

# Effectiveness of Mindfulness-Based Cognitive Therapy and Conscious Yoga on State and Trait Anxiety and Quality Of Life in Women with Obesity

Samaneh Mohamadpour<sup>1</sup>, Vajihe Aboee<sup>2</sup>, Marjan Shahi<sup>3</sup>,  
Soheila Rahmani<sup>4\*</sup> & Somayeh Zalipour<sup>5</sup>

Master`S Of Clinical Psychology, Social Determinants Of Health Research Center, Lorestan University Of Medical Sciences, Khoramabad, Iran.

<sup>2</sup>Master In Counseling And Guidance, Islamic Azad University, Unit Of Abhar, Counseling Group, Abhar, Iran.

<sup>3</sup>Master`S Of Clinical Psychology, Faculty Of Psychology & Education Sciences, Semnan University, Semnan, Iran.

<sup>4</sup>Ph.D, Student Of Health Psychology, Azad Islamic University, Karaj, Iran

<sup>5</sup>Ph.D. Student In Psychology, Razi University, Kermanshah, Iran.

---

## Abstract

**Introduction:** Obesity is the common problem of general health and of the main concerns of world health organization. Quality of life in obese individuals usually faces various problems and they experience a high level of anxiety. So, the present study was conducted with the aim of examining the effectiveness of mindfulness-based cognitive therapy and conscious yoga on state and trait anxiety and quality of life in Women with Obesity.

**Methods:** The study was quasi-experimental with pre-test, post-test, control group and a 2-month follow-up. 24 patients among Women with Obesity who referred to clinic in Tehran were selected in an available way and were randomly assigned into experimental ( $n_1 = 12$ ) and control groups ( $n_2 = 12$ ). The anxiety level and quality of life of the participants are measured using state and trait anxiety inventory (STAI) by spielberger et al (1970). and quality of life questionnaire (SF-36) by wier et al (1988) in pre-test stages. Then, participants of experimental group received group mindfulness-based cognitive therapy and conscious yoga for 8 sessions. After completing the interventions patients' quality of life level was measured again and data were analyzed using covariance analysis.

**Findings:** Findings showed mindfulness-based cognitive therapy can significantly increase quality of life in women of experimental group and significantly decrease state and trait anxiety in them.

**Conclusion:** The results of this study proposes some evidences that mindfulness-based cognitive therapy can be an appropriate therapeutic method for improving quality of life and decreasing state and trait anxiety in women with obesity. So, applying mindfulness-based cognitive therapy is recommended to increase quality of life and decrease anxiety in women with obesity.

**Key words:** mindfulness-based cognitive therapy, conscious yoga, quality of life, state and trait anxiety, Women with Obesity

## Introduction

Obesity is a common public health problem. Its increasing trend has become a major concern of the World Health Organization. World Health Organization reported that there will be more than 700 million obese people around the world by the year 2015 (1, 2) Obesity and increased weight gain is the fifth deadly factor in the world. Medical sources emphasize that obesity and increased weight in adulthood is a major risk factor for several diseases such as diabetes type 2, coronary heart diseases, hypertension, gallstones, sleep apnea, osteoarthritis, hyper-uremia, some types of cancers and even depression. (1, 3, 4). Obesity can have unpleasant effects on individuals' ability for experiencing an active and dynamic life. According to the evidences, this point can be noted that problems resulted from obesity are so complicated and are not just limited to cause of developing physical problems and worsening them since obesity and medical problems due to it can affect individuals' functional ability for having an active and effective life. In the recent decade inabilities due to obesity are increased and obesity

has become a risk factor of inability in individuals' life (3).

Obese people are unable to have totally active life because obesity negatively affects their physical and psychosocial functioning (5, 6). Obesity is also proposed as an independent and influencing factor on the quality of life (7, 8). Quality of life is a phrase that is frequently spoken of (9). The World Health Organization has defined quality of life as the individuals' understanding of their position in life in terms of culture, value systems in which they live, goals, expectations, standards and priorities. So, this concept is totally personal, cannot be observed by others and is based on individuals' understanding of various aspects of their lives (10). Quality of life includes a combination of objective and subjective situations. Its subjective aspect refers to feeling of satisfaction in general and its objective aspect refers to meeting the cultural and social demands for wealth, social status and physical well-being (9). In general, quality of life is a broad concept relating to all aspects of humans' life. Using this concept in health care indicates focusing on the effects of disease and treatment (11). Obesity disrupts individuals' quality of life in mental, social, and psychological dimensions, reduces quality of life and increases functional limitations in patients (6, 12). Effects of obesity on quality of life are very extensive. Various studies have shown an association between obesity and disruption in quality of life. It is emphasized that obesity can disrupt various aspects of life such as physical functioning, general anxiety, sexual performance, self-confidence and job (13, 14). Further studies have shown that physical health and feeling well worsen with gaining weight and obesity. Also, in obese participants with no chronic physical diseases, sense of physical health declines (15). Results of some studies have also shown that the relationship between obesity and various aspects of quality of life is stronger in women than men. Obese women have lower quality of life compared to obese men and significantly have less vitality and physical and mental health (16, 17).

Mindfulness-based cognitive therapy is developed by Kabat-Zinn in Medical Center of Massachusetts University in 1979 (18, 19, 20). It is a kind of structured clinical program. It is one of the therapeutic methods that focuses on the interaction of mind and body and is used broadly in clinics and hospitals around the USA and Europe to help managing the stress and adapting to chronic diseases. It is an 8-week program. Each session lasts about 120 to 150 minutes and mindfulness skills for coping with stress and developing awareness at the present time are taught. It includes thought-related meditations, relaxation and Hatha

yoga (15,21). Mindfulness means paying attention to the present time in a special, purposeful and without judge way (19). One of the main goals of this program is to promote health and reduce stress (22). Meditation and mindfulness exercises lead to increase in self-awareness and self-acceptance ability in patients (23). One core concept of mindfulness training is that individuals be honest to themselves and their feelings. Along with the increase in individuals' ability for mindfulness, they can identify accurately what is happening in their bodies and minds as they are happening around them (20).

Several studies are conducted about the effectiveness of mindfulness-based cognitive therapy. Mindfulness-based stress reduction model has shown success in treating cancer (24) and significant improvement in quality of life, stress symptoms and quality of sleep in patients with breast and prostate cancer (25). It also showed significant effect in increasing mental clarity, mental health and decreasing physical stress (26). The effect of mindfulness-based cognitive therapy on immune system in patients with cancer and AIDS indicates its effect on the amount of NK cells activity in these patients (27). In mindfulness-based and stress reduction intervention during 8 weeks on 19 women with breast cancer, it was found that these intervention have positive effect on improving mental condition (fear of recurrence, stress, anxiety and depression), psychosocial features (optimism, attracting support from others and spirituality) and physical symptoms (28). In a quasi-experimental study with pre-test, post-test and control group it was found that mindfulness practices have effect on mood disorders and ultimately enhancing the quality of life in participants of experimental group (29). In a study that was conducted on 133 patients with breast cancer in stages 1 to 3, the results showed that mindfulness has a significant effect on quality of life in these patients (30). In another study, mindfulness and meditation interventions were conducted on 49 patients with breast cancer and 10 patients with prostate cancer. Results showed a significant reduction in stress symptoms and significant increase in patients' quality of life (31, 32). In examining the amount of quality of life in individuals who received mindfulness-based cognitive therapy for the first time, a study was conducted at the Mayo Clinic. The results showed overall quality of life; psychological, physical, emotional and spiritual well-being; and social activity significantly improved. Also, positive effects on the amount of pain, the severity of pain, the amount of exhaustion, the amount of support from friends and family, and financial and legal concerns were observed. So, a short-term

mindfulness intervention significantly improves the quality of life of participants (33). In a study, the positive effect of mindfulness-based cognitive therapy on stress, anxiety, depression and sleep in patients with Fibromyalgia was reported (34). Considering the physical and psychological problems of Women with Obesity and existing evidences about the effectiveness of mindfulness-based cognitive therapy on improving quality of life and reducing state and trait anxiety in women with obesity or not.

**Method**

All Women with Obesity who referred to clinic in Tehran in 2013 consisted the statistical population of this study. Among them, 24 patients were selected and were randomly assigned into experimental (12 participants) and control groups (12 participants). Inclusion and exclusion criteria included: being infected with the moderate intensity of anxiety(at least score 10), having BMI> 30, individuals should, have middle school education or higher, individuals should be 20-55 years old, individuals should not suffer from other chronic diseases, individual should not have the history of neurological and psychiatric disease and

hospitalization, individuals should not abuse drugs, individuals should be able to participate in group therapy sessions and individuals should be willing to cooperate in study. Exclusion criteria for experimental group included: Absence of intervention sessions more than two sessions and lack of willingness to continue participating in the intervention sessions. The study was conducted at clinic in Tehran by two master clinical psychologists who were familiar enough to the intervention, according to the ethical standards of research such as informed consent and maintaining secrets of participants. Participants of experimental and control groups completed questionnaires in 3 stages, before intervention(pre-test), after intervention (post-test) and 2 months after intervention(follow-up). Treatment was done in 8 group sessions. Eight intervention sessions of this study were followed based on mindfulness-based cognitive therapy [21] and were conducted once a week in 2 hours for participants of experimental group. Participants of control group did not receive any interventions. Due to ethical considerations, at the end of the research, participants of control group were given a CD of yoga practices. A summary of functional instructions of mindfulness-based cognitive therapy is presented in table1.

**Table1. Summary of functional instruction sessions of mindfulness-based cognitive therapy**

Session	Topic
<b>First session: Automatic Pilot</b>	The introduction of automatic guidance system/knowing how to use present moment awareness of bodily sensation, thoughts and emotions in reducing stress/practicing eating raisins <sup>1</sup> ,giving feedback and discussion about the practice/three - minute breathing, giving assignment for next week and distributing leaflets of the first session and CDs of meditation
<b>Second session: facing obstacles</b>	Re-examining body workout/ giving feedback and discussion about examining body workout/ practicing breathing mindfulness meditation/ /distributing leaflets of the second session and CDs of meditation
<b>Third session: Kindness with breathing, body and awareness about breathing and body movement</b>	Having conscious sitting with awareness of breathing(the sitting meditation)/ practicing three -minute breathing /distributing leaflets of the third session and video tape of yoga practices
<b>Fourth session: learning how to answer</b>	Re-examining body workout / (in the hospital chapel)/5-minute practicing of “seeing or hearing”/ re-practicing conscious session with awareness of breathing and body/ distributing leaflets of fourth session and CDs of meditation
<b>Fifth session: slowly cope with difficulty (attendance)</b>	Practicing breathing /re-practicing conscious session(awareness of breathing ,body, sounds and thoughts)/explaining the stress and identifying participants’ reactions to stress/examining awareness of pleasant and unpleasant events on feeling ,thoughts and bodily sensations/ practicing 3-minute breathing /distributing leaflets
<b>Sixth session: thoughts are not facts</b>	practicing sitting meditation (mindfulness of sounds and thoughts)/distributing leaflets of the sixth session and number4 video tape to participants
<b>Seventh session: self-care</b>	Practicing mountain meditation/sleep hygiene/ repeating exercises of

<sup>1</sup>Object attention training

	the previous session/making a list of enjoyable activities/distributing leaflets of the seventh session
<b>Eighth session: going beyond fear</b>	Examining body workout /overview of program/examining and discussing programs /practicing stone, beads and marbles meditation

**Tools**

To data collecting the following questionnaires were used.

**Demographic Information Questionnaire**

This questionnaire was used to collect demographic data required as basic information including age, marital status, education, socio- economic condition, educational background and employment history, alcohol consumption and smoking.

**State - Trait Anxiety Inventory /STAI**

Anxiety is measured using the State - Trait Anxiety Inventory /STAI in this study (35). Concepts of state and trait anxiety were introduced by Cattell first and then, more comprehensive, by Spielbergez (1970) (36). State -Trait Anxiety Inventory that is known as STAI has been applied in studies and clinical activities. This inventory includes separated self-assess scales to measure state and trait anxiety. State anxiety can be considered as a period in a person's life or in other words, its incidence is associated with the situation and is allocated to stressful situations (arguments, loss of social position and security and human health threat) (37).

**Quality of life Questionnaire SF-36**

This questionnaire is designed by (38). It is a comprehensive questionnaire to measure quality of

life in all health-related issues .It examines eight dimensions of quality of life and 36 items that are completed by the patients or through interview .It is implementable in different age groups and diseases. The reliability and validity of the questionnaire was approved by Weir et al. in 1988.This questionnaire shows patients' perception of their quality of life in eight dimensions and the score is between 0 to 100.Score 100 shows ideal situation and score 0 shows the worst situation in each dimension. Physical functioning, activity limitations due to the physical problems, physical pain, vitality, general health, mental health, activity limitations due to mental problems and social functioning are the dimensions of this questionnaire. This questionnaire has international validity and reliability. It is translated by Institute of Health Sciences (SID) in Iran and its international validity and reliability was examined and proved. Chronbach's alpha coefficient of 0.77 to 0.95 was obtained for all aspects of questionnaire except vitality and 0.65 for vitality dimension (39).

**Results**

Collected data were analyzed using mean, standard deviation, frequency distribution tables, univariate covariance analysis test and SPSS-21 software and were shown in the following tables. In this study, 24 Women with Obesity 2 (12 patients in control group and 12 patients in experimental group) aged 32-49 years old were studied. Age mean of participants of experimental group was 42 ± 5/32 years and age mean of participants of control group was 40 ± 4/56 years.

**Table 2. Frequency and the frequency percentage**

	Group	Variables	Frequency	percent
Marital Status	Control	Married	11	91.7
		Single	1	8.3
	Experimental	Married	11	91.7
		Single	1	8.3
Level of Education	Control	Middle and secondary	3	25
		University	9	75
	Experimental	Middle and secondary	4	33.3
		University	8	66.7
Income	Control	The average	6	50
		High	6	50
	Experimental	The average	8	66.7
		High	4	33.3
Status of work	Control	Housewife	4	33.3
		Employed	8	66.7

	Experimental	Housewife Employed	6 6	50 50
Number of parturition	Control	0	2	16.7
		1	2	16.7
		2	4	33.3
		3	4	33.3
Experimental	Experimental	0	3	25
		1	1	8.3
		2	4	33.3
		3	4	33.3

Table 2 shows the frequency and the frequency percentage of demographic characteristics of the Women with Obesity in both groups.

**Table 3. Mean and standard deviation of participants' scores in quality of life**

Modality	Experimental Group (n=12)			Control Group (n=12)		
	pre-test	post-test	Follow-up	pre-test	post-test	Follow-up
Public Health	7.66±0.88	5.50±0.67	6.58±0.66	7.25±0.45	7±1.12	7.25±0.62
physical limitations	22.83±1.58	25.91±1.16	27±1.53	22.16±0.71	23.66±1.43	25.41±1.67
physical functioning	4.50±0.67	6.16±1.11	5±0.95	4.33±0.49	23.66±1.43	4.33±0.49
Effect limitations	3.33±0.49	4.83±0.71	3.50±0.52	3.75±0.86	3.91± 0.66	3.75±0.86
Physical Pain	10.08±1.78	7.41±1.31	7.58±0.90	9.58±1.97	8.83±1.89	9.58±1.97
Energy and vitality	32.66±2.10	35.41±1.56	33.66±1.23	33.91±2.01	33.66±2.06	33.91±2.01
Social Performance	0.28±2.91	0.66±3.91	0.51±2.91	0.38±2.83	0.66±2.50	0.38±2.83
Mental Health	12.33±1.49	14.41±1.67	13.8±1.31	12.33±1.49	12.58±1.31	12.33±1.49
State Anxiety	68.08±1.78	46.75±1.71	47.25±2	68.08±1.78	46.75±1.71	47.25±2
Trait Anxiety	52.25±3.51	43.08±2.39	44±2.29	25.91±1.78	51.58±2.53	51.83±2.97

Table 3 shows mean and standard deviation of participants' scores in quality of life and Anxiety. The effectiveness of mindfulness-based cognitive therapy and conscious yoga on quality of life in Women with Obesity is examined using repeated measures variance analysis. A summary is presented in Table 4, 5.

**Table 4. The summary of repeated measures variance analysis to examine the effectiveness of mindfulness-based cognitive therapy on quality of life.**

	Sum of squares	df	mean of square	F	significance level	Eta square
Public Health	2.042	1	2156.540	4.975	0.036	0.184
physical limitations	13.500	1	930.299	10.340	0.004	0.320
physical functioning	4.741	1	551.076	16	0.0001	0.421
Effect limitations	0.042	1	158.481	0.122	0.730	0.006
Physical Pain	5.671	1	18.100	2.364	0.138	0.097
Energy and vitality	0.167	1	40.764	0.064	0.801	0.003
Social Performance	1.167	1	18.100	2.0791	0.001	0.486
Mental Health	1.185	1	40.764	0.710	0.409	0.031

**Table 5. The summary of repeated measures variance analysis to examine the effectiveness of mindfulness-based cognitive therapy on Anxiety.**

	Sum of squares	df	mean of square	F	significance level	Eta square
Trait Anxiety	289.352	1	289.352	80.711	0.0001	0.786
State Anxiety	192.667	1	192.667	44.705	0.0001	0.670

The results of repeated measures variance analysis in examining quality of life components showed that there is a significant difference in groups in three evaluation stages in general health, physical limitations, physical functioning and social functioning components. Eta square also shows the amount of effectiveness of mindfulness-based cognitive therapy on quality of life in Women with Obesity.

### Conclusions

It was concluded that group mindfulness-based cognitive therapy increases the quality of life in patients with Women with Obesity. This result is consistent with previous studies that showed this program can be an effective psychosocial intervention in improving quality of life (24,28). The result of a study by Carlson and Space showed that doing mindfulness meditations, in addition to reducing stress, significantly increases mental clarity and mental health and reduces physical stress in patients. These researchers concluded that mindfulness-based cognitive therapy has an important role in improving symptoms and brings about positive results for patients following the participation in treatment program (28).

Since many people with obesity experience feeling of shame, it causes forming inefficient coping responses including social isolation and negative self-criticism in them. Promoting mental health has different definitions such as balance between positive and negative emotions and pleasant quality of life. So, according to different definitions it can be concluded that mental health is associated with different factors such as quality of life, coping strategies in dealing with life challenges and managing stress (3). Quality of life is a multidimensional concept. World Health Organization defines it as individuals' perception of their lives, values, goals, standards and personal interests. Sense of security, emotional conflicts, personal beliefs, goals and the amount of frustration tolerance are all effective in determining one's perception of self (feeling good or feeling bad) (40).

Group mindfulness-based cognitive therapy causes mindfulness. Meditation and mindfulness practices leads to self-awareness and self-acceptance in patients. Mindfulness is not a method or technique. It is defined as an available way to reduce pain and expand positive qualities such as consciousness, insight, wisdom and sympathy (23). Applying relaxation training broadly and high emphasis on it

as a valuable stress management skill should be regularly used in individuals' life and be a sustained part of individuals' coping skills. Expressing emotions during all sessions of the program has treatment benefits. Mindfulness affects emotional and sensory components of the body by self-regulating attention through meditation. Regular practice of Hatha yoga increases skeletal – muscular flexibility and helps the individual to experience deep states of relaxation and awareness (18).

In explaining this result it can be said that when individuals understand deep feeling of calmness resulted from mindfulness, do not ask themselves what is the meaning and the aim of living. They will understand obviously that calmness, love and pleasure exist inside them. They will understand that all pains and sadness that exist in the world are because humans deprive themselves of understanding and applying the internal source of calmness, love and happiness. They will understand that bad and unpleasant feelings that sometimes they feel are because of their wrong point of view to the world. When they understand that their goal is to access deeply to internal sources within them and this is not only for them but also for all people around them, in that case life will have a beautiful and deep meaning for them.

Meeting similar individuals causes relief and reassurance in patients and can make them learn coping techniques to overcome the problems and solve them. When individuals with high blood sugar communicate, they show their empathy to each other and discuss broadly about their problems and experiences. So, a supportive environment for conveying knowledge and awareness develops. In general, group treatment factors including catharsis, feeling of being accepted, altruistic, public approval, empathy, identification, imitation, insight, interaction, learning, reality, transfer, universal concept and many other factors cause increase in, creating hope, being more responsiveness to treatment and thus reduction of anxiety and increase of quality of life (34). Since, mindfulness-based cognitive therapy emphasizes on here and now, 'the present' time is the only true thing. Being in the present time and enjoying it is the most important technique applied in this method. Mindfulness training, patience (patience means having a tendency to make things appear in their own time and having tendency to stay with what is happening at the moment). Patience is the ability to endure problems with a state of tranquility or self-control

.It extends the view that individual endures perceived failures of the current situation. This period is helpful in dealing with anxiety. In mindfulness the individuals confidently let the thoughts, feelings, emotions, habits and reactions show themselves. Meanwhile, they do not stick themselves to their thoughts, feelings, ideas and imaginations and do not consider them the same as themselves. I.e. they do not crave their identity of them. For an individual with mindfulness, thought is one thing and reality is another thing and thought is not necessarily the fact of life. Mindfulness helps individuals manage their negative emotions better, gain more adaptive coping skills and be able to reassess stressors (for example, consider fighting with the problem as an opportunity to grow, not a threat). In explaining this hypothesis it can be said that what mindfulness does is that individuals are one step away of all the thoughts, both positive and negative. Thoughts are just thoughts and are not facts. Individuals cannot completely control their thoughts. All that can do is that they look at the thoughts, take away from them and stop their spontaneous reaction to them. The more they are able to do that, the more they feel control on it. Therapeutic effects of group mindfulness-based cognitive therapy increases by group-related factors. This program increases the ability of adaptive coping, creating hope and greater responsiveness to treatment. So; more therapeutic consequences are affected (32). According to the results of the present study, it is recommended mindfulness-based cognitive therapy be applied to enhance the quality of life in Women with Obesity.

#### References

1. World Health Organization .Fact sheet: Obesity and Overweight. Available Online:<http://www.who.int/mediacentre/facts/fs311/en/up> dated March 2011(accessed on 19 June 2011).
2. Chan Ruth S.M, woos Jean; Prevention of overweight and obesity: How Effective is the current public health approach .Int. J. Environ .Research Public Health 2010, 7:765-783.
3. Guh DP, Zhang W , Bans back N, Amarsi Z, Birmingham C 1 ,Anis AH; The incidence of Co-morbidities related to obesity and over weight: A Systemic review and meta-analysis; BMC Public Health;2009;9:88.
4. Pi-Sunyer X; The Medical Risks of Obesity; Post grad Med. 2009 November; 121(6): 21–33. Available in PMC 2010 November 1.
5. Fontaine KR, Bartlett SJ. Estimating health-related quality of life in obese individuals. *Dis Manage Health Outcomes* 1998; 3:61–70.
6. Wen-Ling Tsai, Chun-Yuh Yang , Sheng-Fung Lin and Fu-Min Fang, Impact of Obesity on Medical Problems and Quality of Life in Taiwan; *American Journal of Epidemiology*; 2004;160(6):557–565.
7. Philips David, Quality of life “concept, policy and practice; London, Published by Rutledge; 2006:5.
8. World Health Organization. Quality of Life Assessment: International Perspectives. Berlin: Springer -Verlag; 1994.
9. Guyatt GH , Estwing Ferrans C, Halyard M ,Revicki D A , Symonds T , Varriccho C G and etal Exploration of the value of Health-Related quality of life information from clinical Research and into clinical practice; *Mayo Clinic proceeding* ;October 2007,28(10):1229-1239.
10. Lamai K , Gregg EW , Chen YJ , Zhang P , Rekeneire N , Williamson DF ;The association of BMI with function status and self- lite health in US adults; *Obesity*;2008;16:402-408.
11. Crosby RD, Williams GR; health related quality of life varies among obese subgroups; *Obesity Research*; 2002; 10:748-756.
12. Doll HA, Peterson SEK, Stewart –Brown SL; Obesity and Physical and emotional well-being association between body mass index, chronic illness and physical and mental components of the SF-36 questionnaire; *Obesity Research*; 2000; 8:160-17.
13. Women are more likely than men to suffer health problems and worse quality of life due to obesity. *AHRQ Research Activities* [serial on the Internet]. (2007), [cited August 10, 2011]; (317): 14. Available from: CINAHL with Full Text.15. Kabat-Zinn, J. Full catastrophe living. New York: Delta 1990; 1 - 46.

14. García-Mendizábal M J, Miguel Carrasco J, Pérez- Gómez B, Aragonés N, Guallar-Castillón P, Rodríguez- Artalejo F, López-Abente G, and Pollán M; Role of educational level in the relationship between Body Mass Index (BMI) and health-related quality of life (HRQL) among rural Spanish women; *BMC Public Health* 2009, 9:120:1-10
15. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B; the short form health survey (SF-36): Translation and Validation study of the Iranian Version, *Quality of Life Research* ;2005;14:875-882.
16. Sirtori A, Brunani A, Liuzzi A, Pasqualinotto L, Villa V, Leonardi M and Raggi A; Quality of life, disability, and body mass index are related in obese patients; *International Journal of Rehabilitation Research* 2011, Vol 00 No 00( Brief research report).
17. Saraç F, Parý İdar S, Duman E, Saygý İy F, Tüzün M, Yý İmaz C. Quality of life for obese women and men in Turkey. *Preventing Chronic Disease* [serial online] 2007 Jul [date cited]. Available from: [http://www.cdc.gov/pcd/issues/2007/jul/06\\_0108.htm](http://www.cdc.gov/pcd/issues/2007/jul/06_0108.htm).
18. Vasiljevic N, Ralevic S, Marinkovic J, Kocev N, Maksimovic M, Milosevic G S and Tomic J ; The assessment of health-related quality of life in relation to the body mass index value in the urban population of Belgrade; *Health and Quality of Life Outcomes* 2008, 6:106: available from: <http://www.hqlo.com/content/6/1/106>
19. Kabat-Zinn, J. Mindfulness-based interventions in context: past, present, and future. *American Psychological Association*. 2003; 10(2):144-6.
20. Kabat-Zinn, J. *Coming to our senses: Healing ourselves and the world through Mindfulness*. New York; Hyperion 2005.
21. Matousek R, Dobkin L, Pruessner, J. Cortisol as a marker for improvement in mindfulness-based stress reduction. *Complement Ther Clin Pract*. 2010; 16: 13-19
22. Brantley J. Mindfulness-Based Stress Reduction .In S.M.Orsillo&L.Roemer (Eds), *Acceptance and mindfulness-based approaches to anxiety :Conceptualization and treatment*New York:Springer.2005;131-45.
23. Baer R. *Mindfulness-based treatment approaches: Clinician's guide to evidence base and applications*, San Diego: Elsevier.2006
24. Speca M, Carlson L, Goodey E, Angen M. A randomized wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Med*.2000; 62: 613-22.
25. Carlson L, Speca M, Patel K, Goodey E. Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress, and immune parameters in breast and prostate cancer out patients .*Psychosom Med*.2003; 65: 571-81.
26. Carlson L, Speca M. *Mindfulness - based cancer recovery*. Oakland, CA: New Harbinger.2011; 17-31.
27. Lerner R, Kibler J, Zeichner S. *Relationship between Mindfulness-Based Stress Reduction and Immune Function in Cancer and HIV/AIDS*.Nova Southeastern University, Fort Lauderdale, U Cancer and Clinical Oncology.2013; 2: 1
28. Lengacher C, Barta M, Jacobsen P, Kip K, Shelton M, Budhrani P, et al. Feasibility of a Mindfulness-based cognitive therapy for Early-Stage Breast Cancer Survivors. *J Holist Nurs*. 2011; 29(1) :107-117.
29. Matchim Y, Armer J, Stewart B. Effects of Mindfulness-Based Stress Reduction (MBSR) on Health Among Breast Cancer Survivors . *West J Nurs*. 2011;33(1): 996-101
30. Forti A. *Mindfulness and quality of life among breast cancer survivors*. Carolina: Harvard Health Publications.2011. <http://Library.uncg.Edu>.
31. Carlson L, Speca M, Patel K, Goodey E. Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress, and levels of cortisol, dehydroepiandrosterone sulfate, and melatonin in breast and prostate cancer outpatients

- Psychoneuroendocrinology. 2004; 29: 448-74.
32. Carlson L, Speca M, Faris P, Patel K. One year pre-post intervention follow-up of psychological, immune, endocrine and blood pressure outcomes of mindfulness-based stress reduction in breast and prostate cancer outpatients. *Brain Behave Immune*. 2007; 21:1038-49.
33. Shannon C, Payne S, Fenlon D. What is the evidence for the use of mindfulness-based interventions in cancer care? A review. *Psychooncology*. 2010;20.
34. Fang C, Reibel D, Longacre M, Rosenzweig S, Campbell D, Douglas S. Enhanced psychosocial well-being following participation in a mindfulness-based cognitive therapy is associated with increased natural killer cell activity. 2010. *J Altern Complement Med*, 16, 531-38. <http://dx.doi.org/10.1089/acm.2009.0018>.
35. Caci, H., Bayle, F. J., Dossios, C., Robert, P., & Boyer, P. (2003). The Spielberger trait anxiety inventory measures more than anxiety. *European Psychiatry*, 18, 394–400.
36. Spielberger, C. D., Vagg, P. R., Barker, L. R., Donham, G. W., & Westberry, L. G. (1980). Factor structure of the State–Trait Anxiety Inventory. In I. G. Sarason & C. D. Spielberger (Eds.), *Stress and anxiety* (Vol. 7, pp. 95–109). Washington, DC: Hemisphere.
37. Spielberger, C. D. (1989). *State–Trait Anxiety Inventory: A comprehensive bibliography*. Palo Alto, CA: Consulting Psychologists Press.
38. Ventegodt S, Anderson NJ. & Merrick J. Quality of life theory I. The IQOL theory: An integrative theory of the global quality life concept. *Scientific World Journal*. 2003; 3, 1030-1040.
39. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. *Qual Life Res*. 2005 Apr; 14(3): 875-82.
40. Blain, B. Does depression cause obesity: A meta-analysis of longitudinal studies of depression and weight control? *Journal of health psychology*. 2008; 13, 1190-1197.