The development of a team building program for korean curling team

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Abstract

The purpose of this study was to develop and apply a team building program for a curling team through needs assessment. The participants in this study were 69 high-school, college, professional, and national curling athletes for the needs assessment, 4 sport psychologists and 2 curling experts for verifying the validity of the program, and 5 curling athletes of professional curling teams for the application of the team building program. The needs assessment data were analyzed by inductive content analysis. The team building program was developed based on the results of needs assessment, goal setting of the team building program, and a selection of activities for the team building program. The team building program was applied to five curling players for 7 sessions. Team cohesion, team efficacy, and effective communication were measured two times (i.e., pre and post) to examine the effects of team building intervention. The results of needs assessment indicated interpersonal relationship, communication, and performance were necessary factors for team building. Consequently, goals of the team building program were to improve communication and interpersonal relationships. Team building activities were selected through team building literature review and expert meetings. Secondly, the team building intervention had a positive influence on team cohesion, team efficacy, and communication. These results indicated that team building would positively contribute to team factors and team performance.

Key words: Team building, team cohesion, curling

Introduction

In team sports, the outcome of a game depends on the cohesion of athletes. Previous studies on athletes and coaches who participated in the Olympic Games reported that team cohesion was one of the important psychological factors that affected athletic performance (Kim & Park, 2014; Gould, Greenleaf, Guinan & Chung, 2002). In addition, the higher cohesion a team has, the better the team has athletic performance and success (Bloom, Stevens & Wickwire, 2003; Carron, Bray & Eys, 2002; Carron,

Colman, Wheeler & Stevens, 2002; Loughead & Hardy, 2006). A meta-analysis study also indicated that cohesion and team performance had at least a moderate or high correlationship (Carron et al., 2002). Therefore, cohesion is an essential and important factor in a team's performance. Team cohesion refers to a dynamic process (Carron, 1982) reflected in the tendency of teams to remain bound and united to accomplish their goals. Cohesion is classified into task cohesion (the degree at which members of a team cooperate to accomplish common goals) and social cohesion (the degree at which members of a team get along together).

Team building techniques are utilized to increase the cohesion of a team. Team building is a method of

increasing efficiency of a team, satisfying desires of its members, and helping the team improve task environment (Brawley & Paskevich, 1997). Team building interventions improve group function, increases cohesion among team members, and accomplishes the common goals of the team (Beer, 1980; Carron & Hausenblas, 1998). Team building interventions were mainly studied in the field of organizational psychology. The field of sport psychology started to take notice of team building interventions since the late 1990s, and they were practically used to improve cohesion and athletic performance.

Prapavessis, Carron, and Spink's team building model (1997) was adopted team building interventions in sport. According to the team building model (Carron & Spink, 1997), team structure (e.g., clarity of role, leadership, team norm) and team environment (e.g., similarity, uniqueness) factors affect team process (e.g., team goal, team sacrifice), and team process factors affect team cohesion. Adopting the team building model, sport psychologists can identify factors that affect team cohesion and come up with team building goals and activities needed for team building interventions.

Team building interventions were used in various sports such as soccer (Martin & Davis, 1995; Prapavessis, Carron & Spink, 1996; Voight & Callaghan, 2001), baseball (Alonso, Kavussanu, Cruz & Roberts, 1997; Rainey & Schweickert, 1988), basketball (Senecal, Loughead & Bloom, 2008), gymnastics (McClure & Foster, 1991), horse riding (Bloom & Stevens, 2002) and, ice hockey (Rovio, Arvinen-Barrow, Weigand, Exkola, Lintunen, 2012). Previous studies showed that team building interventions increased cohesion, and thus team building interventions are an effective strategy for improving cohesion. In Korea, team building interventions were utilized to increase cohesion which was directly associated with the athletic performance of soccer (Kim, 2008) and baseball (Kim & Kim, 2012) teams. It implies that studies in the application of team building interventions are expanding from individual athletes to teams.

Curling is one of the team sports in which mental factors such as strategy and mind games with opposing team are more important than physical fitness (Korea Institute of Sport Science, 2010). In addition, a curling team is comprised of four athletes including the skip, third, second, and lead. Each team member is required to understand and master his/her given duties (Korea Institute of Sport Science, 2010). Researchers in the field of sport psychology have studied curling related-topics such as exploring self-control strategy used during preparation and in the middle of curling game to control psychological factors (Collins & Durand-Bush, 2014), improving cohesion and athletic performance using self-control intervention technique (Collins & Durand-Bush, 2010), and verifying the attitude and behavior of curling coaches and the relationship between coaching efficacy and self-confidence perceived by athletes (Paquette & Sullivan, 2012). These studies focused on psychological factors within individuals related to athletic performance. However, because curling is a team sport consisting of four athletes, it is necessary to consider team factors such as team cohesion in addition to psychological factors within individual athletes, and intervention is needed to improve psychological factors of the team.

Powerful curling nations like Canada, Sweden, and Switzerland especially have large pools of athletes and a long history of curling training. The Korean curling team made its debut at the Sochi 2014 Olympic Winter Games and showed potential by making it to the semi-finals at the World Curling Championship. At the 2017 Asian Winter Games, the Korean curling team proved that its athletic performance has improved with the men's team winning a bronze medal and the women's team winning a silver medal. Accordingly, as improving performance at the Pyeongchang 2018 Winter Olympic Games and the Beijing 2022 Winter Olympic Games, the curling teams need to implement systematic psychological training in addition to physical, skill, and tactic training. The purpose of this study was to develop and apply a team building program to improve team cohesion, psychological factors related to the performance of curling teams, and to verify effects of the program.

Methods

Participants

An open questionnaire was carried out on 69 national, professional, college, and high-school curling athletes to perform a needs assessment and analysis for the development of the team building program. Four-sport psychologists and two curling experts (instructors of the national team) were selected as an expert group to analyze responses to the open questionnaire and determine goals and activities of the program. In addition, five professional athletes in professional men's curling teams participated in the application of the developed program. Only the athletes who understood and agreed with the purpose of this study could respond to the questionnaire and participate in the application of the program.

Table 1. Research participants

Category	Type	Number of Participants
Needs assessment	Curling athlete	69
Experts for program development	Curling expert	2
	Sport psychologist	4
Application of program	Curling athlete	5
Total		80

Questionnaires

1. Open-ended questionnaire to assess needs

The open questionnaire for the collection of comprehensive data about factors that would help or hinder team cohesion was prepared by selecting optimal questions through expert meetings of four psychologists following previous studies (Kim, 2010; Yun, 2004). Two questions were selected for the questionnaire, including "What are the factors that have positive effects on cohesion and mood of our curling team?" and "What are the factors that have negative effects on cohesion and mood of our curling team, and what were the major issues?"

2. Questionnaires to verify effects of teambuilding program

1) Group cohesion questionnaire

In order to verify changes in the team cohesion of curling athletes according to the application of the team building program, a group cohesion questionnaire (Lee & Kim, 1995) developed based on a questionnaire for individual and team attributes related to predisposing factors of cohesion (Widmeyer & Williams, 1991) and a group environment questionnaire (Widmeyer, Brawley & Carron, 1985) were used. Reliability of the questionnaire showed internal consistency factors of 0.71~0.80.

2) Group efficacy questionnaire

In order to measure group efficacy of sport groups, a questionnaire developed by Short, Sullivan & Feltz (2005) and comprised of 20 questions divided into four questions for each of five subfactors was used. The subfactors of group efficacy were ability factor, effort factor, patience factor, preparation factor and solidarity factor. Reliability of each subfactor was found to be appropriate with a value of 0.92, 0.88, 0.85, 0.85 and 0.89, respectively.

3) Effective communication questionnaire (SETECTS-2)

Effective communication scale was used to determine how effectively team members communicate. SECTS (The Scale of Effective Communication in Team Sports) developed by Sullivan & Feltz (2003) was modified and supplemented by Sullivan & Short (2011), and this questionnaire is comprised of 4 subfactors and 15 questions. The four subfactors were acceptance, specificity, positive conflict and negative conflict. Reliability of each subfactor was 0.75, 0.78, 0.63 and 0.71, respectively.

Procedure

In order to develop a program that can improve the team cohesion of curling teams, an open questionnaire was carried out on national, professional, college and high-school curling athletes. The open questionnaire deduced factors that either help or hinder team cohesion

through expert meetings, and the program for team cohesion was developed based on the results. The program development procedure model proposed by Kim (2002) presented a four-step model for the development of team building program, which includes goal setting step, program composition step, preliminary research step, and program implementation and modification step. In this study, the program was developed by going through the needs assessment, goal setting, program composition, and preliminary research through the application. Contents of the program were selected through expert meetings of curling instructors and sport psychologists based on the results of the open questionnaire. Specifically, after setting the purpose of the program and subordinate goals of each program component, previous studies were examined for theoretical review. Activities appropriate for each theme were collected, and validity of the final activities determined to be efficient was verified through expert meetings of four sport psychologists and two curling experts. For the application of the team building program, the program was carried out 7 times total (once or twice a week for four weeks during off-season considering schedule of curling teams and athletes). Each session required 90~120 minutes. Changes in group cohesion, group efficacy, and communication were examined by conducting pre- and post-test of program application. Individual athletes were interviewed to specifically find out how they feel about changes in their team.

Data analysis

Raw data collected from the open questionnaire were analyzed by inductive content analysis. The inductive content analysis was performed twice. During the first analysis, individual responses were entered into a computer to categorize themes by the similarity of concept and classify them into the detailed domain and general domain. During the second analysis, factors that could be integrated in the general domain were combined to clarify the general domain. In addition, a triangulation method was used by sport psychologists and curling experts who had extensive experience in content analysis and qualitative research to secure reliability and validity of data analysis.

Changes in team cohesion, group efficacy and communication were analyzed by repeated measurement of single-case experiment design. Values measured before the application of the program play the role of pre-test, and values measured after the application function as post-test. The effects of the program application were verified using the method of interpreting single-case experiment design (Rosnow & Rosenthal, 2002). The SPSS program was used to find the mean and standard deviation as statistical values to examine changes in group cohesion, group efficacy and communication before and after the application of the program.

On the other hand, interview data were analyzed by entering them into a computer. Content analysis was done to deduce opinions on personal experience, meaning and procedure of athletes during the team building program and changes in the team and team members perceived by athletes. These results were used to verify and discuss qualitatively the effects of the application of the team building program.

Results

The results of this study involved the verification of the effects of the development and application of the team building program for improving team cohesion of curling teams. Factors that could help or hinder team cohesion perceived by athletes were extracted to develop the team building program, and the program was applied to examine the changes in team cohesion, team efficacy, and communication.

1. Development of team building program

1) Needs assessment to investigate components of team building program

Because of the open questionnaire about factors affecting team cohesion conducted on 69 curling athletes, 158 raw data were collected for factors that could help team cohesion, and 148 raw data for factors that could

hinder team cohesion. Expert meetings of sport psychologists and curling experts reviewed details and meaning of factors helping or hindering team cohesion perceived by curling athletes and performed inductive content analysis on these details. Based on the inductive content analysis, 155 cases out of 158 cases about factors that reinforce team building were classified into 19 categories after excluding three irrelevant cases. The 19 categories: encouragement / consolation, cheering / high-five, team meeting / conversation, clarification of role, successful performance in games, target setting, effort, tactical matching, overcoming of hardship, friendship / socializing, consideration / interest, intimate relationship, getting along, trust, positive attitude, coaching, leadership, and others. In addition, 148 raw data about factors that hinder team cohesion were classified into 21 categories. The 21 categories included: condemnation, negative expression, less communication, conflict of opinions, negative emotional expression, blaming, misunderstanding, poor performance, lack of attention, lack of enthusiasm, lack of physical fitness, poor team mood, negligence, lack of goal, egoism, mutual distrust, negative hierarchy, excessive sacrifice, conflict with instructor, self-blame, and others.

Based on two meetings of experts, factors that help or hinder team cohesion were determined as presented in Table 2, and Table 3. Communication, athletic performance, and interpersonal relationships were found as important factors related to factors that help or hinder team cohesion. These results were later used to establish goals and directions of the team building program.

2) Goal setting of team building program

Based on the results that communication, athletic performance, and interpersonal relationship factors commonly appeared as factors reinforcing and hindering team cohesion are important team building factors of curling teams, expert meetings were held to set goals of the team building program. Factors that can be changed by the team building program were selected at expert meetings, and goals for each factor and detailed goals were determined. Team mood, lack of enthusiasm and lack of goal, and the sub-factors

of the athletic performance factor were classified as goals of communication factors because they can be improved through communication among team members under various situations.

3) Selection of contents of team building program

In order to come up with activities of the program using goals and detailed goals of the team building program, activities were collected from existing communication programs and interpersonal relationship programs. From the activities collected, activities appropriate for goals of the team building program were selected through expert meetings of four sport psychologists and two curling experts as below.

2. Effects of team building program application

In order to find the effects of the application of the program developed in this study, changes were observed by measurement before and after the program using the questionnaires for team cohesion, team efficacy, and effective communication.

1) Changes in team cohesion

Among subfactors of group cohesion perceived by athletes of the professional curling team, individual social cohesion, individual task cohesion, and group task cohesion were increased, but group social cohesion was decreased after the application of the program. In specific, as presented in Table 4, individual social cohesion was 3.23 before the application and increased to 3.77 after application of the program. On the contrary, group social cohesion was slightly decreased. In the pre-measurement, the mean value was 2.07, but it was decreased to 1.47 after application of the program.

Individual task cohesion was improved from 3.40 to 3.93 after the program. Lastly, mean group task cohesion was increased from 3.97 to 4.51 after application of the program.

Table 2. Positive factors for team cohesion

Raw data themes	Subcategories (frequency, %)	Main categories
Cheering and encouragement when mistake is made (12), encouragement among team members during game (11), consolation for poor shot (2), positive attitude after mistake / failure	Encouragement / consolation (26, 16.77%)	Positive communication (83, 53.54%)
Shouting way to go before game or training (6), Telling team members to cheer up during game (4), shouting way to go (3), cheerful atmosphere (2), cheering each other during game (2), high-five after successful shot (2), high-five before and after shot(2), shouting team slogan before game starts(4), shouting phrases like good shot / good skip after successful shot	Team slogan / cheering (26, 16.77%)	
Frequent communication and conversation among team members (15), settling down emotions by talking to each other about feelings, team meeting while watching a curling video (2), team meeting to share positive words before game, lots of conversation during game, talking together after game(2)	Team meeting / conversation (23, 14.84%)	
Encouragement and compliment (3), complimenting each other, compliment by all team members in loud voices in case of successful shot, cheering the person shooting and complimentingif successful	Compliment (6, 3.87%)	
Doing best and not intruding into each other's position, not shifting responsibilityto others	Clarification of role (2, 1.29%)	
When shot is successful (5), winning (3), when difficult shot succeeds (2), excellent shot (2), good curling (2), outstanding performance at an important moment, scoring a lot	Successful performance in games(16, 10.32%)	Performance (28, 18.07%)
Having same goals (2), definitive goal setting, when goals are accomplished (winning / losing or shot success rate during training), having goals during exercise	goal setting (5, 3.23%)	
Showing best attitude of playing one's roles, enjoying exercise time, focusing, intense training mood	Effort (3, 1.94%)	
Accurate call and strategy, working in harmony (when they have same thought)	lactical matching (2, 1.29%)	
Winning a difficult game, resolving a difficult situation	Overcoming of hardship (2, 1.29%)	
Spending time together other than training, working on other exercises together, kicking ball together (3), playing sports like soccer, competing with other sport events by making teams, playing other sports (4), playing pool together(2)	Friendship / socializing (13, 8.39%)	Positive interpersonal relationship (36, 23.23%)
Covering up shortages, being considerate, feeling that others are thinking about me, taking care of one another, taking a step back for consideration, considerate behavior, respecting one another with trust, regarding team to be more important than self	Consideration / interest (8, 5.16%)	
Calling nicknames, good relationship, close relationship between seniors and juniors (2), when seniors are not too oppressive, active interaction among team members, horizontalhuman relationship	Intimate relationship (7, 4.52%)	
Difficult training or process, forming fellowship while sleeping, eating and playing together, gathering to eat or play in the dormitory, curling training	Getting along (4, 2.58%)	
Trust in each other formed by encouragement, trust among members, when members appear to have trust in each other, trust formed while spendingtime together	Trust (4, 2.58%)	
Bright face, positive words, positive thinking (speech and action), playing with pleasure and thinking positively	Positive attitude (3, 1.94%)	Others (8, 5.20%)
If coach smiles while instructing, when coach makes training fun by making jokes	Coaching (2, 1.32%)	
Having someone brighten team mood, whether it be self or someone else	Leadership (1, 0.65%)	
Creation of casual mood (comfortable), sharing a mind that "we are united as a team"	Others (2, 1.29%)	
Total	155, 100%	

Table 3. Negative factors for team cohesion

Raw data themes	Subcategories (frequency, %)	Main categories
Blaming someone (8), insulting for poor performance (4), stressing failure (2), talking from behind (2), fighting, aggressive style of talking, pushing into corner during ice check	Condemnation (19, 12.84%)	Negative communication (76, 51.36%)
Revealing personal feelings (3), frowning about failure in important situation (2), feeling bad about poor shot (2), anxiety / unresponsiveness, expression of overconfidence / lack of confidence, no encouragement, bad face or way of speech when losing, relevaing bad feeling, expressing bad feeling during practice, voice getting increasingly louder during game, getting frustrated about an unpleasant event, thinking negatively, being worried and speaking negatively	Negative expression (17, 11.49%)	
No speaking after failing shot (5), not communicating during game (3), making calls in small voice (2), not speaking when losing, not talking about shot, not cheering each other, not sharing information, keeping bad emotions in mind	Less communication (15, 10.16%)	
When opinions conflict (4), when members argue (4), arguing during game	Conflict of opinions (9, 6.08%)	
Getting angry about shot (4), getting angry at one another during game (2), expressing anger about personal matters during game / practice, getting angry about poor condition during game, expressing emotions (anger, rage, anxiety) about unsuccessful tactic	Negative emotional expression (9, 6.08%)	
Shifting responsibility (3), shifting one's responsibility to others, not doing best in one's position and intervening in roles of other members	Blaming (5, 3.38%)	
Misunderstanding from differences in thoughts, not being able to bear trivial matters	Misunderstanding (2, 1.35%)	
Poor shot (6), when shot does not turn out was expected (2), when team's success rate is bad, when team's stone is pushed away, continuous shot miss, sweeping miss, over-sweeping, when one cannot fully exhibit skill during game, losing game, frequently failing easy shot	Poor performance (15, 10.14%)	Performance (38, 25.68%)
Not focusing during training / game, talking about something else during exercise (2), not focusing on training, not focusing on game	Lack of attention (5, 3.38%)	
Giving up on game if scores differ by much (4), lack of enthusiasm because of shot mistake, lack of enthusiasm during game / training	Lack of enthusiasm (6, 4.05%)	
Feeling lack of physical fitness(2), collapsing, falling over	Lack of physical fitness (4, 2.70%)	
Ruining team mood after failing shot, difficult to brighten mood if someone has bad face and stops talking, when one of members is in bad mood, when one of members is in bad mood and nobody tries to brighten mood	Poor team mood (4, 2.70%)	
Insincere attitude, only relying on skip, low priority on goal and training	Negligence (3, 2.03%)	
Lack of definitive goal	Lack of goal (1, 0.68%)	
Ruining team mood with selfish behavior (3), being selfish (2), doing as one thinks (2), greedly trying to show off one's skills, placing priority on self over teamwork	Egoism (9, 6.08%)	Negative interpersonal relationship (25, 16.89%)
Not trusting each other (2), shot without trust in each other, discordance among athletes, losing faith during training, being suspicious about trust of each other	Mutual distrust (6, 4.05%)	
Inflexible seniors, too much work, trivial matters (2), nagging of seniors, vertical hierarchy among team members	Negative hierarchy (6, 4.05%)	
Adjusting oneself to other team members, only telling me to do everything, lack of awareness of age difference	Excessive sacrifice (3, 2.03%)	
Problems other than curling (manager, coach)	Conflict with instructor (1, 0.68%)	
Self-blame after missing shot (2), simply regretting and blaming oneself about missing shot, getting intimidated after missing shot	Self-blame(4, 2.70%)	Others (9, 6.08%)
Getting sensitive when tired or stressed (2), ill-mannered behavior, when I am doing my best but seniors get angry about my efforts, being partialto members	Others (5, 3.38%)	
Total	148, 100%	

Table 4. Team building program for curling team

Step	Session	Theme / Goal	Details
Introduction step	1	* Education on team cohesion * Understanding my team	* To understand importance of team cohesion and relationship with athleticperformance * To discuss strengths and weaknesses of my team
Interpersonal relationship step	2	* Understanding self andteam members	* To test and understand personality type of myself and team members * To introduce team members
	3	* Getting closer to team members	* To make a sentence describing myself as an athlete * To introduce my strengths and weaknesses * To share wishes with team members
Communication step	4	* Goal setting	* To set team goal and personal goal
	5	* Role setting	* To understand my role in the team * To select team leader (official / unofficial) and importance of role
	6	* Improving confidence	* To make team's goal ceremony * To come up with positive self-talk
		* Support among team members	* To compliment team members
Summary step	7	* Summary /measurement * In-depth interview	* To express thanks to team members * To measure group cohesion / efficacy / communication

Table 5. Change in team cohesion

Factor	Timing	N	Mean	Standard Deviation
Personal social cohesion	Pre	5	3.23	0.40
	Post	5	3.77	0.25
Group social cohesion	Pre	5	2.07	0.59
	Post	5	1.47	0.56
Personal task cohesion	Pre	5	3.40	0.16
	Post	5	3.93	0.38
Group task cohesion	Pre	5	3.97	0.41
	Post	5	4.51	0.16

2) Changes in team efficacy

Mean value of all subfactors of group efficacy perceived by athletes of the professional curling team including ability, effort, patience, preparation and solidarity was increased after the application of the program.

In group efficacy, the level of ability factor was 4.25 at pre-test, and it was increased to 4.60 after application of the program. In addition, the value of effort factor was it was 4.45 at pre-test, and it was increased to 4.60 after the program. The level of patience factors was increased from 4.05(pre-test) to 4.40(post-test) after the program. In preparation factor, the value was increased from 4.45(pre-test) to 4.60(post-test) after the program. Lastly, for solidarity factor, the value was increased from 3.80(pre-test) to 4.45(post-test) after application of the program.

3) Changes in effective communication

Mean value of all subfactors of effective communication perceived by athletes of the professional curling team including acceptance, specificity, positive conflict and negative conflict was increased after the application of the

Table 6. Change in team efficacy

Factor	Timing	N	Mean	Standard Deviation
Ability	Pre	5	4.25	0.61
	Post	5	4.60	0.37
Effort	Pre	5	4.45	0.32
	Post	5	4.60	0.13
Patience	Pre	5	4.05	0.57
	Post	5	4.40	0.22
Preparation	Pre	5	4.45	0.27
	Post	5	4.60	0.28
Solidarity	Pre	5	3.80	0.41
	Post	5	4.45	0.37

Table 7. Change in effective team communication

Factor	Timing	N	Mean	Standard Deviation
Acceptance	Pre	5	3.75	0.53
	Post	5	4.45	0.20
Specificity	Pre	5	3.86	0.38
	Post	5	4.00	0.23
Positive conflict	Pre	5	3.95	0.18
	Post	5	4.25	0.17
Negative conflict	Pre	5	2.45	0.37
	Post	5	2.95	0.54

program.

As looking at change in effiective communication by each sub factor, acceptance factor was increased from 3.75(pre-test) to 4.45(post-test). Specifically looking at specificity factor, the value was increased from 3.86 before the program to 4.00 after the program. Looking at positive conflict factor, the value was increased from 3.95 before the program to 4.25 after the program. Lastly, looking at negative conflict factor, the value was increased from 2.45 before the program to 2.95 after the program.

3. Changes in athletes according to application of team building program (interview analysis)

In order to examine the effects of the team building

program of this study on a broader perspective, an in-depth interview was carried out on five athletes after the program. Person to person interview was used so that athletes can express changes in self and their team comfortably. Changes in team expressed by athletes during the in-depth interview were classified into two factors. After the application of the team building program, athletes stated that they felt changes in communication among team members and team cohesion.

1) Changes in communication among team members

After application of the team building program, athletes felt that they expressed their thoughts and emotions to their teammates more than before. Additionally, they became to know what they need to say to teammates during the competition, especially adverse situation. With these

communication changes, they perceived that they got closer and felt a rapport.

> "This program allowed me to say things that I could not say to team members, or at least get a sense of what we want to tell one another. I realized that I should talk and express more." (Athlete C)

> "Through this program, I was able to listen to what other team members think and tell them what I think. I said and heard various things that I never had a chance to." (Athlete A)

> "I could get closer to my team members by participating in this program. I learned how I can best behave and talk for the team." (Athlete D)

> "Now I understand how to encourage team members when games are going bad or compliment individual athletes in a more convincing way. I had a chance to take a look into what team members think and how they think about me." (Athlete E)

> "As we observed each other, focused and care more, I came to think that it is important to behave myself so that team members can appreciate my actions. I reflected back on myself and team members through various activities of the program, which made us communicate and get along better." (Athlete B)

2) Changes in team cohesion

During the early stage of the team building program, athletes recognized the importance of cohesion in curling performance, mentioning that team cohesion has over 90% impact on athletic performance and wanting to improve team cohesion. After the application of the team building program, the in-depth interview of athletes showed opinions that team members became more intimate, team mood was also improved, and they are willing to work together more from now on.

> "I was suspicious about this program at first, but it was nice to feel the effects as we progressed through every week." (Athlete C)

> "As we realized how to get together, I gained confidence that we can also achieve our goals." (Athlete B)

> "Our team got into good mood with this program, and we feel closer together." (Athlete A)

> "I felt that I should be friendlier to my team members, even after the program ends." (Athlete D)

> "This can be an opportunity for us to unite and become cohesive. We will work hard to become the world's best curling team." (Athlete E)

Discussion

This study analyzed the needs of athletes for a program that can increase team cohesion of curling teams and developed a team building program based on the analysis results. In addition, the effects of the developed program were verified through the application of the program to the curling team.

1. Development of team building program

For the development of the team building program, an open questionnaire asking for factors that help or hinder team cohesion was carried out on 69 national, professional, college, and high-school curling athletes to assess their needs. It is extremely hard to find previous studies on sports team building programs that performed a needs assessment during program development. In program development, the value of the needs assessment is in determining the contents of the program. The specific purpose of a needs assessment presents a directivity for the program and helps assess goals of the program (Royse,

Thyer, Padgett & Logan, 2001). Problems related to team cohesion perceived by athletes were examined to set the directivity and goals of the program through needs assessment on curling athletes. This is an attempt to increase validity of field application by reflecting the needs of athletes and teams instead of having researchers unilaterally decide contents and procedures of the program intended to resolve problems that appear in previous studies in which researchers, team coaches, or managers applied a program on their sole discretion (Kim, 2003).

Also, based on the needs assessment on curling athletes, factors affecting team cohesion perceived by athletes were communication, interpersonal relationship, and athletic performance. Communication and interpersonal relationship factors agreed with the results of a previous study that conducted the needs assessment on adolescent soccer players (Kim, 2008). However, factors related to athletic performance such as clear role, goal, and team mood newly appeared in this study, implying that athletic performance factor affects team cohesion. In addition, such results were probably caused by differences in items of needs assessment compared to the previous study (Kim, 2008), as well as change in ages of athletes from adolescents to college, professional and national athletes.

Based on the results of the needs assessment, the team building program for curling teams was developed by selecting activities to change communication, interpersonal relationship, and athletic performance related to training and daily life.

2. Effects of team building program application

The developed team building program was applied to a professional male curling team; quantitative and qualitative methods were used to examine the effects. After the application of the team building program, positive changes occurred in team cohesion (excluding group social cohesion), group efficacy, and communication factors. Among factors of team cohesion, group social cohesion was decreased during post-measurement because of change

in perception of cohesion by the professional curling team after the application of the program. To be specific, athletes better understood the concept of social cohesion through the program, which probably lowered the level of group social cohesion due to greater expectation for the overall social cohesion of the team. In addition, when discussing the pros and cons of the team during the first session of the program, athletes believed that the team's social cohesion is lower than task cohesion and needs to be improved. Although professional curling teams spend a lot of time together because of long overseas off-season training and dormitory life, they were found to spend more time personally than try improving social cohesion. Therefore, as athletes gained a better understanding of social cohesion, their increased expectation for social cohesion by attempting to set and achieve the team goal of improving social cohesion was found to be the cause of decrease of group social cohesion. During the in-depth interview conducted on athletes to qualitatively verify the effects of the team building program, athletes mentioned that positive changes occurred in communication among team members and cohesion after the application of the team building program.

These results support the results of previous studies (Kim, 2008; Kim, 2012; Alonso et al., 1997; Martin & Davis, 1995; McClure & Foster, 1991; Rovio, Arvinen-Barrow, Weigand, Exkola, Lintunen, 2012) that applied team building programs to baseball, soccer, basketball, gymnastics and ice hockey teams, in which team cohesion was improved after the programs. This study measured cohesion, group efficacy, and communication factors to verify the effects of the team building program. This suggests that this program can have positive effects on primary factors related to cohesion. The results imply that the program developed and verified in this study can be effectively applied to sport scenes.

Lastly, this study applied the team building program by combining a group counseling approach and educational approach used by previous studies. During this process, it was found to be appropriate to set the directivity of the program according to the size and age of the team. In a

previous study (Kim, 2008) on adolescent soccer teams, group counseling approach was appropriate because the size of team was within 10 athletes. In another study (Kim, 2012) on college baseball team, an educational approach was applied instead of group counseling because the team was comprised of 20 athletes or more. In this study, the professional men's curling team is comprised of five adult athletes. Group counseling was available considering the size of the team, and expert meetings determined that it would be effective to add the educational approach because the team only has adults. The application of the team building program developed in this study for curling teams improved social cohesion, task cohesion, and communication of athletes.

However, there were unexpected difficulties. The program could not be applied to the professional curling team for a long period of time due to the busy game and training schedules. The program was carried out twice a week, which is more frequent than initially planned. Nonetheless, 7 sessions were completed in a relatively short time because activities for two sessions could be applied to each session because the team only had five athletes.

Conclusions and Suggestions

Team cohesion is an important psychological factor related to athletic performance in team sports, and team building is an intervention technique used to improve cohesion. This study attempted to develop a team building program to improve cohesion of curling teams and verify the effects of the program through its application. The conclusions are as follows:

First, based on the needs assessment of curling athletes about the team building program carried out as an open questionnaire, interpersonal relationship, communication, and athletic performance factors were found to be necessary for the team building program. Accordingly, goals of the team building program were to improve communication related to athletic performance, training,

and life and to improve the relationship among team members. Activities for the program were selected based on the goals.

Second, all subfactors of team cohesion perceived by athletes of the professional men's curling team except for group social cohesion were increased after the application of the 7-session team building program. Subfactors of group efficacy including ability, effort, patience, preparation, and solidarity were also increased. Sub-factors of communication, acceptance, specificity, positive conflict and negative conflict, were increased as well. Changes in the team mentioned by athletes during the in-depth interview after the team building program were changes in positive communication and team cohesion. In detail, athletes mentioned that the method and frequency of communication increased after the program, and that team mood was positively changed with increased intimacy among team members.

Suggestions on tasks to be considered or resolve in future studies are as follows:

First, the team building program was only applied for about a month before the start of the season because it was difficult to apply the program for long term due to the game and training schedules of the professional curling team. The effects of the program are expected to increase further by applying it for a long time through close negotiation with curling teams. Athletes who participated in the program mentioned during the in-depth interview that they wish to continue this program. However, it would be necessary to implement a periodic program instead of the one-time application.

Second, the team building program developed in this study was carried out in the sport psychology counseling laboratory of Korea Institute of Sport Science, which had the advantages of using monitors, desks, and chairs for education and being able to focus in a new environment away from the training sites. Team cohesion can be improved more by executing the program in training sites and stadiums during long off-season training period.

Third, the team building program of this study was developed and applied for curling teams. Since cohesion is

an important psychological factor of team sports, the program can have a positive effect on the athletic performance of different sport teams such as bobsleigh and mass start speed skating at the Pyeongchang Olympic Winter Games.

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