

ORIGINAL SCIENTIFIC PAPER

A Qualitative Study on Psychological Skills Training Experiences of Rapid-fire Pistol Athletes

Mun-Gyu Jun¹, Jeong-Ho Kim¹, Chulhwan Choi²

¹Department of Coaching, College of Physical Education, Kyung Hee University, Seocheon-dong 1, Giheung-gu, Yongin-si, Gyeonggi-do 17104, Republic of Korea, ²Department of Physical Education, Gachon University, 1342 Seongnamdaero, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Abstract

The objectives of this study were twofold: (1) to help high school athletes who lacked psychological skills a) overcome psychological difficulties in practice and competition situations and b) reach peak performance, and (2) to understand the effects of psychological skills training on perceived performance of high school rapid-fire pistol athletes. By using a purposive sampling method, this study selected four male rapid-fire pistol athletes from the shooting team of H High School in the Republic of Korea, who were registered with the Korea Sports Federation in 2021. A psychological skills training program was applied for 10 weeks to the treatment group, and this study integrated and analyzed data collected through individual in-depth interviews and participatory observation to test the effectiveness of the program. It was confirmed that the subjects learned how to overcome psychological and physical tension and anxiety by actively applying the acquired psychological skills on the field and improved their confidence in specific skills by using the 10-week psychological skills training, in-depth interviews, and participatory observation. It was also found that the level of personally expected performance increased. These results showed that the psychological skills training program had a partial and positive impact on the perceived performance of high school rapid-fire pistol athletes. It is hoped that the results of this study will serve as a meaningful basis for the development and application of more scientific and systematic psychological skills training programs optimized for each individual while considering the psychological characteristics of athletes.

Keywords: *psychological skills training, self-confidence, perceived performance, rapid-fire pistol athletes*

Introduction

Psychological skills training is a systematic training program designed to help athletes achieve peak performance in competitive situations by equipping them with optimal psychological skills. Psychological skills consist of “all mental strategies and techniques needed to overcome the stress in sporting situations and maximize performance through the regulation of thoughts and emotions,” and psychological skills training refers to “a training process that helps athletes obtain these self-regulatory skills so that they can perform at the highest level possible” (Chung & Kim, 1999). Psychological skills training is one of the major areas of interest of sports psychologists, and it has been the subject of ongoing study to

find the optimal techniques for each sport while considering the unique characteristics of that sport.

Psychological skills have been studied in shooting sports as well. Chun (2010) conducted a single case study on elite shooting athletes and reported that athletes who had received psychological skills training had better psychological stability and improved ability to cope with crises, which led to increased self-confidence and improved performance. Ma (2011) also evaluated female national pistol athletes and revealed that athletes who had experienced psychological skills training showed significant differences in arousal control, pressure relief, achievement motivation, and self-confidence, which resulted in improved performance. Furthermore, a study by



Correspondence:

Chulhwan Choi

Gachon University, Department of Physical Education, 1342, Seongnam-daero, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea 13120, Korea

E-mail: chulhwanchoi@gachon.ac.kr

Kim and Shin (2010) found that psychological skills training improved the performance of shooting athletes with disabilities. In addition, a study by Jun, Kim, and Choi measured the results of neurofeedback psychological skills training using an electroencephalograph (EEG) signals and found positive results in shooting athletes. These studies suggested that psychological skills training could induce a positive psychological state in shooting athletes that could improve performance.

Coaches and athletes on the field have been focusing on finding the culprit in technical training alone (Jung, Kim, & Oh, 2017). As a result, they do not realize the importance of psychological skills training due to a lack of experience and knowledge. Consequently, even high school athletes, who are the future of Korean shooting, do not recognize the importance of psychological training and focus solely on technical training, which is problematic. Although most studies (Lee, 2004; Cheon, 2010; Ma, 2011; Jang, 2012) have examined adult athletes such as university and business team athletes, their research was limited to 10M air pistol athletes. Therefore, only a few studies have evaluated the application of psychological skills training to rapid-fire pistol athletes. Consequently, this study is intended (1) to help high school athletes who lacked psychological skills (a) overcome psychological difficulties in practice and competition situations and (b) reach peak performance, and (2) to understand the effects of psychological skills training on perceived performance of high school rapid-fire pistol athletes.

The concept of psychological skills training

In post-game interviews, athletes and coaches often state, “I lost it due to tactics and strategy” or “I was outperformed physically,” but they just as frequently complain, “I couldn’t concentrate until the last minute” or “I lost in mental strength.” This means that while external factors such as physical fitness, tactics, strategy, and refereeing decisions are important, internal factors such as a player’s psychological state also have a substantial impact on the outcome of a match.

Therefore, sports psychologists have sought to develop methods to enhance psychological skills to allow athletes to perform at their best in practice or competition situations. They have used various terms such as “mental training,” “mental practice,” “mental imagery,” and “mental rehearsal” to describe training intended to improve psychological skills that influence athletes’ performance. According to Vealey (1988), the term “psychological skills” refers to the ability to regulate one’s psychological state through confidence, willpower, concentration, and motivation to perform at one’s best. This can lead to positive changes, such as positive self-awareness, anxiety reduction, self-confidence, and stress coping. On the other hand, the expression “psychological methods” refers to training such as goal setting, mental imagery, focused attention, and routines to maintain the aforementioned psychological skills (Vealey, 1988).

The importance of psychological skills training

Many athletes experience various negative psychological factors (e.g., anxiety and decreased confidence and concentration) both before and during competition. These are triggered by a range of factors such as excessive greed, pressure, and fear of failure, and it is difficult to determine which factors have the strongest influence because they are internal to the athlete. Simone Biles of the United States, who won four gold

medals in women’s gymnastics at the 31st Olympic Games in Rio in 2016, was expected to win six gold medals at the 32nd Olympic Games in Tokyo in 2021. However, after performing poorly in the first event of the team final, she withdrew because she could not withstand the psychological pressure. It became a big topic. This is because she suffered from the “twisties” indicating a phenomenon in which an athlete loses their sense of direction due to tension (Lee, 2021). Many athletes choke because they fail to overcome such psychological difficulties.

Porter and Foster (1987) reported that psychological skills could determine at least 50% of the outcome of any sport and 80–90% of the outcome in such sports as tennis, golf, and figure skating. The results suggest that an athlete’s physical condition is not the only factor determining the outcome of a match. Studies conducted in South Korea support this argument. For example, Lee and Yoo (2020) reported that the application of psychological skills training to high school swimmers positively affected their emotional state, sports performance strategies, and ability to overcome slump symptoms. In a single case study on golfers, Kim (2003a) found that psychological skills training improved players’ concentration, lack of countermeasures against competition anxiety, poor emotional control, and lack of a detailed practice plan for competition. In a study of psychological skills training for archers, Hong (2005) found that it significantly improved their ability to control their mental images, positively affected their mental management and training management, and increased their performance.

Despite its proven effectiveness, psychological training remains neglected in the field due to structural problems such as lack of awareness and outcome mindset of coaches, as well as temporal and economic problems (Jung et al., 2017). In a study of middle and high school golfers, Lee (2015) found that only approximately 19% of the participants were receiving psychological training. Choi et al. (2021) examined players registered with the KLPGA and reported that approximately 90% of the participants were aware of the need for psychological training, but only approximately 14% participated in psychological training. These results are consistent with Kim (2003b), which revealed that more than 90% of the participants (national team athletes) wanted psychological skills training, but only approximately 16% participated in such training. Taken together, these studies show that most athletes recognize the need for psychological training, but the frequency of actual participation is very low.

Methodology

Study participants

As subjects and participants, this study selected male rapid-fire pistol athletes from the shooting club of H High School in Seoul, South Korea, who were registered with the Korean Sports Federation in 2021. This study used a purposive sampling method, a nonprobability sampling method, which is suitable to evaluate the effect of applying psychological skills training to high school rapid-fire pistol athletes. We conducted the study after explaining the objective and content of the study to the coaches of the team and obtaining their approval. First, the coaches of the team recommended tenth- and eleventh-grade athletes who were considered to need psychological skills training, excluding twelfth-grade athletes who were stressed by the pressure of the college entrance exam. This study ultimately selected four athletes who agreed to participate in the study. The characteristics of the participants are shown in Table 1.

Table 1. Characteristics of Study Participants

Subjects	Age (year)	Height (cm)	Weight (kg)	Athlete Career (year)
A	17	168	54	1
B	17	172	60	1
C	18	180	80	2
D	18	183	103	2

Psychological skills training program

This study chose goal setting, routine, positive self-talk, relaxation, mental imagery, focused attention, and neurofeedback training as the main components of the program through a meeting of an expert group, which consisted of a professor majoring in coaching psychology, a Ph.D. majoring in sports psychology, a sports psychology Ph.D. student who was providing mental coaching, and the manager and coaches of the team to develop a suitable psychological skills training program.

In-depth interviews

This study conducted individual in-depth interviews (of approximately 10 minutes each) for each athlete immediately before and after the 10-week psychological skills training program to understand the personal psychological state of the four high school rapid-fire pistol athletes in greater depth. The collected pre- and post-interview data were used as the indices for the qualitative analysis conducted in this study. The in-depth interview used a semi-structured interview method, which combined the advantages of structured and unstructured interviews appropriately (Lee, 2018). The first half of the semi-structured interview asks mostly structured, organized, and systematic questions that are prepared by a researcher, while the latter half uses open-ended questions. As a result, it draws more in-depth, rich, free, and honest responses from an interviewee. The semi-structured interview is a stable interview format because it has a lower interview failure rate than the unstructured interview (Kim, 2015). However, a counselor must possess a certain level of interviewing skills because the semi-structured interview also requires counselors to strive to elicit more effective information based on the formation of human trust between counselors and clients (Kim, 2009). For this purpose, we watch videos related to psychological counseling and participate in seminars related to counseling, so that we can apply the techniques required for counseling in the field. This study used a semi-structured interview method and collected various responses to psychological skills training and related information from the athletes. The semi-structured interview questionnaire was prepared by modifying, supplementing, and reorganizing the interview questionnaires constructed by Park (2016) and Lee (2018) for this study. The interviews were recorded using a smartphone recorder (Samsung Galaxy Note 10) for storage and organizational purposes.

Observation

The participatory observation in this study was intended to closely identify all situations that could involve the subjects in the field and to evaluate the effectiveness of the application of psychological skills training (Shin, 2010). Therefore, this study actively drew on the researcher's experiences and feelings while closely observing and describing the training situ-

ation at International Shooting Range and the situation with respect to the surrounding members on the site. Participatory observation was conducted twice a week, using observations based on the situational circumstances of the field as data, and included observations from key players (e.g., coaches advising on technical aspects and teammates) (Seol, 2010). Moreover, if necessary, the main practice situations of the study subjects were filmed with a smartphone (Galaxy Note 10) and used as a reference to increase the validity and reliability of the observation analysis.

Validity and reliability of data

The design and analysis methods of a qualitative study can increase the validity and reliability of the study through direct participatory observation and in-depth interviews based on the researcher's honesty and exclusion of bias (Park, 2010). However, due to the nature of the method, the researcher's subjective judgment may be involved and have a decisive impact on the results (Jo, 2011). Therefore, studies must employ procedures to increase their validity and reliability (Jo, 2011). Accordingly, this study conducted multilateral verification, a review of the subjects, and an expert review to ensure the validity of the collected data and the analysis results during the study.

Several aspects to this approach are worth highlighting. First, multilateral verification is a process of drawing conclusions about the same research topic through various source materials, and it was an essential method for securing the validity of the data collected in this study (Shin, 2010). This study sought to confirm the consistency and increase the validity of the collected data (e.g., basic information about the subjects, in-depth interviews, participatory observations, and video recordings) by comparing and analyzing them. Second, the review of the subjects (inter-subject) refers to a review process that directly confirms the classification and interpretation of the collected data to the subjects (Sandelowski, 1993). This is a representative feature of the qualitative paradigm, which emphasizes the role of the study participants in the outcome of the study (Lincoln & Guba, 1985). It recognizes that study subjects understand the observed complex interactions better than the researcher and can provide some value in their interpretation (Lincoln & Guba, 1985). Therefore, this study asked the subjects to check the accuracy and error of the analysis results and interpretation of the collected raw data. Third, an expert review is a process to ensure the trustworthiness and unobtrusiveness of the data collected and derived while experts in the field conduct the study (Kim, 2009). Consequently, this study drew conclusions by correcting or supplementing results when an opinion contrary to the analysis results of this study was expressed in an expert meeting consisting of one professor majoring in coaching psychology, one Ph.D. majoring in sports psychology, one Ph.D. student majoring in sports psychology, and two coaches of the team.

Moreover, in a qualitative study, reliability is determined by the amount of time spent forming a rapport (Lee, 2004). Therefore, I first met the athletes while conducting educational service activities for the shooting club of H High School in January 2023 and continued to visit the International Shooting Range 2–3 times a week to form a rapport. In May, I went to H High School for a school practicum. Athlete C and Athlete D were students in my class, so I was able to have more conversations with them. I also made great effort to form a rapport with Athlete A and Athlete B by keeping in contact with them.

Results

Previous experiences with psychological skills training

The transcript of the pre-in-depth interview revealed that most athletes were aware of the existence of psychological skills training, but they were not fully aware of its specific procedure and effectiveness. In addition, none of the athletes had ever experienced a formal psychological skills training program before participating in this study.

Pre-interview about previous experience with psychological skills training

Researcher: Are you familiar with psychological skills training?

Athlete A: No. I don't know much about it.

Athlete B: Uh. I've heard of it, but I don't know exactly "what it is or how to do it."

Athlete C: I've heard of it, but I'm not sure what kind of training it is.

Athlete D: I've heard of it, but I'm not sure what it is...

Researcher: Have you ever received psychological skills training?

Athlete A: No, never.

Athlete B: I am sure if it qualifies for this. When I was in middle school, my coach once showed me some kind of video related to psychology. It was just like how to motivate, not how to train. It was something like that.

Athlete C: No, not at all. I've been wanting to get one for a while, and I'm so glad I got it this time. First of all, my parents liked it, too.

Athlete D: Uh, no, never.

Perceptions about tension and anxiety before psychological skills training

The transcript of the pre-in-depth interview showed that every athlete experienced a variety of psychological difficulties in competition situations. The main symptom was tension, such as constantly thinking that something was wrong while performing, body stiffness, and body trembling.

This phenomenon was common during match firing among all athletes. Athlete A and Athlete D experienced nervousness or anxiety almost every moment of the main event, from the start to the end. Athlete B and Athlete C did not feel nervous or anxious as much during the eight-second and six-second series, but they experienced extreme nervousness and anxiety as they entered the four-second series. Participatory observation also revealed that, in general, before the four-second series, athletes continued to bounce the magazine spring or shake their legs habitually because their preparatory action became more urgent than the eight-second and six-second series. Athletes experienced nervousness and anxiety mainly because of fear of making a mistake, along with excessive greed for high scores and medals in competition situations.

Pre-interview about tension and anxiety

Researcher: Do you experience nervousness or anxiety in practice or competition situations?

Athlete A: A little bit in competition. It is not too serious, but I think it depends on the situation.

Athlete B: Player B: Well, I think I am on the severe side. When I am in the line, my legs and arms are shaking, and my whole body is trembling a lot. I don't think I'm anxious or nervous in my head, but my body tells me differently. It's like my head and my body are working separately.

Athlete C: Not when I am practicing, but during a competition, I get a little nervous, so my body feels very unstable, and I often don't know what I'm doing.

Athlete D: Yes. I feel nervous and anxious during practice and competition about the same. So, when I'm about to shoot, my hands and my legs are shaking. It's a little bit worse in competition.

Researcher: When do you usually experience nervousness or anxiety?

Athlete A: I think I am like that before every series in the rapid-fire.

Athlete B: I experience it in practice when I'm shooting well. In competition, it is really bad during practice shots at the beginning, and it gets a little better during matching firing. Then, it gets really bad again before the four-second series.

Athlete C: I think I feel that most often before the four-second series. Even in a competition, I don't feel much anxiety during the eight-second series or six-second series, but I keep having those thoughts from the four-second load time, and my heart seems to beat a little faster.

Athlete D: It continues from before a competition until the end of it. I feel somewhat frustrated. It's kind of scary. Then it feels okay during practice shots, but when I get into the eight-second match firing, my heart starts palpitating again.

Researcher: In your opinion, what may cause you to experience emotions like nervousness and anxiety?

Athlete A: I think it's just because of "what if I make a mistake?" Yeah. I think it's because of a mistake because if I make a mistake, my score will drop a lot.

Athlete B: I think it's because of greed. Since I just want to shoot well, I care so much about my score. When I'm shooting well, I'm always nervous, and then I make one mistake or something, and then I get relaxed. When I shoot well, I think like "Oh, if I shoot like this, I'm going to make it to the finals" or "I'm going to get a medal." So I feel nervous and anxious about making a mistake. When I'm not shooting well, I don't feel anxious or nervous because I'm not thinking about that at all.

Athlete C: I don't know that. I just get nervous or anxious whenever I go to a competition. If I have to think about it, I think I get nervous because I try too hard to do well. As my manager and coach say, I just need to do what I can do, but when I go into a competition, I just think about the score instead of thinking about that.

Athlete D: I think it's because I'm afraid that I'm not going to shoot well. It's just the thought that I'm going to make a mistake. Oh, I think the biggest thing is that I'm going to misfire. I've been misfiring a lot in practice lately, and I did that in the first match of the year. I missed three shots, and it ruined the match. But I can't find the cause of it, and I have to have a good record next year to get into college! So I think that's what makes me nervous, too.

Perception of perceived performance before psychological skills training

The transcript of the pre-in-depth interview indicated that most athletes perceived that their shooting skills were not at a high level. Specifically, they recognized that technical aspects such as firing and aligning the sight were lacking. In particular, participatory observation revealed that the athletes engaged in self-deprecating self-talk after shooting due to problems such as yanking the trigger or misfiring. Next, when asked about the level of performance they expected in a match situation, most of the players had low expectations. A small difference was apparent between tenth-grade and eleventh-grade athletes: tenth-grade athletes expected between 530 and 540 points, while eleventh-grade athletes expected between 540 and 550 points. Moreover, they had lower expectations for the four-second series than the other series.

Pre-interview about perceived performance factors

Researcher: How would you rate your shooting skills?

Athlete A: I don't think it's too bad, but my scores fluctuate because I keep yanking it when I'm firing. So I think my firing is kind of bad.

Athlete B: I don't think I'm good at rapid-fire. Since I won an individual medal in air rifle this time, I have a lot of confidence in my performance. But a rapid-fire game is a bit difficult because I haven't even been to the finals yet. So I don't think I'm technically good or high.

Athlete C: I don't think my skills are good. I originally thought I was good at aligning my aim and keeping my eyes on the target, but lately, I've been losing my eyes a lot, so I've lost confidence in my skills.

Athlete D: I think I'm just average. I don't think I'm really good at anything.

Researcher: What level of performance do you expect from yourself in a competitive situation?

Athlete A: I don't expect much for rapid-fire. Maybe in the 30s or 40s? I don't have any record expectations.

Athlete B: I think I expect the 40s. I don't think I can have better because I am not good at the four-second.

Athlete C: I don't think it's that high. I think it's in the 40s or 50s. I think the 40s or 50s is like "Well, I can shoot at least this."

Athlete D: I think I can shoot in the 40s. I think I can shoot about 95 in the eight-second and six-second, but the four-second is the issue. If I shoot about 88 in the four-second, I feel like I've done a good job.

Perceptions of tension and anxiety after psychological skills training

According to the transcript of the post-in-depth interview, all the athletes indicated that psychological skills training helped them to control their fears when shooting. Despite their inability to completely control their fears, they were able to overcome some of the nervousness and anxiety they experienced in certain situations. Relaxation training and routine training were the most frequently applied skills that athletes used to overcome these psychological difficulties during psychological skills training. Specifically, Athlete B and Athlete C said that when they conducted relaxation training while shooting, their bodies became more relaxed and calmer to make their swing movements smoother and allow them to move as intended.

Athlete D said that by paying attention to and following the routine he had developed, he was able to eliminate his anxiety about misfiring, which had been a problem for him. Participatory observation also confirmed this. For example, the athletes practiced their own pre-shooting routines or relaxed by closing their eyes or fixing their gaze on a single point after loading live ammunition and before raising the gun.

Post-interview about competitive anxiety

Researcher: Did the psychological skills training help you control your fears, such as nervousness or anxiety?

Athlete A: Yes, I think it does work. I used to tremble a little bit and was nervous when I was looking at that red light before my first shot, but now I feel a little bit more relaxed.

Athlete B: I think it has really helped me a lot. I don't think that psychological training can eliminate anxiety or nervousness completely. But as I know what to do in those situations after the training, it's literally made me realize that I can mitigate it to a certain extent. In particular, my arms and legs tend to shake a lot before I shoot, and I think that I can tremble a little bit less by thinking about what I've learned in the psychological training and preparing myself calmly.

Athlete C: Yes, I think it has really helped me a lot. Even in practice, I was fine at the eight-second and the six-second, but my body was shaking a little bit before shooting the four-second. But after the psychological training, I got rid of a lot of nervousness when shooting the four-second. Frankly speaking, my biggest problem was shaking at shooting the four-second, but once I solved it, my record kept going up. Nowadays, I keep shooting in the 60s. So it's too bad that the competition is canceled for the second half.

Athlete D: Yes. It has been helpful. I think it helped me get rid of my anxiety about misfiring.

Researcher: Have you ever applied (or do you think you can apply) the psychological skills training you learned to overcome emotions such as nervousness and anxiety in practice and competition situations?

Athlete A: I've been using that positive self-talk while shooting. Oh, the routine as well. I've been paying attention to the post-shot routine, and I think that even if I'm nervous in a competition, as long as I stick to the routine, I'll be able to do well.

Athlete B: I've been practicing what I learned in the relaxation training every day. Even if I'm not necessarily nervous or anything like that, sometimes when I'm shooting, my hands and arms can get really tense. I just relax them when it happens. Then, my swing gets much smoother because I'm not tensing up. I don't know if I can do it in the competition, but I think I can do it to some extent.

Athlete C: Yeah. I continue to do the relaxation and routine in practice. I check it every day by keeping a journal so that I can do the things I do in practice like a habit when I go out to compete. I perform the relaxation activity, focusing on the abdominal muscles, before raising my gun in the line. I feel that my stomach is more comfortable when I raise my gun afterward. My body becomes calm, and my initial swing is right in the center. I continue to do the routine in this way, and I think I can shoot well if I apply it in the competition.

Athlete D: Yes. I practice the routine that I made for loading during the routine training during the practice. When I do that, the anxiety about misfiring disappears, so I try to shoot while just thinking about the routine during the competition like in practice. And when I relax and raise my gun, it seems my legs and hands don't shake. I didn't know it before because I did not know, and I think I can do it easily during the competition.

Perceived performance after psychological skills training

The transcript of the post-in-depth interview showed that all the athletes had increased their belief and confidence in their shooting skills. In particular, the pre-interview revealed that most athletes were quite intimidated by firing, but after the psychological skills training, their belief and confidence increased, and it even became their strength. Furthermore, the transcript showed that their expectations that they could demonstrate their desired performance in the competition situation had increased. Even though the pre-interview indicated that they had low expectations or that their actual performance was poor despite high expectations, most athletes' expectations increased after the psychological skills training was completed. Moreover, expectations that they would be able to perform at a corresponding level increased simultaneously. Specifically, Athlete B and Athlete C stated that they would perform at the level of their expectations even in the competition, and Athlete D stated that his expectations had increased drastically and that he would no longer have outrageous records.

Post-interview about perceived performance factors

Researcher: Did you notice any changes in your belief or confidence in your shooting skills after the psychological skills training?

Athlete A: Yes, I think it's increased: my goal was to fix yanking when firing, and it's gotten a lot better. So I think I have a little more confidence in my firing now.

Athlete B: Well, I wasn't that bad at firing. You know, firing is really important in rapid-fire. I tried to focus on the basic actions when firing during this psychological training. I became more confident in my firing, and that's why my score went up.

Athlete C: The thing I was most confident in was aligning the sight, but I couldn't do it well after the Changwon Mayor's Cup. During the focused attention training, I looked for distractions and realized what I needed to do to keep my eyes on the target. Then I gained my confidence again about that part.

Athlete D: I wasn't confident in firing at all because of misfiring, but now I think I've gotten a lot better. I rarely misfire now since I am shooting with the idea that I'm just going to hold it boldly and just let it go on my timing.

Researcher: Do you think you will be able to perform as well as you expect in future matches?

Athlete A: I don't know for sure until I play a match, but I think I'll be able to shoot better than I did in the first half. I think I'll shoot in the 50s.

Athlete B: Well, I think my expectations have been raised a lot. I think it'll be at least come close to the record I'm thinking of right now.

Athlete C: Yes. I think that if I compete now, I'm not going to shoot so much worse than my expected score like before. I

think I'm going to score close to my expectation. I think I'm going to be able to shoot in the 50s.

Athlete D: Uh, I don't think it's going to be easy to shoot the same score that I shoot in practice, because I'm shooting so well in practice now. I don't think I'm going to get a ridiculous score or anything like that. I just feel like I'm going to be easily qualified for the final.

A comprehensive review of psychological skills training

The transcript of the post-in-depth interview revealed that the routine training was the most helpful program for the athletes, followed by the relaxation training after the psychological skills training. This was also confirmed by participatory observation: the athlete put a sheet of paper that recorded their routine on the line and looked at it before shooting and engaged in relaxation exercises with their arms crossed and eyes closed before attention after loading. Among the routines, the one-minute post-load routine was the most beneficial. As they repeatedly performed the routines that they had developed, athletes corrected bad habits with respect to certain skills and improved their confidence. The relaxation training also had a positive impact on their performance because it relieved some of the physical tension they experienced due to fear or anxiety in certain situations. They said that they wanted to make it a habit by making efforts, such as continuously recording it so they could check it easily on their own, to continue to apply programs that had been helpful for them.

Post-interview on the experience of psychological skills training

Researcher: Which psychological skills training program helped you the most or was the most memorable?

Athlete A: To me, they were the positive self-talk and the routine. I used to get mad when I missed a shot. I was looking for excuses or something to blame. But as I learned from the self-talk training that bad thoughts didn't help at all, I tried to change my thoughts positively, and it made me feel better, and it seemed I could shoot better. And, as I made a routine, it felt new every time I shot a series. So I could concentrate better, and it felt good.

Athlete B: Well, the relaxation training and the routine training were memorable, but actually all the rest of them were good. The relaxation training helped me the most. As I said before, when I'm nervous, I shoot with a lot of force in my hands and arms. But then I thought about what you taught me last time, and I thought it was funny because when your body was nervous, your muscles would contract, and I was just trying to make them contract even more. So now I try to relax when it happened, and it really helped me a lot. I had a routine before, but it was a very simple routine before the psychological training. Then after the psychological training, I made my own perfect routine. I think it will be really helpful in the future, especially the pre-load routine.

Athlete C: I really liked the relaxation training and the routine training. When I'm nervous, I feel like my body just stiffens up, and I'm so nervous that I can't align my aiming line well. When I repeatedly tighten and release my abdominal muscles, it seems to loosen my body a little. After I learned that famous players generally had a routine, I participated in it very hard. In particular, the loading routine was really helpful. I feel like I can shoot well if I just pay attention to this.

Athlete D: The routine and the mental imagery training. First of all, I think the routine fixed my bad habits. Once they were

fixed, I didn't misfire any longer. Then my coach touched my firing to make it smoother, and my score went up by a lot. Mental imagery did not show a clear effort or something, but I can see that my alignment is moving when I'm at a shooting range or dozing off on the subway. But it felt perfect, and it had the feeling of 10 points just there. Even when I'm shooting at the line, I feel good when I think about that. Uh, I also liked the relaxation training.

Researcher: How will you continue to practice the training program that helped you?

Athlete A: You know, I can do the positive self-talk and the routines even during training. I'm going to keep trying to do this. And I'm going to make a card and put it in the gun case so that I don't forget. When I shoot, I'm going to take it out and read it whenever I fire.

Athlete B: I do relaxation training every day before I go to bed, in bed. I'm going to keep doing that. I'm checking the routine as I'm shooting. I'm writing it down on my phone to make sure I'm doing it right. Before daily training, I read what I wrote the day before and then start practicing. I'm going to keep doing that.

Athlete C: First of all, I'm going to write a journal for the routine practice every day to check it because I can cope with that situation during the game only when I keep checking my routine when I shoot well or poorly. And for relaxation, I tense and release my arms and abs after I load the gun and before raising it. I'm going to do the same thing when I go to the match.

Athlete D: I'm going to keep doing the routine and the relaxation because I can do it even when I'm shooting. I don't think I'm going to practice mental imagery consistently, but I'll try to do it once in a while.

Discussion

This study qualitatively analyzed the perceived performance of high school rapid-fire pistol athletes due to the psychological skills training program they received and found significant differences. These results suggested that the psychological skills training program increased athletes' perceived performance, which was consistent with the results of studies (Yang et al., 2015; Lee, 2018; Lee & Ryu, 2020) that showed the positive effect of psychological skills training on athletes' perceived performance.

The qualitative analysis results of perceived performance revealed that most of the athletes were aware of problems with their shooting skills (pre-interviews), and as a result, they did not rate their performance highly. In particular, three out of the four subjects were top-ranked air pistol athletes; they had great confidence in certain techniques related to air pistol. However, participatory observation confirmed that they lacked confidence in shooting in the rapid-fire pistol game. When asked about their performance expectations in a competition situation, most of the athletes indicated that their performance level was low. They expected a score between 530 and 550 points. In the same event, expected scores differed between tenth-grade athletes and eleventh-grade athletes, likely due to the different levels of experience in the rapid-fire pistol game between the two grades. Given that the athletes in this study had only one or two years of experience in the sport, one may question whether these results were a consequence of the psychological skills training program or a natural outcome of their development.

Park (2013) applied a psychological skills training program to adolescent billiard players with approximately two years of experience and found that the treatment group had significantly better arousal control, anxiety control, attention, and confidence than the control group. Kang (2016) applied a psychological skills training program to secondary school shooters with approximately one year of experience and found that the treatment group showed significantly better sports psychological skills such as goal setting, mental imagery, and anxiety control than the control group. Kim (2018) also evaluated the effect of a psychological skills training program by the length of dancing experience using high school dance majors. Kim (2018) reported that such a program decreased the level of cognitive and physical anxiety in both beginner (1–2 years of experience) and advanced (5–7 years of experience) groups, but it increased perceived performance only in the beginner group. These results suggest that psychological skills training can have a positive impact even on inexperienced athletes and that its effect may vary because athletes have different psychological skill levels depending on their experience.

Yun (2008) reported that the more experienced athletes had higher levels of psychological skills such as arousal control, self-confidence, and mental image control, which was supported by Lee and Yoo (2011), who analyzed the differences in sports psychological skills among yacht athletes and found that the more experienced athletes had higher levels of psychological skills. Considering the results of other studies, it cannot be ruled out that the effect of psychological skills training may be lower for more experienced athletes because they would have higher levels of psychological skills. Moreover, it is possible that less experienced athletes, such as the subjects of this study, benefit more from psychological skills training because they have lower levels of psychological skills. Therefore, it is believed that the results of this study reflect the effect of psychological skills training, rather than the naturally improved performance of inexperienced players.

The post-interview after 10 weeks of psychological skills training showed an overall increase in the athletes' belief and confidence in their shooting skills. In particular, it was observed that athletes' confidence in their shooting skills decreased due to technical problems such as misfires, misses, and lost alignment before treatment, but they became more confident in their shooting skills after treatment. It can be inferred that the athletes learned how to overcome the psychological difficulties through the psychological skills training program and actively applied them in the field. In addition, when asked whether they would perform as expected in a competition, most of the athletes answered that they would perform as expected, which confirmed that the program induced a positive change in their belief and confidence in their performance. Compared to the pre-interview, the expected performance of the athletes increased. It is believed that the athletes' confidence increased because, unlike previously, their mental state did not collapse in certain situations in which they experienced psychological difficulties and that they calmly overcame those difficulties by applying the psychological skills they had acquired.

Nevertheless, this study confirmed through the pre-in-depth interviews that no participants had knowledge of and experience with psychological skills training. It is believed that most student-athletes are likely to be constrained from participating in psychological skills training for reasons (e.g., time and cost) suggested by previous studies (Heo & Park, 2010;

Choi et al., 2021). Although studies have already proved both the importance and effectiveness of psychological skills training programs by developing and applying them scientifically and systematically, these programs have not been widely used in the field. Moreover, even though psychological skills training can be implemented efficiently when a counselor has a thorough knowledge of the sport and considerable experience, and athletes also value the counselor's expertise and field experience (Lee, 2021), the number of coaches with both expertise and experience is seriously lacking. Therefore, it is hoped that future studies will prepare plans and measures to overcome challenges required for the field application of psychological skills training and that elite athletes will be cultivated in line with contemporary trends.

Taken together, these findings suggest that the psychological skills training program contributed to an increase in the perceived performance of high school rapid-fire pistol athletes. However, this study could not determine the effect of perceived performance on actual performance because competitions were postponed or canceled due to COVID-19. Therefore, future studies need to evaluate the effect of increased perceived performance on the actual performance of rapid-fire pistol athletes.

Conclusion

The qualitative analysis of this study confirmed that the 10-week psychological skills training program helped the rapid-fire pistol athletes learn how to overcome psychological challenges and increased their belief and confidence in their shooting skills and performance. However, cultivating elite athletes is still difficult due to the narrow-minded perspective in the field, which tries to situate the cause of poor performance in skills training alone. Therefore, it is necessary to break away from the obsolete mindset of the past; recognize the importance of psychological skills; and seek ways to provide systematic education and training for student-athletes, who represent the future of elite sports. In this sense, this study

makes recommendations for future studies as follows.

First, it is difficult to generalize the given results because this study evaluated only four high school rapid-fire pistol athletes and applied a psychological skills training program. College and general athletes with more experience and excellent performance may be experiencing different types of psychological difficulties than less experienced high school athletes. Therefore, future studies need to develop and apply a psychological skills training program suitable for college and general athletes and analyze its effectiveness systematically.

Second, this study carried out a psychological skills training program consisting of goal setting, positive self-talk, routine, relaxation, mental imagery, and focused attention for 10 weeks. Since the period was relatively short, the study did not consider the individual implementation level of the subjects while providing many psychological techniques. In the post-in-depth interviews, participants almost universally mentioned that two techniques were the most helpful, suggesting that the positive results might be a function of program quality rather than quantity. Therefore, future studies should try to analyze the effects of one or two more sophisticated and applied psychological skills training programs according to the individual characteristics of the subjects.

Third, this study did not examine the effect of psychological skills training on performance, which was one limitation of the study. It was found that the performance of three athletes except for Athlete B improved after the psychological skills training program when competition results were compared before and after the program. However, it is difficult to conclude that the increased performance was due to the program because the competition, which was scheduled immediately after the end of the program, was postponed until about 60 days after the treatment due to COVID-19. Therefore, future studies need to analyze the effect of a psychological skills training program by comparing the performance of the athletes immediately after the treatment and whether that program is continued.

Acknowledgments

There are no acknowledgments.

Conflict of Interest

The author declares that there is no conflict of interest.

Received: 11 January 2024 | **Accepted:** 23 January 2024 | **Published:** 01 February 2024

References

- Cheon, Y. S. (2010). *The effects on psychological skills training of elite shooting athlete: Single subject design (Unpublished master's thesis)*. Incheon, Korea: Incheon National University.
- Choi, D. H., Lee, H. S., & Park, B. Y. (2021). An analysis on perception and the actual condition of participation of psychological skills training for KLPGA golfers. *Journal of Coaching Development*, 23(2), 24-45.
- Chung, C. H., & Kim, B. J. (1999). *Understanding sports psychology*. Seoul, Korea: Keumgwang.
- Hong, K. D. (2005). *The study on development and practical application of psychological skills training program for archery (Unpublished doctoral dissertation)*. Seoul, Korea: Seoul National University.
- Huh, J. H., & Park, Y. B. (2010). The case study of sport psychology counseling and supporting junior golfers. *Journal of Coaching Development*, 12(4), 127-138.
- Jang, J. Y. (2012). *The effect of psychological skills training on psychological variable and performance in shooting and archery players (Unpublished doctoral dissertation)*. Gwangju, Korea: Chonnam National University.
- Jo, S. W. (2011). *Effect of psychological training on bowling players' confidence (Unpublished master's thesis)*. Ulsan, Korea: Ulsan University.
- Jun, M. G., Kim, J. H., & Choi, C. (2023). Effects of psychological skills training on brain quotient and perceived performance of high school rapid-fire pistol athletes. *Applied Sciences*, 13(5), 3118. <https://doi.org/10.3390/app13053118>
- Jung, S. W., Kim, J. W., & Oh, J. S. (2017). A case study on elementary school gymnast sports counseling and psychological skills training effect. *The Korean Journal of Elementary Physical Education*, 22(4), 59-74.
- Kang, H. C. (2016). *The verification on effect of mindfulness acceptance commitment (MAC) and psychological skills training (PST) for shooting athletes (Unpublished doctoral dissertation)*. Seoul, Korea: Korea National Sport University.
- Kim, B. J. (2003a). The effects of psychological skills training on mental game and golf performance. *Korean Journal of Sport Psychology*, 14(2), 213-233.
- Kim, B. J. (2003b). A survey of Korean athletes about psychological skills and sport psychology services. *Korean Journal of Sport Psychology*, 14(4), 205-222.
- Kim, B. R. (2019). *The effect of psychological skill training of dance majors on competitive state anxiety and performance evaluation in high school (Unpublished master's thesis)*. Seoul, Korea: Yonsei University.
- Kim, K. Y. (2009). *A case study on the application of psychological skills training to professional golfers (Unpublished doctoral dissertation)*. Ulsan, Korea: Ulsan University.
- Kim, S. H., & Shin, J. T. (2010). The effects of psychological skills training on psychological skills and performance of Korea national shooting athletes with disabilities. *Korean Journal of Sport Science*, 21(3), 1355-1367.
- Kim, T. Y. (2015). Data collection, analysis, and thesis writing using qualitative research methods, focusing on interview methods. *Korean Language and Culture Education Society Conference*, 9-14.
- Lee, D. H. (2004). *The effects of mental training program on competition state anxiety and performance of shooting players (Unpublished master's thesis)*. Kyungnam, Korea: Kyungnam University.

- Lee, H. S. (2021). *Analysis of negative experience factors in psychological skills training of KPGA players: Focused on the players who stopped psychological skills training (Unpublished master's thesis)*. Ansan, Korea: Hanyang University.
- Lee, K. H. (2004). *Effect of pre-shot routine training on golf performance: Case study of KPGA & KLPGA tour golfers (Unpublished doctoral dissertation)*. Seoul, Korea: Sungkyunkwan University.
- Lee, U. K., & Yoo, H. S. (2020). The effects of psychological skills training on mood states, sports performance strategy and perceived performance of high school swimmers in slump. *Korean Journal of Sport Psychology*, 31(2), 107-122.
- Lee, Y. J. (2015). *A study about awareness and the condition of field application of psychological skill training with middle school and high school golfers (Unpublished master's thesis)*. Seoul, Korea: Yonsei University.
- Lee, Y. J. (2021). "Secret Special Training" by Simon Biles's valuable bronze medal. What's the secret to overcoming herself? Available online: <https://www.joongang.co.kr/article/24120847>
- Lee, Y. N. (2018). *The effects of psychological skills training on competitive anxiety, attention concentration and perceived performance of high school Taekwondo Poomsae athletes (Unpublished master's thesis)*. Seoul, Korea: Chung-Ang University.
- Lee, Y. T., & Yoo, J. I. (2011). Study on the yacht player's level of sports psychological skills. *Korean Journal of Sport Psychology*, 22(2), 65-76.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Ma, Y. S. (2011). *The effects of psychological skills training program on anxiety, psychological skills, and performance of female Korea national shooting athletes (Unpublished master's thesis)*. Gangwon, Korea: Kangwon National University.
- Park, J. H. (2010). *Effects of psychological skill training program on the psychological skill factor and performance in fencer (Unpublished master's thesis)*. Ulsan, Korea: Ulsan University.
- Park, J. H. (2016). *The effects of psychological skills training on Taekwondo athletes' competitive anxiety and self-efficacy (Unpublished master's thesis)*. Seoul, Korea: Korea National Sport University.
- Park, J. S. (2013). *The effects of psychological skills training on attention, competitive state anxiety and performance of teenage billiards players (Unpublished master's thesis)*. Seoul, Korea: Chung-Ang University.
- Porter, K., & Foster, J. (1987). *The mental athlete*. New York: Ballantine Books.
- Sandelowski, M. (1993). Rigor or rigor mortis: The problem of rigor in qualitative research revisited. *Advances in Nursing Science*, 16(2), 1-8.
- Seol, Y. H. (2010). *Effects of psychological skill training on the mental toughness, team cohesion and performance in high school Kumdo players (Unpublished master's thesis)*. Ulsan, Korea: Ulsan University.
- Shin, D. K. (2010). *Effects of psychological skill training on competitive state anxiety and performance in girls' high school fencer (Unpublished master's thesis)*. Ulsan, Korea: Ulsan University.
- Vealey, R. S. (1988). Future directions in psychological skills training. *The Sport Psychologist*, 2(4), 318-336.
- Yun, M. J. (2008). *The influence of archers' performance on psychological skills (Unpublished master's thesis)*. Yongin, Korea: Kyung Hee University.