Paper

The relationship between health-related life skills and sport experience for adolescents

Kiso MURAKAMI[*1], Mikio TOKUNAGA[*2], Kimio HASHIMOTO[*3]

*1 Japan Institute of Sports Sciences
3-15-1, Nishigaoka, Kita, Tokyo, 115-0056 Japan
murakami.kiso@jiss.naash.go.jp
*2 Fuculty of Human and social welfare, Daiichi Welfare University
*3 Institute of Health Science, Kyushu University

The purpose of the present study was to develop a scale to measure individual differences in health-related life skills in adolescents, and to examine the relationship between evaluation of health-related life skills and sport experience. The scale was based on a framework of health defined by WHO (1994), which includes 3 aspects: physical, psychological, and social. In study 1, we analyzed 1755 adolescents (846 junior high school students, 557 high school students, and 352 university students). A factor analysis for each of the 3 scales was conducted to find the factor component. Consequently, 6 factors were extracted: physical skills (physical activities skills and health maintenance skills), psychological skills (goal pursuing skills and coping skills), and social skills (collective bahavior skills and interpersonal skills). The results also showed that the scale was moderately reliable and valid for measuring health-related life skills in adolescents. In study 2, another survey was carried out on 304 high school students who had experience in athletic activities and 215 students who had not experienced athletic activities. From the results, it was clarified that students who had experienced athletic activities acquired more health-related life skills than students who had not experienced athletic activities. These results suggested that sport experience influences health-related life skills.

1. Introduction

Changes in society and environment surrounding young people have created various problems in their growth and development of health. For example, competitive examinations, reduction of free time, reduction of interpersonal relationship skills and low self-training skills are said to cause juvenile worries, anxiety and stress. Their low tolerance and inappropriate management toward stress are highlighted and have made health issues surrounding them varied and more serious. The trend is expected to become more complex. Under these circumstances, valued skills to survive in healthy conditions are life skills, with which we can subjectively and positively solve various everyday problems and requirements. The World Health Organization (WHO) has defined life skills as 'necessary skills to constructively and effectively manage various issues and needs arising in daily life'. They are regarded as skills for people to act in a flexible and positive way. The present study focuses on these life skills as youth survival skills in healthy conditions and, using the framework of WHO's definition of three aspects in health: physical, psychological, and social aspects, aims to understand the skills that are useful in enhancing health in daily life (health-related life skills, hereafter). Formerly researchers have made a variety of studies on life skills for comprehensive understanding of different

aspects necessary for healthy development and function. With WHO (1994) being at their center, they have tried to create scales to measure life skills or training programs to promote development of life skills. In the USA, based on theories of development and studies on life skills, scales have been designed to measure life skills that are expected in each developmental stage. Among these examples is the Darden, et al. (1996) Life-Skills Development Scale-Adolescent Form (LSDS-B), a 65-item version for the measurement of adolescents (13 － 18 years of age). The LSDS-B consists of four sub-scales: interpersonal communication and human relation skills, problem-solving and decision-making skills, physical fitness and health maintenance skills, and identity development and purpose in life skills. In Japan, no such scale for wide and comprehensive measurement of youth skills in various fields has been created and the development of a scale to measure various skills is urgently needed. In addition, a variety of educational programs focusing on the formation of life skills for health action have been developed. They are reports of prevention of drinking, smoking, and drug abuse (Botvin, et al, 1984; Pentz, 1983), teenage pregnancy (Zabin, et al, 1986), improvement of intellectual skills (Gonzalez, 1990),and bully prevention (Olweus, 1990), in which their validity is described.

With heightening expectations to foster life skills for health action, sport activities have brought attention, especially in Western nations, as a promoting factor to advance life skills. Sport activities are easy to understand as challenge or management experience (Chalip, et al, 1984), and are considered to be desirable experience for fostering life skills. For example, through the process of experiencing sport activities, players are required to have various skills. These skills include such psychological skills as stress management, time perspective, communicative skills with others, and self-control. If these skills acquired through exercises and athletic situations can be transferred to daily life, good management in the present life or any future event in life is feasible (Danish, et al., 1992 ; Ueno and Nakagomi, 1998). Danish (1998), based on a hypothesis that psychological and social skills acquired in exercises and participation in sports are applicable to different situations, developed educational programs, including the GOAL (Going for the Goal) program, to foster life skills

by participating in sport activities. GOAL is targeted for primary school students, and is implemented to prevent smoking, drinking and drug abuse by heightening self-efficacy experienced in acquiring life skills and their processes.

Meanwhile, in Japan, research focusing on skills in the field of sport activities includes social skills (Sugiyama, 1999), coping skills (Aoki and Matsumoto, 1997 ; Sasaki, 1999), psychological competitive ability (Tokunaga and Hashimoto, 1988), and competitive situation skills and life skills (Ueno and Nakagomi, 1998). There are, however, only a few studies on how skills acquired through sport experiences are applied in daily life. One such study was made by Ueno and Nakagomi (1998), who, by creating a scale of life skills, found that students who participate in sport club activities acquire higher interpersonal and personal skills in daily life than general students. The scale prepared in their study, however, had such problems that it did not aim at a diagnosis of personal skills but was developed based on students' in-school experiences, and its sub-scale was only categorized to personal skills and interpersonal relationship skills. Therefore, we have tried to create a new scale to understand health-enhancing skills in daily life in a versatile and comprehensive manner.

In this sense, in Study I, we designed a scale to examine the reliability and validity of health-related life skills in the aspects of physical, psychological and social health, which conform to the WHO definition of health by interpreting them as health enforcing skills. Then, using the created scale, we clarified differences in gender and age with subjects (junior high school students, senior high school students, and university students). In Study II, we analyzed the relationship of health-related life skills with sport experience, sports event characteristics, and athletic level to clarify how sport activities may influence the acquisition of health-related life skills.

Study I: Creation of a scale to evaluate health-related life skills and comparison in gender and grade differences

1. Purpose

The purpose of Study I is to clarify the specific nature of health-related life skills that may enhance young

people's physical, psychological and social health, to examine the reliability and validity of the scale for evaluation, and to show gender and grade differences in health-related life skills.

2. Method

2.1. Subjects

We conducted a survey of junior high school, senior high school and university students in Fukuoka and Saga prefectures. After excluding short entries and misentries, we collected a total of 1755 surveys (male: 1079, female: 676): 846 junior high school students (male: 442, female: 404), 557 high school students (male: 389,female: 168), and 352 university students (male: 248, female: 104) as the subjects for our analysis. We re-studied 124 university students (male: 84, female: 40) in order to examine the reliability of the created scale and validity of standard relativity. We also re-checked 280 high school students (male: 165, female: 115) in Fukuoka Prefecture to verify factor component via confirmatory factor analysis.

2.2. Period and Method for Study

The study was conducted from late November of 1999 to early January of 2000 using a survey by means of the call and retention method, in which each class teacher distributed the survey to students and collected it after their entries. Then, we re-surveyed during the period of June to July of 2003 in an interval of three weeks. Computer applications used for analysis of collected data were SPSS9.0J and Amos4.0.

2.3. Descriptions of the Study

2.3.1. Scale for Evaluation of Health-Related Life Skills

There are various views in specific nature of skills necessary for daily life. In the 'Life Skills Training (LST)' and 'Know Your Body' (KYB) programs (Walter et al., 1988), in which their validity has been examined through many close evaluative studies, target setting, stress management, and social skills are regarded as important life skills. Each question of health-related life skills was prepared in consideration of these necessary

skills assumable to improve health in daily life with reference to the definition of life skills by Danish, et al. (1995), of lifestyle by Tokunaga, et al. (1993), and of coping skills by Ozeki, et al. (1994). For each item, we set three scales that capture health-related life skills from physical, psychological, and social aspects, which is the definition of health by WHO (WHO, 1994), and prepared questions that may represent different skill items in each scale. Consequently, we prepared 12 items in a respective scale with a total of 36 items of health-related life skills. These 36 items were examined by five master course students studying health science and by two university teachers, and were endorsed as items appropriate to evaluate health-related life skills. The respondents were asked to make a five-scale rating ('1 : hardly ever yes' － '5 : always yes'). Answers were pointed in the Rickert's brief method, giving five points to answers that had the strongest tendency of using the skill, one point to the weakest answers, and four, three, and two respectively to the middle. It means that the one who gained higher scores in the scale for evaluating health-related life skills used in the present study is considered to have higher skills.

2.3.2. Momentum by Self-Rating

We measured subject momentum according to exercise performance frequency × time × intensity (Kasari, 1976). It may be expected to show a positive correlation with physical skills.

2.3.3. GHQ-30

GHQ-30 (Nakagawa and Obo, 1996) is a survey comprising thirty items, which was prepared to identify mentally handicapped people among the general population in a psychiatric epidemiological survey. The content includes 6 factors of general disorder tendency, physical symptoms, dysgryphia, social activities disorder, anxiety and dysthymia, and depressive tendency. In each question there are four answers and the result is summarized by counting the score: the respondents give zero points to the most preferable answer, three to the least preferable answer, and one or two to the middle answers. One who receives a high GHQ score is considered to be low in mental health. Since the 'general disorder tendency' factor consists of items relating to fatigue or health conditions, it can be associated

with physical skills. The 'Anxiety and dysthymia' factor consists of items that ask about depression and apprehension, or self-doubt and affliction, so that it may have a negative correlation with psychological skills.

2.3.4. Kikuchi's Social Skill Scale: 18 items version (KiSS-18)

This scale, developed by Kikuchi (1988) and based on 6 categories of social skills proposed by Goldstein, et al. (1984), is intended to measure the degree of acquiring social skills. The answer has four scales: from '1: always no' to '4: always yes'. It may have a positive correlation with social skills.

2.4. Method for Analysis

Factor component of the scale for evaluation of health-related life skills was examined based on the factor pattern coefficient of exploratory factor analysis by the principal factor analysis promax solution. Reliability of this scale for evaluation was verified by calculating Cronbach's α coefficient, which is a reliability index of internal consistency. In addition, a test/retest was conducted to determine its stability. We prepared a survey with the content relevant to health-related life skills shown in each scale and the criterion-related validity was confirmed by calculating its correlation coefficient. Then, the construct validity of extracted health-related life skill factors was checked by confirmatory factor analysis of covariance component analysis. In confirmatory factor analysis, variance of each latent variable was bound to one to secure the discrimination of models using the maximum-likelihood method. Also, the pass from error variable to observational variable was bound to one. The Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Root Mean Square Error of Approximation (RMSEA), and Chi-square are used as the indices of goodness-of-fit of the models in confirmatory factor analysis.

3. Result and Observations

3.1. Creation of the Scale for Evaluation of Health-Related Life Skills

3.1.1. Analysis of Items

Table 1 Analyzed result of factors in the scale for evaluation of health-related life skills

Physical scale（α=.72）	F1	F2	h²
Physical activities skill（α=.78）			
22) Do exercises and sports to maintain and strengthen health and physical fitness.	.88	-.21	.82
13) Do exercises or sports at least once everyday.	.52	.15	.29
25) Do exercises and sports better than others.	.46	.10	.22
29) Can physically hold on when necessary	.42	.20	.22
1) Control body weight well (not to be overweight or underweight)	.40	.01	.16
Maintenance of body conditions skill（α=.74）			
5) Maintain body condition to prevent sickness.	.08	.55	.31
8) Can sleep well at night.	-.09	.52	.28
19) Can recover from physical fatigue easily.	.12	.41	.18
Fixed Value	2.75	1.08	
Contribution Ratio	34.38%	13.44%	
Cumulative Contribution Ratio	34.38%	47.81%	

Psychological scale（α=.78）	F1	F2	h²
Target pursuing skill（α=.73）			
6) Can persistently attain everything.	.79	-.12	.64
12) Can set a target and carry it out according to plan.	.61	.01	.37
2) Can concentrate once starting something.	.51	.10	.27
28) Have some target.	.49	.02	.24
Stress management skill（α=.71）			
17) Can be relaxed in a tense situation.	-.16	.70	.52
26) Can change mood well when something bad happenes.	.15	.56	.34
14) Try to change the situation even in a stressful mood.	.08	.49	.25
30) Can be confident of my ability.	.29	.41	.25
Fixed Value	2.94	1.10	
Contribution Ratio	36.79%	13.80%	
Cumulative Contribution Ratio	36.79%	50.59%	

Social scale （α=.78）	F1	F2	h²
Interpersonal Relationship Skill （α=.68）			
15) Always observe promises with friends and comrades	.78	-.17	.64
23) Listen carefully and try to understand what friends tell	.68	.07	.47
31) Politely greet superiors	.66	.01	.44
7) Support those in need of help	.45	.03	.20
Collective Behavior Skill （α=.70）			
10) Become leader of a group and can lead everyone	-.19	.89	.83
18) Have found my role in a group	.12	.72	.53
20) Easily feel familiar with a new class or a group	-.01	.68	.46
27) Can do jobs or work in cooperation with friends and comrades	.31	.45	.30
Fixed Value	3.06	1.11	
Contribution Ratio	38.21%	13.85%	
Cumulative Contribution Ratio	38.21%	52.06%	

As we inspected the histogram in each item, we decided to exclude 6 items that clearly did not show normal distribution for the subsequent analysis. To examine the internal consistency of the items in question, we calculated the correlation coefficient between the summation of item scores in each sub-scale and the rated scores in each item. As a result, a significant correlation was obtained in the range of r ＝ .397 － .701（ p ＜ .01) in all 30 items, which showed the internal consistency.

3.1.2. Factor Component of Scale for the Evaluation of Health-Related Life Skills

30 questions were categorized into three scales: physical scale, psychological scale, and social scale. To check the factor component of each scale, we

performed exploratory factor analysis in each scale. Because correlation was expected between factors from the content of the items, factor load was obtained by principal factor analysis promax solution. Although we sampled factors in accordance with the standard of eigenvalue MIN. 1.0, we had to make factor analysis by principal factor analysis promax solution again by excluding items with their factor load below .40 in all scales. After making factor analysis with all of them, factor analysis was made according to age: junior high school students, senior high school students, and university students. Since each age group was classified into factors similar to those of the whole, the following analysis was performed to all ages combined. Table 1 shows the result. Eight physical items extracted 2 factors, and their cumulative contribution ratio was 47.8%. The first factor included 5 items in total, with the content relating to items of physical activities such as 'Do exercises and sports to maintain and strengthen health and physical fitness,' 'Do exercises and sports better than others,' and 'Control body weight well.' We named this factor, 'Physical Activities Skill.' The second factor had 3 items in total, which was the items group representing maintenance of body condition such as 'Can sleep well at night,' 'Maintain body condition to prevent sickness,' 'Can recover from physical fatigue easily.' This factor can be considered as relating to 'Maintenance of Body Conditions'.

Eight psychological items had 2 factors, and their cumulative contribution ratio was 50.6%. The first factor had a total of 4 items, which represented target setting and pursuit such as 'Can persistently attain everything,' 'Can set a target and carry it out according to plan,' 'Concentrate once starting something,' and 'Have some target.' This factor was named 'Target Pursuing Skill.' The second factor contained 4 items, which concerned items of stress management such as 'Can be relaxed in a tense situation,' 'Can change mood well when something bad happens,' and 'Try to change the situation even in a stressful mood'. This factor was named 'Stress Management Skill.'

Eight social items sampled 2 factors and its cumulative contribution ratio was 52.1%. The first factor contained 4 items in total, which related to items of interpersonal relationship such as 'Always observe promises with friends and comrades,' 'Listen carefully and try to

understand what friends say,' and 'Well support those in need of help,' which was named 'Interpersonal Relationship Skill.' The second factor had 4 items relating to items of leadership and in-group cooperation such as 'Become leader of a group and can lead everyone,' 'Have found my role in a group,' 'Easily feel familiar with a new class or a group' and 'Can do jobs or work in cooperation with friends and comrades,' which was named 'Collective Behavior Skill.'

As described above, the result of exploratory factor analysis sampled, from the items of present study, 'Physical Activities' and 'Maintenance of Body Conditions' as physical skills, 'Target Pursuing' and 'Stress Management' as psychological skills, and 'Interpersonal Relationship' and 'Collective Behavior' as social skills. Each skill was turned out to hold construct factors relating to at least two skills. Danish, et al. (1995) presented target-setting skill, coping skill, and communicative skill as items of life skills, which we thought appropriate in terms of content. Also, 'Physical Activities' and 'Maintenance of Body Conditions' skills are considered to be necessary for controlling body conditions to maintain and strengthen health because many researchers have reported that regular physical activities and exercises contribute to preventing various diseases and are greatly beneficial psychologically and physically (Kujala, 2002; Shephard, 2002; Wein & Micheli, 2002).

Here in the present study, we decided to have, as the component of the scale for evaluation of health-related life skills, 24 items in total with 8 physical scale items (5 items in Physical Activities Skill, and 3 items in Maintenance of Body Conditions Skill), 8 psychological scale items (4 items in Target Pursuing Skill, and 4 items in Stress Management Skill), and 8 social scale items (4 items in Interpersonal Relationship Skill, and 4 items in Collective Behavior Skill).

3.1.3. Verification of Reliability

To examine the reliability of the scale for evaluation of health-related life skills, Cronback's coefficient was obtained. Coefficient of each factor in the scale for evaluation of health-related life skills was .68 - .78, which verified admissible reliability (Landis & Koch, 1977) of this scale although the reliability coefficient of interpersonal relationship skill was rather low (Table 1).
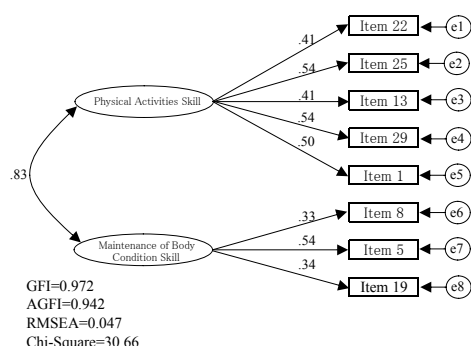
GFI=0.972
AGFI=0.942
RMSEA=0.047
Chi-Square=30.66

Figure 1 Analyzed result of physical scale by confirmatory
factor analysis

GFI=0.986
AGFI=0.973
RMSEA=0.042
Chi-Square=16.46
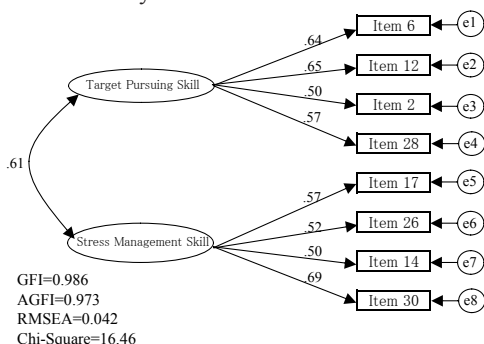
Figure 2 Analyzed result of psychological scale by confirmatory
factor analysis

GFI=0.969
AGFI=0.940
RMSEA=0.058
Chi-Square=36.69
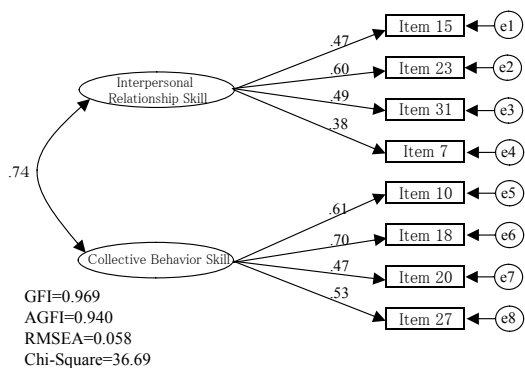
Figure 3 Analyzed result of social scale by confirmatory
factor analysis

Then, as we conducted correlation analysis between factors of test/re-test, the correlation coefficient between tests was r=.49-.70 (p<.01),which showed a moderately positive correlation. This may show that the scale for evaluation of health-related life skills is moderately reliable.

3.1.4. Verification of Validity
(1) criterion-related validity

The validity of scale standard relevance was analyzed. To examine the relation of each sub-scale of the scale for evaluation of health-related life skills with other scales, Pearson's product-moment coefficient was calculated. The correlation coefficient between self-rating momentum and physical activities skill was r=.37(p<.01). The relation of 'Maintenance of Body Conditions Skill' with 'General Disease Tendency' of GHQ-30 was examined. The result was r=-.48(p<.01), which verified negative correlation. As with the relation between each psychological scale and 'Anxiety and Dysthymia' factor measured by GHQ-30,we obtained moderate negative correlation in 'Target Pursuing Skill' (r=-.42, p<.01),and 'Stress Management Skill' (r=-.51, p<.01). In each scale of social aspect, the correlation coefficient between social skill and interpersonal relationship skill, measured by KiSS-18, was r=.56(p<.01), and the correlation coefficient between social skill and collective behavior skill was r=.52 (p<.01), both of which showed a moderate positive correlation. These may prove the validity of the component concept in each sub-scale of health-related life skills. Thus, the scale for evaluation of health-related life

Table 2 Difference in gender and age of mean scores in each factor of health-related life skills

Name of Factor	Male			Female			Primary Effect		Interaction	Sub-test
	J. High (N=442)	S. High (N=389)	Univ. (N=248)	J. High (N=404)	S. High (N=168)	Univ. (N=104)	Age	Gender		
Physical Activities Skill	16.6 (4.29)	17.2 (4.01)	16.3 (3.64)	14.4 (3.74)	15.9 (4.19)	14.4 (4.07)	12.40**	47.92**	1.70	J, U<S
Maintenance of Body Conditions Skill	10.6 (2.72)	10.7 (2.50)	10.4 (2.48)	10.0 (2.91)	10.6 (2.43)	10.6 (2.54)	3.02	0.77	1.85	
Target Pursuing Skill	13.4 (3.45)	14.1 (3.21)	13.9 (2.67)	12.6 (1.37)	13.6 (3.50)	13.9 (3.25)	12.64**	4.39*	1.03	J<S, U
Stress Management Skill	12.0 (3.37)	12.3 (3.41)	12.6 (2.92)	10.5 (3.25)	11.2 (3.15)	11.8 (2.66)	7.15**	31.06**	1.14	J<S, U
Interpersonal Relationship Skill	14.3 (3.07)	15.0 (2.68)	14.7 (2.53)	14.8 (2.87)	15.5 (2.46)	14.8 (2.54)	10.42**	3.28*	0.24	J<S
Collective Behavior Skill	12.6 (3.59)	13.2 (3.45)	12.4 (3.19)	12.5 (3.38)	13.2 (3.33)	12.2 (2.94)	7.46**	0.21	0.07	J, U<H

Note: Mean values are in figures and standard deviation is in parentheses. **p<.01 *p<.05

skills should have certain validity.

(2) Verifying factor component by confirmatory factor analysis

To verify the validity of factor component in a hypothetical model that was assumed from the result of exploratory factor analysis, confirmatory factor analysis was performed. Figure 1 to Figure 3 are the product-momentum correlation coefficient between the standardized coefficient and each factor in the exploratory factor analysis relating to each range in the scale for evaluation of health-related life skills. The goodness-of-fit index, GFI, which shows the model fitness with the baseline being MIN. 0.90 (Toyota,1998), marked values more than 0.90 in all models. The adjusted goodness-of-fit index, AGFI, in which the value usually shows a little smaller than that of GFI, was not extremely small in each model, and, therefore, was considered to be appropriate. In the Root Mean Square Error of Approximation, RMSEA, values less than 0.08 are desirable in model fitness and those more than 0.10 are not well fit in goodness-of-fit (Yamamoto,1999). In all physical, psychological, and social scales, the values obtained were less than 0.10, and proved high goodness-of-fit. Also in Chi square, all scales showed a significant difference (approx. 1%). These facts verified factor component of the scale for evaluation of health-related life skills in all physical, psychological, and social aspects.

3.2. Difference in Gender and Grade in Health-Related Life Skills

We made an analysis of variance in two factors of 3 (age: junior high school, senior high school, and university) × 2 (gender: male and female) in the scores of each sub-scale of three scales for evaluation of health-related life skills. Table 2 presents the result. The result showed a significant effect in age in 'Physical Activities Skill,' 'Target Pursuing Skill,' 'Stress Management Skill,' 'Interpersonal Relationship Skill,' and 'Collective Behavior Skill.' In gender, 'Physical Activities Skill,' 'Target Pursuing Skill,' 'Stress Management Skill,' and 'Interpersonal Relationship Skill' showed a significant effect. The interaction was not observed in all factors. In a sub-test (Scheffe's multi-comparison text), senior high school students and university students gained significantly higher scores than junior high school students in 'Target Pursuing Skill' and 'Stress Management Skill.' In 'Physical Activities Skill' and 'Collective Behavior Skill,' senior high school students gained significantly higher scores than junior high school students and university students. In 'Interpersonal Relationship Skill,' senior high school students marked higher scores than junior high school students. It was revealed that males gained higher scores than females in 'Stress Management' and 'Physical Activities' while females received higher scores in interpersonal relationship skill. Concerning these results,

Table 3 Exercise and sport experience and acquisition of health-related life skills

Name of Factor	Male		Female		Primary Effect		Interaction
	Experience (N=191)	N-Experience (N=109)	Experience (N=113)	N-Experience (N=106)	Group	Gender	
Physical Activities Skill	17.9 (3.86)	15.0 (4.25)	17.5 (3.49)	12.7 (3.71)	89.61**	11.74**	5.42*
Maintenance of Body Conditions Skill	10.9 (2.46)	10.2 (2.41)	11.1 (2.26)	9.6 (2.44)	18.64**	0.62	2.44
Target Pursuing Skill	14.2 (3.17)	12.5 (3.53)	14.6 (3.10)	11.4 (3.29)	51.64**	1.12	3.12
Stress Management Skill	12.5 (3.41)	11.0 (3.44)	12.1 (2.94)	9.5 (2.90)	34.84**	8.45**	2.71
Interpersonal Relationship Skill	14.6 (2.68)	13.5 (3.12)	15.5 (2.33)	13.6 (2.97)	28.30**	2.96	2.18
Collective Behavior Skill	13.5 (3.31)	11.4 (3.51)	13.9 (3.22)	11.9 (3.13)	34.80**	1.97	0.02

Note: Mean values are in figures and standard deviation is in parentheses. **$p < .01$ *$p < .05$

Table 4 Difference in type of sport in mean scores of each factor in health-related life skills

Name of Factor	Male		Female		Primary Effect		Interaction
	Individual (N=84)	Group (N=74)	Individual (N=69)	Group (N=52)	Type	Gender	
Physical Activities Skill	18.3 (3.50)	18.5 (2.62)	17.9 (3.25)	17.9 (3.40)	0.12	1.47	0.07
Maintenance of Body Conditions Skill	11.1 (2.13)	11.3 (1.93)	11.5 (2.00)	11.1 (2.17)	0.26	0.15	1.76
Target Pursuing Skill	16.2 (2.98)	14.9 (2.53)	16.1 (2.63)	14.3 (3.23)	8.99**	0.15	2.11
Stress Management Skill	13.6 (3.22)	14.0 (2.65)	13.0 (2.80)	12.5 (2.82)	0.02	9.45**	1.53
Interpersonal Relationship Skill	15.4 (2.57)	15.6 (2.38)	16.1 (1.87)	15.8 (2.17)	0.04	2.44	0.87
Collective Behavior Skill	14.1 (3.45)	14.4 (2.56)	14.6 (2.94)	14.7 (2.89)	0.25	1.05	0.17

Note: Mean values are in figures and standard deviation is in parentheses. **$p < .01$

previous studies of social skills accounted for higher social skills with less individual variation of females compared with males (Kikuchi,1988 ; Shoji,1991). The result of our present study, in which higher female scores in interpersonal relationship skill were gained, coincides with the result of these previous studies.

Study II: Relationship between Sport Experience and Health-Related Life Skills

1. Purpose

From previous studies, it has been shown that sport experience may give influence on health-related life skills. We tried to clarify the relationship between sport experience and acquisition of health-related life skills by measuring health-related life skills of youth using the scale prepared in Study I. Factors influencing health-related life skills acquired through sport activities may include environmental and experiential factors such as the forms of sports event and the duration of experience. Therefore we intended to determine the relationship between health-related life skills and type of sport, the duration of sport experience, and athletic level.

2. Method

2.1. Subjects

We conducted a study with a total of 519 students: 300 males (sport activities group: 191 ; non-activities group: 109) and 219 females (sport activities group: 113 ;

non- activities group: 106) at a high school in Fukuoka Prefecture.

2.2. Period

The study was conducted during the period from late November of 1999 until late January of 2000.

2.3. Descriptions

2.3.1. Personal Profiles
We collected data of name, gender, age, age group, experience or non-experience in sports and the duration of experience, type of sporting event, and athletic level as personal profiles.

2.3.2. Acquisition of Health-Related Life Skills
The scale to measure students' health-related life skills used in the present study was the scale for evaluation of health-related life skills consisting of physical, psychological, and social items that was prepared in Study I.

3. Result and Discussion

3.1. Sport Experience and Acquisition of Health-Related Life Skills

To check how much those with sport experience have acquired health-related life skills in physical, psychological, and social aspects when compared with general students, we conducted a 2-factor analysis of

Table 5 Difference in duration of experience in mean scores of health-related life skills

Name of Factor	Male (Years)				Female (Years)				Primary Effect		Interaction
	1-2 (N=27)	3-4 (N=20)	5-9 (N=54)	over 10 (N=54)	1-2 (N=11)	3-4 (N=22)	5-9 (N=60)	over 10 (N=27)	Duration	Gender	
Physical Activities Skill	18.6 (3.59)	17.5 (3.35)	18.1 (3.05)	18.9 (2.64)	14.5 (3.08)	14.5 (2.84)	14.5 (2.85)	14.9 (3.03)	0.44	1.08	0.06
Maintenance of Body Conditions Skill	11.3 (1.94)	11.0 (2.01)	11.1 (2.26)	11.4 (1.89)	11.3 (2.24)	11.5 (2.13)	11.2 (2.15)	11.3 (1.82)	0.26	0.15	1.76
Target Pursing Skill	15.3 (2.72)	14.7 (3.11)	14.6 (2.55)	15.7 (2.83)	15.5 (2.69)	15.3 (2.59)	15.1 (3.19)	15.5 (3.11)	0.99	0.8	0.25
Stress Management Skill	12.9 (3.29)	13.5 (3.56)	13.5 (2.94)	14.6 (2.39)	13.0 (3.41)	12.4 (2.16)	12.7 (3.04)	12.9 (2.45)	1.21	4.88*	0.79
Interpersonal Relationship Skill	15.1 (2.87)	15.3 (2.69)	15.1 (2.46)	16.0 (2.11)	16.2 (2.23)	15.5 (1.99)	15.9 (2.09)	16.1 (1.72)	1.07	2.91	0.68
Collective Behavior Skill	13.9 (3.38)	13.9 (3.76)	14.3 (2.94)	14.6 (2.79)	14.5 (3.08)	14.5 (2.84)	14.5 (2.85)	14.9 (3.03)	0.44	1.07	0.06

Note: Mean values are in figures and standard deviation is in parentheses. *p＜.05

variance of 2 (experienced and non-experienced in sports) × 2 (gender: male and female) in rating scores of each sub-scale of health-related life skills. Here, we called those who had belonged to athletic or sports clubs for more than one year as experienced in sport. Table 3 is the result. All factors showed a primary effect in sport experience: students who had experienced any sport had acquired higher skills than general students in 'Maintenance of Body Condition Skill,' 'Target Pursuing Skill', 'Stress Management Skill,' 'Interpersonal Relationship Skill', and 'Collective Behavior Skill.' The interaction was observed only in 'Physical Activities Skill'. As the result of conducting a sub-test (Scheffe's multi-comparison test), males and females who were experienced in sport showed no difference in the scores of 'Physical Activities Skill.' However, when males and females in the non-experienced group were compared,

females scored lower than males in the same skills. Ueno and Nakagomi (1998) suggest that similar life skills of interpersonal and personal skills that are acquired in sports events can be acquired by participating in sports club activities. Also, Danish, et al. (1992) asserted that various events experienced in sports events such as target setting, communication with others and management of body conditions are internalized in life skills. Similarly, in the present study, factors of health-related life skills relating to physical, psychological, social aspects might be presumably acquired through participation in sports activities. Psychological skills that may be nurtured in the process of athletic improvement in the duration of exercises and sports practices should be quite important in the management of various problems and stress arising in daily life. Supposing psychological skills acquired in sports events are internalized in sport experience, they

Table 6 Difference in ahtletic level in mean scores of health-related life skills

Name of Factor	Male (level)		Female (level)		Primary Effect		Interaction
	General (N=106)	National (N=85)	General (N=33)	National (N=80)	Level	Gender	
Physical Activities Skill	17.7 (4.19)	18.2 (3.40)	15.8 (3.69)	18.2 (3.17)	9.36**	4.31*	4.29*
Maintenance of Body Conditions Skill	10.8 (2.67)	11.1 (2.19)	10.5 (2.35)	11.3 (2.19)	3.37	0.01	0.79
Target Pursing Skill	13.6 (3.30)	15.0 (2.85)	13.4 (2.54)	15.2 (3.18)	15.66**	0.01	0.33
Stress Management Skill	11.9 (3.42)	13.3 (3.24)	10.8 (2.77)	12.6 (2.89)	16.00**	4.85*	0.25
Interpersonal Relationship Skill	14.2 (2.63)	15.2 (2.65)	14.2 (2.27)	16.1 (2.14)	20.57**	2.25	1.86
Collective Behavior Skill	12.9 (3.19)	14.2 (3.34)	12.1 (3.08)	14.7 (2.99)	22.74**	0.16	2.59

Note: Mean values are in figures and standard deviation is in parentheses. **p＜.01 *p＜.05

shall become quite influential on acquiring health-related life skills. Nevertheless, the present study was laterally conducted so that the question of how much sport experience may contribute to formation and change of the skills cannot be answered from these results. In future study, as we make the result of the present study as a base, we hope to conduct another longitudinal study to track the effect of sport experience on health-related life skills.

3.2. Type of Sport, Duration of Experience, and Athletic Level Differences in Health-Related Life Skills

To examine the difference in acquiring health-related life skills according to the type of sport, a 2-factor analysis of variance of 2 (type: individual and group) × 2 (gender: male and female) was performed in rating scores in each sub-scale of health-related life skills. We analyzed type of sport by categorizing it into two groups: individual sports event and group sports event. Table 4 shows the result of mean scores, standard deviation, and analysis of variance according to gender and event in the scale for evaluation of health-related life skills. In the difference of type of sport, we recognized a significant difference only in 'Target Pursuing Skill.' It shows that players of individual events, when compared with those of group events, have acquired psychological skill, in which they pursue a goal and accomplish it somehow or other. In 'Collective Behavior Skill' and 'Interpersonal Relationship Skill,' which are expected to be higher for group players than individual players, it showed no difference between the two groups. We may find the reason in the fact that the subjects of this study were mostly students who participated in school club activities, in which students perform uniform practice in sports activities regardless of individual or group event and there should not necessarily be any difference in its quality in terms of group activities. Organizational factors such as rules and pecking order rather than the type of sport can affect the social scale.

Then, to examine the difference in acquiring health-related life skills according to the duration of experience, we made a 2-factor analysis of variance: one factor is the duration of 4 groups (1−2 years,3−4years,5−9years,and over 10years), and the other, gender (male and female). Table 5 shows the result of mean value, standard deviation, and analysis of variance according to the duration of experience in this scale. As a result, no factor had a significant difference. The result of the present study showed that the duration of sport experience may not greatly affect health-related life skills. If skills are learned, athletes with longer experience should have developmentally acquired higher skills. The result, however, did not support the tendency. Indeed, it was contradictory to the hypothesis that health-related life skills can be acquired through sport activities. Even so, students can securely gain psychological skills, which are generally acquired through sports events, if they subjectively practice activities for the primal purpose of sport activities, that is, "Enjoying sports as a challenge for techniques and records of higher level (the Ministry of Education, Culture, Sports, Science and Technology, 2000)" (Ueno and Nakagomi, 1998). In this sense, longer experience in sport activities does not necessarily result in the acquisition of greater skills. Another assumption to cause the result is that the participants of this study were students who all fell into a similar high school age group. The fact that no difference was observed in the duration of experience might result from our observational point of view, in which we saw specific skill factors. It is possible that different results can be obtained in different potential skills. Further study is necessary on this point.

To examine the relationship between our scale and athletic level, we made a 2-factor analysis of variance of two types of athletic level (those who can go to national games and those who go to local games) and gender (male and female). Table 6 showed the result of mean scores, standard deviation, and analysis of variance according to the athletic level in each scale of health-related life skills. The result revealed that there is a significant primary effect in the difference of athletic level in 'Physical Activities Skill,' 'Target Pursuing Skill,' 'Stress Management Skill,' 'Interpersonal Relationship Skill,' and 'Collective Behavior Skill.' In 'Maintenance of Body Conditions Skill,' there was also a tendency of significant difference. The interaction was observed only in 'Physical Activities Skill.' All of these justified some influence of athletic level on scales of health-related life skills. In relation to psychological skills acquired in sports events, previous reports claim that players with higher athletic level show more superior

psychological skills in sports events. In Japan, studies by Tokunaga, et al. (1988,1991,and 2000) asserted that the more players achieved in athletic level, the more superior they are in psychological competitive ability. In this sense, if skills acquired in sports events can be transferred to daily life, it is highly possible that athletes who are superior in athletic level and in psychological skills such as time perspective, life management, coordination with teammates, perseverance, and coping skills have acquired health-related life skills.

2. Summative Discussion

The purpose of this study was to develop a scale to evaluate health-related life skills in order to physically, psychologically and socially improve health and to examine the relationship between health-related life skills and sport experience.

The scale for evaluation of health-related life skills developed in Study I was a survey comprising a total of 24 items of physical scale: 8 items in 2 factors (Physical Activities Skill and Maintenance of Body Conditions Skill), psychological scale: 8 items in 2 factors (Target Pursuing Skill and Stress Management Skill), and social scale: 8 items in 2 factors (Interpersonal Relationship Skill and Collective Behavior Skill). We also verified its reliability and validity by exploring internal consistency and construct of this survey. The scale for evaluation of health-related life skills was an effective survey to assess specific skills applied in our daily life to live a life of improved health. We also believe that it can evaluate health-related life skills to improve health in a versatile and comprehensive way. Belloc and Breslow (1972) suggest seven health practices including sleeping hours, proper weight, and exercise. Morimoto (1988) also proposes eight similar desirable practices related to exercise, drinking, smoking and sleeping. In previous studies on lifestyle, exercise and sleep are always included, which may account for the necessity of such skills to reinforce health as 'Physical Activities Skill' and 'Maintenance of Body Conditions Skill,' which were the result obtained in the physical aspect in our study. Adkins (1984), a researcher on life skills, described that if a training participant acknowledges his/her own attained skills beforehand, he/she will have a 'Feeling of competence,' suggesting the importance of checks

of the present skill using self checklists on skills. He further commented that it is quite important to make the participant conscious of lack of skills through the use checklist in order to motivate the participant to join skill training. In this sense, the youth can apply this scale to promote self-understanding. A report says that the number of items of psychological scale should generally be limited (Sugawara, 1994). Relating to this suggestion, we used a small number of items (24 items) in this scale, and we believe its feasibility in a real situation. We therefore offer this scale to be easily and conveniently used as an assessment tool that can measure skills which develop physical, psychological, and social health.

Using the developed survey, we, then, examined the difference in gender and grade in health-related life skills.

The result showed a significant primary effect in gender in each sub-scale scores of 'Physical Activities Skill,' 'Target Pursuing Skill,' 'Stress Management Skill,' and 'Interpersonal Relationship Skill,' and also in grade in each sub-scale scores of 'Physical Activities Skill,' 'Target Pursuing Skill,' 'Stress Management Skill,' 'Interpersonal Relationship Skill,' and 'Collective Behavior Skill.' Especially, males were able to use exercises and sports more positively and have higher stress management skill than females. From the fact that male and female senior high school students marked higher scores in all factors than male and female junior high school students, it is assumed that they have acquired more skills in physical, psychological, and social aspects. In the meantime, university students are suggested to have lower social skill and physical activities skill than senior high school students.

In Study II, using the scale for evaluation of health-related life skills that was developed in Study I, we studied the relationships between sports experience and acquisition of health-related life skills and found a significant primary effect in all factors of sport experience. It was suggested that students who have experienced sports activities have acquired more health-related life skills than those who have not experience sports. It implies that exercises and sport experience may influence on health-related life skills. This study, then, further examined the relationship of type of sport, duration of sport experience and athletic level with health-related life skills. The result showed that players of individual sports are expected to have

high target pursuing skill. In the duration of experience, there was no primary effect in every factor, which indicated that the duration of experience does not cause any difference in acquiring health-related life skills. This result is contradictory to the suggestion that skills improve with the duration of experience if skills are what we learn. We think it because the present study was conducted in a framework that all subjects were similar in age. Also, instructors may be required to guide athletes by relating skills attainable in sport activities with daily life since exercises and sport activities cannot necessarily be acquired only in continuation. In athletic level, there was a significant primary effect on factors other than 'Maintenance of Body Conditions Skill.' A previous study (Eysenck, et al., 1982) argued that extroversion is the most notable characteristics observed in athletes of high athletic level. The result of our study also pointed that the acquisition of social skills such as 'Collective Behavior' and 'Interpersonal relationship' skills was noted in athletes of high athletic level.

As a whole, the result of our study clarified the influence of sport experience on health-related life skills. As health is gaining greater attention, the necessity and significance of health education have been more frequently discussed. Health education indicates 'Education on acquisition of knowledge and stance necessary to maintain and promote mental and physical health' (Kusumoto, 1998). It also implies how we teach the meaning of health or stance and methods to lead a healthy life. Instructions with consideration of acquisition of health-related life skills in competing sports shall be of valid and substantial perspectives in health education.

Our study was laterally examined. Future investigation of a longitudinal design shall explain the relation of cause and effect between sport experience and acquisition of health-related life skills. We also think it critical to study the quality of instructor as well as sport experience factors that may influence health-related life skills.

3. Summary

The present study aimed to develop a scale for evaluation of health-related life skills to enhance health and to examine the relationship between sport experience and health-related life skills with a total of 1755 subjects consisting of 846 junior high school students, 557 senior

high school students, and 352 university students. What we summarize from the results are:

1. We developed the scale for evaluation of health-related life skills consisting of 24 items in three scales: physical scale (3 items of physical activities skill and 5 items of maintenance of body conditions skill), psychological scale (4 items of target-pursuing skill and 4 items of stress management skill), and social scale (4 items of interpersonal relationship skill, and 4 items of collective behavior skill).

2. We examined differences in gender and grade on health-related life skills. The result was that males are good in acquiring physical activities skill and stress management skill. Male and female senior high school students marked higher scores than male and female junior high school students in all skills.

3. It was clear that those who have had sport experience are expected to acquire health-related life skills when compared with non-experienced students. Health-related life skills are affected by the type of sport (individual or group) and athletic level but not by the duration of sports experience.

4. From the above results, it was assumed that sport experience affects the acquisition of health-related life skill. To apply skills acquired in sports events to daily life, students' subjective activities are requisite. We need to clarify the cause-and-effect relation between both factors as well as the influence of composition and instructor factors.

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