



Original Article

# The comparison of pain perception, coping strategies with pain and self-efficacy of pain in athlete and non-athlete women

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## Abstract

**Introduction:** Pain is an unpleasant sensory experience which occurs in actual or potential physical harm. Exercise is one of the factors affecting pain. The aim of this study is comparison of pain perception, coping strategies with pain and self efficacy of pain in athletes and non-athletes women.

**Materials and Methods:** Ex post facto method was used on 60 female professional athletes and 60 non-athletes women from students of academic year 2013-14 of Shiraz University who were selected through multi-stage random sampling. The instrument was McGill pain, coping strategies with pain and self efficacy of pain questionnaire. The findings were analyzed through descriptive statistic, Leven Test Multivariate variance analysis using SPSS version 16.

**Results:** Results showed that female athletes in comparison with non-athletes women have lower pain perception ( $P=0.003$ ) and high self efficacy of pain ( $P<0.001$ ). In addition, these women used coping strategies of distraction, reinterpreting the pain, ignoring, hoping or praying, self talking and increase of activity more than others ( $P<0.001$ ) while female athletes exaggerated their pain less than non-athletes women ( $P=0.003$ ).

**Conclusion:** This research indicated that exercise affected on pain perception experience, self-efficacy of pain and use of coping strategies with pain among women.

**Keywords:** Exercise, Pain, Pain perception, Self-efficacy

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## Introduction

Exercise has lots of psychological effects such as attention, memory, mood stabilizers raise and anti-pain effects (1-4). International Association for the study of pain defines pain as an unpleasant emotional or sensory experience which is associated with actual or potential harm. Pain experience is comprised of two dimensions: sensory and emotional. Emotional pain indicates intensity of pain and emotional pain indicates level of dissatisfaction of one's from experience of pain (5). Pain is a complex perceptual experience influenced by broad psychological- social factors. How to pain in people, are unique and individual difference, racial, psychological, cultural, social, environmental and even religious variables are involved in perception of ones from pain (6). In general, despite the assumption that a person's pain threshold is relatively constant but the pain is greatly

affected by psychological and physiological factors (7). For example, perception of pain in athletes and non-athletes ones is different. In fact, the athletes endure pain more than non-athletes (8,9). Furthermore, meta-analysis also showed that the perception of pain in athletes is different than non-athletes. In fact, according to this meta-analysis, pain tolerance in athletes is higher. The first time researchers paid attention to the differences in the perception of pain in athletes was the time that they saw despite the severe damage during exercise; athletes still continue their activities (10). Sharma, Sandhu and Shenoy (8) engaged with psychological factors associated with pain intensity in athletes in a study. The results indicated that psychological variables such as social support, pain self efficacy and coping strategies with pain is associated with pain intensity perception and process of pain compatibility in athletes. One of the psychological factors that can affect the amount of pain of a person is self-efficacy. With regard to pain, self-efficacy is confidence of the individual to its ability to maintain the function despite the pain (11). Research has shown

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that higher self-efficacy is associated with higher pain threshold and tolerance of pain (12). Another factor that plays a mediating powerful role in the psychological and physiological experience of pain is coping strategies. Lazarous and Folkman in their discussion stipulated that coping involves the movement and effort to control stressful situations and only those efforts which have objective and conscious efforts are called coping. As a result, automatic thoughts and behaviours which do not require effort cannot be called coping (13). But another group of researchers believe that in the study of coping strategies, those types of automatic, behavioural and cognitive activities with the aim of controlling stressful situations shall be also considered (14,15). So, coping with pain is defined as specific thoughts and behaviours that people use to manage their pain or their emotional reactions to pain (6). Researchers believe that coping strategies affect perception of individuals from pain, as well as their ability to control and tolerate pain and continuity of daily activities (14). Ways to deal with pain can be divided into two categories: drug and non-drug. The non-drug methods can be catastrophizing, aberration of mind, relaxation, imagery, talking to themselves, irritation and exercises (16). Studies about patients with pain have shown while using active coping strategies (such as trying to perform tasks despite the pain, lack of attention to the pain, using muscle relaxation) have adaptive results, the use of passive coping strategies (catastrophizing dependence and limiting the activities) include with more pain, severe physical disability, terror, anxiety and depression (8).

Sharma, come to the conclusion that athletes use compatible coping strategies than non-athletes ones while having pain and feel more self-efficacy to deal with the pain. In fact, use of incompatible coping strategies is far more harmful for athletes (8). Smith, Scott and Wiese have figured out that injured athletes experience higher levels of depression, frustration and anger over the normal population in case of using incompatible coping strategies (17).

Because of this analgesic effect, exercise is one of the multiple therapies for patients with various pains (18). The research showed that sports trainings can significantly be effective in controlling acute postoperative pain in abdominal surgery patients (19). Bonika in 1998 about the impact of sport practices on pain come to the conclusion that at first and second 24 hours after surgery, there were significant differences between the control and experimental groups in terms of receiving painkillers but difference was remarkably significant in the third and fourth days (20).

Despite the importance of the role sport plays in coping with acute and chronic pain, the role of exercise in coping with pain in Iranian population has not been studied yet. Because the pilot studies to evaluate the soothing effects of exercise is time consuming, researchers often study on athletes who have several years of regular physical activity (Tesarz). Due to the above, this study compares the pain intensity perception, coping strategies with pain and self-efficacy of pain in athletes and non-athletes women.

### Materials and Methods

This descriptive research is based on Ex Post Facto Method. To achieve the objectives of research, 60 samples has been elected as Multi-Stage Random Sampling among the members of female sports team of various fields of physical education faculty of University of Shiraz in academic year 2013-14. Furthermore, 60 female were elected as Multi-Stage Random Sampling among the female students who did not practice sports for 6 months. To collect data, three questionnaires were used in this research.

*A) Pain Perception:* To measure pain perception, McGill Pain Intensity Scale is applied. The questionnaire allows patients to express their perception of pain in the sensory, affective and evaluative statement using the right words. This questionnaire is a powerful tool for the qualitative and quantitative aspects of pain and contains 20 words to describe the pain. Scoring is based on place value of words; it means that the first words of each group will receive score 1. Therefore, selected words not only represent the quality of pain but also represent the intensity. Sum of scores of selected words in various groups are called Pain Rating Index (PRI). Higher PRI of score shows pain severity. Reliability and validity of this questionnaire has been proven in different studies (21). Dworkin and et al has estimated the Cronbach's alpha coefficients of this questionnaire an amount of 0.95 (22). Validity of this questionnaire inside the country is estimated 0.85 as to Cronbach's alpha (23). Dworkin and et al reported the validity of this questionnaire appropriate (22). In studies of Amin, Siratinir, Ebadi and Moradian, concurrent validity of this questionnaire with pain visual scale is obtained 0.86 (24).

*B) Coping Strategies with Pain Questionnaire:* Coping Strategies with Pain Questionnaire has been made for the first time by Rosenstiel and Keefe. This questionnaire using 42 statements assessed 6 cognitive coping strategies (distraction, reinterpreting the pain, self-instruction, ignoring the pain, catastrophizing, and prayer/hoping) and one

behavioural coping strategy (behavioural activity raise). Each of the 7-element coping strategies consists of 6 words. Subjects will be asked to read each statement carefully and determine that when faced with pain to what extent they use each of the strategies using 7 point scale (zero to six). Moreover, questionnaire of coping strategies asked the subjects to specify with 7 degree scale that using strategies for dealing with pain to what extent could reduce and control their pains. Rosenstiel and Keefe standardized this questionnaire among patients suffering Chronic Low Back Pain and evaluated its even subscales internal consistency coefficient between 0.71 to 0.85 (25). Since, this questionnaire has been used in many studies with acute pain and chronic pain patients and its reliability and validity have been confirmed. For instance, Asghari Moghaddam and Galk have assessed psychological features of this questionnaire in Iranian population and reported the reliability of its subscales between 0.74 to 0.83. Also, study of their result confirmed the criterion validity and predictive validity of this questionnaire (13).

*C) Pain Self-Efficacy Questionnaire (PSEQ):* This 10-question questionnaire is based on theory of Bandura about Self-Efficacy which is made by Nicholas and assesses the efficacy and sufficiency of individual to live with pain. Responding to this questionnaire is in 1-6 degree Likert Scale and its range is between 10 to 60. Higher scores indicate a stronger belief in daily activities despite pain. Nicholas has estimated the validity of this questionnaire an amount of 0.93 with Cronbach's Alpha (26). To assess the validity of questionnaire, Asghari Moghadam and et al has obtained coefficients of test's validity by Cronbach's Alpha, Bisection and Retest Method an amount of 0.81, 0.78 and 0.77, respectively which represents a satisfactory reliability (11); furthermore, Nicholas has reported the validity of test appropriate. Concurrent validity of this questionnaire in research of Mesgarian, Asghari Moghaddam and Shaeiri has been assessed through computation of correlation between self-efficacy with psychological and general health ( $r=0.42$ ) and confirmed (27). To analyze the data, descriptive statistics, Levine test and multivariate analysis of variance (MANOVA) were used.

## Results

Mean and standard deviation of age of athlete group are respectively 24.5 and 1.25 years and mean and standard deviation of age of non-athlete group are respectively 23.7 and 1.87 years. Table 1 shows the mean, standard deviation of scores of pain

intensity perception, subscales of coping strategies with pain and self-efficacy.

**Table1.** The mean and standard deviation of pain perception, pain coping strategies subscales and self-efficacy subscales of pain in athletes and non-athletes

Variable	Athlete group		Non-athlete group	
	Mean	Standard deviation	Mean	Standard deviation
Perception of pain	27.75	13.99	35.13	12.93
Distraction	23.21	6.17	17.91	7.59
Reinterpreting the pain	18.18	8.23	10.40	6.70
Catastrophizing	10.75	7.41	14.98	7.73
Ignoring the pain	21.73	9.94	13.53	8.18
Prayer/hoping	26.60	6.09	22.23	7.92
Self-instruction	25.16	5.96	20.23	5.69
Increasing activity	20.45	7.36	15.45	7.77
Self-efficacy of pain	11.85	40.80	31.16	14.06

To assess the difference between two groups in terms of research variables, multivariable variance analysis has been applied. Before stating the results of the multivariate analysis of variance, it is necessary to mention the results of the most important assumptions of analysis of variance. Table 2, shows the result of Levine test to assess the homogeneity of variance of variables in athlete and non-athlete groups.

**Table2.** Result of Levine test for variance homogeneity of research variables in athlete and non-athlete group

Variable	Df1	Df2	F	Significance
Perception of pain	1	118	0.16	0.68
Distraction	1	118	0.64	0.42
Reinterpreting the pain	1	118	2.81	0.09
Catastrophizing	1	118	0.007	0.93
Ignoring the pain	1	118	5.86	0.08
Prayer/hoping	1	118	4.11	0.10
Self-instruction	1	118	0.20	0.65
Increasing activity	1	118	0.19	0.65
Self-efficacy of pain	1	118	2.60	0.10

Table 2 indicates that there is no significant difference between athlete and non-athlete groups in terms of variances of research variables; therefore, assumption of equality of variances is confirmed. Table 3 shows the result of multivariable variance analysis on variables of research. The result of table 3 indicates that there is meaningful relationship between scores of athlete and non-athlete groups, at least in terms of one of the research variables. To understand this difference, four-analysis of variance was performed in the context of MANOVA which its result is listed in Table 4.

Result of table 4 indicate that there is a significant relationship between athlete and non-athlete groups in terms of pain intensity perception, distraction,

reinterpreting the pain, catastrophizing, ignorance, hoping, or praying, talking to themselves, activity raise and self-efficacy of pain in the required level ( $P < 0.05$ ).

**Table 3.** Result of multivariable variance analysis on mean of research variables in athlete and non-athlete group

Effect	Value	F	Hypothesis df	Error df	Eta	Observed power	Significance
Pilla's trace	0.3	5.35	9	110	0.3	1	<0.001
Willk's lambda	0.69	5.35	9	110	0.3	1	<0.001
Hotelling's trace	0.43	5.35	9	110	0.3	1	<0.001
Roy's largest root	6.36	20.28	9	110	0.3	1	<0.001

**Table 4.** Result of ANOVA in the context of MANOVA on research variable athlete and non-athlete group

Variable	Sum of squares	Df	Mean square	F	Eta	Observed power	Significance
Perception of pain	1635.40	1	1635.40	9	0.07	0.84	0.003
Distraction	842.70	1	842.70	17.50	0.21	1	<0.001
Reinterpreting the pain	1817.40	1	1817.40	32.20	0.07	1	<0.001
Catastrophizing	537.63	1	537.63	9.36	0.17	0.85	0.003
Ignoring the pain	2017.20	1	2017.20	24.30	0.06	0.99	<0.001
Prayer/hoping	396.03	1	396.03	7.90	0.15	0.79	0.006
Self-instruction	730.13	1	730.13	21.40	0.10	0.99	<0.001
Increasing activity	750	1	750	13.10	0.12	0.94	<0.001
Self-efficacy of pain	2784.03	1	2784.03	16.40	0.12	0.98	<0.001

## Discussion

Result of research indicates that athlete women have lower pain perception and higher self-efficacy. In addition, athlete women use more coping strategies of distraction, reinterpreting the pain, ignorance, hope or pray, talk to themselves and activity raise. However, athlete women consider a pain less catastrophizing than non-athlete ones. The result of current research aligns with the research of Sharma, Sandhu and Shenoy, Hall, Davies, Tesarz and Bonika (8,9).

In explaining the findings, we can say that athletes typically encountered with unpleasant sensory experiences during physical exercise and have high resistance to physical and psychological tools to overcome the challenges and activities (28). Indeed, pain is an integral part of athletes' life, so an athlete one needs to cope with pain and injury effectively (8). Disability related to pain and pain intensity is associated with coping strategies. So, athletes that use consistent coping strategies than incompatible athletes will return to professional sport earlier. In addition, adaptive coping strategies will help athletes to be less affected by negative results of an injury (8 and 28). On the other hand, it seems that variety of coping strategies can affect the severity of the pain So that passive coping strategies, especially disaster seemed more associated with pain (29). In addition, self-efficacy usually along with active and adaptive coping strategies and causes the person tend to the situations instead of avoiding and show more efforts. In addition to self-efficacy effects and

coping strategies with pain intensity perception, some researchers have attributed the analgesic effects of exercise to opioid mechanisms. Research has shown that physical activity has a beneficial effect on chronic pain conditions. Silent myocardial ischemia in athletes may partly explain the increase in opioids; because painful warning sign of ischemia in athletes are neutral (30).

Studies have shown that the endorphins release from the pituitary gland increases after exercise. In fact, endorphins, enkephalins, and serotonin release increased during exercise and all these hormones have analgesic effect (29). Therefore, regular exercise of athlete leads to change of his perception form pain (10).

This study conducted on female gender that it is a limitation so it is recommended that future studies conduct on both gender.

## Conclusion

Results have shown that regular exercise can reduce perception of pain and increase pain self-efficacy and lead to more effective coping strategies for pain in women.

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