

## **A Study on the Impeding Factors of Disability Participate in Table Tennis in Taiwan**

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**Abstract** : The purposes of this study were to investigate current situation and impeding factors of disability participate in table tennis. The research tools adopted is questionnaire. Means of statistics in use in this research include: Descriptive Statistics, t-test and One-way Anova. To analysis different of impeding factors by background variables and disability classification of disability individual who participate in table tennis. Results of this research are as follows:

- 1.Disability who participate in table tennis almost 80% were male, more than 60% married, more than 50% childless, more than 60% were 40 to 49 years old, 40% education were high school, occupation were military, civil servant and teacher close 35%, about 23% earn less 20,000NTD per month.
- 2.Different disability classification of disability who participate in table tennis were, more than 75% were polio, acquired were close 90%, Disability classification of ITTC were more than 50% on TT4 and TT5. Use walking stick help to walk was 34.12% and useless any thing to help walking was 31.76%.
- 3.Among the background variables, gender, married, child, age, education, occupation, income per month show no significant variance for impeding factors to participate in table tennis.
- 4.Among the inherent or acquired and classification of disability show significant variance for impeding factors to participate in table tennis.

**Keywords: Disability, impeding factors, table tennis**

### **1 Historical Background**

In 2000's Special Olympics held at Sydney, there were a total of one gold, two silver and four bronze medals awarded; and in table tennis alone, Taiwan had won two silver and two bronze medals. Back in 2004's Athens Special Olympics, our nation was awarded with two gold, two silver and two bronze each; table tennis awards accounted for one silver and two bronze awards. This researcher has been involved in promoting table tennis for years. In addition, this researcher also witnesses that the exercise itself would be vital, in the sense of leisure life, to those who are disabled. It not only can pace both mind and body with enhancement noted in physical fitness, but also get to know friends of the same aspirations during exercise sessions, culminated with a sense of achievement.

At the time, table tennis is one of the many athletic items with ardent participation by the bodily disabled in Taiwan. There are at least 20 tournaments for bodily disable athletes held annually both domestic and abroad. These contests not only provide the bodily disabled with opportunities of participating to these activities, but also motivate their participation to the sport of table tennis. Hence, for these table tennis participants, while engaging in the sports of table tennis, the conditions developed as well as impediments derived from the participation, motivated this author in this research.

The purpose of this research is to understand the impediment factors for bodily disabled athletes in participating to table tennis here in Taiwan. And based on research findings, suggestions will be made to training

organizations, the coaches as well as to bodily disabled athletes. Additionally, it would provide relevant organizations for reference as to enhance and rid off the impediment factors for bodily disabled athletes in participation to table tennis. Furthermore, it would enhance the passion and motivation for the bodily disabled to participate table tennis, ensued with the upgrade of living qualities for bodily disable persons.

The main purpose for this research:

- (1) Understand the current status for those who disabled in the participation with table tennis in Taiwan.
- (2) Compare and locate the impediment factors for those disabled in participating to table tennis here in Taiwan.
- (3) Analyze the different variables as well as differences of impediment factors between different levels in disability for the disabled in general, while participating to table tennis sport.

### **2 Research methodology**

The subjects under this study were those who registered to the participation for 2005 Postal service and life insurance cup dedicated to nation's disabled tennis athletes. And these athletes originated from the bodily disabled persons, a total of 94.

The questionnaire for this research was the primary survey tool. The contents for questionnaire included for parts. The first part was the survey for table tennis participation status. The contents of survey included the number of days, time and duration, transportation, time spent on traffic, participation location, any fees paid, any

available coaching, any actual contest entered, ever served as athletes representing our country and years of the athletic experience in table tennis. The second part was the measurement chart this research adopted for questionnaire for the impediment factors for participating table tennis, originated from referencing Tsai, Hui-Chun's (2003) "Survey query for impediment factors of adults participating leisure athletic events" in addition to compliant to bodily disabled special configuration, and these were compiled into 18 questionnaires as result. The third part was primarily

the survey tables for bodily disabled information acquisition. This questionnaire was to reference Kuan, Te-Tsai (2003) compiled "Survey for orientation of leisure exercise for bodily disabled". And the questionnaire included type of disability, born with disability, classification level and the auxiliaries to assist walking, etc. The fourth part was primarily personal information. The questionnaire included filling out basic information (including gender, marital status, siblings, age, education background, profession and income, etc). Please reference the following (Fig. 1)

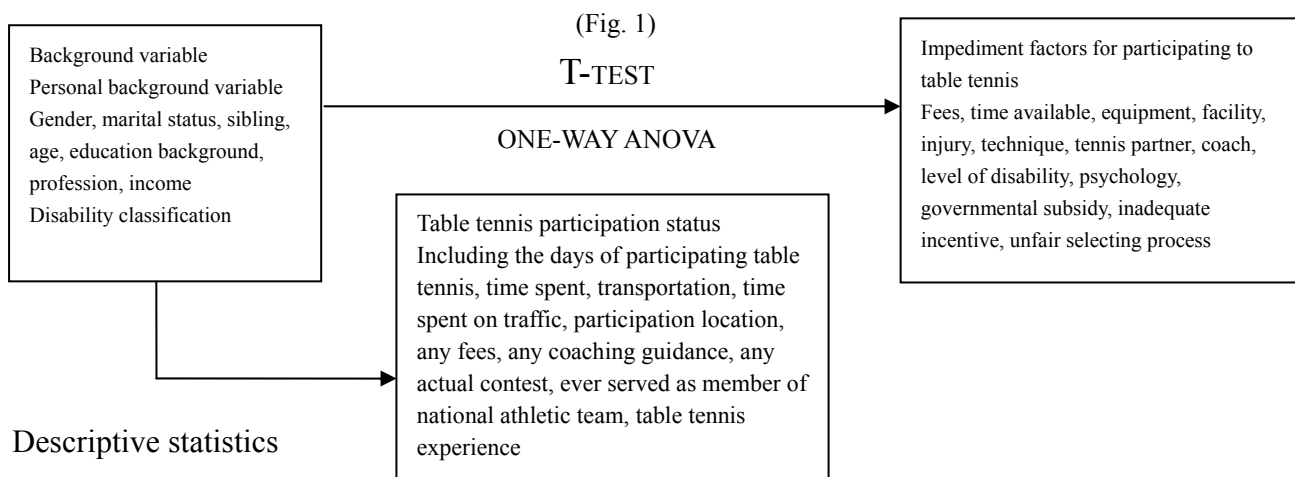


Table1. Itemized analysis summary for "Athletic impediment factor chart for bodily disabled to articulate to table tennis"

# of quiz		CR,Critical Ratio	Relevancy with the measurement chart's total scoring	Notes
6	I felt like that I was frequently injured after	2.801*	0.371	Deleted
7	I felt that every time when I participated to table tennis game, I was always in high	2.401*	-0.195	Deleted
8	I felt that I frequently got physically exhausted which led to further weakening	2.140*	0.306	Deleted
9	I felt that there was less time than I would have spent with my family members.	0.951	0.186	Deleted
11	I could not participate with table tennis	1.830	0.302	Deleted
23	I felt that there were too few subsidies from local government to the bodily disabled	2.584*	0.339	Deleted

\*p<.05

(1) Compilation for the questionnaire .

The research tools were carefully tested after compilation by professionals, and they were modified and finalized with some of the question updates and minor wording corrections in compliance to finished pre-questionnaire requirements. In filling out the measurement chart, this research adopted the so called "five-point Likert item". Since the reactions to this Likert scale are the most distinct with sufficient differentiation, therefore, under most circumstances, the five-point Likert measurement chart is the most reliable design

(Chiu, Yung-Chiao, 2005;). In the five-point Likert item, the format for rating is:1. "Strongly disagree"; 2. "Disagree"; 3. "Neither agree or disagree"; 4. "Agree"; ; 5. "Strongly Agree"

(2) Item analysis

After filing away the collected survey query sheets, we applied the criterion of internal consistency which sequenced the summarized scores for all the participants' measurement chart conducted in the bathroom facility, then, arranged for those who scored the top 27% as the high-score team and the bottom 27% as the low-score team. By applying t-test for the participants under the same question posed, we arrived with the value of "critical ratio" for each query . Then, followed with correlation analysis to compute the product-moment correlation between each item and total scores. If the related coefficient did not exceed the standard .40, this would signify that this question item could not distinguish the reaction level for the participant under test (i.e. having no distinguishing effect), and it should be crossed out or deleted. As long as the distinguishing capability could match to the level of the question posed, it could then be selected as the official question. (Wang, Chun-Ming, 1999)

1.Within the original 23 questions of "Athletic impediment factor chart for bodily disabled to participate to table tennis", the 9<sup>th</sup> and the 11<sup>th</sup> questions were deleted because they did not reach the significance level. Other than these, the significance

levels for the 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> and 23<sup>rd</sup> questions opposed to the measurement chart's total scoring respectively were less than .40, thus, these were also deleted. 17 out of the 23 questions were retained as result. ( Table 1)

(3)Factor analysis

The factor analysis for this research primarily adopts "Principal component analysis" to analyze the common factors, which adopts "Varimax" to sample the

factor's characteristic value greater than 1.0. In this research survey, the impediment factor portion for the bodily disable participating to table tennis sport was sampled for four factors with each Eigen value separately as 32.215, 11.907, 9.387 and 8.000, and the accumulated interpreted variance was 61.51, like depicted in Table 2:

Table 2. Summary table for factor "Athletic impediment factor chart for bodily disabled to participate to table tennis"

Item No.	Question	Factor 1	Factor 2	Factor 3	Factor 4
17	I felt frustrated because I frequently needed to handle wheelchair.	0.828			
18	I felt I was severely disabled therefore I was afraid of participating.	0.748			
10	I felt that every time I finished off playing, and I was sweating all over and felt uncomfortable thus I did not want to participate.	0.716			
20	I felt unable to get to know the friends whom I wanted to associate with.	0.667			
19	I felt there were too many players during activity and there were few tables available.	0.608			
13	I felt not to join because my family members were against this.	0.608			
14	I felt that I was not skilled enough and also lack of practicing companions therefore I did not want to participate.		0.778		
12	I felt there was lack of coaching, therefore I did not want to participate.		0.753		
16	I felt that I was unable to find an opponent player or coach therefore I lost interest.		0.751		
15	I felt that I was not able to upgrade my playing skill and felt bored, therefore I did not want to participate.		0.746		
2	I felt I spent too much on the equipments.			0.751	
4	I felt that, by participating to table tennis, it made me have less financial income.			0.739	
1	I felt that the participation to table tennis wasted too much time in transit.			0.716	
22	I felt that Chinese Taipei Paralympics Committee was into unfair practice in the selecting for national athletic team members as well as coaching staffs, and this prompted me with resignation from participation.				0.838
21	I felt there was not enough national incentive or encouragement to the disabled, which discouraged my motivation to participate to table tennis.				0.699
3	I felt there was too few or none Barrier-Free Facilities and this was rather inconvenient to me.				0.607
5	I felt that the installation and equipments were not up to par, and usually felt that I would get hurt.				0.561
Characteristic Value		5.476	2.024	1.596	1.360
Eigen value%		32.215	11.907	9.387	8.000
Accumulated Eigen value%		32.215	44.122	53.509	61.508

(4)Factor contents and nomenclatures

The first factor is primarily concerned with psychological self which contains frustration regarding wheelchair transport, level of disability led to afraid to participate, body stickiness preventing from participation, too many players without available table to practice and family member's objections to participate, etc. Therefore it is named as "Self rejection factor". The second factor contents include lack of practicing partners, lack of coaching guidance, unable to acquire encouragement and unable to upgrade playing skills, etc. Therefore it is named as "skill and coaching factor". The third factor contents include too expensive, less economical income, too much time wasted in traffic. Therefore it is named as "economical and traffic factor". The fourth factor

contents include unfair selection process, inadequate incentive, unable to acquire encouragement, very few Barrier-Free Facilities and poor playing facilities, etc. Therefore, it is named as "policy and installation factor".

(5) Reliability for measurement chart

According to a measurement chart or survey with good reliability coefficients must have its reliability coefficients for the total measurement chart above 0.80, coefficients between 0.70 and 0.80, are still acceptable. For sub-measurement chart, reliability coefficients are better off above 0.70, coefficients between 0.60 and 0.70, are still acceptable. From the above, we can learn that, this measurement chart's reliability is still in good range (Table 3).

Table 3. The summarized reliability analysis for “Athletic impediment factor chart for bodily disabled to participate to table tennis”

Name of	No. of question	Cronbach’s $\alpha$
Self rejection	10, 13, 17, 18, 19,	0.833
Technique	12, 14, 15, 16	0.830
Economic and	1, 2, 4	0.685
Policy and	3, 5, 21, 22	0.693
Total		0.856

(6) Validity for measurement chart

The compilation for this research’s measurement chart references the compiled measurement charts by Tsai, Hui-Chun (2003) and Kuan, Te-Tsai (2003). In addition, it accommodates the characteristics of table tennis sport for the disabled with modifications ensued with careful review by both the scholars and professionals. Factor analysis methodology is thus conducted to certify the construct validity for measurement chart.

(7) Official measurement chart

This research’s “Athletic status and impediment factor survey for bodily disabled to participate to table tennis” was completed after test trial for survey sheet, item analysis and factor analysis. The survey can be decomposed into four parts:

(A) Table tennis participation status:

- 1.How many days in a week do you play table tennis?
- 2.How long do you play table tennis each time you engage in this sport?
- 3.What are the primary transportations when you go to play table tennis ?
- 4.How long does it take in a round trip to get to the location for table tennis?
- 5.What are the locations where you play table tennis ?
- 6.Do you have to pay for the location you play or the organization which it is affiliated to on regular basis ?
- 7.Is there any coaching available at the location where you play table tennis ?
- 8.Have you ever participated with any table tennis tournament dedicated for the bodily disabled?
- 9.Have you ever been selected as the athlete who represented our nation for bodily disabled table tennis tournament?
- 10.How long have you being participated in table tennis?

(B) Athletic impediment factor chart for participating to table tennis

- 1.I felt that my family members are against it therefore I don’t want to participate.
- 2.I felt that every time I finished off playing, and I was sweating all over and felt uncomfortable thus I did not want to participate.
- 3.I felt frustrated because I had to carry and transport the wheelchair every time I went to the game.
- 4.I felt since I was severely disabled and was afraid of going to the game.
- 5.I felt that there were too many players onsite and lack of table to play.
- 6.I felt that I could not get to know the friends I desired.

7.I felt that the lack of coaching diminished my desire to participate.

8.I felt that I was not proficient enough to play as well as lack of partner to practice, therefore I did not want to participate.

9.I felt that it was also impossible to upgrade my playing skills and got frustrated, therefore I did not want to participate.

10.I felt that I couldn’t get the encouragement from either other players or coaches, therefore I was not motivated.

11.I felt that too much time spent on traffic while attending the table tennis sport.

12.I felt the equipments were too costly.

13.I felt that my income tended to be less and less while participating to the game of table tennis.

14.I felt that there were too few Barrier-Free Facilities or it was simply nonexistent which would be inconvenient.

15.I felt the facilities were rather lacking and constantly worried that I could get hurt.

16.I felt that there wasn’t enough national incentives provided to the bodily disabled, which tended to lower my motivation to participate to table tennis sport.

17.I felt that Chinese Taipei Paralympics Committee was into unfair practice in selecting national athletic team members as well as coaching staffs, and this prompted me with resignation from participation.

(C) Bodily disabled information

- 1.What is the your bodily disabled category ?
- 2.Is the disability congenital or postnatal ?
- 3.What is the category of table tennis that you are classified as ?
- 4.What kind of assistant equipment do you use while walking ?

(D) Personal information

- 1.Gender
- 2.Marital status
- 3.Any kids?
- 4.Age
- 5.Educational background
- 6.Profession
- 7.Average monthly income

**3.Findings and discussions**

(1) Current status for the bodily disabled with different background variables participating to table tennis sport

According to the information available, those who are bodily disabled participating to table tennis sport are predominantly male (78.82%). In the marital status portion, most of them are married with 64.71%. And 52.94% of the persons being interviewed have no kids. As for the age category, predominant group is between the age of 40~49, which accounts for 64.71% of the interviewed. As for the portion for highest educational background, they are high (vocational) school (40.00%), junior college (23.5%), university (18.82%), junior high

(11.76%), above graduate school (4.71%) and others (1.18%).

In the area of profession, 34.12% of the participants under test are military, civil servant and teaching. Then it is followed by commerce (12.94%), labor (9.41%) and (1.18%) in agriculture, lumber, fishing, animal and stock-raising related professions. In the average monthly income, those who have less than 20,000NTD belong to the predominant group, accounting for 23.53% in the total persons under test. Then followed by monthly income between 40001~50000 NTD (18.82%). The rest are respectively with monthly income in the range of 20001~30000 NTD (17.65 %), 30001~40000 NTD (16.47%), 50001~60000 NTD (11.76 %), 90001 NTD and above (4.71 %), 60001~70000 NTD (3.53 %), 70001~80000NTD(2.35 %),80001~90000NTD which is in the group with least participants under test with only 1.18%.

(2) Current status for attending the table tennis sports from bodily disabled with different level of disability

According to our information, in the category of bodily disabled protion, there is 3.53% suffering Cerebral Palsy, 75.29% with polio, 15.29% with spinal chord injury, 2.35% with limb amputation and 3.53% in multiple disabilities. As for whether the disability is congenital or postnatal, the former accounts for 10.59% of the persons under test and the latter with 89.41%.

As for what kind of category in table tennis: For those who under test are categorized in TT1 accounts for 4.71% of the total; 0.00% in TT2, 10.59% in TT3, 27.06% in TT4, 23.53% in TT5, 2.35% in TT6, 2.35% in TT7, 16.47% in TT8, 5.88% in TT9 and 7.06% in TT10.

As for what kind of assisting equipments being used while walking, 17.65% using wheelchair, 34.12% with walking sticks, 31.76% without any assisting equipments, and others accounted for 16.47%.

(3) In the portion of what kind of assistant equipment being used during walking, there are 17.65% of the persons under test who use wheelchair, 34.12% using walking stick, and 31.76% not using any assistant equipments at all, and others accounted for 16.47% of the total under test.

According to information, for those who bodily disabled with different background variables, gender, marital status, whether having kids, age, educational background, profession and monthly income, etc, did not attain the significance level in four of the profiles for impediment factors participating table tennis. And these four profiles were “self-rejection”, “technique and training”, “economy and transportation” and “policy and installation”.

(4) Analyze to determine whether there exists significant difference for the athletic impediment factors of those who are bodily disabled with different level of disability in participating to table tennis

According to information, for those who are congenital disabled or postnatal disabled of bodily

disabled persons, there were significant differences in the profile of “policy and installation” (p-value = .048: p<.05). And this could be attributed to the fact that those who disabled did show the reaction to the policy as well as the gap between anticipation and reality in using the facilities, entailing with performance of difference between the timeframe of prior to and after the occurrence of bodily disability. For those who are congenitally disabled, from birth up to growing up, they are already used to the feeling from the policy as well as the usage of facilities, therefore, there are some differences. Detailed as follow ( Table 4)

Table 4 : t-test for athletic impediment factors for those who either congenitally disabled or postnatally disabled persons in participating to table tennis sports

Name of	Congenital		t Value	
Self-rejection	Congenital	8	-1.09	0.281
	postnatal	76		
Technique	Congenital	8	-0.67	0.507
	postnatal	76		
Economy and	Congenital	8	0.92	0.361
	Postnatal	76		
Policy and	Congenital	8	2.01	0.048*
	postnatal	76		

\*p<.05

The “self-rejection” profile in the classification for different disability level on table tennis (F value is 2.44, p<.05) and the profile of “policy and installation” (F value is 2.48, p<.05) have significant differences. Moreover, if applying Scheffe’s posteri, in the profile of “self-rejection”, it did not show any significant difference. In the “policy and installation”, TT6 class was more significant than that of TT7 class. This could be attributed to the fact that for those who were classified in TT6 of bodily disabled were much more severe than those classified in TT7, therefore, in the feeling from policy as well as the usage of installation, the former had much stronger experiences than the latter. For the impediment factors of other classifications of bodily disabled who participated to table tennis, they did not reach the level of significance in four of the profiles for impediment factors in participating to table tennis: “self-rejection”, “technique and training”, “economy and transportation” and “policy and installation”

#### 4. Conclusions

1. Disability participate in table tennis almost 80% were male, more than 60% married, more than 50% childless, more than 60% were 40 to 49 years old, 40% education were high school, occupation were military, civil servant and teacher close 35%, about 23% earn less 20,000 NTD per month.

2. Different disability classification of disability who participate in table tennis were, more than 75% were

polio, acquired were close 90%, Disability classification of ITTC were more than 50% on TT4 and TT5. Use walking stick help to walk was 34.12% and useless any thing to help walking was 31.76%.

3. Among the background variables, sex, married, child, age, education, occupation, income per month show no significant variance for impeding factors to participate in table tennis.
4. Among the inherent or acquired and classification of disability show significant variance for impeding factors to participate in table tennis.

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