

Effect of Social Support of Table Tennis Players on Athletic Stress and Athletic Performance

¹SeungJae Lee, ²Sunmun Park

¹Associate professor, Department of Sports Leisure, Nambu University, Korea

²Associate professor, Department of Sports Leisure, Honam University, Korea
lsjwp@nambu.ac.kr, psmun@honam.ac.kr

Abstract

The purpose of this study is to investigate the effect of social support of table tennis players on exercise stress and athletic performance. To clarify the purpose of this study, middle and high school table tennis players registered with the Korea Table Tennis Association in 2020 were targeted. After that, a total of 300 subjects (150 males and 150 females) were selected using the convenient sampling method. The survey tool consisted of a questionnaire on a 5-point scale. Also, the collected data were statistically processed using SPSS version 20.0. The results obtained through this research procedure are as follows. First, it was found that the social support of athletes partially affected the exercise stress. Second, it was found that the social support of athletes partially affected athletic performance. Third, exercise stress of athletes was found to have a partial effect on athletic performance.

Keywords: Athletic, Social Support, Exercise Stress, Athletic Performance

1. INTRODUCTION

In today's sports, each country invests a lot in improving its performance under the recognition that the level of performance of a country is the national strength of that country. In the case of Korea, as the economy has stabilized since the 1960s, medal acquisition in international competitions has been recognized as an important means to elevate the national status. With the successful hosting of the 1986 Seoul Asian Games and 1988 Seoul Olympics, many sports were revitalized and the elite-oriented school sports department was activated. According to the social awareness of these sports, elite sports have had an impact on various fields at the level of individual citizens and the country as a whole. It became an opportunity to have [1], [2]. Athletes, unlike general students, do not engage in sports as a physical activity, but train as a means to achieve their team or individual goals. That is, this training method is uniform like a pendulum, training like a machine for one goal, and is exposed to intense physical training and mental tension from technology development to achieve this goal, and repetitive training. It can be said that it is acting as a factor giving a lot of stress to athletes. Therefore, social support has been shown to be beneficial to mental or physical adaptation and to reduce negative effects on stress. That is, although negative effects exist, social support generally reduces negative effects caused by stress and is beneficial to physical and mental [3], [4]. Social support generally refers to the support provided

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Corresponding Author: psmun@honam.ac.kr

Tel: +82-62-413-7443, Fax: +82-62-910-3607

Department of Sport Leisure, Honam University, Korea

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by others in the presence of a valued, caring, and dependable person. In other words, it is a positive resource that can be obtained through the expression of positive emotions toward others, recognition of the actions or perceptions of others, symbolic or material help, or through interpersonal transactions. As a result, social support plays a role in providing coping behaviors that can overcome the stressful situations that individuals face. The ultimate goal of elite athletes and coaches is to compete and achieve good results, which is athletic performance. According to Steiner's model on the performance of sports groups, actual productivity is the remainder after subtracting the loss in the process from potential productivity, and this is the group's performance [5], [6]. This means that the effectiveness of a sports group cannot be measured only by simple performance, and factors such as member satisfaction and group attachment must be considered at the same time. Athletes, unlike general students, do not engage in sports as a physical activity, but train as a means to achieve their team or individual goals [7], [8]. In other words, this training method is uniform like a clock pendulum, training like a machine for one goal, and is exposed to mental tension from intensive physical training and technology development to achieve this goal, and repetitive training. It can be said that it is acting as a factor giving a lot of stress to athletes. Social support has been shown to be beneficial for mental or physical adaptation and to reduce negative effects on stress [9]. That is, although negative effects exist, social support generally reduces the negative effects of stress and is beneficial to physical and mental health [10]. Therefore, in this study, middle and high school table tennis players are stressed by many factors such as their future career, excessive training, lack of personal time, competition tension, and school maladjustment, the purpose of this study was to examine the effects of social support, exercise stress, and athletic performance. This study is to clarify.

2. ANALYSIS METHOD AND SURVEY TOOL

2.1 Study Subjects

To clarify the purpose of this study, middle and high school table tennis players registered with the Korea Table Tennis Association in 2020 were targeted. After that, a total of 300 subjects (150 males and 150 females) were selected using the convenient sampling method. The demographic characteristics of specific study subjects are shown in <Table 1>.

Table 1. Study Subjects

	Variable	Number of cases(N)	percentage(%)
Gender	Female	150	50
	Male	150	50
Athletic career	3 years or less	80	27
	3 years or more - 5 years or less	105	35
	more than 5 years	115	38
Income level	200 or less	110	37
	More than 200-less than 300	100	33.3
	More than 300	90	30

2.2 Survey Tools

A questionnaire was used as the research tool. First, social support means support that weakens an individual's psychological and physiological effects. In this study, it refers to the degree to which subjects

perceive social support, and it is composed of three sub-factors: emotional, material, and instrumental support [11], [12]. In addition, exercise stress refers to stress caused by an imbalance between demands and abilities in a competitive situation of exercise, and is composed of four sub-factors: team, personal life, environment, and performance-related stress [13]. Finally, athletic performance relates to how efficiently a member of a sports group performs a training or task. Efficiency of a sports group cannot be measured with simple game performance, and factors such as member satisfaction and group attachment must be measured simultaneously [14]. Therefore, in this study, in the field of athletic life performance, which means subjectively perceived the level of training methods, overcoming stress, close relationships with colleagues, and efficiency, of table tennis players, and competition performance, meaning subjective perception of one's own performance. composed. All questionnaires were composed on a 5-point scale. The composition indicators of the questionnaire are shown in Table 2.

Table 2. Questionnaire Composition Indicator

Constituent indicators	Sub-factor	Number of questions
Demographic characteristics	Gender	1
	Athletic career	1
	Income level	1
Social support	Emotional support	10
	Material support	6
	Instrumental support	4
Exercise stress	Environment	4
	Team	5
	Perform	3
	Personal life	4
Athletic performance	Match performance	4
	Sports life performance	5

3. VALIDITY AND RELIABILITY OF THIS STUDY

3.1 Exploratory Factor Analysis

<Table 3> shows the results of exploratory factor analysis, which is a validity test for social support.

Table 3. Exploratory Factor Analysis of Social Support

Variable	Factor 1	Factor 2	Factor 3	
Social support	Q06	0.729	0.208	-0.116
	Q08	0.659	0.064	0.144
	Q07	0.619	0.157	0.059
	Q02	0.507	-0.062	0.315
	Q05	0.480	0.159	0.152
	Q03	0.422	-0.105	0.327
Material support	Q14	0.106	0.753	0.086
	Q15	0.265	0.641	-0.087
	Q13	0.073	0.627	0.240
	Q12	-0.188	0.484	0.299

Instrumental support	Q17	-0.106	-0.070	0.607
	Q19	0.016	0.261	0.570
	Q18	0.128	0.146	0.519
	Q20	0.111	0.041	0.484
Eigen Value		1.729	1.432	1.280
Variance (%)		24.706	20.458	18.291
Cumulative(%)		24.706	45.164	63.455

<Table 4> shows the results of exploratory factor analysis, which is a validity test for exercise stress.

Table 4. Exploratory Factor Analysis for Exercise Stress

Variable		Factor 1	Factor 2	Factor 3	Factor 4
Personal life	Q03	0.855	0.109	0.145	0.143
	Q02	0.800	0.139	0.222	0.163
	Q04	0.666	0.281	0.311	0.101
Environment	Q02	0.074	0.824	0.186	0.106
	Q13	0.221	0.820	0.014	0.239
	Q14	0.238	0.617	0.242	0.229
Team	Q06	0.314	0.172	0.805	0.104
	Q07	0.221	0.172	0.782	0.271
Perform	Q18	0.090	0.168	0.165	0.856
	Q17	0.247	0.259	0.174	0.730
Eigen Value		2,142	1,997	1,637	1.528
Variance (%)		21,416	19,965	16,370	15.278
Cumulative(%)		21,416	41,381	57,751	73.030

According to <Table 4>, the items showing a high factor load (0.666 or more) in factor 1 are items 3, 2, and 4, which are items related to personal stress. Questions 1 and 5 were removed because the factor load value was low. The items showing a high factor load (over 0.617) in factor 2 are three items of items 12, 13, and 14, which are related to environmental stress. Item 15 was removed because the factor load value was low. The items showing a high factor load (more than 0.782) in factor 3 are two items of items 6 and 7, which are questions about team stress. Questions 10, 9, and 16 were removed because the factor load value was low. The items showing a high factor load (0.730 or more) in factor 4 are two items of items 18 and 17, which are related to performance stress. Item 19 was removed because the factor load value was low. And the cumulative ratio explaining the four factors of exercise stress, personal stress, environmental stress, team stress, and performance stress, was 73.030%. Such analysis results show that exercise stress was measured relatively reasonably.

<Table 5> shows the results of exploratory factor analysis, which is a validity test for exercise performance.

According to <Table 5>, the items showing a high factor load (more than 0.770) in factor 1 are items 8, 9, and 6, which are related to competition performance. Item 7 was removed because the factor load value was low. The items showing a high factor load (over 0.696) in factor 2 are items 1, 2, 3, and 4, which are related to exercise life performance. Item 5 was removed because the factor load value was low. And the cumulative ratio explaining the two factors of athletic performance and athletic performance was 67.840%. Such analysis results show that the exercise performance was measured relatively reasonably.

Table 5. Exploratory Factor Analysis on Exercise Performance

Variable		Factor 1	Factor 2
Match performance	Q08	0.913	0.150
	Q09	0.893	0.125
	Q06	0.770	0.211
Sports life performance	Q02	-0.179	0.775
	Q04	0.337	0.742
	Q03	0.326	0.703
	Q01	0.251	0.696
Eigen Value		2.538	2.210
Variance (%)		36.264	31.576
Cumulative(%)		36.264	67.840

3.2 Reliability Analysis

The results of the reliability analysis of this study are shown in <Table 6>.

Table 6. Reliability Analysis

Factor	Sub-factor	Cronbach's α
Social support	Emotional support	0.71
	Material support	0.74
	Instrumental support	0.70
Exercise stress	Environment	0.79
	Team	0.76
	Perform	0.70
	Personal life	0.71
Athletic performance	Match performance	0.86
	Sports life performance	0.74

Looking at <Table 6>, Cronbach's α value of social support was .70-.74, and Cronbach's α value of exercise stress was .70-.79. Also, the Cronbach's α value of motility was .74-.86. In this study, the reliability coefficient for all factors, Cronbach's α , was found to be at a high level, so it was judged to be a reliable item.

4. STATISTICAL ANALYSIS

For data analysis, the question arises with answers completed were collected, data with double entry or no-entry was excluded, and valid samples were coded according to the guideline of coding. The coded data was input individually into the computer, and then frequency analysis, exploratory factor analysis, reliability analysis and multiple regression analysis were done with the use of SPSS Windows 20 Version statistical program.

5. RESULTS

5.1 Effect of Social Support on Exercise Stress

<Table 7> shows the results of multiple regression analysis to find out the effect of social support on exercise stress.

Table 7. Multiple Regression Analysis on the effect of Social Support on Exercise Stress

Variable	Personal life		Perform		Team		Perform	
	β	t	β	t	β	t	β	t
Constant		12.361		12.317		10.141		1.929
Emotional support	0.063	1.120	-0.109	-1.963*	-0.005	-0.082	0.031	1.138
Material support	-0.110	-1.873	-0.005	-0.093	-0.030	-0.516	0.014	0.487
Instrumental support	-0.137	-2.441*	-0.114	-2.045*	-0.220	-3.959***	0.858	30.908***
R ²	0.22		0.033		0.044		0.262	
F	2.816*		4.221**		5.701***		20.023***	

*p<0.05, ***p<0.001

Looking at <Table 7>, in the final regression equation, social support was found to have a statistically significant effect on personal life stress, environmental stress, team stress, and performance stress of exercise stress at 0.1% level. Looking at this in detail, first, it was found that the instrumental support of social support negatively affects personal life stress at the level of 5%. Looking at the beta (β) value representing the relative contribution, it was found to have an effect in the order of instrumental support (-0.137), material support (-0.110), and emotional support (0.063). In addition, it was found that emotional support and instrumental support of social support had a negative effect on environmental stress at the level of 5% statistically. Looking at the beta (β) value indicating the relative contribution, it was found to have an effect in the order of instrumental support (-0.114), emotional support (-0.109), and material support (0.005). And it was found that the instrumental support of social support had a negative effect on team stress at the level of 0.1% statistically. Looking at the beta (β) value representing the relative contribution, it was found to have an effect in the order of instrumental support (-0.220), material support (-0.030), and emotional support (0.005). Finally, it was found that the instrumental support of social support had a statistically significant effect on performance stress at the 0.1% level. Looking at the beta (β) value indicating the relative contribution, it was found to have an effect in the order of instrumental support (0.858), emotional support (0.031), and material support (0.014).

Therefore, it was found that the explanatory power of social support for exercise stress was 22% for personal life stress, 3.3% for environmental stress, 4.4% for team stress, and 26.2% for performance stress in the total variables.

5.2 Effect of Social Support on Athletic Performance

<Table 8> shows the results of multiple regression analysis to examine the effect of social support on athletic performance. Looking at <Table 8>, it was found that social support in the final regression equation had a statistically significant effect on athletic performance and athletic performance at 0.1% level. Looking at this in detail, first, it was found that the instrumental support of social support had a statistically significant effect at the level of 0.1% on the economic performance. Looking at the beta (β) value representing the relative contribution, it was found to have an effect in the order of instrumental support (0.279), emotional support (0.075), and material support (0.026). In addition, it was found that the instrumental support of social support had a statistically significant effect on sports life stress at the level of 0.1%. Looking at the beta (β) value representing the relative contribution, it was found to have an effect in the order of instrumental support (0.239), emotional support (0.044), and material support (0.033).

Therefore, as for the explanatory power of social support for athletic performance, it was found that 10.3% of competition performance and 7.3% of exercise life stress were explanatory for the total variable.

Table 8. Multiple Regression Analysis on the effect of Social Support on Athletic Performance

Variable	Match performance		Sports life performance	
	β	t	β	t
Constant		4.521		10.630
Emotional support	0.075	1.398	0.044	0.812
Material support	0.026	0.463	0.033	0.582
Instrumental support	0.279	5.180***	0.239	4.358***
R ²	0.103		0.073	
F	14.288***		9.850***	

***p<0.001

5.3 Effect of Exercise Stress on Athletic Performance

<Table 9> shows the results of multiple regression analysis to investigate the effect of exercise stress on exercise performance.

Table 9. Multiple Regression Analysis of the Effects of Exercise Stress on Exercise Performance

Variable	Match performance		Sports life performance	
	β	t	β	t
Constant		2.726		5.200
Personal life	-0.016	-0.250	-0.311	-5.506***
Environment	-0.117	-2.044*	-0.263	-5.039***
Team	-0.165	-2.624**	-0.002	-0.029
Perform	-0.208	-4.202***	-0.129	-2.861**
R ²	0.133		0.283	
F	14.317***		36.809***	

*p<0.05, **p<0.01, ***p<0.001

Looking at <Table 9>, in the final regression equation, it was found that exercise stress had a statistically significant effect on athletic performance and exercise life performance at the level of 0.1%. Looking at this in detail, first, it was found that exercise stress had an effect on performance at a statistical level of 0.1%, team stress at a statistical level of 1%, and environmental stress at a statistical level of 5%. When looking at the beta (β) value, which represents the relative contribution, it was found that performance stress (-0.208), team stress (-0.165), environmental stress (-0.117), and personal stress (-0.016) were affected in that order. In addition, it was found that individual stress and environmental stress had a statistically significant effect on exercise life performance at 0.1% level, and performance stress statistically at 1% level. Looking at the beta (β) value indicating the relative contribution, it was found that individual stress (-0.311), environmental stress (-0.263),

performance stress (-0.129), and team stress (-0.002) had an effect in that order. Therefore, it was found that the explanatory power of exercise stress for exercise performance showed 13.3% of competition performance and 28.3% of exercise life stress on the total variable.

6. CONCLUSION

The purpose of this study is to investigate the effect of interest in sports media on sports values and sports activities. The results obtained through the research procedure to achieve these research objectives are as follows.

First, it was found that the social support of athletes partially affected the exercise stress. In other words, it was found that personal life stress and team stress were higher as the instrumental support of social support was lower, and the lower the emotional support and instrumental support of social support were, the higher the environmental stress was. In addition, it was found that the higher the instrumental support, the higher the performance stress. Second, it was found that the social support of athletes partially affected athletic performance. In other words, it was found that the higher the means of social support, the higher the athletic performance and athletic performance. Third, exercise stress of athletes was found to have a partial effect on athletic performance. In other words, the lower the environmental stress, team stress, and performance stress of exercise stress, the higher the performance.

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