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ORIGINAL ARTICLE

The Effect of Mindfulness Techniques Training On Sport Performance among Tennis Players

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ABSTRACT
The aim of this study was to investigate the effect of mindfulness techniques training on sport performance among table tennis players. The population of this research was the all adult table tennis players of East Azarbaijan Province who play in professional league or first division. Among them, 40 athletes were selected by available sampling method. Twenty athletes (M=25/95 years old, SD=6/02) were replaced by random to the control group and 20 athletes (M=24/45 years old, SD=7/7) in the experimental group. Data were gathered using Mindfulness Awareness Assessment Scale (MAAS) and for sport performance, total scores of 5 games by maximum 11 scores in each game was used. Data were analyzed with ANCOVA. Results showed that mindfulness training has increased significantly (F=22.20; p<0.001) sport performance in experimental group.
Keywords: *sport performance, mindfulness, table tennis*

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INTRODUCTION

Sports and professional athletic activities, as their nature implies, are competitive; consequently, constant efforts are made to achieve better results and to reach the higher levels. Accordingly, one of the aspects of athletic championship competitions is performing it under diverse tensions and pressures [1]. Therefore, athletes must be mentally ready and prepared to do such activities in such stressful conditions. Orlick and Partington [1], defined the athlete's mental states, just before and during the competition, as an actual factor in determining the outcome of championship competitions [2]. In order to help their mental readiness in competition conditions, athletes often develop their conventional performances. Studies have shown that those with conventional pre-competitive readiness will do better in overcoming distractions and undesirable conditions[2]. Qualitative studies on the wrestlers in the U.S.A Olympics in 1988 indicated that the mental readiness quality of athletes to compete was the major factor for their success in the competitions. Some other popular factors such as pre-competitive modified plans, competitive focus and refocusing plans, self-confidence, strength, control, commitment, and post-competitive analyses are common[3]. In addition, some athletes may experience slight to average decline in their performance when they encounter anxiety and stress conditions. Alternatively, some others may proceed up choking point, which is illustration of their meaningful deficiency in competitive performance [4]. Applied sport psychology, in an effort to enhance competitive performance of athletes, traditionally has made use of techniques based on self-control enhancement and cognitive- behavioral methods, which skill improvements are mainly considered in these methods [4]. In contrast, the recent orientations of behavioral theories – the third wave of behavior therapy – in occupational psychology emphasizes on the variations such as values, acceptance, and pervasive consciousness. The new approaches, instead of having their focus more on controlling or declining inner experiences, emphasizes the psychological interventions of mindfulness, non-judging awareness and cognitive, passive, and perceptional acceptance in the present instant. In these approaches, inner experiences are considered as natural circumstances which normally and regularly happen, and are of expected aspects of human existence. According to this pervasive view, human problems are originating from the fact that they intend to involve and join

themselves in experiences like thoughts, emotions, and other self-assessments. Thus, inner processes are considered as the actual facts[2,5]. Consequently, instead of involving in behaviors which reflect individual's commitment and valuable goals like training quality, intensive training, aggressive competitive performance, maintained programs and strategic choices, individuals opt behaviors or competitive choices which more often are apt to control or limit individuals' inner experiences, and are considered as unacceptable or disturbing in their judgments

Today, the mindfulness techniques have found extensive use as a means of controlling the negative feelings of athletes in order to make them use their utmost skills and abilities in competitive fields. Kabat-Zinn , defines the mindfulness as an attention on something in a specific and purposeful way in the present moment without any pre-judgments[3,4,6]. Mindfulness is a form of meditation originating from eastern rituals and practices especially from Buddha. Mindfulness-based interventions are regarded as one of the cognitive-behavioral therapies of third generation or third wave type. Through mindfulness-based techniques and practices, individuals become aware of their daily routine and automatic performance of their mind in past or future; and through momentary awareness of their thoughts, feelings, and physical states, they can take control of the, and get rid of their mind's daily and automatic focus on the past and future[8,6]. Through mindfulness, the individual becomes aware of the way his mind acts; then, through becoming aware of two procedures of mind, which one of them is to do and another is to exist, he learns how to move from one procedure to another. This necessitates learning of behavioral, cognitive, and particular met cognitive strategies in order to centralizing attention process [6,7]. Through the combination of related, particular, and acceptance-based components of mindfulness interventions, Gardner & Moore established mindfulness intervention and acceptance program to enhance the performance, and named it "the mindfulness-acceptance-commitment-based approach" (MAC)[8,5,9,10,]. This guidance program targets and emphasizes the non-judgmental present-moment acceptance and development of self-controlling attention skills which are connected with optimal performance. The mentioned authors conducted two case studies, and reported that learning through planned self-adjusted approach originated from the present-moment awareness leads to performance promotion and alacrity in the athletes [9]. Mindfulness demands the improvement of three qualities i.e. judgment avoidance, targeted awareness, and the present-moment attention which leads to processing of entire aspects of immediate experiences including cognitive, behavioral, and physiological activities. Recent studies in sports psychology have proved the relation between mindfulness and athletic performance [9,10,12]. These researchers found out that the mindfulness is related to the-present-moment attention which is the base of high performance psychology in sports [13,14]. a condition in which the athlete is in his maximal performance and is experiencing the minimal negative states. Kay and Wang study, which was based on cluster analysis, indicated that athletes with more intend to mindfulness will more possibly experience the maximal states of performance. Additionally, these researchers investigated the relation between mindfulness and mental skills. They indicated that athletic groups with more mindfulness, in contrast with those having less mindfulness, will get significantly higher scores in choosing among mental skills such as attention control, excitement control, target selection, and self-talk which are measured by performance strategy test [15]. By some changes in therapy protocol and coordination with the type and requirements of a specific athletic activity, interventions and trainings related to mindfulness would be applicable in a great range of sports. As an instance, in a case study done by Schwanhausser on a diving competitive athlete, both the athlete and his trainer underwent the MAC approach to enhance their performance. Nine-session training had considerable effects on the attention, balance, value-oriented behaviors for concentration enhancement, and overall performance of the athlete. Also, self-reporting scales of mindfulness and maximal experiences during the visual measurement of diving performance were investigated just before and after the intervention. Findings indicated some enhancements in mindfulness awareness, mind-full attention, empirical acceptance, maximal experiences, and diving performance compared to the stage before the invention [16]. Despite the not-so-brief history of these kinds of trainings and mindfulness interventions in competitive and athletic sports, no studies still have been conducted in Iran. The present study is the premier study of this kind in Iran which was conducted in order to investigate the effects of these trainings on the athletic performance of professional table tennis players.

METHOD

The present research project is of a fully-experimental research design type, in which pre-test, post-test, and control group designs are applied.

The Population, Sampling, and Sampling Methods

The population of the present research included all the table tennis adult players in East Azarbaijan, which were engaged in one of the table tennis clubs in Iran's pro-league or super league as a professional

player. Among these players, 40 of them were selected as sample of the study through availability method, of whom 20 players were randomly placed in control group with the average age of 25/95 and SD= 6/02, and 20 of them were placed in experimental group with the average age of 24/45 and SD=7/7. In data analyses, descriptive methods such as mean and standard deviation, and inferential methods including analysis of covariance (ANCOVA) were implemented. Data analysis was done by SPSS-20.

RESERARCH INSTRUMENT

A- Mindfulness Awareness Assessment Scale (MAAS)

The scale, designed by Brown and Ryan, is comprised of 15 articles and is scored based on a 6-point Likert scale. The minimum score is 15 and the maximum is 90. The higher points indicate higher mindfulness. This scale evaluates an individual's ability to operate automatically regardless of attention on the current activity. Articles of the mindfulness scale include being aware of emotional states, experiences, activities; neglecting the surrounding issues; implementing an activity without concentration or awareness on the activity, and being unaware of the start and ending time of daily routine [17]. Using the Cronbach's alpha, different studies, reported the internal consistency of the scale between 0/82 and 0/87 [18].

B- Athletic Performance

In order to measure the athletic performance of the table tennis players, each of them performed 5 matches in pre-test stage. To achieve a better measurement, every match was over in score 11, and regardless of the results of the matches, the player's scores were summed up and recorded. The same procedure was implemented for the both controlled and experimental group after intervention of mindfulness training. The sum of player's scores was considered as the athletic performance score.

RESULT

To investigate the effects of mindfulness training on the athletic performance of the individuals, alongside the application of descriptive statistics, analysis of covariance (ANCOVA) was also used in this study.

table 1:Descriptive statistics of participants in every dependent variable, also in covariant variable are shown in table 1.

Variables	Groups	Pre-test		Post-test	
		Mean	Standard Deviation	Mean	Standard Deviation
Mindfulness	Experimental	40/50	64/7	35/56	10/7
	Control	40/51	62/9	55/51	20/9
Athletic Performance	Experimental	15/42	40/7	47	27/6
	Control	65/41	23/6	70/43	35/7

According to table 1, a rise in the scores of mindfulness scale and athletic performance is observed. In order to analyze the theory hypothesis and to determine the effect of independent variable (learning mindfulness techniques) on the dependent variable (athletic performance), an experiment of covariant analysis (ANCOVA) is implemented.

Table 2: Assumptions of covariance analysis are shown.

Variables	Variance Homogeneity		Regression Homogeneity		Normality (Kolmogorov-Smirnov)			
					Experimental		Control	
	F	P	F	P	statistic	P	statistic	p
Mindfulness	94/0	33/0	38/1	24/0	13/0	20/0	18/0	07/0
Athletic Performance	11/0	73/0	06/0	80/0	14/0	20/0	13/0	20/0

As it is shown in table 2, the variance error of the case study groups is the same. Also, the regression variance of both control and experimental group is homogenizes. In other words, the interaction between auxiliary variable and independent variable in estimating the dependent variable is not meaningful. Also, the control and experimental groups are selected through sampling method from a normal population. The outcomes of covariance analysis from the effects of mindfulness on the athletic performance are shown in table 3.

Table3. Covariance analysis from the effects of mindfulness on the athletic performance

	Sum of squares	Degrees of Freedom	Average of Squares	F	Meaningfulness	Eta-Square
Pre-test	24/1256	1	24/1256	39/89	000/0	70/0
Group	90/108	1	90/108	74/7	000/0	17/0

According to table 3, the difference between the pre-test and post-test of the control and experimental group for the athletic performance variable is meaningful (p<001/0, F= 39/89) , and the average of the scores of experimental group for athletic performance variable (p<001/0, F= 74/7) is also significantly more than the same average in control group. Regarding the obtained Eta-Square, it can be inferred that learning mindfulness would determine 17 percent of athletic performance variance.

DISCUSION AND CONCLUSION

The aim of the study was to investigate the influence of mindfulness technique learning on the athletic performance of the table tennis players. The initial findings of the research indicated that mindfulness learning in experimental group significantly enhanced the athletic performance of the table tennis players. These findings are in accordance with the research of "kay & Wang, Gardner & Moore, and Schwanhausser" [9,10,11,12,16].

In an effort to find a principle and a logical reason to clarify the relation of these findings with competitive athletics, Marks indicated that by a continuous training, attention control and experimental acceptance through the practice of meditation exercises and mindfulness, it would be possible for the athlete to automatically be able to recognize and guide his attention towards a desired stimulus, without being unaware of external information related to his feelings or inner information related to his body such as (automated motivation) [19].

Through empirical supports of the view, Chambers et al. indicated that mindfulness enhancement would lead to attention maintenance and transmission, the abilities which they defined them as the ability of altering the centered attention between the related stimulus [20]. The further data in supporting the Marks' hypothesis were provided by Brefczynski-Lewis and et al. . These researchers, during the investigating experienced in contrast with less experienced mediators, found out that automated attention process in experienced mediators is likely to pave the way of the optimum devotion of the attention resources [21]. In this regard, the enhanced level of central attention can occur alongside the low levels of overall motivation i.e. apparent attempt. It can be inferred from these findings that through entirely consistence directing of attention resources, and the reduction of the attention involvement possibility in peripheral cognitive "noise [13]" such as accidental excitements and cognitions, an elite athlete maintains his conversance or increasing awareness about the context i.e. competitive athletics related environmental cues. However, it holds constant the conflict of self with the task to be done. According to the experimental findings, which have investigated the relations between the mindfulness training and neural relations, it can be logically inferred [19]. that mindfulness trainings may efficiently facilitate specifically the growth of this economical state through specifying the attention-cognition resources. It should be noted that the automated attention processes, which are experienced through the mindfulness trainings, are completely deferent from the control-based approach that are often used in traditional psychological skills training [14]. Generally, in table tennis game, which high conscious attention and concentration is required, mindfulness training can improve individuals' performance by increasing the momentary awareness and elimination of the attention orientations. From the view point of the influence of mindfulness enhancement on reducing the negative feelings like anxiety, these findings might be justifiable in performance improvements [22, 23, 24]. Campbel-Sills et al. researches (2006) indicates that, in contrast with control group, people with high anxiety use less excitement acceptance as one of the components of mindfulness. These individuals, instead of accepting thoughts, excitements, and their own mental image, try to avoid them [25]. The anxious individuals, instead of responding to their thoughts and feelings, which is one of the features of mindfulness, show a negative reaction (like the fear of excitement) to experiencing the excitements [26]. Moreover, both the anxiety and the negative excitement responses of these individuals are in connection with the lower level of mindfulness. Thus, the regular mindfulness trainings, and enhanced awareness and attention related to mindfulness, more likely lead to stable performance through reduction of speech-verbal component of the anxiety and fear.

Like other studies, the present study also had some limitations, of which the following cases could be mentioned:

Although, to evaluate the performance in the present study, the simple matches were used, it will be better to use national league, or at least, state league matches in future studies. Also, in non-competitive conditions, the performance can be evaluated through service shoots on a specific point on the table (like a 10×10 centimeter square). Non-cooperation of some clubs was the other limitation in this study.

REFERENCES

1. Craft, L.L., Magyar, T.M., Becker, B.J., & Feltz, D.L. (2003). The relationship between the Competitive State Anxiety Inventory-2 and sport performance: A meta analysis. Journal of Sport & Exercise Psychology, 25, 44–65.
2. Orlick, T., & Partington, J. (1988). Mental links to excellence. The Sport Psychologist, 2, 105–130.
3. Gould, D., Eklund, R.C., & Jackson, S. (1992). 1988 U.S. Olympic wrestling excellence I: Mental preparation, precompetitive cognition and affect. The Sport Psychologis, 6, 358–382.
4. Whelan, J. P., Mahoney, M. J., & Meyers, A.W. (1991). Performance enhancement in sport: A cognitive behavioral domain. Behavior Therapy, 22, 307-327.
5. Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. Journal of Consulting and Clinical Psychology, 64, 1152-1168.
6. Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse. New York: Guilford.
7. Ost, L.G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. Behaviour Research and Therapy, 46, 296 321.
8. Rygh, J.L., & Sanderson.W.C. (2004). Treating generalized anxiety disorder: evidence-based strategies, tools, and techniques. New York: Guilford Press.
9. Gardner, F.L., & Moore, Z.E. (2004). A Mindfulness-Acceptance-Commitment (MAC) based approach to performance enhancement: Theoretical considerations. Behavior Therapy, 35, 707–723.
10. Gardner, F.L., & Moore, Z.E. (2006). Clinical sport psychology. Champaign, IL: Human Kinetics.
11. Gardner, F.L., & Moore, Z.E. (2007). The psychology of enhancing human performance: The Mindfulness-Acceptance-Commitment (MAC) approach. New York: Springer.
12. Kee, Y.H., & Wang, C.K.J. (2008). Relationships between mindfulness, flow dispositions and mental skills adoption: A cluster analytic approach. Psychology of Sport and Exercise, 9, 393–411.
13. Jackson, S.A., & Csikszentmihalyi, M. (1999). Flow in sports: The key to optimal experience and performances. Champaign, IL: Human Kinetics.
14. Ravizza, K. (2002). A philosophical construct: A framework for performance enhancement. International Journal of Sport Psychology, 33, 4–18.
15. Thomas, P.R., Murphy, S.M., & Hardy, L. (1999). Test of Performance strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. Journal of Sports Sciences, 17, 697–711.
16. Schwanhausser, L. (2009). Application of the Mindfulness-Acceptance-Commitment (MAC) Protocol with an Adolescent Springboard Diver: The Case of Steve. Journal of Clinical Sports Psychology, 3, 377-396.
17. Brown, K.W., Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. Journal of Personality and Social Psychology, 84(4), 822-48.
18. Marks, D.R. (2008). The Buddha's extra scoop: Neural correlates of mindfulness practice and their relevance for clinical sport psychology. Journal of Clinical Sports Psychology, 2, 216–241.
19. Chambers, R., Chuen Yee Lo, B., & Allen, N.B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style and affect. Cognitive Therapy and Research, 32, 303–322.
20. Brefczynski-Lewis, J.A., Lutz, A., Schaefer, H.S., Levinson, D.B., & Davidson, R.J. (2007). Neural correlates of attentional expertise in long-term meditation practitioners. Proceedings of the National Academy of Sciences of the United States of America, 104, 11483–11488.
21. Ferrando S. (2005). Mindfulness based cognitive therapy for trait anxiety. J Psychol; 22: 1-12.
22. Roemer, L., & Orsillo, S.M. (2007). An open trial of an acceptance-based behavior therapy for generalized anxiety disorder. *Behavior Therapy, 38,* 72–85.
23. Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann S. G. (2003). The relevance of emotion regulatory processes to anxiety and mood disorders. Manuscript submitted for publication.
24. Mennin, D. S. , Heimberg , R. G. , Turk , C. L. , & Fresco , D. M. (2005). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. Behavioural Research and Therapy, 43, 1281 – 1310.
25. Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for General Anxiety Disorder: Integrating mindfulness/acceptance-based approaches withexisting cognitive-behavioral models. Clinical Psychology: Science and Practice, 9, 27-44.
26. Davidson, R.J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. Psychosomatic Medicine, 65, 564–570.

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