A study of junior high school students' involvement in table tennis courses and cognition of leisure benefits in Kaohsiung City

Hui-Chun Hung[1] and Mei-Jen Huang[1]
[1]Department of Physical Education, National Kaohsiung Normal University, Kaohsiung, Taiwan
(Tel.: +886-7-717-2930ext 2911; E-mail: t2081@nknucc.nknu.edu.tw)

Abstract: this study aimed to analyze the different backgrounds of junior high school students in table tennis course involvement and the perception of leisure benefits in Kaohsiung. The "table tennis involvement and leisure benefits cognition questionnaire" was used in this study. The subjects were junior high school students from Kaohsiung City. Hotelling Trace, single-factor multivariate analysis of variance statistical methods was used in data analysis. The results are summarized as follows: (1) Grades and participation in table tennis clubs had significant differences with involvement in table tennis courses for Kaohsiung City junior high school students. However, there was not a significant difference between gender and involvement in table tennis courses. (2) Grades and participation in table tennis clubs had significant differences when examining cognition of leisure benefits in Kaohsiung City junior high school students. However, gender did not have a significant difference with the cognition of leisure benefits of Kaohsiung City junior high school students. Suggestions: (1) There was a need to promote benefits of table tennis participation. (2) Different grades and whether or not participation in table tennis clubs need to have different strategies to increase students' involvement and cognition of table tennis.

Keywords: table tennis, involvement, cognition of leisure benefits.

1. INTRODUCTION

1.1 Background

Since its official introduction at the Olympic Games in Seoul in 1988, table tennis has undergone many developments, evolutions, and innovations. Characteristically, table tennis is a highly skillful sport. Strength, speed, and endurance are not its only requirements; it demands overall coordination, dexterity, explosive power, and anticipation as well, training the mind as well as the body, and placing heavy emphasis on sharpening techniques, strategies, and intelligence [1]. Huang [12] has asserted that table tennis as a sport is a highly desirable choice for extensive promotion. The reasons enumerated are thus: the space and equipment requirements are inexpensive to fulfill; it does not require good weather; age and body build are not prohibiting factors; the intensity is moderate; the chance for sport injuries is low; the rules are easy to understand; essentially, it is a sport in which one can fully participate for a lifetime without trouble. Considering its benefits, especially toward the health of the people, table tennis is definitely a sport worthy of extensive promotion and widespread adoption.

Fang [9] has remarked that participants of a sport will exhibit varying degrees of involvement depending on the nature of the sport and the habits of the participants. Involvement is the measure of the amount of personal interest and dedication regarding the activity. The degree of involvement is influenced by the individual's needs, values, and dispositions, and it in turn influences the individual's willingness for continual participation. In essence, if during participation a person finds table tennis to be a meaningful and important activity, the person would more likely become involved. There have been many studies that have discussed the phenomenon of sport involvement among people of varying characteristics. Chang's [3] study concluded that the two genders differed significantly in terms of their degree of involvement in sports as hobbies and of their cognition of the leisure benefits derived therefrom, with males showing greater involvement and greater cognition of benefits than females. Wu's [27] study on the involvement and leisure benefits of runners concluded that the males exhibited greater continual involvement and cognition of benefits than the females. Wu also came to a similar conclusion when comparing long-term participants versus part-time participants: the former were significantly more involved than the latter. Chen's [4] study on the sport involvement of university students concluded that male students showed significantly greater overall involvement than female students, although the differences between students of different grade levels were insignificant. Additionally, Lee's [17] study on the members of Kaohsiung City's Guang Wu Table Tennis Club found no significant difference in the degree of involvement between the two genders, but that significant differences did exist between participants of different ages, with older participants being more involved. Lai's [15] study on participants of university dance clubs found no significant difference in involvement between the two genders; however, it found people who had participated in the activity for a longer time to be significantly more involved than those who had not participated for as long. It can be surmised, then, that the research targets' personal characteristics were important background variables that influenced the result of sport involvement studies.

Hung [14] defined leisure benefits as the subjective cognition of the beneficial powers of the leisure activity in improving an individual's mental and physical condition or in satisfying the individual's needs, and

described the source of the cognition to be the individual's immediate sensations during and after the activity. Hsieh's [10] study on the leisure benefits of internet usage for children found a significant difference between the two genders, with males recognizing greater benefits than females, but that no significant difference existed between students of different grade levels. Similarly, Lai's [16] study on rollerblade participants of junior college students found the males to have significantly greater cognition of leisure benefits compared to the females, but that no significant difference existed between different grade levels. Cai's [2] study on university students from the Yunlin-Chiayi region found that female students had significantly greater cognition of leisure benefits from participating in a school club as compared to the male students, but that no significant difference existed between different grade levels. Moreover, Hung's [14] study on adventure-based recreation programs for mid- and upper-level elementary students and junior high students found significant differences between the genders, but not across grade levels. Lai's [15] study on participants of junior college dance clubs did find significant differences between the genders, across grade levels, and between long-time participants and newer participants, with females recognizing greater benefits than males. However, Yao's [28] study on members of university theatrical clubs in the Taipei region found no significant differences between genders or across grade levels.

In summary, when studying sport involvement and leisure benefits, the nature of the activity and the characteristics of the target sample are all important background variables that would influence the outcome. In studying students, another variable to be considered is their membership in the school's table tennis club. Therefore, this study proposes to examine the differences in involvement and leisure benefits of Kaohsiung City's junior high students who are taking table tennis courses, with gender, grade level, and membership in the school table tennis club as variables. The study hopes to provide Kaohsiung City with data that can be used to promote and popularize table tennis at the junior high level.

1.2 Objectives

Motivated by the aforementioned goals and background, this study proposed to accomplish the following primary objective:

(1) To understand the difference between Kaohsiung City's junior high students' degree of involvement in table tennis courses and the background variables.
(2) To analyze the difference between Kaohsiung City's junior high students' cognition of the leisure benefits of table tennis courses and the background variables.

2. METHOD

2.1 Sample

The subjects of this study were public junior high school students from Kaohsiung City whose schools enrolled them in table tennis courses during the 99th Taiwanese school-year. In total, 708 students from 17 schools participated in the survey, of which 349 were male students and 359 were female students.

2.2 Research tools

(1) Survey structure

This study examined both the behavioral and psychosocial aspects of involvement. In measuring behavioral involvement, this study refers to Tsai's [22] study on scuba-divers and considered the following four aspects: participation, equipment, other resources, and skill. In measuring psychosocial involvement, this study refers to Chen's [5] study and considered psychosocial involvement as composed of the following three aspects: attraction, centrality, and self-expression. In measuring leisure benefits, this study refers to the studies of Hung [14] and Lin [20], categorizing leisure benefits into the following three aspects: physiological benefits, psychological benefits, and social benefits. This study created a "Table Tennis Involvement and Leisure Benefits Cognition Questionnaire." The questionnaire is divided into three parts: Basic Information, the Involvement Survey, and the Leisure Benefits Survey. Each item is rated using a five point Likert scale system. The levels are "Strongly Agree," "Agree," "Indifferent," "Disagree," and "Strongly Disagree;" and they contribute five, four, three, two and one point respectively towards the total score.

(2) Analysis of survey validity

a. Item analysis on the pilot questionnaire

This study performed a pilot trial of the questionnaire in order to test its validity. Analyses were performed with the data gathered from the pilot trial. Firstly, item analysis was performed according to the procedure explained in Wu and Tu's [26] work. It assessed each item's discrimination power with extreme-group comparisons and homogeneity tests. During extreme-group comparisons, the upper- and lower-group of the total pilot sample, defined as those with test scores in the upper and lower 27% respectively, were isolated, and then t-tests were performed to determine each item's discriminatory power. The critical ratio (CR) was computed, and results showed that for each item the discriminatory power achieved significance ($p < 0.05$). The homogeneity tests measured the correlation of each item with the total score. It had been proposed that a correlation coefficient higher than 0.40 was necessary for determining the existence of correlation [25]. Item analysis on the pilot questionnaire yielded the following results: (1) For the Involvement Survey, all the items achieved significance ($p < 0.05$) in discriminatory power, as well as having correlation coefficients above 0.40; therefore all 23 items were retained. (2) For the Leisure Benefits Survey, items 4, 10, and 16 did not achieve significant discriminatory power, and had correlation coefficients below 0.40; they were therefore discarded. The rest of the items on the Leisure Benefits Survey, 13 in total, all achieved a significant difference ($p < 0.05$), and were retained.

b. Factor analysis on the pilot questionnaire

As explained in Wu and Tu's [26] work, after having performed item analysis the next procedure would be to perform factor analysis to determine the construct validity of the questionnaire. However, it should be ascertained beforehand that the sampling was appropriate for factor analysis by using the Kaiser-Meyer-Olkin measure (KMO) and the Bartlett test of sphericity. For the KMO test, a measure of 0.60 and above would signify adequacy for factor analysis, and a measure of 0.80 and above would signify a high level of adequacy, demonstrating that common factors existed among the items and that the factor model was appropriate. After the tests, the next procedure would be to perform principal components analysis. Factors with eigenvalues greater than 1 would be retained. Subsequently, orthogonal rotation would be performed using varimax rotation. Items with factor loadings greater than 0.30 would be seen correlating adequately with the factors. These factor analysis procedures were performed on the pilot questionnaire that resulted from item analysis, and the conclusions were as follows: (1) For the Involvement Survey, 23 items were retained and they yielded a KMO measure of 0.90, affirming the appropriateness of factor analysis. Four factors with eigenvalues greater than 1 were identified, with all the items having factor loadings greater than 0.30. (2) For the Leisure Benefits Survey, 13 items were retained, and they yielded a KMO measure of 0.92, affirming the appropriateness of factor analysis. Three factors with eigenvalues greater than 1 were retained, and all the items had factor loadings greater than 0.30.

c. Reliability Analysis on the Pilot Questionnaire

After factor analysis was complete, this study employed the Cronbach's α method to test the reliability of both surveys. A higher α would signify greater internal consistency. Wu [25] proposed that in order to qualify a sub-survey as reliable, the α should be 0.70 or above, meanwhile for the composite survey the α should be 0.80 and above. An α of 0.90 and above would signify a high degree of reliability. Reliability analysis on the pilot questionnaire yielded the following results: (1) For the Involvement Survey, the α value of the composite survey was 0.95, and when dividing the survey into sub-categories according to the factors, it was found that the α value for each subcategory fell between 0.77 and 0.95, all surpassing the threshold for reliability, affirming the internal consistency of the survey. (2) For the Leisure Benefits Survey, the α value of the survey was 0.96, and the α value of each factor fell between 0.88 to 0.94, all surpassing the threshold of reliability, affirming the internal consistency of the second survey.

(3) The final questionnaire

The final questionnaire was the product of the aforementioned analysis, and was called the "Table Tennis Involvement and Leisure Benefits Cognition Questionnaire." It was composed of three sections. The first section was called "Basic Information;" the information it requested included the three background variables: gender, grade level, and membership in the school table tennis club. The second section was the "Involvement Survey." It included 4 factors and 23 items: 4 items for the "Participation" factor, 3 items for the "Skill" factor, 11 items for the "Psychosocial Involvement" factor, and 5 items for the "Equipment and Resources" factor. The third section was the "Leisure Benefits Survey." It had 3 factors and 13 items: 3 items for the "Physiological Benefits" factor, 7 items for the "Psychological Benefits" factor, and 3 items for the "Social Benefits" factor.

3. FINDINGS AND DISCUSSION

3.1 The analysis of the background information of the junior high school students' table tennis course

According to the valid questionnaires of this section, using descriptive statistics of frequency distribution and percentage of subjects to understand the distribution of personal information and the variables of the analysis included gender, grade level, and membership in the school's table tennis club. The data from 708 valid sample questionnaires is shown in Table 1.

It can be seen that the number of students who did not participate in the school's table tennis club accounted for more than 90% of the total. It is suggested that school authorities should actively establish table tennis clubs in order to enhance students' involvement in table tennis.

Table 1 The analysis of background information

Variable	Kind of Variables	Sample Size	Percentage
Gender	M(1)	349	49.3
	F(2)	359	50.7
Grade	7 grade(1)	250	35.3
	8 grade(2)	227	32.1
	9 grade(3)	231	32.6
Membership	Yes(1)	44	6.2
	No(2)	664	93.8

3.2 The background variables' influence on the degree of involvement

This section explores the influence of the background variables on the junior high students' involvement in table tennis courses. It primarily relies on a one-way multivariate analysis of variance (one-way MANOVA), and assumes $p = 0.05$ as the threshold for concluding that significant differences exist as the background variables vary. Additionally, in the discussion of the grade level variable, if a significant difference is found, a further analysis composed of a one-way analysis of variance (one-way ANOVA) and Scheffé's method is performed to determine the exact nature of the difference between each grade level.

(1) Gender: as shown in Table 2, the comparison of the four involvement factor scores across gender yielded a Hotelling value of $T^2 = 0.02$, and a Wilks' value of $\Lambda = 0.98$, with a corresponding value of $p = 0.003$ signifying that among the four factors, at least one factor

demonstrated a significant difference between the data for the two genders. Further analysis revealed that, for each factor, no significant difference was found between the scores for the two genders. The result agreed with previous research such as the works done by Fang [9], Yao [28], Hsu [11], Lai [15], Lee [17] and Chen [6]. Of special note is Lee's [17] study, which concluded that the difference in gender did not affect people's degree of involvement in table tennis activities. In conclusion, for junior high students, gender was not a factor that affected the degree of involvement in table tennis classes.

Table 2 Comparison of involvement across genders

Factor Name	Gender	Avrg. Score	Standard Dev.	Sample Size	F
Participation	M (1)	3.58	0.92	349	0.48
	F (2)	3.63	0.90	359	
Skill	M (1)	3.48	0.99	349	0.52
	F (2)	3.42	0.99	359	
Psychosocial	M (1)	3.33	0.87	349	4.49
	F (2)	3.20	0.79	359	
Equipment & Resources	M (1)	2.90	0.96	349	1.41
	F (2)	2.82	0.93	359	
Wilks $\Lambda = 0.98$*		Hotelling $T^2 = 0.02$*			
*$p < 0.05$					

(2) Grade: Table 3 illustrates the results from comparing the degree of involvement across grades. Among the four involvement factors, at least one manifested a significant difference across grades ($\Lambda = 0.96$, $p < 0.05$). Further analysis demonstrated that, for the "Participation" and "Equipment and Resources" factors, the difference across grades achieved significance ($Pj = 0.01$), with 7th grade junior-high school students scoring higher in the "Participation" factor than 8th grade students and in the "Equipment and Resources" factor than both 8th grade and 9th grade students. It is surmised that the phenomenon is due to 7th grade students being newcomers to junior high school, and are thus less familiar with the table tennis classes, leading to greater willingness to give full attention to the coach's instructions on table tennis techniques and knowledge. Furthermore, as absolute beginners, they may be more willing to display greater care and discernment in choosing and purchasing their table tennis equipment. Therefore, they demonstrated higher involvement with respect to the "Participation" and "Equipment and Resources" factors.

Table 3 Comparison of involvement across grades

Factor Name	Grade	Avrg. Score	Std. Dev.	Sample Size	F	Post hoc
Participation	7 grade (1)	3.71	1.00	250	14.87**	(1) > (2)
	8 grade (2)	3.45	0.86	227		
	9 grade (3)	3.64	0.84	231		
Skill	7 grade (1)	3.53	1.07	250	2.21	
	8 grade (2)	3.34	0.95	227		
	9 grade (3)	3.47	0.92	231		
Psychosocial	7 grade (1)	3.34	0.93	250	3.17	
	8 grade (2)	3.15	0.77	227		
	9 grade (3)	3.29	0.76	231		
Equipment & Resources	7 grade (1)	3.08	1.01	250	11.68**	(1) > (2)
	8 grade (2)	2.68	0.93	227		(1) > (3)
	9 grade (3)	2.80	0.83	231		
Wilks $\Lambda = 0.96$	**$p < 0.05$	**$Pj < 0.01$	($Pj = \alpha \div 4 = 0.01$)			

(3) Membership in the school's table tennis club: Table 4 illustrates the results from comparing the degree of involvement between students who were members of the school's table tennis clubs and students who were not. Among the four involvement factors, at least one factor manifested a significant difference when comparing members to non-members. Further analysis revealed that there were significant differences in the scores for all four factors. It can be concluded that junior high students who were members of the school table tennis club were significantly more involved in all four aspects, "Participation," "Skill," "Psychosocial Involvement," and "Equipment and Resources," than students who were not members. This conclusion is in agreement with the conclusion of Lai's [15] study, which, in studying members of junior college dance clubs, found that those who had participated for a longer time showed significantly greater involvement than the newer members. Similarly, Ewert and Hollenhorst [8] found that, as people participate in an activity more and more frequently, they become more and more involved. Furthermore, Lee [17] found that the degree of involvement corresponded positively with the measure of skill; in other words, the more involved a player was, the more skillful he or she was likely to be. Therefore, it is concluded that junior high students who were members of the school's table tennis club were more involved, in terms of all four involvement factors, than students who were not members.

Table 4 Comparison of involvement across members of the school's table tennis clubs

Factor Name	Member -ship	Avrg. Score	Standard Dev.	Sample Size	F	Post hoc
Participation	Yes (1)	4.20	0.72	44	21.10**	(1) > (2)
	No (2)	3.56	0.91	664		
Skill	Yes (1)	3.96	0.85	44	12.84**	(1) > (2)
	No (2)	3.42	0.99	664		
Psychosocial	Yes (1)	3.99	0.63	44	37.35**	(1) > (2)
	No (2)	3.22	0.82	664		
Equipment & Resources	Yes (1)	3.77	0.71	44	47.21**	(1) > (2)
	No (2)	2.80	0.92	664		
Wilks $\Lambda = 0.93$*		Hotelling $T^2 = 0.08$*				
*$p < 0.05$	**$Pj < 0.01$	($Pj = \alpha \div 4 = 0.01$)				

3.3 The background variables' influence on the cognition of leisure benefits

This section explores the influence of the background variables on the students' cognition of the leisure benefits of table tennis.

(1) Gender: Table 5 shows that there is no conclusive evidence of the two genders experiencing significantly different measures of leisure benefits, with respect to all three factors: "Physiological Benefits," "Psychological Benefits," and "Social Benefits." The results correspond with the conclusions of previous studies, including the works of Chen [7], Hung [14], Ma [21], Yao [28],Wu [24], Hsu [11] and Wang [23], all of which did not find

gender to affect the cognition of leisure benefits. Therefore, it is concluded that gender does not affect junior high students' cognition of the leisure benefits of participating in table tennis courses.

Table 5 Comparison of cognition of table tennis' leisure benefits across genders

Factor Name	Gender	Avrg. Score	Standard Dev.	Sample Size	F
Physiological	M (1)	3.63	0.93	349	3.37
	F (2)	3.50	0.94	359	
Psychological	M (1)	3.56	0.94	349	1.64
	F (2)	3.48	0.91	359	
Social	M (1)	3.44	0.98	349	4.29
	F (2)	3.29	0.94	359	
Wilks Λ = 0.99		Hotelling T^2 = 0.008			

(2) Grade: as Table 6 illustrates, among the three leisure benefits factors, at least one factor manifested a significant difference when comparing grades. Further employment of ANOVA and Scheffé's method revealed that for the factors "Physiological Benefits" and "Psychological Benefits," the differences across grades achieved significance (Pj = 0.02). The results demonstrated that for 7th grade students, the cognition of table tennis' "Physiological Benefits" and "Psychological Benefits" was higher than it was for 8th grade students; meanwhile, the cognition of "Social Benefits" was not significantly different. The results correspond with the conclusion of Lai [15] on the cognition of leisure benefits of junior college dance club participants, in which it was found that a significant difference existed when comparing across students' grades. Furthermore, Li and Fang's [18] study on the fitness and amount of exercise of junior high students found that 7th grade and 8th grade students typically exercise more than 9th grade students do. Another study [19] also demonstrated that, among junior high students, 9th grade students had the worst overall fitness. Additionally, Huang's [13] study on participation in sports, sports acknowledgement, and fitness of junior high students found that the lower grade level students exhibited greater sports participation than higher grade level students, and that the higher the grade level, the higher the ratio of students who lacked the habit of participating in sports. Today's Taiwanese educational environment places heavy emphasis on graduating into a top-level school, reducing the time junior high school students have for extracurricular sport activities. However, 7th grade students usually have smaller workloads and less pressure relative to 8th and 9th grade students, and are therefore able to spend more time involved in sports, leading to a corresponding higher cognition of the leisure benefits of sport activities.

Table 6 Comparison of cognition of table tennis' leisure benefits across grades

Factor Name	Grade	Avrg. Score	Standard Dev.	Sample Size	F	Post hoc
Physiological	7 grade (1)	3.67	1.02	250	5.16**	(1) > (2)
	8 grade (2)	3.41	0.90	227		
	9 grade (3)	3.60	0.86	231		
Psychological	7 grade (1)	3.62	0.99	250	4.75**	(1) > (2)
	8 grade (2)	3.37	0.88	227		
	9 grade (3)	3.56	0.89	231		
Social	7 grade (1)	3.47	1.05	250	2.96	
	8 grade (2)	3.26	0.89	227		
	9 grade (3)	3.35	0.91	231		
Wilks Λ = 0.98*						
*p < 0.05 **Pj < 0.02 (Pj = α÷3 = 0.02)						

(3) Membership in the school's table tennis club: as shown in Table 7, among the three leisure benefits factors, at least one factor manifested a significant difference when comparing members and non-members. Further analysis shows that junior high students who were members of the school table tennis club entertained higher cognition of the activities' "Physiological Benefits," "Psychological Benefits," and "Social Benefits" as compared to students who were not members. The results mirrored the conclusion of Lai's [15] study on the involvement and cognition of leisure benefits of junior college dance club participants, in which it was found that those who had been involved in the club for a longer time recognized greater leisure benefits than those who had been involved for a shorter time. Therefore, it is concluded that junior high students who were members of the school table tennis club had greater cognition of the leisure benefits of table tennis than students who were not members.

Table 7 Comparison of cognition of table tennis' leisure benefits and members of the school's table tennis clubs

Factor Name	Membership	Avrg. Score	Standard Dev.	Sample Size	F	Post hoc
Physiological	Yes (1)	4.17	0.71	44	20.39**	(1) > (2)
	No (2)	3.52	0.94	664		
Psychological	Yes (1)	4.21	0.64	44	26.94**	(1) > (2)
	No (2)	3.47	0.92	664		
Social	Yes (1)	4.04	0.78	44	24.13**	(1) > (2)
	No (2)	3.32	0.95	664		
Wilks Λ = 0.96*		Hotelling T^2 = 0.04*				
*p < 0.05 **Pj < 0.02 (Pj = α÷3 = 0.02)						

4. CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

(1) Difference in degree of involvement for junior high students with varying background variables:

This study showed that the involvement of junior high students in table tennis activities was not influenced by gender; that the "Participation" factor of involvement was higher for 7th grade students as compared to the other grades; and that the members of the school's table tennis club exhibited greater involvement compared to non-members. Therefore, it is concluded that "Participation" is an important factor for

the involvement of junior high students in table tennis courses. The study also showed that students who were members of the school's table tennis club scored higher on the "Skill" and "Psychosocial Involvement" factors. It could be worth the effort for schools to ensure the establishment of table tennis clubs, as not only would it promote sports and exercise, it would also encourage greater involvement in table tennis activities. Additionally, the study showed that 7th grade students were more involved in terms of "Equipment and Resources" commitment, and that members of table tennis clubs were similarly more involved compared to non-members. If schools could provide more adequate equipment, it would also contribute towards increasing the degree of junior high students' involvement in table tennis.

(2) Difference in cognition of leisure benefits for junior-high students with varying background variables:

This study showed that the measure of students' cognition of table tennis' leisure benefits was not influenced by gender. It also showed that first year junior high students recognized greater "Physiological" and "Psychological" benefits compared to students in other grades, manifesting a declining cognition of leisure benefits as students grew older. Schools are therefore encouraged to establish comprehensive plans to facilitate and encourage students to participate in sports, in order to enhance their skills in physical activities and derive healthy benefits. Schools are also encouraged to communicate the benefits of table tennis to the students to increase their appreciation of its leisure benefits. The study showed that, at the same time, students who were members of table tennis clubs showed greater cognition of benefits than non-members. If schools are able to maintain table tennis clubs, to allocate time for students to participate together in challenges and competitions, and furthermore to institute frequent games and tournaments, it would not only encourage involvement, but also increase the cognition of benefits.

4.2 Suggestions

(1) Suggestions to the government's educational institutions:

It is important for the relevant governmental institutions to acknowledge the benefits and utility of sports promotion. They are encouraged to take the responsibility to implement sports promotion, to communicate the physical and mental health benefits of table tennis activities, to advocate good exercise practices among table tennis participants, and to encourage schools' adoption of table tennis and their establishment of table tennis facilities, all for the ultimate goal of increasing students' understanding and involvement in table tennis. Although some schools may already possess serviceable table tennis facilities, such facilities are usually only available during classes. If the government can effectively take advantage of the sharing of community resources to provide table tennis facilities for public use and if it can also effectively advertise the operating hours of such facilities, it would allow students to easily start participating in table tennis activities with minimal equipment requirement, and provide them the opportunity to become more involved. This study also showed a positive correlation between table tennis involvement and cognition of its leisure benefits. If, while promoting table tennis, the government can also organize frequent fun activities to attract students, it would also contribute towards increasing the students' cognition of table tennis' leisure benefits.

(2) Suggestions for Kaohsiung City junior high table tennis courses:

This study showed students' cognition of leisure benefits to decline as they grow older. Physical education teachers are encouraged to advocate the benefits of table tennis activities, especially in consideration of the fact that it is a highly safe sport, that it does not require elaborate equipment, and that it is able to provide great physical and mental health benefits for minimal cost. Unused spaces in the school can be used as table tennis classrooms. Table tennis courses can be incorporated into the physical education curriculum. These measures would not only increase students' cognition of its leisure benefits, but encourage greater involvement. Furthermore, it is shown that students who are members of school table tennis clubs exhibit both greater involvement and greater cognition of leisure benefits. Therefore, schools are encouraged to establish table tennis clubs or teams to provide students with the opportunity to increase their involvement and improve their cognition of leisure benefits.

(3) Suggestions for future studies:

The scope of this study was limited to students currently studying in Kaohsiung City's public junior high schools. Future studies on this topic may be able to expand the scope and include students from elementary schools, high schools, and even higher education institutions. If time and resources permit, studies could be done on the junior high students of the entire nation, with the goal of investigating regional differences in table tennis involvement of cognition of table tennis benefits. Lastly, future studies could target teachers and parents as well, and compare their appreciation of table tennis courses to the appreciation of the students, in an effort to understand teachers' and parents' influence on the students' involvement and cognition of leisure benefits.

REFERENCES

[1] Beijing Institute of Sports Science. *Training Guide for Coache*. Wen-shi-ze Publishing, 1994.

[2] Cai, S.T. *A study of academic stress, leisure efficiency and scholarship achievement - A case students of Yunlin Chiayi County universities* (unpublished master degree thesis). Nanhua University, Chiayi County, 2010.

[3] Chang, K.C. *A study on bicycling participants' recreation involvement and recreation benefit*

(unpublished master degree thesis). National Taiwan Normal University, Taipei, 2008.

[4] Chen, C.F. *Study on the correlation of participation, involvement and satisfaction of university students in recreational sports* (unpublished master degree thesis). National Chiayi University, Chiayi City, 2007.

[5] Chen, C.W. *A study on relationship among enduring involvement, benefits of leisure and well-being in Taiwan hiking* (unpublished master degree thesis). Ming Chuan University, Taipei, 2006.

[6] Chen, K.Y. *A study of surfers'life styles, leisure involvement and consumption decision making styles* (unpublished master degree thesis). Fu Jen Catholic University, Taipei County, 2009.

[7] Chen, Z.Y. *Study on the recreation participation, recreation benefits, and job satisfaction of elementary school teachers* (unpublished master degree thesis). National Taiwan Normal University, Taipei, 2001.

[8] Ewert, A. and Hollenhorst, S. Testing the adventure model: empirical support for a model of risk recreation participation. *Journal of Leisure Research*, 21, 124-139, 1989.

[9] Fang, Y.Y. *The relationships between recreation involvement and recreation experience - A case study of Pei-tou hot spring sites* (unpublished master degree thesis). National Taiwan Normal University, Taipei, 2002.

[10] Hsieh, C.C. *A study on the relationships between perceived freedom in leisure and leisure benefits among the participants of network of elementary school students* (unpublished master degree thesis). National Taichung University of Education, Taichung City, 2009.

[11] Hsu, H.S. *A study on relationships among leisure motivation, involvement levels and leisure benefits in surfing* (unpublished master degree thesis). National Chung Cheng University, Chiayi County, 2007.

[12] Huang, M.J. Discussion on the principles behind the "plan on augmenting the sports-participating population" and the promotion of table tennis. *The University Physical Education and Sports*, 89, 1-4, 2007.

[13] Huang, M.K. *The effect of sports participation and exercise perception on fitness of junior high school students in Penghu* (unpublished master degree thesis). Fu Jen Catholic University, Taipei County, 2005.

[14] Hung, H.C. *A study of leisure benefits of adventure-based recreation programs* (unpublished master degree thesis). National Taiwan Normal University, Taipei, 2002.

[15] Lai, W.L. *A study of the involvement and leisure benefits to participants of dance sport clubs in colleges* (unpublished master degree thesis). Taipei Physical Education College, Taipei, 2008.

[16] Lai, Y.S. *A study of exploring the backgrounds, the motivations, as well as the leisure benefit of university students that participate in inline skating* (unpublished master degree thesis). National Pingtung University of Education, Pingtung City, 2009.

[17] Lee, I.H. *A study on relationships among achievement, motivation, involvement levels and skill levels of the table tennis players - GuangWu table tennis club in Kaohsiung as an example* (unpublished master degree thesis). Chaoyang University of Technology, Taichung City, 2008.

[18] Li, T.H. and Fang, C.L. A study of physical activity level and its affecting factors of junior students in Taipei City. *Physical Education Journal*, 25, 139-148, 1998.

[19] Liang, Y.M. and Hung, W.L. Establishing the data on the fitness norm of elementary and middle school students. *The University Physical Education and Sports*, 50, 69-72, 2000.

[20] Lin, Y.M. *The research on swimmers' exercise of adherence in benefits of leisure and wellbeing* (unpublished master degree thesis). National Yunlin University of Science and Technology, Yunlin County, 2004.

[21] Ma, S.C. *The relationship between leisure benefits and life stress: An example of the hiker in suburban mountains of Kaohsiung area* (unpublished master degree thesis). National Taiwan Normal University, Taipei, 2002.

[22] Tsai, C.L. *The study of gender role and leisure involvement of recreational scuba divers* (unpublished master degree thesis). National College of Physical Education, Taoyuan County, 2005.

[23] Wang, C.T. *The study on elementary school teachers' leisure involvement, leisure benefits and wellbeing* (unpublished master degree thesis). Asian University, Taichung City, 2009.

[24] Wu, K.H. *The research on the motivation, the sustained participation, the recreational effect, and the sense of happiness of mountain hikers* (unpublished master degree thesis). National Taiwan Institute of Physical Education, Taichung City, 2006.

[25] Wu, M.L. *SPSS Operation and Application: The Practice of Quantitative Analysis of Questionnaire Data*. Wu-nan publishing, Taipei, 2009.

[26] Wu, M.L. and Tu, G.T. *SPSS and the Application and Analysis of Statistics*. Wu-nan publishing, Taipei, 2005.

[27] Wu, Y.F. *A study on enduring involvement, leisure benefits and wellbeing of road running participants* (unpublished master degree thesis). National College of Physical Education, Taoyuan County, 2006.

[28] Yao, T.P. *A study on the attitude, involvement and benefit of the leisure-motivated drama amateur* (unpublished master degree thesis). DaYeh University, Changhua County, 2005.