



Investigating Physical and Psychological Interventions on the Performance and Bold Behavior of Elite Kung Fu Fighters



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ABSTRACT

Background: The aims and all the aspects related to the assessment, will be taken into consideration, together to that can have a positive effect on performance, allowing each athlete, team and coach a good workout or match, whatever their competitive level. This study aimed to investigate the effect of eight weeks of physical and psychological interventions on the performance and bold behavior of elite Kung Fu fighters.

Methods: The research method was quasi-experimental with pre-test and post-test with a control group. N=40 elite Kung Fu fighters (25.31 ± 3.25 years) were selected as volunteers and were randomly divided into two groups (n= 20 for each of the experimental and control group). The data were collected using two questionnaires on sports performance and bold behavior. The experimental group did combine physical-psychological exercises for eight weeks. During this time, the control group did their daily activities. **Results:** The results of Mixed ANOVA and independent sample t-test showed that eight weeks of combined exercises (physical-psychological) significantly increased the sports performance and bold behavior scores of Kung Fu fighters.

Conclusion: According to the findings, it is suggested to the coaches that, in addition to daily technical and tactical exercises, use psychological skills training in combination with physical exercises along with different psychological approaches and different training systems in order to improve the performance and boldness of Kung Fu fighters.

1. Introduction

Mental skills practicing effects on sports performance has always been considered in many studies. R  thlin (2020), by reviewing 54 studies, reported that 83 cases, i.e. 58% of the examined cases, indicated the positive effect of practicing mental skills on performance. On the one hand, adaptation to pressure can cause positive and constructive changes and as a result, the physical and psychological growth and development of athletes, and on the other hand; destructive and negative pressure can cause health disorders (Webster et al., 2019). Athletes at the elite level may also be weak in some psychological variables such as neuroticism and need training (VaezMousavi & Shams, 2017). An athlete who becomes a champion with intense physical and psychological pressures needs special physical and psychological preparation and skills. In this regard, VaezMousavi and Shojaie (2005) showed that both girls and boys showed more aggression when they lost and won, respectively, than when the scores were equal. Jans et al. (2021), supports the idea that psychological skills training (PST) can increase sports enjoyment and performance of athletes. The importance of PST in the development of sports performance is widely known, therefore; the athlete must have certain mental abilities in order to overcome intense pressure in

these sensitive situations, and his/her mental skills are developed (Jans et al., 2021). Mental and psychological issues are the determining factors in achieving sports results. As different training methods and skill execution methods have evolved and the distance between champions has decreased to a few thousandths of a second and a few millimeters, it seems that the difference in the performance of the champions is more than ever related to their mental and psychological preparation (Safaei and Qorbaninejad, 2020).

When we consider topics such as aggression, anxiety, motivation, and daring, the question comes to mind as to why people differ in these aspects and how they can be changed in order to improve the performance of athletes. Boldness or self-expression is one of the important components of life skills, and in fact, it is the heart of healthy interpersonal behavior and the key to human relationships, which plays an effective role in the flourishing of talents and creativity of athletes (Pratomo & Gumantan, 2021). Boldness includes: taking one's rights and expressing one's thoughts, feelings, and beliefs in an appropriate, direct and honest manner, in a way that does not violate the rights of others. Boldness is a behavioral trait that is characterized by positive social behavior in order to defend the right or achieve a goal (Shah Hosseini et al., 2020). Wolpe (1992), who is the first theoretical and clinical researcher on boldness, first identified non-daring among patients with social anxiety that is unable to engage in oppositional behavior and say the

word no, and reject unreasonable requests. Wolpe considered non-bold people to be afraid to face others. Wolpe considered anxiety to be the main factor of this deterrence and considered an irreconcilable conflict between anxiety and boldness (cited by Elvers & Steffens, 2017). Strandvik et al. (2018) confirmed the positive effect of PST on swimming performance and all psychological skills profiles. Personality and choice of the sports field is a topic that raises an important area and shows some important differences between the personalities of successful athletes in different fields (Holgado et al., 2018). According to the view of sports psychologists, social learning theory, unlike trait theory, has this very important and strong point that they assume the personality of athletes to be flexible and changeable. This means that we can interfere with and manipulate the sports behavior patterns of athletes, and daring as one of the personality dimensions of people, especially athletes of various sports fields, can be included in this category (Kuan et al., 2017). Chow & Etnier (2017), by examining the relationship between the use of imagery and mental toughness in 76 male and female judo athletes, reported a positive and significant relationship between the use of mental imagery and mental toughness. In other words, judokas who used more mental imagery had higher mental toughness. Psychologists believe that people with little boldness cannot interact properly with the people around them. These people experience guilt, mistrust, and dominance in social relationships and show fear, anxiety, and depression. An athlete who has bold is able to change his view of himself/herself, increase his/her self-expression, and reasonably express his/her mood and thoughts, thus increasing his/her self-confidence and communicating appropriately and pleasantly in different sports situations.

Researchers believe to increase the performance of athletes, 50% of physical components and 50% of psychological components should be considered (Rüb et al., 2017). Developing mental skills that can be taught (either given or taken) can help an athlete perform sports skills more optimally (Killham et al., 2018), enjoy sports more and achieve sports success. The athlete must first know the weaknesses and strengths of his/her psychological aspects. Also, team coaches and doctors should measure these variables and help the athlete in this task (Khanjari et al., 2013). Then, they must learn how to strengthen their weak skills. Athletes should be trained for this. Some national athletes acquire these skills by doing various sports exercises and competitions. But many can't acquire the necessary mental abilities in an experimental way. However, in the case of people of the first group, this takes years. But with training, these skills can be taught to athletes with little time. Athletes must first learn and practice the principles and methods of skill acquisition and then practice their use in competitive conditions (ShoaKazemi & MomeniJavid, 2010). Jan's et al., research showed female athletes have more acceptance and counseling of sports psychology compared to male athletes. Female athletes are more likely to work with a sports psychologist, are less likely to stigmatize the service, and have more confidence in the usefulness of psychological skills training consultations than male athletes. Research on athlete expectations has also shown that female athletes are more committed to the sports psychology counseling process than their male counterparts (e.g., higher levels of responsibility, openness, and motivation), until, in a habitual way, by performing the relevant actions, desirable mental and psychological changes are created in them (Jans et al., 2021). Acquiring psychological skills requires practice and precision, and one should not expect instant miracles from them. Therefore, coaches and athletes should do mental and psychological exercises in addition to physical exercises. Considering that immediate results are not obtained with these exercises and by performing the necessary exercises during a reasonable time, the desired changes are achieved. Today, athletes need help to develop psychological skills and considerable knowledge that can be useful (Chow & Etnier, 2017). The training of these skills has very little risk of causing psychological damage to athletes. A few ultra-cautious sports psychologists say, "We still don't have enough scientific evidence to tell coaches how athletes

can acquire psychological skills". Boldness, as one of the dimensions of human personality is considered one of the most effective psychological skills in sports, and of course; it is one of the effective factors in the sports performance of athletes of different disciplines and according to this point, it can be included in the topic of sports psychology (Shah Hosseini et al., 2020).

The researches that have been conducted in the field of boldness indicate that this behavioral characteristic is in clear contrast with the characteristic of anxiety, and by reducing anxiety to some extent, we can strengthen this behavioral pattern in people, or even by using the techniques, teach this behavioral trait. Anyway, all the effort made in this research is to find out how boldness can be strengthened according to the listed exercises that exist in people, especially in athletes, and increase performance in their sport. This issue is useful not only for professional athletes and participants in Olympic competitions but also for athletes of any level who want to work to remove psychological barriers and have better performance quality (Khanjari et al., 2013). According to what was stated, there seems to be a relationship between athletes' performance and personality traits, and psychological skills (Röthlin et al., 2020), and the main issue is that this relationship or effect has not been investigated in the case of elite Kung Fu fighters. Considering that the athlete's performance and behavior are directly affected by their thoughts (Camomilla et al., 2018), therefore, the main question is whether this effect exists in elite Kung Fu fighters or not. Also, considering that mental preparation plays a very effective role in international arenas today, it seems that more research is needed in this field. In our country, such an important issue has received less attention and most research has focused on showing the profile of psychological skills or comparing these skills. While the need of our country's sports, especially the national teams, is to perform psychological skills and use psychological programs continuously in order to learn and internalize these skills and improve sports performance as much as possible, there are very few studies that have implemented a psychological training program during the preparation period for athletes. Also, considering that Kung Fu has different styles, therefore, on the one hand, it can bring many medals to the country in world competitions, and on the other hand, this sport requires a lot of bold behavior. It seems that one of the problems that the country's elite Kung Fu fighters have in world competitions is not having much daring in performing kata and the effect of the competition atmosphere on their performance. Therefore, the researcher is looking for an answer to the question of whether physical and psychological interventions have an effect on the performance and bold behavior of elite Kung Fu fighters.

2. Materials and methods

2.1. Subjects

This research is a quasi-experimental of pre-test-post-test with a control group. The statistical population included all the elite Kung Fu fighters of Mashhad in the age range of 18 to 30 years with at least three years of continuous activity in the field, who have participated in provincial and national competitions at least once in the past year (150 fighters). After functional and psychological examinations, 40 Kung Fu fighters who (25.31 ± 3.25 age) had less bold behavior than others were selected as volunteers and randomly divided into two groups ($n=20$ for each experimental and control group). All the participants voluntarily signed a written consent form during the research stages according to Declaration of Helsinki of 1975.

2.2. Apparatus and Task

Bold Behavior Questionnaire

This scale has 21 items prepared in 2021 by Al-Khafaji et al. to measure the daring behavior of athletes and has 4 subscales including will (items 1 to 6), determination (items 7 to 11), risk

taking (items 12 to 16) and sacrifice (items 17 to 21). This scale is scored based on a 5-point Likert scale (from very low= 1 to very high= 5). The minimum and maximum scores can be in the range of 21 to 105. To determine the validity of the daring behavior questionnaire, the content analysis method was used, and the content validity index of the questionnaire was higher than 0.7, and also, the reliability coefficient was calculated using the alpha coefficient of internal consistency, which was obtained as 0.86 for the entire questionnaire (Al-Khafaji et al., 2021).

Sports Performance Questionnaire

This scale has 5 items prepared in 2016 by Nahum to measure the sports performance of athletes. The scores obtained from 5 questions shows the final scores of athletes' performance. To determine the validity of the questionnaire, the content analysis method was used, and the content validity index of the questionnaire was higher than 0.7, and the reliability coefficient was calculated using the alpha coefficient of internal consistency, and was 0.89 for the entire questionnaire (Charbonneau et al., 2001).

2.3. Procedures

After selecting the participants, first, during a coordination meeting with these people, the research's subject, the study's purpose, and the method of conducting the test came to their knowledge. In the present study, an 8-week program of physical and psychological interventions was designed as described below and all the subjects started to do it (**Table 1**).

1. First, performance and bold behavior were measured by questionnaires (pre-test);
2. Before starting the main training program: general body warm-up for 5 minutes;
3. 5 minutes of soft movements and performing static stretching movements;
4. Training protocol for physical intervention including eight weeks of training and three sessions each week;

5. Training protocol for psychological intervention including eight sessions of 90-minute;
6. At the end of the 8th week (the end of the 24th training session), performance and bold behavior were measured again.

2.4. Data analysis

Using the Kolmogorov-Smirnov (KS) test, all the studied variables were evaluated to measure the normality of the distributions and homogeneity of the variances. Also 2 (group) * 2 (test) Mixed ANOVA was used, and independent sample t-test was used to compare the groups at the post test. All analyzes were carried by SPSS version 20 at significantly level of $P \leq 0.05$

3. Results

The mean scores of research variables are shown in **table 2**. The results of the Kolmogorov-Smirnov test showed the distribution of the data is normal ($P \geq 0.05$). Also, Levene's test shows that the variance of the research variables is homogenous ($p \geq 0.05$). The results of 2 (group) * 2 (test) Mixed ANOVA for sport performance showed the main effects of test, group and interaction effect of test * group are significant. Independent sample t-test at the post-test showed a significant difference between the two groups of experimental and the control group ($t_{(38)} = 3.24$, $P = 0.001$). This finding shows that physical and psychological interventions have significantly increased the sports performance score of Kung Fu fighters. According to the results of 2 (group) * 2 (test) Mixed ANOVA on the bold behavior, the main effects of test, group and interaction effect of test * group are significant (**Table 3**). The independent sample t-test on the bold behavior and its components at the post-test showed a significant difference between the two groups of experimental and the control group (**Table 4**). This finding shows that physical and psychological interventions have significantly increased the bold behavior and its components score of Kung Fu fighters.

Table 2.
Mean score of variables

Group	Variable	M	
		Pre test	Post test
Intervention	Sport performance	14.41	15.85
	Bold behavior	68.12	86.37
	Will	17.61	21.50
	Determination	16.79	20.37
	Risk taking	17.62	23.75
	Sacrifice	16.10	20.80
Control	Sport performance	18.09	14.90
	Bold behavior	65.94	68.11
	Will	15.69	16.25
	Determination	17.5	18.26
	Risk taking	15.5	16.1
	Sacrifice	17.25	17.5

Table 3.
Summary of mixed ANOVA for sport performance and bold behavior

	Source of effect	DF	F	Sig
Sport performance	Test sessions	1	9.014	0.001
	Groups	1	6.841	0.001
	Groups * Sessions	3	13.186	0.001
Bold behavior	Test sessions	1	8.620	0.001
	Groups	1	5.308	0.001
	Groups * Sessions	3	11.749	0.001

Table 4.
Results of independent sample t-test for bold behavior and its components

Index	t	Df	Sig
Bold behavior	4.120	38	0.001
Will	3.41	38	0.001
Determination	2.52	38	0.001
Risk taking	4.04	38	0.001
Sacrifice	2.63	38	0.001

Table 1.

Exercise protocol of physical exercises and boldness.

Session	Topic	Content
First	Introducing, and explaining the concept of social fear and self-expression	Familiarizing the group members with each other, justifying the program and rules and expressing the effects of physical exercises, light and gentle stretching of the hands and feet for 15 minutes, cooling down the body through soft jogging and relaxing the body for 5 minutes, assigning sports skills - Psychological part: After the greeting and welcome, in order to familiarize the members with each other, they were asked to form groups of 2 people and try to get to know each other in a few minutes (5-15) and then each person asked to introduce the other party to the whole group. Then, the members were asked to express their mentality and expectations from participating in this group meeting, thus the expectations of the members were determined.
Second	Introducing various communication styles including passive, aggressive, expressive	Warming up for ten minutes, performing physical exercises of Kung Fu fighters relying on the agility factor - Psychological part: The session started with a summary of the content of the previous session and homework was discussed. Then, three passive, aggressive, and expressive communication styles were examined.
Third	Requesting skills, the difficult act of making requests	Warming up for ten minutes, performing physical exercises of Kung Fu fighters relying on the speed factor - Psychological part: Why should we request? 1- We can love ourselves by requesting. 2- By expressing our desires, we will feel more confident. 3- By request, we will feel less embarrassment and anxiety and will have less intellectual preoccupation.
Fourth and Fifth	Refusing unreasonable requests, saying no	Warming up for ten minutes, performing physical exercises of Kung Fu fighters relying on the strength factor - Psychological part: At the beginning of the fourth and fifth session, as usual, the assignments of the previous session were reviewed and after giving feedback to the group members, some points about "saying no" was mentioned. Because according to the interview conducted in the first session, it was found that most of the participants' problems were related to this category (saying no), the researcher dedicated two sessions to teach this skill.
Sixth	Expressing positive feelings	Warming up for ten minutes, performing physical exercises of Kung Fu fighters relying on the reaction time factor - Psychological part: At the beginning of the sixth session, the review of the previous session and providing feedback to the members was discussed, and then the discussion related to the sixth session, "expressing positive feelings", was discussed. First, the reasons for the lack of showing love were asked from the members, after hearing and summarizing the reasons, the following points were pointed out: Why do we have problems expressing positive feelings? b) How to express our positive feelings?
Seventh	Constructive criticism	Warming up for ten minutes, performing physical exercises of Kung Fu fighters relying on the balance factor - Psychological part: At the beginning of the seventh session, there was a discussion about the previous session and providing feedback to the participants, and then a discussion about "criticism and ways to deal with it" was discussed. a) Why do people criticize? b) How to deal with criticism? c) How to constructively criticize others?
Eighth	Final session	First, the technique (constructive criticism) of the previous meeting and giving feedback was discussed, and then the contents of the previous meetings were reviewed. They were asked to be divided into groups of two and to play roles related to the cases and topics mentioned in the previous sessions, that is, to request with self-expression and to say yes or no depending on the type of request, express their positive and negative feelings, and respond appropriately to criticism and criticize each other constructively.

4. Discussion and conclusion

Nowadays, the role of sports psychology training and interventions on athletes' performance is very important. Usually, athletes are more familiar with physical aspects than other aspects and often neglect the psychological aspects, while the cognitive components affect the performance and increase positive mental energy. Therefore, the main purpose of the study was to investigate the effect of eight weeks of combined physical-psychological training on sports performance and the daring behavior of Kung Fu fighters. The findings showed that the combined exercise (physical-

psychological) have a significant effect on the sports performance and daring behavior of Kung Fu fighters and improved their acquired scores. The findings on the effect of physical and psychological interventions on sports performance are consistent with the results of Al-Khafaji et al. (2021), Jans et al. (2021) and Shah Hosseini et al. (2020). In a study, Al-Khafaji et al. (2021) by investigating the role of sports coping skills and spiritual attitude in predicting the daring behavior of elite Iraqi football players, showed that sports coping skills play a significant role in predicting the daring behavior of elite Iraqi football players and were able to predict its changes. Also, spiritual attitude plays a significant role in

predicting the daring behavior of elite Iraqi football players and was able to predict its changes. Also, Jans et al. (2021) investigated the effect of psychological interventions and the performance of marathon runners and found that by controlling for age and running experience, the intervention significantly reduced the level of perceived stress and the occurrence of negative thoughts before, during, and after the race. Also, the training of cognitive control skills and relaxation, as a part of psychological skills training, can determine the performance quality of marathon runners. Also, Shah Hosseini et al. (2020), by examining the effectiveness of the mindfulness model based on sports performance enhancement (MSPE) on the planning and sports performance of elite judokas came to the conclusion that mindfulness training based on sports performance enhancement significantly improved sustained, selective and planned attention. Also, the results regarding the sports performance also showed that the athletes had a growing trend during the intervention and follow-up period.

Developing physical and mental skills both require practicing the part that needs strengthening to improve performance. In other words, if a certain part of the body is to be strengthened, such as a special muscle, the exercises related to that part are performed. Similarly, if the intention is to strengthen a certain part of the person, it can be extended to special mental exercises. So, practicing psychological skills can influence other psychological skills, which has been proven in various researches (Kordan et al., 2019). Psychological skills training programs can include different skills focusing on one or two psychological skills and have a special effect on sports performance (Chung et al., 2009). In addition, coaches and athletes consider arousal regulation, mental preparation and visualization, increasing self-confidence, increasing motivation and commitment through goal setting, attention and concentration, internal dialogue, and mental programs as the best and most practical subjects in designing psychological skills training programs and a professional coach can identify the various dimensions of an athlete's needs even if he/she is a student (Azimkhani et al., 2021).

Also, in explaining the reasons for the effectiveness of physical and psychological interventions on sports performance, we can mention some things, including Bloom's (1968) mastery learning perspective, which points to the effectiveness of the training process in creating learning and ultimately achieving desired performance. Bloom's mastery learning is close to the concepts of competence and skill; as a result, adequacy as a mental element, in addition to mastery, also includes gaining self-confidence or a sense of coping with problems. Self-confidence is the emotional element of sufficiency and since mastery is a prerequisite for sufficiency, skill, and self-confidence, the positive emotional consequences associated with mastery cause a person to reach sufficiency and change to a skilled level through practice, and as a result, improves his/her sports performance. Probably, by increasing the awareness of training, game, and competition situations and creating basic mental schemas, athletes help to regulate their arousal and control their emotions, and by mentally activating the set of responses related to the task, they lower the sensory threshold of performance and mentally warm up the muscles and thus improve their sports performance.

Also, the findings on the impact of physical and psychological interventions on bold behavior are consistent with the results of ShoaKazemi & MomeniJavid (2010) and Golby & Wood (2016).

Golby & Wood (2016), by examining the level of courage and mental toughness of professional wrestlers, showed that wrestlers accept all dimensions of mental toughness correctly, they are good in the dimensions of courage in sports such as determination, assertiveness, risk-taking, and participate in self-sacrifice, but experienced uncertainty in the competence-mastery dimension. Also, there was a positive and significant relationship between the

dimensions of courage and mental toughness. Also, ShoaKazemi & MomeniJavid (2010), in their research regarding the daring behavior, self-esteem, and religious orientation of student-athletes and non-athletes concluded that there is a positive and significant relationship between self-esteem, daring behavior, and religious orientation, also; a significant difference was observed between the daring behavior and self-esteem of athletes and non-athletes, and the athletes have more daring behavior and self-esteem.

In explaining the reasons for the effectiveness of physical and psychological interventions on bold behavior and its components, it can be mentioned that psychological skills make the athlete feel progress and allow the athlete to gain self-confidence during the competition, and provides him with information that prepares the body for optimal individual performance (Behzad, 2011). Cooks believes that athletes who have high psychological and physical skills are as successful as possible in their sports competitions, and they perform their duties well in a team and individual sports (HasanvandAmuzadeh, 2011). In recent years, sports psychologists have come to the conclusion that athletes need psychological skills more than physical skills to achieve their goals. Recently, American and Canadian psychologists have evolved the implementation of psychological skills and by using psychological skills, they have made a significant improvement in the performance of professional, Olympic, and university athletes (D'Santo et al., 2019). There are several theories regarding the practice of mental skills. One of these theories is that psychological skills are only relevant to athletes with problems. Of course, this doesn't make a difference, because if mental skills are learned, eventually; it has very beneficial effects for all athletes (Vaculik et al., 2018). The second theory is that the psychological skills training program is only for elite athletes, while sports psychologists also design their programs in relation to youth, developing athletes, and special people such as mentally retarded, physically disabled, and deaf people. And the third theory is that if coaches and players believe that psychological skills are learned quickly, so these skills are learned quickly. While this is not the case and these skills need time and proper practice (Van Vuuren et al., 2018). Each of the components of athletes' mental and physical condition is one of the important factors influencing their performance. In the planning stage, when faced with an unfortunate situation, a person plans to reduce the complications caused by the incident. Apparently, both professional and semi-professional athletes are better adapted to this situation and can perform better in adverse situations to fight this situation. Probably, athletes for some reason cannot attribute internal factors to their failure or success and consider other external factors as important factors in this matter. A person's rumination, with the occurrence of unfortunate circumstances, creates intellectual preoccupation around various aspects of the event and constantly reviews the feelings and thoughts created due to the unfortunate circumstances (Hagyard et al., 2021). To fight this negative component, athletes involve their minds with sports activities so that they can overcome it. Therefore, it is felt that professional and semi-professional athletes can overcome this component through sports activities. Also, research shows that sports and physical activities increase psychological well-being and reduce psychological problems. Physical health leads to the development of mental health and the increase and growth of cognitive well-being in people. Athletes are sociable and daring people so in dealing with problems and issues, they have a higher tolerance threshold than their normal counterparts (Hornsby et al., 2018). Sports and physical activity can lead to the strengthening and growth of psychological well-being as one of the constructs of positive psychology by increasing positive personality aspects and reducing unpleasant behaviors. In addition, athletes use sports and physical activities as an effective coping method to deal with worries and anxieties caused by daily life, which can increase psychological well-being as one of the constructs of positive psychology.

It seems that acquiring new abilities requires being in difficult and hard situations, and these conditions make one acquire new abilities.

When a person is under pressure, these talents are frequently discovered and show their power to change the situation. Therefore, by strengthening psychological well-being, exercise allows athletes to better cope with stress and upcoming challenges.

Authors' contribution

Authors' contribution: Conception and design of study: Z.B; data collection: Z.B; Data analysis and/or interpretation: A.Z; Drafting of manuscript and/or critical revision: A.Z; Approval of final version of manuscript: M.V.

Conflict of interests

The authors declare that there is no conflict of interest.

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