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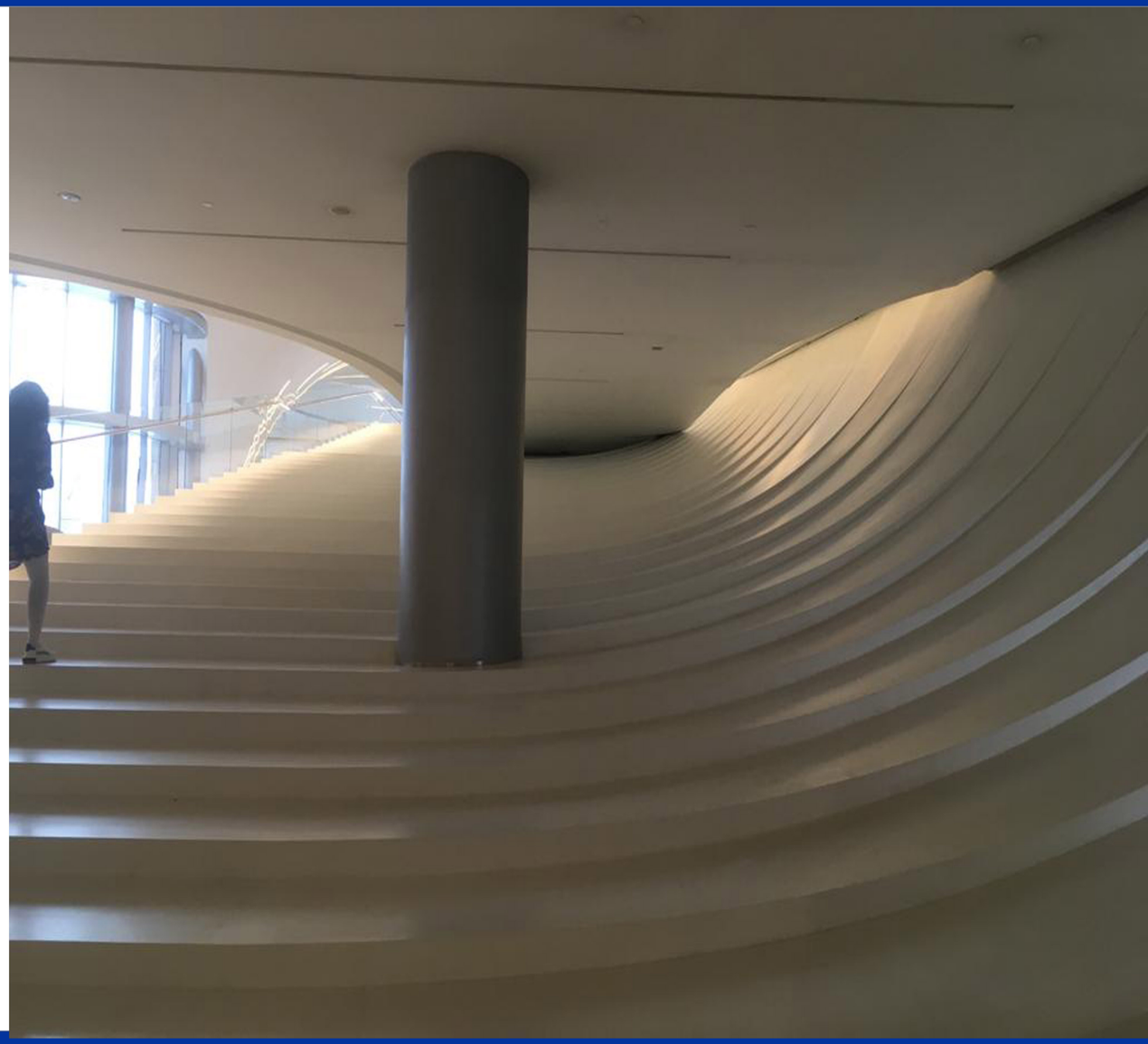

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If photographs of patients are used, either the subjects should not be identifiable or the photographs should be accompanied by written permission to use them. Permission forms are available from the Editorial Office.

Medical and scientific illustrations will be created or recreated in-house. If an outside illustrator creates the figure, the *Journal of Body, Mind and Culture* reserves the right to modify or redraw it to meet its specifications for publication. The author must explicitly acquire all rights to the illustration from the artist in order to publish the illustration. Legends for figures should be an editable text as caption and should not appear on the figures.

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Cross-Cultural, Interdisciplinary Health Studies

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

The Mediating Effect of Metacognition Learning on Mental Health of Veterans in Golestan Province, Iran

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Empirical Study

Abstract

Background: The main purpose of the present study was to investigate the impact of metacognition learning on the mental health of veterans of Golestan Province, Iran.

Methods: The present study was an applied, semi-experimental study with a pretest-posttest design and a control group. The statistical population consists of all veterans of Golestan Province. From among this population, a sample of 200 people was selected through convenience sampling method. From among this sample, 100 people were selected as the experimental group and 100 people were selected as the control group. Both groups underwent the pretest and posttest. The members of the experimental group in each city were subjected to 6 sessions of metacognition training workshops lasting 2 hours in 10 cities of Golestan Province.

Results: The data analysis using independent group t-test showed that metacognition learning led to the reduction of disorders related to the four subscales of mental health which led to increased level of general health.

Conclusion: It can be concluded that metacognition learning led to an increase in the level of general health of the participants.

Keywords: Meta-Cognition, Learning, Mental Health

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Introduction

Various definitions have been presented for mental health hitherto, such as lack of disease, emotional balance, social adaptation, sense of comfort, personality integrity, and awareness of self and the environment. One of the definitions provided for mental health, which is widely accepted and used, is that people are mentally normal when they are in harmony with themselves and their environment, adapt to their cultural requirements and social facilities, and a medical disease or disorder does not cause the destruction of their reasoning, judgment, intellectual ability, and their personal and social adaptability (Kaplan & Sadock, 2003).

The role of mental health in various aspects of social life, working environment, family and society is indisputable and it aims to provide mental health by preventing

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complications, providing appropriate and timely treatment, and ultimately, creating a healthy environment for the establishment of healthy human relationships (Milani, 1999).

Metacognition is a new field of science that can lead to the formation of a training method for wise thinking and thoughtful decision-making, and better understanding and learning in educational settings. In general, metacognition is another way toward training. Metacognition can be defined as the "critical analysis of thoughts" and "knowledge and cognition of cognitive phenomenon", and in simpler words, "thinking about thinking" (Flavell, 1976). The 8-year imposed war has led to physical injuries, adverse neuropsychiatric complications, physical, emotional, and financial problems, and reduced social interactions that create a complicated life for veterans. Moreover, veterans are people who have faced the most complexities both during and after the war. Therefore, attention to mental health, communications, and interactions of veterans, and providing effective strategies, and teaching metacognitive concepts and how to use them in life are among the important goals of this study, which has also achieved important results.

Knowing that veterans have poor mental health and use more destructive communication patterns and negative thoughts, and the fact that learning metacognition can help them can assist professionals in helping these people solve their problems and manage their daily lives.

Considering the importance of pressures resulted from war and the many problems of veterans, we aimed to teach them metacognitive methods and measure their impact on their mental health. The importance of this study is due to the fact that it can result in the following functions:

- Reduced disorder in physical functions, anxiety, depression, etc., and improved social performance and interaction;
- Increased mental health and the creation of the grounds for the promotion of mental health and reduction of crises caused by physical and psychological disabilities of veterans;
- Learning metacognitive strategies and applying them in daily life.

The present study was an attempt at teaching metacognition and familiarizing veterans with cognitive trust, positive beliefs, cognitive self-awareness, how to deal with and control negative beliefs, and how to use metacognitive strategies in life, and ultimately, increase their general health.

Research hypotheses: 1. Metacognition learning leads to a reduction in veterans' physical symptoms.

2. Metacognition learning leads to the reduction of anxiety and sleep disorder in veterans.

3. Metacognition learning leads to the reduction of disorder in social function of veterans.

4. Metacognition learning leads to the reduction of severe depression in veterans.

5. Metacognition learning leads to an increased level of mental health in veterans.

Methods

A semi-experimental and pretest-posttest design with a control group was used in the present study. In this design, according to Figure 1, two groups of subjects are selected. Before applying the independent variable (only for the experimental group), both groups are evaluated in the pretest. After applying the independent variable on the experimental group (and not applying it for the control group), again both groups are evaluated in the posttest (Delavar, 2009).

E	T_1	X	T_2
C	T_1	_	T_2

Figure 1: Unequal control group design with pretest and posttest

The statistical population of the present study consisted of all veterans diagnosed with chemical, shots and fragments, blast wave, and nervous and psychosocial injuries, and mutilation. The statistical population (17,640 people) consisted of individuals who,

according to the diagnosis of doctors and medical commission, are veterans, have some percentage of injuries, and are covered by the Foundation of Martyrs and Veterans Affairs in Golestan Province, Iran. From among the statistical population, 200 people were selected from among which 100 subjects were selected as the experimental group and 100 were selected as the control group. The sampling method used was convenience sampling.

Method of holding workshops and teaching metacognition

After undergoing the administrative steps in selecting the target community and providing financial resources for the training workshops, the methodology of the training workshops was determined as listed below.

The first session: Pretest was implemented among the participants at the beginning of their entrance into the training workshops.

The second session: The second session consisted of an opening, introduction, and development and description of the metacognitive training workshops plan in patients with post-traumatic stress disorder (PTSD) and the division of the participants into groups of 9 to 15 people.

The third session: The participants made a list of their educational needs, and then, the educational sessions were directed toward metacognitive topics in the 5 categories used in metacognition including self-regulation, cognitive trust, cognitive confidence, controlling negative thoughts, and positive beliefs, and interpretation of these topics based on the temporal necessities. In the third session of the workshop, people, enjoying opportunities of the workshop, discussed the recollection and refreshing of the relevant flashbacks, and at the end of the third session, the teachers provided a description of metacognitive beliefs and the metacognition concept (pages 1 to 10 of the package).

The fourth session: In this session, metacognitive concepts associated with PTSD, metacognitive models and beliefs, and academic metacognitive strategies (pages 11 to 30 of the package) were taught. Conceptualization was performed and discussed based on the metacognitive table of Wells and Sombie under the title of automatic adaptive processing. In this section, the concepts of this model and concepts such as symptoms including disturbing thoughts and images, arousal, and biased responses were discussed as emotional processing as natural reactions after the accident (extracted from page 24 of the book).

The fifth session: In the fifth session of the workshop, other concepts of the metacognitive model in PTSD patients were described by the teachers under the titles of worry and rumination, threats review, types of confrontation avoidance, and self-evaluation. Then, participants, as a group work, listed the efficient and inefficient metacognitive strategies. In this session, they became aware of efficient metacognitive strategies such as self-regulation, cognitive trust, cognitive awareness, and positive thoughts and discussed them. The three stages of war and defense, the stages of development of defensive identities, Iraqis' belief in their disability, belief in war without a winner, belief in Iraq's isolation, and whether defensive identities are rootless or rooted in religions (pages 31 to 96 of the package) were also described.

The sixth session: In this session, inefficient metacognitive strategies such as anxiety, death due to war and violence, and sense guilt were described and taught under the titles of phenomenon of anxiety about death due to war and violence, and events and symptoms that reduce death anxiety, thoughts and mental schemas of fighters, mechanism of sense of guilt, mechanisms of thinking about death, wanting death, fighting death, and so forth. Moreover, the impact of death anxiety mechanism on war fighters and victims of accidents was discussed. At the end of the session, after completion of the workshop, the participants had the opportunity to express their individual feelings freely, and then, the mental health posttest was performed in both groups.

It is worth mentioning that the above

workshops were held and taught by Dr. Saeed Bani Fatemi and Dr. Haghighi, and the above tests were carried out by Elaheh Angazi. The workshops, as mentioned in the attached letter, were held from 2011.12.23 to 2012.02.23.

The only data collection tool used was the Goldberg General Health Questionnaire (GHQ-28). The items of the GHQ-28 are scored on a 4-point scale ranging from 0 to 3 (options A to D, respectively). Therefore, the score of each person in each subscale will range from 0 to 21, and the total score of the questionnaire will range from 0 to 84.

The scores of each participant in each scale are calculated separately, and then, the total score is obtained as the sum of the scores of the 4 subscales. In this questionnaire, a low score indicates better mental health. Based on the obtained score and using the table below, the status of the person in each subscale and in the whole questionnaire can be determined. According to this table, it can be said that a score of 17 and higher in each subscale and a score of 41 and higher in the total scale indicate very poor mental health. The results of several studies indicate that there is a strong correlation between the results obtained from GHQ-28 and the 60 articles of general health in the diagnosis of psychological disorders (Medina, Mora et al., 1983, quoted from Hamidi, 2003), and the GHQ-28 has adequate ability to assess severity of psychological disorders (Robbins and Brakes, 1981, quoted from Hamidi, 2003).

Evidences related to GHQ validity

A. Out of the country: Goldberg (1970) reported the correlation between GHQ scores and the result of clinical evaluation of the disorders to be +0.80. In addition, in another study, Goldberg, Rickels, Downing, and Hesbacher (1976) reported the correlation between GHQ scores and SCL-90 to be +0.78. Jones et al. (1978) reported the correlation between GHQ scores and PSE-90 to be 76%. Chan and Chan (1983), and Cheung and Spears (1994) reported the internal coordination coefficient of GHQ-30 and GHQ-28 questionnaires to be 0.85 and 0.85, respectively (quoted from Houman, 1992).

B. Inside the country: In Iran, several studies have been conducted on various statistical populations such as university students, and students and employees.

Hamidi (2003), Palahang (1995), Yaghobi (2008), Tabatabai and Rasouli (2016) have reported the validity of the Persian version of the GHQ-28 to be equal to 84%, 88%, 62%, 61%, 73%, 96%, respectively.

Results

The first hypothesis: Metacognition learning leads to a reduction in veterans' physical symptoms.

As can be seen in table 1, the mean differences in physical symptoms in the test group are greater than the control group.

Table 1. Descriptive statistics of the difference between pretest and posttest in terms of physical symptoms

Descriptive statistics of groups				
	Group	N	Mean ± SD	Mean standard error
Physical symptoms	Test	100	9.85 ± 2.92	0.291
	Control	100	0.70 ± 3.18	0.317

According to the results presented in table 2, significance level of sig1 = 0.339 is greater than 0.05, which proves the equality of variances.

Table 2. Independent t-test of differences between groups in physical symptoms

Independent t-test								
		Levene's test for equality of variances		Independent t-test for mean equality				
		F	P1	t	Degree of freedom	P2	95% confidence interval	
							Lower bound	Upper bound
Physical symptoms	Assumption of equality of variances	0.733	0.393	21.2	198	< 0.001	8.29	10.00
	Assumption of inequality of variances			21.2	196.5	< 0.001	8.29	10.00

Table 3. Descriptive statistics of the difference between pretest and posttest in terms of anxiety and sleep disorder

Descriptive statistics of groups				
	Group	N	Mean ± SD	Mean standard error
Difference between scores of anxiety and sleep disorder	Test	100	8.75 ± 3.118	0.311
	Control	100	0.54 ± 4.391	0.439

In t-test, the significance level is sig2 < 0.001 and less than 0.05; thus, there is a significant difference between the experimental and control groups in terms of physical symptoms in the pretest and posttest.

The second hypothesis: Metacognition learning leads to the reduction of anxiety and sleep disorder in veterans.

As can be seen in the table 3, the mean differences in anxiety and sleep disorder in the test group is greater than in the control group.

According to the results presented in table 4, the significance level of sig1 < 0.001 is less than 0.05, so the equality of variances is rejected. Therefore, assuming inequality of variances in t-test, the significance level of sig2 < 0.001 is less than 0.05. Therefore, there is a significant difference between the experimental and control groups in terms of anxiety and sleep disorder in the pretest and posttest.

The third hypothesis: Metacognition learning leads to the reduction of disorders in social function of veterans.

As can be seen in table 5, the mean differences in social function in the experimental group were greater than in the control group.

According to the results presented in table 6, the significance level of P1 = 0.440 is greater than 0.05, which proves the equality of variances. Moreover, in t-test, the significance level of P2 < 0.001 is less than 0.05. Therefore, there is a significant difference between the experimental and control groups in terms of social function disorder in the pretest and posttest.

The fourth hypothesis: Metacognition learning leads to the reduction in severe depression of veterans.

As can be seen in table 7, the mean differences in anxiety in the experimental group were greater than in the control group.

According to the results presented in table 8, the significance level of sig1 = 0.002 is less than 0.05, so the equality of variances is rejected. Assuming inequality of variances, we can see in the t-test that the significance level of sig2 < 0.001 is less than 0.05. Therefore, there is a significant difference between the experimental and control groups in terms of depression in the pretest and posttest.

The fifth hypothesis: Metacognition learning leads to increased mental health in veterans.

As can be seen in table 9, the mean differences in mental health in the experimental group is greater than in the control group.

According to the results presented in table 10, the significance level of sig1 = 0.027 is less than 0.05, so the equality of variances is rejected. Assuming inequality of variances, we can see that in the t-test, the significance level of sig2 < 0.001 is less than 0.05. Therefore, there is a significant difference between the experimental and control groups in terms of mental health in the pretest and posttest.

Discussion

Empirical and theoretical results of the research

Hypothesis 1: Metacognition learning leads to a reduction in veterans' physical symptoms.

Table 4. Independent t-test of differences between groups in terms of anxiety and sleep disorder

Independent t-test								
		Levene's test for equality of variances		Independent t-test for mean equality				
		F	P1	t	Degree of freedom	P2	95% confidence interval	
							Lower bound	Upper bound
Anxiety and sleep disorder	Assumption of equality of variances	13.651	< 0.001	15.2	198	< 0.001	7.14793	9.272
	Assumption of inequality of variances			15.2	178.6	< 0.001	7.147	9.272

Table 5. Descriptive statistics of the difference between pretest and posttest in terms of social function

Descriptive statistics of groups				
	Group	N	Mean ± SD	Mean standard error
Difference between scores of social function	Test	100	8.81 ± 2.983	0.298
	Control	100	0.62 ± 3.087	0.308

The results showed that metacognition learning leads to a reduction in veterans' physical symptoms. Previous studies have not precisely worked on this issue; however, Aversa et al. have examined the combined effect of PTSD, depression, and smoking on physical symptoms as three determining variables.

They indicated that overlapping of some of the symptoms of PTSD and depression may cause an increase in the incidence rate of physical diseases simultaneously. They suggested that both PTSD and depression are independently related to physical pain (Aversa et al., 2012). In general, the differential effect of depression has been less considered in comparison to the physical health of war veterans; a better understanding of this variable can increase our understanding of the relationship between mental and physical health (Rauch, Favorite, Giardino, Porcari, Defever, & Liberzon, 2010).

Hypothesis 2: Metacognition learning leads to the reduction of anxiety and sleep disorder in veterans.

The results showed that learning metacognition reduces anxiety and sleep disorder in individuals. These results are consistent with previous results that have examined the effect of metacognitive therapy on veterans with PTSD (Bakhtavar, Neshatdoust, Moulavi, & Bahrami, 2007). It is also consistent with the results of studies that have examined the role of metacognition in obsessive-compulsive disorder (OCD) and pervasive anxiety, and have found a significant relationship between metacognition and reduction of anxiety and OCD symptoms (Irak & Tosun, 2008).

Hypothesis 3: Metacognition learning leads to the reduction of social function disorder in veterans.

The results showed that metacognition learning improves the social performance of veterans. A previous study that has examined metacognition and performance in schizophrenic individuals found that metacognition improves social performance (Lysaker et al., 2011). Despite the difference in the studied individuals, the results are consistent with this hypothesis (Lysaker et al., 2011).

Hypothesis 4: Metacognition learning leads to the reduction in severe depression of veterans.

Table 6. Independent t-test of differences between groups in social function

Independent t-test								
		Levene's test for equality of variances		Independent t-test for mean equality				
		F	P1	t	Degree of freedom	P2	95% confidence interval	
							Lower bound	Upper bound
Difference of scores in social function	Assumption of equality of variances	0.440	0.508	21.9	198	< 0.001	8.58	10.27
	Assumption of inequality of variances			21.9	197.7	< 0.001	8.58	10.27

Table 7. Descriptive statistics of the difference between pretest and posttest in terms of depression

Descriptive statistics of groups				
	Group	N	Mean ± SD	Mean standard error
Difference between scores of depression	Test	100	11.78 ± 3.29	0.328
	Control	100	0.68 ± 4.42	0.442

Table 8. Independent t-test of differences between groups in terms of depression and tendency toward suicide

Independent t-test								
		Levene's test for equality of variances		Independent t-test for mean equality				
		F	P1	t	Degree of freedom	P2	95% confidence interval	
							Lower bound	Upper bound
Difference between scores of depression and tendency toward suicide	Assumption of equality of variances	10.155	0.002	20.1	198	< 0.001	10.013	12.186
	Assumption of inequality of variances			20.1	182.7	< 0.001	10.12	12.187

The results showed that learning metacognition and its strategies reduces depression and tendency toward suicide in veterans. These results are consistent with that of a previous study that examined the role of metacognition in anxiety and depression and their negative impact on life and smoking in 202 people and found that metacognition has a positive effect on reduction of the mentioned symptoms (Jens Sewell, 2010).

Hypothesis 5: Metacognition learning leads to increased mental health in veterans.

The results showed that metacognition learning and its components increase the mental health of veterans. There is currently no research in this area. However, as the relationship between metacognition and all mental health subscales was significant according to global researches, it can be concluded that metacognition improves mental health.

Conclusion

In all findings of this study, the important conclusion was that metacognition learning leads to an increase in the level of general health of the participants; that is, it can be said that factors affecting the increased level of general health in veterans have been learning cognitive trust, positive beliefs about worries, cognitive self-awareness, and controlling of negative beliefs and beliefs about the need to control thoughts.

Given that such trainings have not been provided so far, and general health affairs of veterans have been less considered, the related authorities should note that attention to training is a vital and continuous issue. Furthermore, these results obtained in different studies can show the need for more attention to teaching metacognition and increasing the level of general health in veterans.

Conflict of Interests

Authors have no conflict of interests.

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Table 9. Descriptive statistics of the difference between pretest and posttest in terms of the mental health scale

Descriptive statistics of groups				
	Group	N	Mean ± SD	Mean standard error
Difference between scores of mental health	Test	100	39.19 ± 8.67	0.866
	Control	100	1.30 ± 10.87	1.087

Table 10. Independent t-test of differences between groups in terms of mental health

Independent t-test								
		Levene's test for equality of variances		Independent t-test for mean equality				
		F	P1	t	Degree of freedom	P2	95% confidence interval	
							Lower bound	Upper bound
Difference between scores of mental health	Assumption of equality of variances	4.971	0.027	27.2	198	< 0.001	35.147	40.63
	Assumption of inequality of variances			27.2	188.6	< 0.001	35.146	40.63

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References

Aversa, L. H., Stoddard, J. A., Doran, N. M., Au, S., Chow, B., McFall, M. et al. (2012). PTSD and depression as predictors of physical health-related quality of life in tobacco-dependent veterans. *J Psychosom.Res*, *73*(3), 185-190. doi:S0022-3999(12)00178-X [pii];10.1016/j.jpsychores.2012.06.010 [doi]. Retrieved from PM:22850258

Bakhtavar, E., Neshatdoust, H. T., Moulavi, H., & Bahrami, F. (2007). Efficacy of meta cognitive behavioral therapy in reducing self punishment in patients with post traumatic stress disorder. *J Res Behav Sci*, *5*(2), 93-98.

Chan, D. W., & Chan, T. S. (1983). Reliability, validity and the structure of the General Health Questionnaire in a Chinese context. *Psychol Med*, *13*(2), 363-371. Retrieved from PM:6878523

Cheung, P., & Spears, G. (1994). Reliability and validity of the Cambodian version of the 28-item General Health Questionnaire. *Soc Psychiatry.Psychiatr.Epidemiol.*, *29*(2), 95-99. Retrieved from PM:8009326

Delavar, A. (2009). *Educational and psychological research* (27th ed.). Thehran, Iran: Virayesh Publicatins.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp. 231-235). Hillsdale, NJ: Earlbaum.

Goldberg. (1970). 28 -item short form questionnaire, GHQ mental health survey.

Goldberg, D. P., Rickels, K., Downing, R., & Hesbacher, P. (1976). A comparison of two psychiatric screening tests. *Br.J Psychiatry.*, *129*, 61-67. doi:S0007125000093430 [pii];10.1192/bjp.129.1.61 [doi]. Retrieved from PM:938806

Hooman, A. (2019). *Standardization and normalization of general health questionnaire for undergraduate students of Tarbiat Moallem University*. Tehran, Iran: Educational Institution, Kharazmi University.

Irak, M., & Tosun, A. (2008). Exploring the role of metacognition in obsessive--compulsive and anxiety symptoms. *J Anxiety Disord.*, *22*(8), 1316-1325. doi:S0887-6185(08)00045-5 [pii];10.1016/j.janxdis.2008.01.012 [doi]. Retrieved from PM:18339516

Kaplan, H. I., & Sadock, B. (2003). *Synopsis of psychiatry: behavioral sciences, clinical psychiatry. Trans. Rafie, H., Rezaei F*. Arjmand Publications: Tehran, Iran.

Larkin, S. (2010). *Metacognition in young children*. London, UK: Routledge.

Lysaker, P. H., McCormick, B. P., Snethen, G., Buck, K. D., Hamm, J. A., Grant, M. et al. (2011). Metacognition and social function in schizophrenia: associations of mastery with functional skills competence. *Schizophr.Res*, *131*(1-3), 214-218. doi:S0920-9964(11)00316-1 [pii];10.1016/j.schres.2011.06.011 [doi]. Retrieved from PM:21745724

Milani, B. (1999). *Mental Health*. Theran, Iran: Ghoomes Publications.

Ormel, J., Koeter, M. W., van den Brink, W., & Giel, R. (1989). Concurrent validity of GHQ-28 and PSE as measures of change. *Psychol Med*, *19*(4), 1007-1013. Retrieved from PM:2594877

Palahang, H. (1995). *Epidemiology of mental disorders in Kashan townships [MSc Thesis]*. Tehran, Iran: Iran University of Medical Sciences.

Rauch, S. A. M., Favorite, T., Giardino, N., Porcari, C., Defever, E., & Liberzon, I. (2010). Relationship between anxiety, depression, and health satisfaction among veterans with PTSD. *Journal of Affective Disorders*, *121*(1), 165-168. Retrieved from http://www.sciencedirect.com/science/article/pii/S0165032709002341

Taghavi, S. M. R. (2002). Validity and reliability of the General Health Questionnaire (GHQ-28) in college students of Shiraz University. *Journal of Psychology*, *5*(4), 381-398.

Yaghobi, H. (2008). Screening of mental disorders:

The Place of examinations and how to determine the cutting score and validation. *Mental Health, 1*(1), 39-51.

Yaghubi, N., Nasr, M., & Shahmohammadi, D. (1995). Epidemiology of mental disorders in Urabn and rural areas of sowmaesara-Gillan. *Iran J Psychiatry Clin Psychol, 1*(4), 55-60.

Yaris, S. (2010). *The mediating role of metacognition on the relationship among depression/anxiety/ negative impact of life experiences and smoking dependence [MSc Thesis]*. Ankara, Turkey: Middle East Technical University

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Portrait of an Organ: A Cultural Analysis of Medical Images and Treatments of the Uterus

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Theoretical Study

Abstract

Medical imaging of the uterus has a long, rich, and important history; yet, how the cultural past bears on current-day medical thinking and procedures is rarely considered. This paper examines the influential early modern idea of the autonomous womb, its resonance within modern medicine, and its traces in medical imaging and procedures. We argue that descriptions of the autonomous womb, as an isolatable, independent, and active body part, were ingrained into modern reproductive science during its formative period in the eighteenth and early nineteenth centuries, and have continued to resonate in modern medical imaging and practices. To demonstrate this phenomenon, we combined methodologies from cultural studies and visual studies to determine how the uterus is viewed and treated in medical science. Ultimately, this historical analysis contextualizes present-day uterine imaging and its associated medical practices such as hysterectomies, surrogacy, uterine transplantations, and extracorporeal gestation.

Keywords: Cultural history, Medical imaging, Modern medicine, Pregnancy, Reproductive medicine

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Introduction

Making images is never a purely objective undertaking. Yet, contemporary medical images are often regarded as objective depictions—removed from observational subjectivities by the distancing of quantification and technological instrumentation—and therefore beyond the considerations of visual and cultural analysis. Like any other image, medical images evoke a range of responses, convey layers of meanings, and are subjectable to interpretation and criticism as visual representations [For the widening of subject matter within visual studies, see Mitchell (2004)]. It is apparent that medical imaging participates in wider visual, scientific, and professional cultures that have continuities and traditions related to past socio-cultural concerns about the body and health. Indeed, to claim otherwise is to be ignorant of the

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social and cultural history of medical images. Cultures, particularly medical cultures, ascribed many different qualities to specific body parts. To demonstrate how antiquated medical ideas can be resonant within modern-day medicine, this article examines the images, meanings, and interventions associated with a single organ—the uterus.

Through the long history of gynecological and obstetrical traditions that extend back to antiquity, the uterus has been known by visual representation. However, this organ, like many body parts, is not a historically stable subject. For instance, between the early modern period and the present day, uteruses have undergone many quantifiable changes; the average age for the onset of menarche and menopause, rates of fecundity and birth, and the prevalence of uterine disorders and diseases. Early modern surgical and midwifery texts describe many uterine disorders and illnesses, including those related to cancer, menstruation, implantation, gestation, and labor, which clinicians now describe differently [Texts consulted include Gibson (1682), Bartholin and Chadwyck (1668), Pechey (1696), Chamberlayne (1698), Barret (1699), Mauriceau (1710), Dionis (1719), Mowbray (1724), Sharp (1725), Bracken (1737), Turner, Rivington, and Clarke (1742), van Deventer (1746), Pugh (1754), Astruc (1762), Memis (1765), and Smellie (1768). By way of example, seventeenth- and eighteenth-century authors typically described menarche as occurring at 15 or 16 years of age. Recent US national statistics given by the Centers for Disease Control and Prevention gives an average age for menarche of 12.5 years. For more on comparisons of menarche ages see Lehmann, Scheffler, and Hermanussen (2010) and Kronenberg, Williams, Melmed, Polonsky, and Larsen (2008)]. The kinds of medical interventions associated with uterine conditions have changed dramatically with such developments as anesthesia, sanitation, radiography, hormone therapy, antibiotics, minimally invasive surgery, assistive reproduction technologies, and oral and intrauterine contraceptives. Ways of knowing about the uterus have also changed. However, the epistemological traditions of medicine reiterate and retain many of the uterine qualities known and taught by past medical authorities. Imaging has not only been central to changing perceptions of the uterus, but it has also encoded certain long-held notions and characteristics.

In early modern gynecological and obstetric medicine, the womb was often conceived of as an autonomous body part with special psychosomatic properties; in other words, the womb was thought to be self-willed and self-moving. By the nineteenth century, that theory had been discredited and was no longer explicitly taught in formal medical education. Yet, sentiments from the long-held and once-fundamental theory of an autonomous womb continued to linger in medical thinking and practice. The perspective that the uterus is an essentially active and problematic, but readily isolated and extractable organ persists in medical approaches and is an especially resilient, albeit little discussed, feature of modern uterine imaging. Recognizing the historical precedents of current medical imaging of the uterus is crucial to better understanding the possible subjectivities in current and future medical approaches pertaining to that body part, and especially such interventions as hysterectomies, surrogacy, uterine transplantations, and extracorporeal gestation.

Methods

Our analysis was conducted according to standard research practices in cultural history and visual studies. We undertook critical readings of a broad range of medical literature related to women's reproductive bodies and health, including obstetrical manuals, anatomical atlases, medical journals, and various kinds of cultural and social responses. The examination of literature and images revealed the trend in

medical understandings and visual depictions of the uterus from the mid-seventeenth century to the present day [This methodology is closely associated with that of Gilman (2018)]. Our transhistorical analysis of medical images is part of the "visual turn" now pursued and promoted within medical humanities scholarship (Johnstone, 2018).

Not wandering but autonomous: At the beginning of the professionalization of obstetrics and gynecology, a significant shift in the perception of the uterus occurred. The notion that the womb possesses its own volition and the capacity to move itself within the female body had long been a medical doctrine, dating at least as far back as the Hippocratic era. Scholars debated the existence of the so-called "wandering womb" until the eighteenth century. Even after that notion was put to rest, medical authors continued to use ideas about womb autonomy to explain problems in women's bodies and various phenomena of generation, menstruation, passions, gestation, birth, and many diseases and disorders. Prior to the establishment of endocrinology in the mid-nineteenth century, and then, the discovery of hormones in the early twentieth century, several theories circulated about how the uterus affected the body and mind. For example, the womb could produce noxious vapors, press itself against the diaphragm, disrupt neural pathways, and release taints into the blood—any of which could impair a women's health and psyche [Conversely, a women's mind could influence the womb and, when gravid, the fetus (see Stafford, 1993)].

However, the womb was not merely a disorderly organ: it was seen as an independent creature. This idea was hotly debated in learned medical circles until the early eighteenth century. The widely esteemed Dutch professor of medicine and anatomy at Utrecht University, Isbrand van Diemerbroeck (1609-1674) was one such authority to voice his opinion on the matter. It was, as van Diemerbroeck averred, too frequently believed that the womb "is mov'd of it self by its own proper Power" (1694, p.174). Even after a woman's death, some believed that the womb could remain alive. More than residual nervous twitches in an otherwise lifeless body, the womb was thought to be "a Creature of it self, not living a Life common to the rest of the Body" (van Diemerbroeck, 1694, p.174). This perception of the womb as an autonomous creature related closely to a more general conception of women's health, including pathologies like hysteria and *furor uterinus*, physiological explanations of sexual promiscuity, and theories about maternal-fetal interactions [For the history of these pathologies, see King (2004), Gilman, King, Porter, Rousseau and Showalter (1993), and Huet (1993)].

Anatomical studies flourished in Western Europe from the sixteenth to the nineteenth century. This science developed in step with innovations in graphic techniques and technologies, such as etching and mezzotint in printmaking or vascular injections and corrosion casting for anatomical preparations. The uterus—a medically important, but seemingly enigmatic internal organ—had a special appeal as an anatomical subject. In the late seventeenth and eighteenth centuries, the number of accoucheurs and man-midwives rapidly grew, as did the array of newly invented obstetrical tools and techniques [For man-midwifery, see Wilson (1995).]. These early stages of the medicalization of pregnancy and birth ushered in many new forms of visual representation of the uterus. Printed images of the uterus, like figure 1 from an English translation of van Diemerbroeck's *Anatome corporis humani*, communicate both anatomical and physiological ideas, including references to the autonomous womb theory.

However, in mid-eighteenth-century London, which was then a leading center of science and medicine, the notion that the uterus was self-willed and independent

acting came under sharp criticism by Royal Society members and by Grub Street satirists alike [See Todd (1995) and Buckley (2017)]. Pathologies and phenomena previously caused by an unwieldy and willful uterus were increasingly explained in terms of nerves, psychology, and eventually hormones.

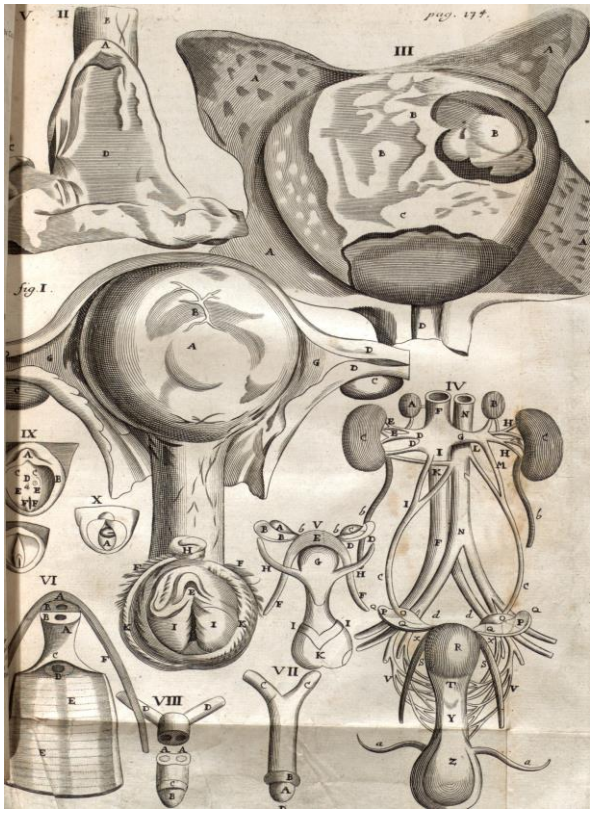

Figure 1. Various conformations of the womb in different stages of pregnancy by van Diemerbroeck (1694) [For example, fig.I is a gravid womb and fig.VII shows a non-gravid womb (courtesy of the Thomas Fisher Rare Book Library, University of Toronto).]

Yet, the autonomous womb idea left an indelible mark on the formative period of modern perceptions of the uterus and an enduring impression on medical education, visual technologies, and epistemological practices. William Hunter's *Anatomia uteri humani gravidi tabulis illustrata* [*The Anatomy of the Human Gravid Uterus Exhibited in Figures*] (1774) exemplifies the transition to a more recognizably modern anatomical illustration. The images in his atlas have a determined accuracy and bold stylistic realism (Jordanova, 1989, 45-49). Many figurative elements common in earlier anatomical texts are stripped away. Yet certain aesthetic features, such as the inclusion of dissection tools and the statuesque poses of dismembered cadavers, are consistent with that era of anatomical images. The book's images focus on the uterus as the sole context—both visually and developmentally—for the embryo or fetus (Figure 2). Moving through the many arresting plates in Hunter's atlas, the uterus becomes an isolated body part with its own special qualities, in ways that no other body part has in anatomical illustration. Hunter's portrait-like engravings remained the foremost images of the uterus for many successive generations of medical practitioners. Although the wandering womb had then been discredited, a sense of autonomy and independence was fixed to the uterus by subsequent images such as these.

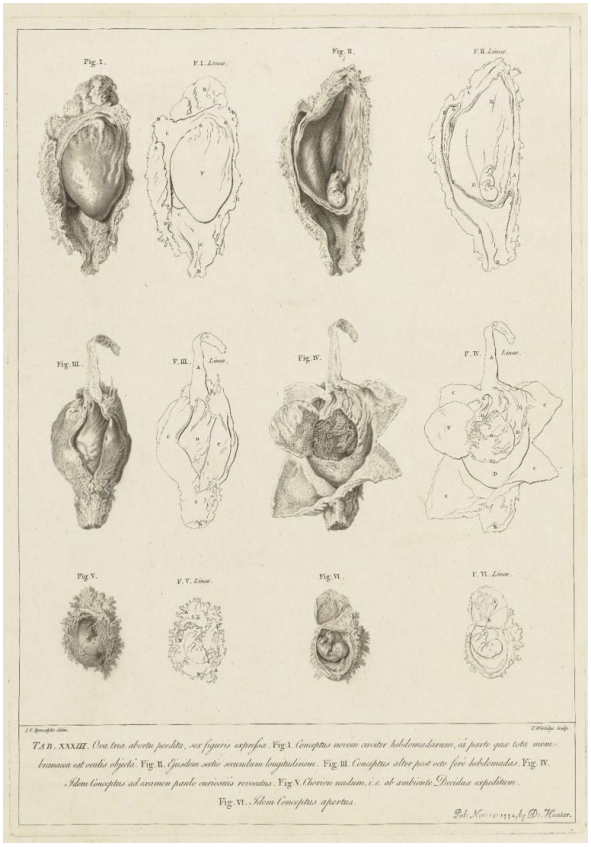

Figure 2. Six prosections of three fetuses demonstrating their position in the uterus and the

various layers of surrounding tissue (Hunter, 1774; Credit: Wellcome Collection. CC BY.)

Modern imaging: The earlier preoccupation with visualizing the uterus continued with twentieth-century imaging technologies such as radiography, ultrasonography, computer enhancements, magnetic resonance imaging, hysterosalpingogram, and endoscopy (Nicolson & Fleming, 2013, p.1). It is perhaps unsurprising, with consideration of the early modern history of uterine images, that "the uterus was one of the first organs to be examined by ultrasonography when ultrasound was introduced into clinical practice" (Mulic-Lutvica, Bekuretsion, Bakos, & Axelsson, 2001, p.491). Whereas early modern practitioners necessarily relied on touch as a primary means for determining the status of the fetus and womb [For prenatal diagnostic touch, see Pugh (1754)], and nineteenth-century practitioners added the stethoscope (Pinard horn or "fetoscope") to their repertoire, ultrasonography has now become "the preferred imaging modality in the study of the female pelvis" (Derchi, Serafini, Gandolfo, Gandolfo, & Martinoli, 2001, p.2137). Earlier generations of anatomists had only the appearance of morbid uteruses vivified in illustrations; today, *in vivo* uterine imaging allows practitioners to view the uterus in real time. Yet, even with all the diagnostic and therapeutic advances brought about with these relatively recent technological innovations, perceptions of the uterus as active, isolatable, and pathological remain quietly embedded in modern uterine imaging.

A common sociological argument is that modern uterine imaging expresses androcentric tendencies or a "male gaze" inherent in professional medicine (see Hinze, 1999; Hoff, 1998; Silver, 2007, p.418). The female individual, as this criticism emphasizes, is routinely cropped out of uterine images and thereby marginalized. There are, of course, also technical limits and physical parameters at play. Modern visual technologies necessarily apply a discrete visual field with precise borders around the uterus and its cavity. Fetal imaging typically includes the uterus, albeit as the context rather than the focal subject. Ultrasonographic scans have become routine since their clinical inception in the 1950s; having at least one ultrasonographic examination during pregnancy is now a normal obstetrical experience. Anthropologists Faye Ginsburg and Rayna Rapp (1999, p.279) suggest that through "widespread public deployment of sonogram imaging, fetal representations have become increasingly visible". For example, the three-dimensional ultrasonogram in figure 3 is intended to demonstrate the status of the fetal subject. Yet, the uterus appears as the frame for the fetal image, thereby establishing the uterus, and not the whole woman, as the definitive environment for the conceptus. The inclusion of only the uterus in the fetal image is partly a technical constraint, but also a diagnostic convention used for observing features like the placenta, which functions as an essential nutritive and communicative conduit between fetus and mother. However, cultural expectations also underpin the inclusion of the uterus when imaging and viewing the unborn.

Imaging has created a widely recognizable fetal identity. The opportunity to treat the fetus as a patient, especially through surgical intervention, has also relied on imaging technologies. This visual power is now central to numerous political discussions in issues ranging from abortion, to parenthood, to embryonic stem cells (Casper, 1999, p.106). In fetal images, inclusion of the uterine wall often conveys a cradle-like aesthetic, which, in turn, adds an infant-like quality to the fetus. This is especially apparent in figure 3. Images such as three-dimensional reconstructions of fetal facial expressions allow parents, clinicians, and the public to see a fetal individual with accentuated personal attributes through a distinctive portraiture style (Hartouni, 1997, p.26-51). There is a long history to this kind of fetal

portraiture. Early modern images like figure 4 similarly animate the fetus as if a fully developed child (see Pranghofer, 2015, 167-194). In her study of early modern medical images of fetuses, art historian Lianne McTavish (2005, p.172-173) suggests that they "seem familiar to contemporary eyes because representations of fetuses detached from the maternal body proliferate in Western culture". Indeed, one need only recall Lennart Nilsson's iconic 1965 photo essay "Drama of Life before Birth" to see how this kind of image persisted (see Jülich, 2017). Throughout the visual history of the fetus, the uterus is regularly featured as the backdrop for the fetal individual. Physiologically speaking, the uterus and placenta are the intermediary between the fetus and mother. However, rather than an intermediary, the uterus in fetal images often appears as a boundary. The uterus is the definitive context or frame for the fetus in these images, and therefore, stands in for the woman's body, as if that one organ was independently responsible for gestation. As these criticisms highlight, the uterus has assumed a highly symbolic role within fetal imaging.

Figure 3. A three-dimensional ultrasonographic image of a nine-week gestational age fetus (© R. A. Pierson)

Uterine activity: The idea that the uterus is quintessentially active endures in reproductive medicine. Far from a wanton creature wandering within the female body, present-day discussions of uterine activity include electro-physiological properties, cellular structure, and neural or hormonal messengers effecting uterine musculature as well as glandular and vascular changes in mucosal tissue.

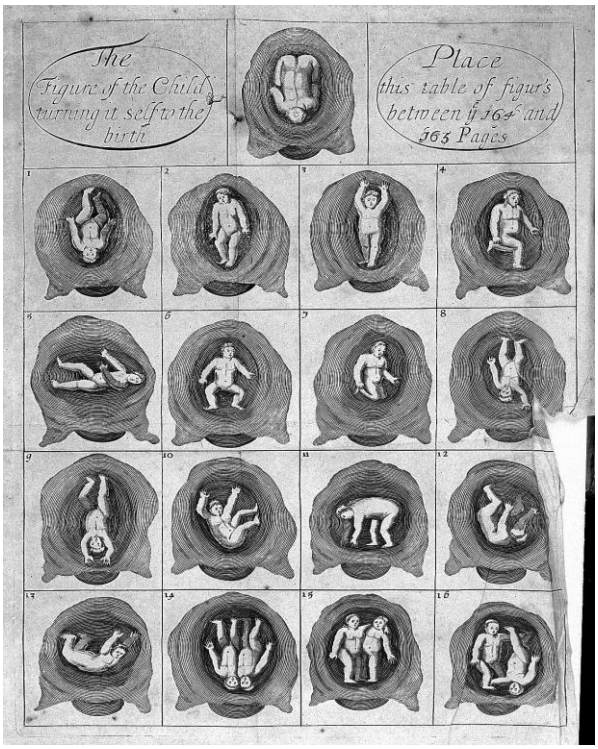

Figure 4. Various fetal positions demonstrated in a late-seventeenth-century surgical treatise (Cooke, 1685; Credit: Wellcome Collection. CC BY.)

Pathologies that result from inappropriate or abnormal uterine activity include dysmenorrhea, endometriosis, polyps, fibroids, and fecundity disorders. For instance, studies have tried to determine the normalcy of uterine activity by using topographic measurements to differentiate between what is "normal from the physiological point of view" and the "medical diagnostics point of view" (Oczeretko, Kitlas, Borowska, Swiatecka, & Laudanski, 2007, p.50). Visual imaging is essential for hypothesis testing, and measuring and documenting such uterine activity. Other studies have measured uterine activity during genital stimulation and orgasm using real-time ultrasonography, thereby showing the uterus' involvement in sexual pleasure (Figure 5). Technologies like

hysterosalpingography, hysterosalpingo-contrast ultrasonography and laparoscopy can be used to show the role of uterine movements in the transport of spermatozoa from the cervix towards the fallopian tubes (Zervomanolakis et al., 2007, p.1-20). Magnetic resonance imaging has also been crucial to investigating the poorly understood peristaltic motions of the uterus (Kido et al., 2007, p.1813-1819; see figure 6). Common to these studies is the idea of a scientific observer capturing the cryptic uterus in the act or, rather, in action.

There is continuing research into the singular activity of the uterus. For instance, researchers examining the mechanisms of labor initiation and uterine activity are still elucidating the importance of prostaglandins (Fuchs, Fuchs, Husslein, Soloff, & Fernstrom, 1982; Jenkin & Young, 2004; Vidaeff & Ramin, 2008; Sugimoto, Inazumi, & Tsuchiya, 2015). This group of lipid hormones causes varied physiological responses, particularly vasodilation and vasoconstriction, and has a significant role in uterine contractions, cervical ripening, and ultimately, parturition. Ambiguity still surrounds the dynamics of spontaneous uterine activity as normal or abnormal, and the influence that the mother's mind has on conception, nidation, maternal recognition of pregnancy, gestation, and labor. Notions of an inherently active uterus are still at the fore of medical and scientific study and continue to rely greatly on visual imaging. Indeed, these research programs examining uterine activity can trace their roots back to enlightenment anatomists investigating the movements of the wandering womb.

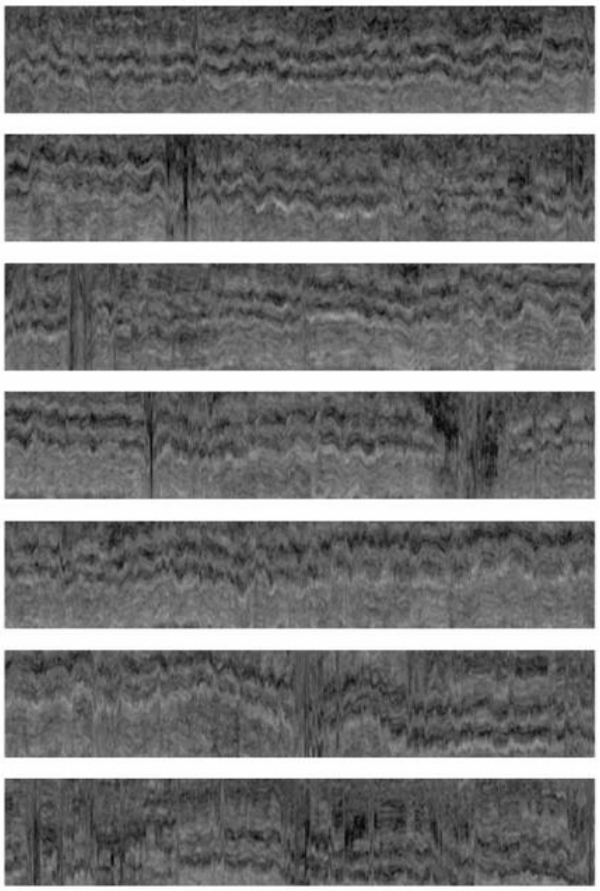

Figure 5. Concatenated time series data lines from continuous real-time ultrasonographic images of contractile activity in the lining of the uterus during sexual arousal and orgasm (© R. A. Pierson)

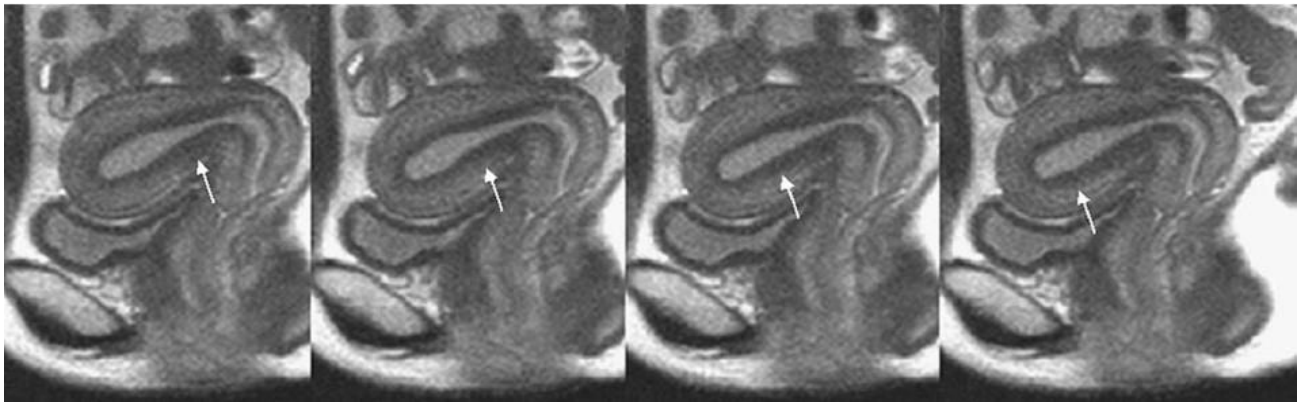

Figure 6. Four serial Half-Fourier Acquisition Single-Shot Turbo Spin-Echo (HASTE) magnetic resonance images of the midsagittal uterine plane of a healthy individual during the periovulatory phase [The arrow indicates a peristaltic contraction moving from the cervix to the fundus (Kido et al., 2007).]

Isolation and extraction: hysterectomies, surrogacy, uterine transplants, and ectogenesis: Medical techniques of hysterectomy, gestational surrogacy, uterine transplantation, and imaging conceptually and procedurally disunite the uterus from the body, consequently perpetuating a sense of the uterus as readily isolatable and extractable. Now one of the most common surgical procedures, hysterectomies are a typical treatment for ailments like cancers, dysfunctional uterine bleeding in peri- or postmenopausal women, and as a prophylactic measure to obviate those diseases, especially once reproductive function is deemed no longer pertinent. Uterine imaging plays an essential role in these extractions. For example, ultrasonograms are used to assess the risk of uterine cancers. Medical diagnostic images isolate the uterus as the visual and pathological subject; following assessment, subsequent therapeutic measures frequently involve total extraction (Nezhat, Nezhat, Gordon, & Wilkins, 1992, p.39).

Such procedures reflect a perception of the uterus as disorderly, but excisable. However, that perception and the associated medical procedures come at a cost. Women who have had their uterus removed can experience an altered gender identity. Many women have concerns similar in sentiment to one patient who felt that she "wouldn't feel like a whole woman without her uterus" (Dwyer, Cerfolio, Murray, & Rosenthal, 1996, p.29). As this woman's comment suggests, the uterus can be a powerful and dear symbol of gender, womanhood, and sexuality. In recent years, attention to the non-pathogenic significance of the uterus, such as its social and personal value, has informed the public, and thus, reduced the trend toward invasive treatment options and caused a marked decrease in rates of hysterectomies performed in the US (Wright et al., 2013). Non-vital and problematic, but dearly valued, the uterus' reproductive and social role is at odds with its worrisome potential for disease.

Transplanting a functional uterus or creating an artificial uterus presses even further the conceptualization of the uterus as a moveable, replaceable, and self-contained reproductive organ. Therapeutic human uterus transplantations are reserved for cases of absolute uterine infertility (Pearson, 2007; Grynberg, Ayoubi, Bulletti, Frydman, & Fanchin, 2011). The first human uterine transplant was performed in Saudi Arabia in 2000, although the donor uterus had to be removed after 99 days due to a threatening blood clot (Fageeh, Raffa, Jabbad, & Marzouki, 2002, p.245-251). The first uterine transplantation with a subsequent successful livebirth was carried out in 2013 at Sahlgrenska University Hospital, Gothenburg, Sweden (Brannstrom et al., 2015). Uterine transplantations are also a hypothetical consideration for male recipients (Caplan, Perry, Lauren, Joseph, & Frances, 2007, p.19). However, uterine transplants might not be needed to realize a male pregnancy and birth [For male pregnancy and birth in the early modern period, see Velasco (2006)]. Individuals who have undergone female-to-male gender transitions may conceive, carry, and deliver. One highly publicized case is that of Thomas Beatie, who underwent partial gender reassignment surgery and hormone therapy to be identified as a man (see Landau, 2012; Shapiro, 2015, p.236-243). Using assisted reproductive technologies, Beatie was eventually able to successfully deliver three infants.

The practice of surrogacy—whether genetic, gestational, or both—further complicates the association between maternal identity and uterine function. Gestational surrogacy involves the transfer of an embryo into the carrier's uterus, whereas genetic surrogacy or genetic and gestational surrogacy involves a donation of an egg as well. The premise of commercial surrogacy is that the genetic parents are essentially renting the womb of the surrogate mother. Gestational surrogacy agreements assume

that parentship of the conceptus is entirely based on genetic contribution, consequently, discounting the developmental and relational role of gestation. The notion that the womb is an independent space or preserve within the carrier's body is a foundational precept of gestational surrogacy. Yet, surrogacy also affirms the necessity of the uterus.

Ectogenesis, literally "outside birth", dissolves the solely female proprietorship of gestation, makes redundant human uteruses, and advances the idea that the womb is a self-contained and disembodied reproductive unit (see Bulletti, Palagiano, Pace, Cerni, Borini, & de Ziegler, 2011). It has been suggested by bio-ethicist Stephen Coleman (2004, p.1) that such technology would be actualized "some time in the not too distant future". Even though several other established assisted reproductive technologies already make redundant the *natural* reproductive role of certain male and female sex organs, ectogenesis represents a profound challenge to the conventional meanings of reproduction and especially those ascribed to the uterus. With ectogenesis, the uterus is no longer requisite as an intermediary for intrapersonal nurturing and bonding with the fetus. More than simply removing the organ from the body, ectogenesis effectively transposes the gestational qualities *ex corpus*, replacing the uterus' primary biological function. Yet, in the meantime, the womb has accrued a greater ethical and moral significance. Nicholas Agar (2007) suggests that since new technologies can be used to replace several reproductive processes, including coitus, fertilization, and the very early or later stages of gestation, the uterus is now positioned as a uniquely irreplaceable biological component of reproduction—at least for the time being.

Ectogenesis will be perhaps the ultimate realization of the autonomous womb. Modern discussions of *ex vivo* conception and gestation engage with a long tradition of imagining the womb separate from the woman (see Haraway, 2000). These kinds of notions hark back to such mythical births as Bacchus, Erichthonius, and Orion. In the sixteenth century, the Swiss physician Paracelsus proposed an alchemist recipe for gestating babies (see Cobb, 2007, p.19). More than two centuries later, a treatise called *The Man-Plant: or, Scheme for Increasing and Improving the British Breed* (1752) published under a probable pseudonym made a mockery of the emergent science of reproduction and the physicians, man-midwives, and natural philosophers who busied themselves with such studies. The plot of the satire is the invention of an artificial womb and discovery of a technique for "the Extraction of the Egg, or Human-fœtus, in order to its Transplantation" into that womb (p.20) (This is one of the earliest uses of "transplantation" to mean a surgical procedure.). Although intended as a farcical affront to the medical profession, *The Man-Plant* connects ideas about autonomous wombs, assisted reproductive technology, ectogenesis, and gender in ways that are now gaining real-world relevance. Recently, another advance has been reported in developing an extracorporeal system for gestation "that closely reproduces the environment of the womb" (Partridge et al., 2017, p.1). The research team based at The Children's Hospital of Philadelphia Research Institute transferred fetal lambs into the extrauterine device and successfully gestated them for up to four weeks. The envisioned clinical device for extremely premature human fetuses would "be designed with many features that should allow the parent to be connected with the fetus including ultrasound, a darkfield camera allowing real-time visualization of the fetus within its darkened environment and the ability to play maternal heart and abdominal sounds to the fetus" (p.9). Even with artificial wombs, imaging will remain integral to knowing the fetus and experiencing reproduction.

Concluding remarks: Medical imaging has an ever-expanding array of available technologies capable of displaying more

about the uterus and its contents. However, such medical practices and images silently carry past ideas and meanings. The sense that the uterus is an inherently active, easily isolatable, and especially problematic body part was ingrained in scientific theories, surgical approaches, and visualization techniques at the beginning of modern professional medicine. Eighteenth-century practitioners and anatomists had scrutinized, debunked, and discarded the notion of the wandering womb. Yet, elements of the uterus' perceived autonomy remain resonant in medical thinking and procedures today. Several conflicting meanings are affixed to the uterus; it is a gender-specific, virtually irreplaceable, and disease-prone organ that has long been viewed as distinct and readily excisable from the female body. Such medical perceptions have long influenced diagnostics and therapeutics. These different meanings of the uterus are being continually challenged and changed. Only by looking back at the lineage of ideas, technologies, and practices can we accurately delineate current and future medical perspectives on reproductive processes and body parts, like the uterus.

Conflict of Interests

Authors have no conflict of interests.

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References

Agar, N. I. C. H. (2007). Embryonic potential and stem cells. *Bioethics*, *21*(4), 198-207.

Astruc, J. (1762). *A Treatise on the Diseases of Women. London, UK:* J. Nourse.

Barret, R. (1699). *A companion for midwives*. London, UK: Ax.

Bartholin, T., & Chadwyck, H. (1668). *Bartholinus Anatomy; Made from the Precepts of His Father, and from the Observations of All Modern Anatomists Together with His Own ... in Four Books and Four Manuals Answering to the Said Books ... Published by Nich. Culpeper and Abdiah Cole.* London, UK: John Streater.

Bracken, H. (1737). *The Midwife's Companion: Or, a Treatise of Midwifery*. London, UK: J. Clarke.

Brannstrom, M., Johannesson, L., Bokstrom, H., Kvarnstrom, N., Molne, J., Dahm-Kahler, P. et al. (2015). Livebirth after uterus transplantation. *Lancet.*, *385*(9968), 607-616. doi:S0140-6736(14)61728-1 [pii];10.1016/S0140-6736(14)61728-1 [doi]. Retrieved from PM:25301505

Buckley, J. (2017). *Gender, Pregnancy and Power in Eighteenth-Century Literature: The Maternal Imagination*. Basingstoke, UK: Palgrave Macmillan.

Bulletti, C., Palagiano, A., Pace, C., Cerni, A., Borini, A., & de Ziegler, D. (2011). The artificial womb. *Annals of the New York Academy of Sciences, 1221*(1), 124-128.

Caplan, A. L., Perry, C., Lauren, A. P., Joseph, S., & Frances, R. B. (2007). Moving the Womb. *The Hastings Center Report, 37*(3), 18-20.

Casper, M. J. (1999). Operation to the Rescue: Feminist Encounters with Fetal Surgery. In L.M. Morgan & M. W. Michaels (Eds.), *Fetal Subjects, Feminist Positions* (pp. 101-112). Philadelphia, PA: University of Pennsylvania Press.

Centers for Disease Control and Prevention. National Center for Health Statistics. National Survey of Family Growth. Accessed 28 September 2017. https://www.cdc.gov/nchs/nsfg/index.htm

Cobb, M. (2007). *The Egg and Sperm Race: The Seventeenth-Century Scientists Who Unravelled the Secrets of Sex, Life and Growth.* Toronto, Canada: Pocket Books.

Coleman, S. (2004). *The Ethics of Artificial Uteruses: Implications for Reproduction and Abortion*. Ashgate studies in applied ethics. Aldershot, UK: Ashgate Pub.

Cooke, J., & Hodgkin, T. (1685). *Mellificium chirurgiæ, or, The Marrow of chirurgery: an anatomical treatise : institutions of physick, with Hippocrates's Aphorisms largely commented upon : the marrow of physick, shewing the causes, signs and cures of most diseases incident to humane bodies : choice experienced receits for the cure of several distempers*. London, UK: T. Hodgkin.

Derchi, L. E., Serafini, G., Gandolfo, N., Gandolfo, N. G., & Martinoli, C. (2001). Ultrasound in gynecology. *European Radiology, 11*(11), 2137-2155.

van Deventer, H. (1746). *The Art of Midwifery Improv'd*. London, UK: Printed for W. Innys and C. Hitch.

Dionis, P. (1719). A general treatise of midwifery. London, UK.

Dwyer, J., Cerfolio, N., Murray, T. H., & Rosenthal, M. B. (1996). The value of a uterus.

Hastings Cent.Rep., *26*(2), 28-29. Retrieved from PM:8722523

Fageeh, W., Raffa, H., Jabbad, H., & Marzouki, A. (2002). Transplantation of the human uterus. *Int J Gynaecol.Obstet*, *76*(3), 245-251. doi:S0020729201005975 [pii]. Retrieved from PM:11880127

Fuchs, A. R., Fuchs, F., Husslein, P., Soloff, M. S., & Fernstrom, M. J. (1982). Oxytocin receptors and human parturition: a dual role for oxytocin in the initiation of labor. *Science*, *215*(4538), 1396-1398. doi:10.1126/science.6278592 [doi]. Retrieved from PM:6278592

Gibson, T. (1682). *The Anatomy of Humane Bodies Epitomized*. London, UK: by M.Flesher For T.Flesher.

Gilman, S. L., King, H., Porter, R., Rousseau G. S. & Showalter, E. (1993). Hysteria Beyond Freud. Berkeley, CA: University of California Press.

Gilman, S. L. (2014). *Illness and Image: Case Studies in the Medical Humanities*. Piscataway, NJ: Transaction Publishers.

Ginsburg, F., & Rapp, R. (1999). Fetal Reflections: Confessions of Two Feminist Anthropologists as Mutual Informants. In L.M. Morgan & M. W. Michaels (Eds.), *Fetal Subjects, Feminist Positions* (pp. 279-295). Philadelphia, PA: University of Pennsylvania Press.

Grynberg, M., Ayoubi, J. M., Bulletti, C., Frydman, R., & Fanchin, R. (2011). Uterine transplantation: a promising surrogate to surrogacy? *Ann N.Y.Acad.Sci*, *1221*, 47-53. doi:10.1111/j.1749-6632.2011.05952.x [doi]. Retrieved from PM:21401629

Hartouni, V. (1997). *Cultural Conceptions On Reproductive Technologies and the Remaking of Life* (NED - New edition ed.). Minneapolis, MN: University of Minnesota Press.

Hinze, S. W. (1999). Gender and the Body of Medicine or at Least Some Body Parts: (Re)Constructing the Prestige Hierarchy of Medical Specialties. *The Sociological Quarterly*, *40*(2), 217-239.

Hoff, T. J. (1998). Same Profession, Different People: Stratification, Structure, and Physicians' Employment Choices. *Sociological Forum*, *13*(1), 133-156.

Huet, M. H. (1993). *Monstrous Imagination*. ACLS Humanities E-Book. Cambridge, MA: Harvard University Press.

Hunter, W. (1774). *Anatomia uteri humani gravidi tabulis illustrata*. E collectione-medingiana. London, UK: John Baskerville.

Jenkin, G., & Young, I. R. (2004). Mechanisms responsible for parturition; the use of experimental models. *Anim Reprod.Sci*, *82-83*, 567-581. doi:10.1016/j.anireprosci.2004.05.010 [doi];S0378432004000995 [pii]. Retrieved from PM:15271480

Johnstone, F. Manifesto for a Visual Medical Humanities. *Medical Humanities.* https://blogs.bmj.com/medical-humanities/2018/07/31/manifesto-for-a-visual-medical-humanities/

Jordanova, L. J. (1989). *Sexual visions: Images of gender in science and medicine between the eighteenth and twentieth centuries*. Science and literature. Madison, WI: University of Wisconsin Press.

Jülich, S. (2017). Picturing Abortion Opposition in Sweden: Lennart Nilsson's Early Photographs of Embryos and Fetuses. *Social History of Medicine*, *31*(2), 278-307.

Kido, A., Togashi, K., Nishino, M., Miyake, K., Koyama, T., Fujimoto, R. et al. (2007). Cine MR imaging of uterine peristalsis in patients with endometriosis. *Eur.Radiol.*, *17*(7), 1813-1819. doi:10.1007/s00330-006-0494-9 [doi]. Retrieved from PM:17119973

King, H. (2004). *The Disease of Virgins: Green Sickness, Chlorosis and the Problems of Puberty*. London, UK: Routledge.

Kurjak, A., Miskovic, B., Andonotopo, W., Stanojevic, M., Azumendi, G., & Vrcic, H. (2007). How useful is 3D and 4D ultrasound in perinatal medicine? *J Perinat.Med*, *35*(1), 10-27. doi:10.1515/JPM.2007.002 [doi]. Retrieved from PM:17313305

Kronenberg, H., Williams, R. H., Melmed, S., Polonsky, K. S., & Larsen, P. R. (2008). *Williams Textbook of Endocrinology* (pp.971-973).). Philadelphia, PA: Saunders.

Landau, J. (2012). Reproducing and Transgressing Masculinity: A Rhetorical Analysis of Women Interacting With Digital Photographs of Thomas Beatie. *Women's Studies in Communication*, *35*(2), 178-203.

Lehmann, A., Scheffler, C., & Hermanussen, M. (2010). The variation in age at menarche: an indicator of historic developmental tempo. *Anthropol.Anz.*, *68*(1), 85-99. Retrieved from PM:20954458

Mowbray, J. (1724). *The Female Physician, Containing All the Diseases Incident to that Sex, in Virgins, Wives, and Widows*. London, UK: Printed for James Holland.

Mauriceau, F. (1710). *The Diseases of Women with Child and in Child Bearing* London, UK.

McTavish, L. (2005). *Childbirth and the Display of Authority in Early Modern France*. Women and Gender in the Early Modern World. Farnham, UK: Ashgate.

Memis, J. (1765). *The Midwife's Pocket-companion: Or a Practical Treatise of Midwifery.* London, UK: Edward and Charles Dilly.

Miller, V. (1752). *The Man-plant: Or, Scheme for Increasing and Improving the British Breed*. London, UK: M. Cooper.

Mitchell, W. J. T. (2004). *What Do Pictures Want?: The Lives and Loves of Images*. Chicago, IL: University of Chicago Press.

Mulic-Lutvica, A., Bekuretsion, M., Bakos, O., & Axelsson, O. (2001). Ultrasonic evaluation of the uterus and uterine cavity after normal, vaginal delivery. *Ultrasound.Obstet Gynecol., 18*(5), 491-498. doi:10.1046/j.0960-7692.2001.00561.x [pii];10.1046/j.0960-7692.2001.00561.x [doi]. Retrieved from PM:11844171

Nezhat, F., Nezhat, C., Gordon, S., & Wilkins, E. (1992). Laparoscopic versus abdominal hysterectomy. *J Reprod.Med, 37*(3), 247-250. Retrieved from PM:1532990

Nicolson, M. & Fleming, J. E. E.(2013). Imaging and Imagining the Fetus: The Development of Obstetric Ultrasound. Baltimore: Johns Hopkins University Press.

Oczeretko, E., Kitlas, A., Borowska, M., Swiatecka, J., & Laudanski, T. (2007). Uterine contractility: visualization of synchronization measures in two simultaneously recorded signals. *Ann N.Y.Acad.Sci, 1101*, 49-61. doi:annals.1389.007 [pii];10.1196/annals.1389.007 [doi]. Retrieved from PM:17435123

Partridge, E. A., Davey, M. G., Hornick, M. A., McGovern, P. E., Mejaddam, A. Y., Vrecenak, J. D. et al. (2017). An extra-uterine system to physiologically support the extreme premature lamb. *Nat.Commun., 8*, 15112. doi:ncomms15112 [pii];10.1038/ncomms15112 [doi]. Retrieved from PM:28440792

Pearson, H. (2007). Infertility researchers target uterus transplant. *Nature., 445*(7127), 466-467. doi:445466a [pii];10.1038/445466a [doi]. Retrieved from PM:17268438

Pechey, J. (1696). *A General Treatise of the Diseases of Maids, Bigbellied Women, Child-bed-women, and Widows.* London, UK: H. Bonwick.

Chamberlayne, T., Rhodes, H., Culpeper, N., Pechey, J., & de Mayerne, T. T. (1698). *The Compleat Midwife's Practice.* London, UK: H. Rhodes ... J. Philips.

Picciano, M. F., & McGuire, M. K. (2009). Use of dietary supplements by pregnant and lactating women in North America. *Am.J Clin.Nutr., 89*(2), 663S-667S. doi:ajcn.2008.26811B [pii];10.3945/ajcn.2008.26811B [doi]. Retrieved from PM:19073789

Pranghofer, S. E. B. A. (2015). Changing Views on Generation: Images of the Unborn. In R.A.Y.M. Stephanson & D. N. Wagner (Eds.), *The Secrets of Generation* (pp. 167-194). Reproduction in the Long Eighteenth Century. Toronto, Canada: University of Toronto Press.

Pugh, B. (1754). *A Treatise of Midwifery: Chiefly with Regard to the Operation* (pp.1-2). London, UK: J. Buckland.

Shapiro, E. (2015). *Gender Circuits: Bodies and Identities in a Technological Age*. Sociology Re-Wired. London, UK: Routledge.

Sharp, J. (1725). *The Compleat Midwife's Companion, Or, The Art of Midwifry Improv'd: Directing Child-bearing Women how to Order Themselves in Their Conception, Breeding, Bearing, and Nursing of Children : in Six Books, Divided Into Several Chapters from Each Book : with Physical Prescriptions for Each Disease Incident to the Female Sex, Whether Virgins, Wives Or Widows : Adapted Chiefly for Their Use*. London, UK: John Marshall.

Silver, C. B. (2007). Womb envy: loss and grief of the maternal body. *Psychoanal.Rev, 94*(3), 409-430. doi:10.1521/prev.2007.94.3.409 [doi]. Retrieved from PM:17581094

Smellie, W. (1768). *A Collection of Cases and Observations in Midwifery* (4th ed.). London, UK: D. Wilson and G. Nicol, and T. Durham.

Haraway, S. (2000). Reproducing the posthuman body: Ectogenetic fetus, surrogate mother, pregnant man. In J. Halberstam & I. Livingston (Eds.), *Posthuman bodies* (pp. 113-134). Bloomington, IN: Indiana University Press.

Stafford, B. M. (1993). *Body Criticism: Imaging the Unseen in Enlightenment Art and Medicine*. Mit Press (pp.211-253).). Cambridge MA: MIT Press.

Sugimoto, Y., Inazumi, T., & Tsuchiya, S. (2015). Roles of prostaglandin receptors in female reproduction. *J Biochem., 157*(2), 73-80. doi:mvu081 [pii];10.1093/jb/mvu081 [doi]. Retrieved from PM:25480981

Todd, D. (1995). *Imagining Monsters: Miscreations of the Self in Eighteenth-Century England*. Chicago, IL: University of Chicago Press.

Turner, D., Rivington, C., & Clarke, J. (1742). *The art of surgery*. London, UK: Printed for C. Rivington ..., and J. Clarke.

van Diemerbroeck, I. (1694). The Anatomy of Human Bodies. London, UK.

Velasco, S. M. (2006). *Male delivery: reproduction, effeminacy, and pregnant men in early modern Spain*. Nashville, TN: Vanderbilt University Press.

Vidaeff, A. C., & Ramin, S. M. (2008). Potential biochemical events associated with initiation of labor. *Curr Med Chem., 15*(6), 614-619. Retrieved from PM:18336276

Wilson, A. (1995). *The Making of Man-midwifery: Childbirth in England, 1660-1770*. Concepts in Social Thought. Cambridge MA: Harvard University Press.

Wright, J. D., Herzog, T. J., Tsui, J., Ananth, C. V., Lewin, S. N., Lu, Y. S. et al. (2013). Nationwide trends in the performance of inpatient hysterectomy in the United States. *Obstet Gynecol., 122*(2 Pt 1), 233-241. doi:10.1097/AOG.0b013e318299a6cf [doi];00006250-201308000-00008 [pii]. Retrieved from PM:23969789

Zervomanolakis, I., Ott, H. W., Hadziomerovic, D., Mattle, V., Seeber, B. E., Virgolini, I. et al. (2007). Physiology of upward transport in the human female genital tract. *Ann N.Y.Acad.Sci, 1101*, 1-20. doi:annals.1389.032 [pii];10.1196/annals.1389.032 [doi]. Retrieved from PM:17416925

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From Geometric Nature to Natural Geometry: Bodies We Create for Ourselves

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Theoretical Study

Abstract

One of the fundamental questions, which most of us have throughout childhood and until adulthood – and of course is usually forgotten or sometimes passes our mind very quickly –, is: "where do I end?" or "where does the world begin?" Perhaps you have never asked such questions explicitly; perhaps this question seems eccentric to you. Nevertheless, in the following discussion, you will surely remember that you have some relevant experiences.

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Introduction

When you walk along the river, you perceive that which is outside of your skin as outside, city, and the other and that which is inside of your skin is perceived as inside, self, and I. However, when you get into your car, you carry this relation into your car's boundaries, and when you enter your house, the walls somehow become your skin. Of course, being in these temporal skins, we sometimes return to our original state and assume the original boundaries of our skin. When you sit at the table to eat something, the dish in front of you is regarded as a part of the outside world, but the fork and spoon you use to take the food to your mouth are extensions of your body.

These body boundaries alter not only when in connection with tools and spaces but with family, group, age, and sex belongings. This in turn changes our perception of inside, outside, self, and the other.

The systemic approach to health explores the strange and multiple dynamism of these boundaries and associates the health of human systems to the clarity and fluidity of these boundaries, to being aware of them, having the insight that house, city, and nature are not spaces for us, but are our topological bodies embedded within each other, and that these physical bodies can be either healthy or unhealthy, lively or sluggish, invigorating or tiring.

Cities and houses are our architectural bodies whose coordination with our physical and ecological bodies guarantees our survival and health.

Architecture involves the experience of

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"being-in-the world" as if the sense of being in the world had been incorporated and created cities and houses. This is the sense which was the beginning of our awareness and self-consciousness; the sense which was given rise to by the fact that a being emerged from the soul of nature who could see its self from outside of itself and could refer to itself to show that he/she exists and is in-the world.

But gradually, over time, man's excessive focus on "being-in-the world" and forgetting other aspects of being – that is, "being from the world" and one's splendid and wonderful feeling-full of solemn respect- of "being with the world" made man a spoiled, irreverent, and stubborn being who sees nature neither as his mother nor a divine gift, but his heritage or right. His/her connection with the world has gradually become more goal-oriented, authoritarian, and ruinous; this relation was due to his alienation from his ecological bodies. Nature, which was animate and intelligent-natured in our ancestors' view and all its phenomena were respected, has now become a mass of raw materials without intelligence, which has to be exploited and become dominated by human being. But, the dominance of which human being are we talking about?

We are talking about the one who has emerged from human-made tools and social systems; the one who has lost his connection with earth and heaven and abuses his bodies; the one who merely increases his desires without seeking to increase his understanding of being, the other, and his self or at least without authentic desire to increase his fulfillments and bliss.

Evidently, the biggest problem of such a human being is depression and its consequent numerous somatic, psychological, and social disorders, the many kinds of addictions, communicative disorders, job problems, crimes, ….

Prior to manifestation of depression in the form of hopelessness, worthlessness, and desperateness, it emerges as one's loosened I–self connection, as Kierkegaard refers to it. Where we cannot establish a coordinated and dynamic communication among our various bodies and where the connection between architectural, physical, and ecological bodies loosens, cities become messy and ignorant of body and nature, and the tools are made based on the benefit they have for economic systems rather than for the sustainable development of happiness.

Soul of the place

There is no need to be an architect or an environmental psychologist to understand that the soul of our cities is so disturbed. We neither see any ergonomic, aesthetic, semantic, and structural harmony, nor see sufficient and appropriate context. Except a few constructs in some places and corners of the city, the mere dominance of wandering merchandizing, which seems to have no ideal beyond gaining more and sooner benefits, is observed in cities. Visual manifestations of this idea are disharmonious and even horrifying constructs or – under the best conditions – harmonious ones which are inconsistent with other biopsychosocial dimensions. They are mostly the result of using modern materials, which are fashionable in the market and are reproduced inappropriately due to blind competitions. In the most appropriate way, they create superficial aesthetics only with the aim of mere visual enchantment – like a histrionic personality – while their coldness rejects all people.

We have to remember that our architectural body is not for showing off, but for being, to be comfortable and in harmony with it and in it, and because it facilitates our psychosomatic functions, and to grow into it.

A body between body and the world

From the above brief introduction, we have understood that when we are talking about corporeal connection with house, city, and nature, we do not just mean paying attention to the superficial appearance of these bodies. From a systemic point of view, when we are

talking about boundaries and bodies, we are referring to a bodily connection like the one we have with our bodies. Such a connection is established neither by mere emphasis on mechanical functions nor by considering histrionic manifestations. Rather, it is possible through being and living in/with these bodies. In this way, such a connection gradually becomes more refined and coordinated.

This is our architectural body which can either connect us to nature, being, and the self, make our life meaningful, and help us move through our daily doings in a subtle, coordinated, and meaningful manner, or can always make inter/intra/transpersonal communication into reductive encounters by harsh and incompatible boundaries merely in a goal-oriented manner and make eyes and hearts distant from each other and loosen meaning bonds:

"Buildings and cities provide the horizon for the understanding and confronting of the human existential condition. Instead of creating mere objects of visual seduction, architecture relates, mediates and projects meanings …Profound architecture makes us experience ourselves as complete embodied and spiritual beings." (Pallasmaa, 2012, p. 13).

Our cosmic body

It seems that the word ecosystem or urban area as the spaces that have surrounded us cannot explain our deep and complicated relationships. Today, everyone understands that our harms to nature due to our avarice and incaution are threatening our life, and therefore, environmental movements are no longer recognized as the sensationalism of some educated and sentimental people or those who are against the progression of society. However, what we have to understand and teach our children is that before our harms to nature reflect to us, cause other destructive events, and create some biological problems for us, our psychological and ontological detachment from nature will lead to the disconnection of our bonds with our shared body and this will consequently lead to destruction of minds and culture. This common extended body was known as mother earth, tree of life, or Spiritus by our ancestors and, today, theoreticians call it biosphere, Gaia, or semiosphere. It is an intermingled network of living, self-organizing, and evolutionary connections, which behaves as a single system. Of course, we have imprisoned our self-consciousness inside our skin boundaries to the extent that we do not realize this harmony and dance in life, the reason for our discontents and inconsistencies.

School of nature

Today, many pioneering universities in developed countries have developed extensive programs for increasing ecological literacy and sustainable development in children and many of such programs have been widely incorporated into educational systems. The aim of such programs are one's psychological connection with nature, overcoming self-alienation, learning natural orders, and understanding how life has maintained itself through networking, cooperation, and correlation in the course of four milliard years that have led to a qualitative and quantitative order which has to be obeyed by each system for its survival.

Ecological literacy not only plays an important role in the ability of modern citizens of the world to communicate with their society and nature, but is also a very efficient foundation for our biopsychosocial health. Understanding networks and life cycles, solar energy, cooperation, diversity, and dynamic balance are six-fold principles of ecological literacy:

1. Networks: Living systems nest inside other living systems in all hierarchies of life – networks inside networks. Their boundaries are not separating ones, but identity boundaries. All living systems communicate with each other and share resources over their boundaries.

2. Life cycles: All living systems need to exchange matter and energy with their environment so that they can survive.

Although all living systems continuously produce remains, a biological system does not produce any useless remains; the remains of one species become the food of another. In this way, matter circulates in a living network.

3. Solar energy: Energy from the sunlight is converted into chemical energy through photosynthesis in plants. This energy moves ecological cycles on.

4. Cooperation: The transactions of energy and resources are sustained by cooperation. Life has not survived through fighting, but through cooperation, partnership, and networking.

5. Diversity: Ecological systems obtained the features of self-improving and stability due to their richness and the complexity of their ecological networks. The more their biological diversity is, the more self-improving they are.

6. Dynamic balance: An ecological system is a flexible and ever-circulating network. Its flexibility is the outcome of multiple feedback cycles, which keep the system in a dynamic balance. No individual variable reaches its maximum, but rather all variables revolve around their favorable values (Capra, 2002).

Perhaps talking about ecological literacy seems very untimely in our consumer culture in which productive and proactive values are deprecated, showing off and competition are deemed worthier than comfort, development, and health, and technology and management are increasingly and blindly progressing. However, the current dangers that have affected and are threatening our biopsychological health make each one of us contribute in our own way to the resolution of this crisis. I call this ecological literacy the "A to Z of natural body"; this is the body that is now ill and, obviously, has made all other bodies ill. From this perspective, systemic thought and understanding of communicative networks, that is, the principle that leads to our bodily understanding of our relation with our environment and the understanding that we are not separated from, but in relation with other members, are organs of one body, and respecting the other (other human beings and nature) is in fact respecting ourselves.

A disorder in life cycles is actually like a physiological disorder in our organs and cooperation means our coordinated behavior with our extended bodies; since diversity in natural temperaments and characteristics provides us with a wider range of possibilities in our experience and life, and to exit our hard shell of ego-centrism and participate in the harmonious dance with other human beings, human and natural societies are the condition for an authentic life and being/becoming the self.

Therefore, we have to look back to revise structure and the effect of our behaviors and setting. And, if we find out that they are inappropriate and incongruent and are not aligned with the several-milliard-year order of life, we have to destroy what we have made and construct something new since health is nothing more than being aligned with life – this wonderful generating order.

Liberty of constraints

As it was explained above, bodily understanding of the world does not disturb boundaries that give us identity, responsibility, and freedom. If it did, it would lead to madness and depersonalization. What we mean is coordination of will with life through replacing hard structural boundaries of modern knowledge and technology with fluent functional ones. It is seemingly a paradoxical principle in systemic biology that freedom of a system increases by increased coordination between higher and lower systems and increased constraints. However, our observations show that this paradox is the foundation for the consistency of living systems with each other.

Many may consider that ecological considerations are hindering, limit their possibilities, stop their imaginary plans, and slow down work procedures. These are the

results of the bored and hasty mind of the modern human being who is entangled in his/her hyper-individualism.

Systemic thought teaches us that more possibilities do not necessarily mean more freedom since freedom is realized when biopsychosocial characteristics of the human being have the chance for emergence and sustainable and coordinated development. Many times, we have experienced that more possibilities are overwhelming, and thus, lead to dispersion and disturbance of our bioenergy, and consequently, cause us to miss our opportunities. All of us have experienced being so busy with the imaginary features of a possibility or idea that we completely ignore the favorable quality we intended on achieving. For instance, the image of a house in the picture, movie, fantasy, or somewhere else has haunted our mind to the extent that we do not think about its appropriateness as a house in the periphery or climate, or the comfort and joy we have to gain. It is no surprise that despite expressing our happiness and showing it off to others, we do not feel well.

Sometimes we only find our freedom in the actualization of the picture we have made in our mind, not the quality that was our favorable intention. Therefore, we trap and harm ourselves by cathecting on actualizing that picture without regarding its time-space and psychocultural coordination and fitness.

Many of us have had such experiences as selecting our university major, job, or house; the selections that seemed so beautiful and lively in the emptiness and abstractness of mind space, when realized in the context of our communicative network, turned out to be inconsistent and incompatible. These incompatibilities are not necessarily due to the untimely nature or defects of those possibilities and opportunities.

A subtle and psychological element is required in order for possibilities to create freedom. Wise men in our culture called this element "courtesy". Courtesy means compliance with the wise appropriateness of time-space-mind-culture, which tells us how and where to use our bioenergy so that our communicative extended bodies are not hurt, and consequently, do not harm ourselves or others.

Courtesy means listening to the rhythm of time-space, since every place may have varying order and rhythm, and the order of the air, light, water, and earth vary in different moments. The enigma of this rhythm and order is only revealed for those whose bodies are open to it; it tells you how to take timely steps, and if you want to build something, it tells you in what rhythm you can grow it from the earth. It talks to you in a way as if it had always existed there, but had only recently emerged.

Courtesy is making dance with the rhythm of mind-culture that is currently flowing in the here and now and incorporating the wandering fantasy in place; not like the impertinent deaf who suddenly start to sing off tempo in a subtle and great symphony. Being off tempo alone is sufficient for creating ugliness, but to also be out of tune significantly adds to the problem.

Present-day medical and psychological knowledge coupled with natural and social sciences try to understand these morphogenic fields; the fields that give form to the stream of events and things, and change mountains, houses, tools, and human beings into different shapes and create beautiful, tuned, healthy, or ugly, inconsistent, and ill morphs.

The blind movement of increasing production and powerful movement of universalization have disturbed not only our understanding of these fields, but also the fields themselves to a great extent. For this reason, we understand less proportion between architecture, clothes, means, language, and behavior compared to previous times as a homogeneous and coordinated context. In many present-day Eastern and Western cultures, we see how they have repaired some lost parts of this

time-psychocultural context or even recreate it in a new, but coordinated way to reestablish their connection with their own condition.

As when disobeying rules of construct, which is related to the earth and leads to not constructing the construct or its collaps and severe consequences for health and life, not responding to comprehensive morphogenic forces leads to non-endurance and fundamental difficulties in building, maintaining, and quality of health of residents and even by-passers. The effect of this morphic and energentic inconsistency on the field of city and nature causes chaos on lifeworlds and inconsistency in the course of life.

Consciousness flow in matter

Every form directs the stream of matter-energy-information-consciousness in a specific way and gives form to it. Moreover, the forms themselves are some forms of energy since various energies are nothing more than vibrations with various forms. Houses, automobiles, or bridges in fact slow the vibrations within a longer time span. Bodily understanding of the world causes these vibrations to flow through our body and causes us to understand that being-in-the world is not a topological relation, but a morphic-energetic one, which causes the world to flow in us and us in the world and forms us in the world and the world in us.

This relation between the world and us may seem eccentric, fanciful, and impossible to you, and its realization in social life utopian and far from vital and everyday issues around us. Nevertheless, I should say that not only has such a humanistic and meaning-oriented attitude been employed in some modern, developed cities but it also guides matter-energy-information-consciousness toward human being's evolution and development (see human design cities); however, some parts of a city, where visualization of the order of mind-time-space flows, has still remained in our memory and the body of our cities.

Through research and deep and wonderful symbology of /Siosepol/ (thirty-three bridge), and phenomenological contemplation on this ancient construct, I tried, in the book "one bridge, 33 contemplations", to show how this relation with being, nature, and culture has been established. Surprisingly, the wonderful structure and musical harmonies of this ancient construct will be an aspiration for our own future city.

Disregarding the other excellent instances of organic and live city-building of that era, the coordinated psychological, sociological, ecological, and ontological functions of this bridge are sufficient as a model for constructing a city.

I also tried in this book to show how the philosophy of illumination has been written by blocks, stones, and sand, and how a bridge connects earth and heaven, mind and body, and outside and inside, and has integrated our various Iranian, Islamic, and Greek subcultures in a mystical and hermetic manner.

Here, there is no time for retelling evidences and rereading the signs of this bridge. Suffice it to say that what I am talking about is not only possible but has been done. But, a new translation and insight is required to understand that everyday unlimited problems, our disturbances and depressions have risen from the same disturbing morphogenic fields; these tired and perished bodies.

Windows to the hearts

Now we know that our illnesses are subordinate to everyday patterns, rather than accidental events. This means that it is our lifestyle and our way of coping with events that make our lifeworld.

For the same reason, in the systemic approach to health, energy is consumed to create and design these lifeworlds. We are the architectures of these lifeworlds, but very rarely are we aware of our art and create it consciously. Our structural body is a tangible representation of our world making, and

comes into our world and transforms our inner life.

Only very recently have we understood the profound effects of architecture and urbanization on citizens' biopsychosocial health and how these morphogenic fields gradually transform the forms of human communications, settings, individual and collective ideals, lifestyles, and even bodies. Recently, we have realized through the language of our empirical knowledge – not merely based on the enlightenments of our wise ancestors– that streets and bridges do not only guide us to other places, but to other states and qualities, and windows not only guide us to other spaces, but to other hearts and visions. The effect of the form of human constructs on the mind, body, and energy exchanges that they create are dealt with in many various fields of knowledge from social medicine to environmental psychology, architecture, and ergonomics. Regarding the present-day complicated sociocultural systems, it seems that we need a wide interdisciplinary knowledge so that we can construct the appropriate body for this time. We have to keep in mind that human beings are body-making animals who come to this world naked and have to continuously construct various technological and communicative bodies. It is evident that most of their life is spent on constructing, scanning, and repairing these bodies and this is indeed not a worthless deed since each body is the key to entering a new world.

A new place for transformation

If, as stated in the Ecclesiastes, "For everything there is a season, and a time for every purpose under heaven", we can also say that the city is a place where for everything there is a place; a place for working, a place for relaxing, a place for recreation, and a place for being cured. But, is there a place for transformation, development, and evolution? Is there a place for what humanistic psychologists call self-actualization, a place for learning to bear our responsibility and build our own cities, a place for creation of human being from the womb of his consciousness, a place where each of its blocks reflects human being to himself and guides oneself to the self through its passages and alleys, a place that teach us to build new lives, relationships, beliefs, and states, a place for being-thinking-building?

I – like many others – have often thought that our cities are devoid of such a thing. This is highlighted when we consider all the haste and massive load of necessary affairs that hinder our important works and, of course, the great work which our wise ancestors called /estekmal-e nafs/ (consciousness evolution). From this point of view, many diseases, nostalgias, and entanglements are nothing other than evolutionary disorders. This is the story of a lost man who does not know he/she must construct him/herself and does not search for something which is not constructed since he/she has not created it yet. The earth and imagination have to always be mingled with each other for the creation of our architectural body; of course, in a specific proportion so that a space will appear for that way of being.

Coordinated stream of signs

If we recognize health as a progressive inter/intra/transpersonal coordination, we need to have a relation with earth and heaven which allows consciousness to move freely between the self, the other, and being, and connects oneself to the self, and human beings to each other and the nature. Once a part of our body does not adhere to the overall order of the body, its connection with other parts and vital systems breaks and illness emerges. It is the same obstinate act towards others, nature, being, and God which makes us ill.

From the biosemiotic point of view, disease is in fact a communicative disorder and a systemic defect. Now the question is: "Can the technology, architecture, and communicative network, which we construct for ourselves, systematically disrupt the

coordinated and meaningful stream of signs? Can the matter-energy-information-consciousness stream flow in a way that causes the methodological and systematic promotion of health?

The authentic meaning of sustainable development is finding and refining a city that gathers and integrates human beings – these inter/intra/transpersonal beings – and as Habermas says, makes the ideal communicative condition possible. Have present-day cities, which have provided unlimited communications through media and communication channels, integrated human beings? Is this increasing thirst for seeing and making contact – which has become possible by televisions and networks – our authentic thirst for communicative and cultural intellect? Has this cumulative accumulation of knowledge made us wiser? Does medicine development lead to a development in the quality and meaning of life just as it has increased our social efficiency and lifetime?

It seems we need spaces for contemplation, revision, meditation, and education of coping with all these new, coming factors in order to include medicine in life, knowledge in wisdom, and wandering in exploration.

Just as cities have been born from villages, we need some villages to be born out of cities so that the lost balance and alienation from the self, the other, and nature is restored. Such presence and such being can gradually change our lifestyle, discourses, and institutions, and these embassies of cities in the heart of nature can direct natural order toward the cities and life of citizens in a new, natural order.

Reflection on the current wonderful horizon has given rise to our hidden connections with other human beings, animals, plants, and the whole cosmos and we know that the health of the body cannot be separated from that of the mind, society, culture, and ecosystem, and the constant and boundariless stream of signs flows through and beyond the limits we know and expands itself. These connections are often disconnected in disharmonic and elusive bodies, which we have constructed for ourselves, and our body becomes sick and our mind wanders. Therefore, it demands a prototype so that we can retune our bodies with nature. I emphasized form and place to a great extent in this essay since I believe that where we are standing and the distance, angle, and relation we have established with the self, the other, and being makes us unique, and then, this embodied thought manifests itself in our behavior in a certain way and builds our world. Our knowledge of systemic psychology and medicine tells us that we cannot cause some fundamental and pervasive evolution in health, and the quality and meaning of life unless we transform our individual and collective narratives and world-making ways. To this end, we need an appropriate setting and architectural and institutionalized bridge between technology and nature. We need a move from the geometrized nature of modern cities to the natural, cultural, and spiritual geometry of post-modern cities.

Therefore, returning to the lost model of nature does not mean a permutation and return to the infancy of human being and returning to the embrace of Mother Nature. Rather, it means being open to the other, nature, and being, and to dialog, and exercising the creation and obtaining of health from the source of life, the place that is so inside that is outside.

Conflict of Interests

Authors have no conflict of interests.

References

Pallasmaa, J. (2012). The eyes of the skin: Architecture and the senses (3rd edition). London, UK: John Wiley & Sons Ltd.

Capra, F. (2002). The hidden connections. New York, NY: Doubleday.

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The Effectiveness of Mindfulness-Based Cognitive Therapy on Life Expectancy and Depression in Patients with Multiple Sclerosis

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Quantitative Study

Abstract

Background: Multiple sclerosis (MS) is one of the most common diseases of the central nervous system (CNS) that can affect life expectancy and depression in patients suffering from this disease. The aim of this study was to determine the effectiveness of mindfulness-based cognitive therapy (MBCT) on life expectancy and depression in patients with MS.

Methods: The study adopted a pretest-posttest research design with a control group. The statistical population included all patients with MS enrolled in the MS Society of Tehran, Iran, from 2009 to 2016. Using simple random sampling, 30 subjects were assigned to two experimental and control groups. The research tools included the Life Expectancy Questionnaire (LEQ) and Beck Depression Inventory (BDI). Data were analyzed using univariate analysis of covariance in SPSS software.

Results: MBCT training led to significantly higher life expectancy in the experimental group with a greater mean life expectancy in the experimental group than the control group ($P < 0.01$; $F = 42.22$). Moreover, MBCT training reduced depression in the experimental group with a higher mean depression score than that of the control group ($P < 0.0001$; $F = 22.53$).

Conclusion: It can be concluded that MBCT training increased life expectancy and decreased depression in the experimental group.

Keywords: Mindfulness-based cognitive therapy, Life expectancy, Depression, Multiple sclerosis

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Introduction

Multiple sclerosis (MS) is one of the most common diseases of the central nervous system (CNS) in young people. This chronic and progressive disease damages the brain myelin tissue and spinal cord, and leads to a wide

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range of neurological symptoms such as blurred vision, muscular weakness, and sensory impairment (Kenner, Menon, & Elliott, 2007). Neurological symptoms initially include atony, ataxia, diffuse sensory and motor disturbances, and visual changes (McCabe, 2005). Some studies have focused on viral infection and immune system dysfunctions (Rasova, Havrdova, Brandejsky, Zalisova, Foubikova, & Martinkova, 2006). The presentation of MS varies from a benign disease to a rapidly progressive and debilitating disease (Rickards, 2005). MS influences the life expectancy level, and patients live with its symptoms and consequences for many years (Tepavcevic, Kostic, Basuroski, Stojsavljevic, Pekmezovic, & Drulovic, 2008). This disease poses a permanent challenge for individuals and their families, causing energy depletion, and reduced movement vigor and family activities, and is a costly disease in many respects (Kenner et al., 2007). In a clinical study, Langgartner stated that the most important support for MS patients may be the support provided by family members and friends, who can provide them with physical and psychological support on a daily basis. The provision of the support required by the patients, however, is considered a great effort for family members, and they may spend a great deal of their energy on this task. A high rate of perceived family support and regular and energetic entertainments can make the disease tolerable and increase the life expectancy of these patients and their family members. Regarding the variable role of hope in tolerance and improvement of some diseases, a study showed that adolescents with depressive symptoms or other emotional or behavioral problems had lower hope (Rajabi & Abasi, 2012). Hope has existed since the advent of mankind. When one is convinced that the future is generally saddening and absurd, he/she may lose the will to tolerate the present moment. According to Augustine, "Hope deals only with good things and the future and has a direct relationship with a hopeful person." When the goal of hope is fulfilled, it is no longer hope, but it becomes one's property, and hope creates the ability not to be affected by problems in the present moment. It also results in openness to new opportunities (Melyani, Alahyari, Azadfallah, Fathi Ashtiani, & Tavoli, 2014). Schneider believes that hope is the process by which people first determine their goals. Then, they create solutions to achieve those goals, and then, create the incentive to implement these strategies and maintain them (Melyani et al., 2014).

Fatigue and depression are considered as two important factors in MS-related cognitive dysfunction. Many studies have shown that MS patients present with declined cognitive function and increased fatigue, though these observations are not widespread in patients. Moreover, depression was considered as a factor in cognitive impairment in the disease (Gilbert & Procter, 2006; Grossman, Niemann, Schmidt, & Walach, 2004). Even though many MS patients with cognitive impairment do not demonstrate high levels of active adaptation and low levels of social adjustment as symptoms of depression, some of them have low levels of social adjustment and accountability (Gilbert & Procter, 2006). Feinstein (2002) stated that major depression in patients with obsessive-compulsive disorder (OCD) had negative effects on life expectancy and quality of life (QOL) in MS patients, and that it was a key factor in reducing the prevalence of suicide in these individuals (Papageorgiou & Wells, 2004; Kozak, 2008). García and Feinlai Saun (2007) conducted a study on 2700 patients with MS and noted that many of these patients did not receive much support and help, and suffered from various emotional disturbances (Papageorgiou & Wells, 2004).

Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Kabat-Zinn, & Hanh, 2009). In another study, 44% of the elderly individuals studied reported that they experienced depression and presented with abnormalities in their memory and mental health (Kabat-Zinn & Hanh, 2009).

As a lifestyle, mindfulness through the use of meditation exercises integrated in everyday life helps people to become familiar with their dual mindsets and consciously use them as an integrated mind. With this method, people realize that they do not only think, but they can see their thinking. Through formal meditations (such as breathing and body meditation, conscious yoga meditation, and body scan meditation), informal meditations (such as eating, walking, showering, etc.) and habit-breaking exercises, people learn to live in the "here" and "now" (Stahl, Goldstein, Kabat-Zinn, & Santorelli, 2010). Studies have associated mindfulness training with various health outcomes such as pain (Stahl et al., 2010), anxiety, depression, and stress relief (Kabat-Zinn, 2003). Stahl et al. (2010) also showed that mindfulness techniques were effective in increasing muscle relaxation and reducing anxiety and stress. They further indicated that mindfulness-based treatment could effectively increase muscle relaxation and reduce anxiety and depression in physical patients (Stahl et al., 2010; Kabat-Zinn, 2003). Mindfulness-based cognitive therapy (MBCT) resulted in improved symptoms of stress and anxiety, and increased self-esteem (Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). The variety of interventions shows that there are many potential methods that can help people with MS. Psychosocial interventions help to reduce or manage psychosocial challenges and create hope in patients with MS (Stahl et al., 2010). According to the abovementioned facts, it can be argued that recognition of effective psychological variables and the implementation of various psychotherapy methods, including MBCT, can be useful for these patients. The main objective of this study, therefore, was to determine the effectiveness of MBCT on the life expectancy of patients with MS.

Methods

The present study was a quasi-experimental pretest-posttest research with a control group and random assignment to the experimental group. The statistical population included all patients with MS enrolled in the MS Society of Tehran, Iran, from 2009 to 2016. In total, 30 patients were selected using convenience sampling method and according to the Krejcie-Morgan (1970) table. The researcher referred to the MS Society of Tehran and made the necessary coordination. After an explanatory session on the research overview and objectives, samples were selected from among all those who were willing to participate in the study, and randomly assigned to two groups of 15 subjects. The two groups were matched for age and education, followed by the random determination of an experimental group and a control group. At the completion of the treatment, a posttest was performed (two months after the pretest), and the follow-up session (last intervention session) was held for the test group one month after the posttest. The inclusion criteria were membership in the MS Society of Tehran and at least 1 year of disease history. The exclusion criteria were a history of mental illness and complications associated with MS. All subjects in both groups were fully involved in the research until the end of the study, and there was no drop in the number of subjects. To increase the participation of individuals in this research, contact numbers were obtained from all individuals and the day and time of sessions were coordinated with all the members to ensure the attendance of all participant.

The experimental group received MBCT, and the control group received no treatment. Both groups were evaluated using the Life Expectancy Questionnaire (LEQ) (Mousavi & Ghorbani, 2006) and Beck Depression Inventory (BDI) before and after the intervention. Then, the experimental group was subjected to treatment. The MBCT plan was implemented in 8 sessions (1 session per week), each lasting approximately 90 minutes.

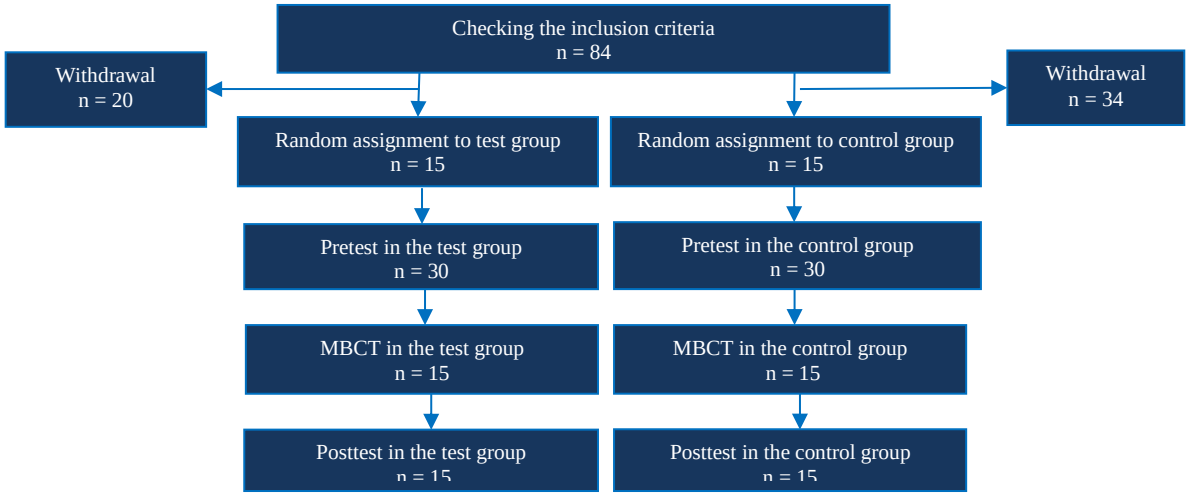

Figure 1. The CONSORT chart of entering the research

All subjects received written information about the study and provided consent for participation in the research. They were assured of the confidentiality of all information and the use of data for research purposes. Moreover, the subjects' names and surnames were not registered to observe their privacy. Figure 1 shows the CONSORT chart of entering the research.

Research tools

Life Expectancy Questionnaire: The life expectancy of patients with MS was measured using the LEQ developed by Hezarossi (Mousavi & Ghorbani, 2006). This questionnaire consists of 70 questions scored on a 4-point Likert scale. In addition to life expectancy, this questionnaire also evaluates the M (significance) and R (responsibility) scales each with 28 and 19 questions, respectively. There is a correlation between low scores on M and R scales of the LEQ and high scores on D scale of the Minnesota Multiphasic Personality Inventory (MMPI) (Mousavi & Ghorbani, 2006). The formal validity of the LEQ was confirmed by Hezarossi. Furthermore, a reliability coefficient of 0.89 was obtained for the LEQ using Cronbach's alpha based on its implementation on a community of 62 people (Mousavi & Ghorbani, 2006). In this study, a significant Cronbach's alpha of 0.87 was obtained for this questionnaire.

Beck Depression Inventory (BDI): The BDI was designed by Aaron Beck to measure the feedback and symptoms of depressed patients. It consists of 21 items, which are based on the observation and demonstration of common attitudes and symptoms among depressed psychotic patients. BDI is a kind of self-assessment test completed in 5-10 minutes. The test consists of totally 21 items associated with different marks. to the items are scored based on a 4-point scale ranging from 0 to 3. These items are related to areas such as sadness, pessimism, feelings of disability and failure, sense of guilt, insomnia, anorexia, self-denial, etc. As such, 2 items are devoted to affection, 11 items to cognition, 2 items to obvious behaviors, 5 items to physical signs, and 1 item to interpersonal semiotics. Accordingly, this scale determines different degrees of depression from mild to extremely severe and its score ranges from a minimum of 0 to a maximum of 63 (Beck, Steer, & Carbin, 1988). A high internal consistency coefficient of 0.89 was obtained for this scale using Cronbach's alpha (Beck et al., 1988). A Cronbach's alpha of 0.87 was achieved for this questionnaire in the present study.

In addition to descriptive statistics, data were analyzed using univariate analysis of covariance (ANCOVA) in SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

A summary of the MBCT sessions is presented in table 1.

Table 1. Summary of MBCT sessions

Session description	Session goal	Session time
Session 1: Welcoming and introducing members, expressing the general structure of sessions and the study process, contracting treatment, explaining the general objective and some subjects on MS, and explaining the tasks	Introduction and familiarization of groups, explaining the rules	90
Session 2: Examining tasks, informing the members of the basic concepts of logotherapy, providing an understanding and perception of the meaning of life, reviewing the executed tasks, providing a concise account of Frankl's biography and a concise explanation of the fundamental beliefs of logotherapy, holding a group discussion on life and its meaning, explaining the tasks	Perception of life meaning	90
Session 3: Reviewing the tasks, informing the patients of meaning in life methods, providing an understanding and perception of the meaning of life, holding a group discussion on the meaning of life, and explaining the tasks	Dealing with the meaning of life	90
Session 4: Reviewing the tasks, adopting individual freedom and accountability, reviewing the tasks, all members explaining their meaningful past experiences, receiving feedback from each other and the therapist, holding a group discussion on freedom and accountability, the therapist providing an outline of the concepts of freedom and responsibility, and relating each concept to the reality of the members' lives, and explaining the tasks	Discussion on the adoption of individual freedom and accountability	90
Session 5: Reviewing the tasks, providing a perception and understanding of the meaning of love, reviewing the assignments, and addressing accountability, group discussion on love and its meaning, the therapist providing a conclusion (definition of love, love categorization, and loving practices), and explaining the assignments	Perception and understanding the meaning of love	90
Session 6: Reviewing the tasks, providing a perception and understanding of the suffering and pain of patients with MS, reviewing the tasks of previous sessions based on personal experiences of members regarding love, holding a group discussion on agony and the meaning learned from it, the therapist drawing a conclusion, and explaining the assignments	Understanding and perceiving the meaning of agony	90
Session 7: Reviewing the assignments and addressing the meaning of agony, the participants expressing their views about death in the past, reviewing the assignments, the participants addressing their dealing with life meaning, the therapist drawing a conclusion, and explaining the assignments	Addressing the meaning of life and finding meaning in suffering	90
Session 8: Reviewing assignments, providing the positive meaning of MS, concluding the previous statements, hearings, readings, and findings of the clients, the feedback, and termination, reviewing of the assignments from the previous meeting based on the experiences of the members on seeking their inner world and communication with the sacred and spiritual parts of their being, and receiving feedback from the group, reviewing the assignments of the previous meeting and presenting a summary of the previous findings	Conclusion and termination of the intervention	90

Results

There were 7 (46.7%) men and 8 (3.53%) women in each group. The mean (± standard deviation) ages of the subjects in the experimental and control groups were 33.1 ± 9.1 and 31.5 ± 8.4 years , respectively.

Table 2 presents the descriptive analysis of the pretest and posttest scores of life expectancy and depression in patients with MS. Based on the results, the average posttest life expectancy score increased in the test group, but it was almost constant in the control group. In addition, the mean posttest depression score decreased in the experimental group, but it was almost constant in the control group.

Table 2. Descriptive findings of the research variables

Variables		Life expectancy	Depression
		Mean ± SD	Mean ± SD
Pretest	Experimental	183.15 ± 15.17	23.9 ± 6.75
	Control	187.4·± 17.8	22.01 ± 7.70
Posttest	Experimental	194.15 ± 13.7	20.10 ± 5.27
	Control	189.22 ± 15.1	24.93 ± 7.07

Among the scales related to the life expectancy and depression, Levene's test showed no significantly difference in any of the scales.

Table 3. Results of analysis of covariance of adjusted mean differences for life expectancy scores in the two groups

Source of variance	Sum of squares	df	Mean squares	F	P	ηp²	Test power
Pretest stage	5199.39	1	5199.39	91.62	0.0001	0.72	1.00
Group	4791.98	1	2395.99	42.22	0.0001	0.70	1.00
Error	2043.93	26	65.75				

; accordingly, the two groups were homogeneous in terms of the research variables before the intervention (P > 0.05). The assessment of the normal distribution of data indicated that both life expectancy and depression scales followed the assumption of normal distribution (P > 0.05). Moreover, the homogeneity examination using regression analysis showed no significance in either scale (P > 0.05).

Based on the results presented in table 3, H0 is rejected because the amount of calculated F (42.22) with df values of 1 and 26 is larger than that in the table. This confirms the research hypothesis (with 0.99 confidence), stating that MBCT training has an effect on the life expectancy of patients with MS. Furthermore, based on the results presented in table 4, the mean posttest scores of the experimental group increased significantly compared to the control group. The effect index shows that a 70% increase in the life expectancy of patients with MS in the experimental group can be attributed to MBCT training.

Moreover, the pretest control revealed significant differences in terms of depression between the patients in the experimental and control groups (P < 0.0001; F = 22.53). In other words, MBCT training reduced depression in the experimental group based on the mean depression score in the experimental group compared to that of the control group. The effect index or difference is equal to 0.48 meaning that 48% of individual differences in posttest scores are related to the fear of failure in the impact of MBCT training.

Discussion

The results of this study show that MBCT training has an impact on life expectancy in patients with MS, which is consistent with the findings of Brennan, Emmerling, and Whelton (2014), Gilbert and Procter (2006), and Kozak (2008). Therefore, it can be concluded that the achievement of a meaningful living requires self-knowledge in the first stage and attainment of a coherent definition of oneself. Therefore, one must adopt a coherent framework from the various governing views in the environment to grant a meaning to one's life and the world. In fact, when there is hope in life, one will not suffer from absurdism, futility, despondency, and frustration, and will be more capable of dealing with difficulties and failures. The presence of meaning in life requires that values, goals, and criteria be processed, evaluated, and structured carefully and meticulously. With obtaining more hope in this area, people gain more success and receive positive feedback from society.

To explain this finding, it can be stated that MBCT training affects life expectancy and teaches skills such as suitable methods of communication. Thereby, it allows an individual to improve his/her ability to act according to his/her own criteria and to achieve the desired outcomes in a special situation. In addition, it increases one's knowledge and strengthens one's positive beliefs.

Table 4. Results of analysis of covariance of mean differences adjusted for depression scores in the two groups

Source of variance	Sum of squares	df	Mean squares	F	P	ηp²	Test power
Pretest stage	435.70	1	435.70	2.057	0.0001	0.54	0.87
Group	568.14	1	568.14	22.53	0.0001	0.48	0.72
Error	529.36	25	21.17				

All of these prevent the emergence of factors that impair one's mental health since most psychiatric disorders seem to emerge from the inadequacy to act in accordance with one's own criteria followed by failure to achieve expected outcomes and lack of adequate knowledge and misguided beliefs about oneself and the surrounding world. Training increases individuals' awareness of themselves, helps them recognize their strengths and weaknesses and achieve some kind of self-knowledge by which to correct their weaknesses and increase their strengths; as a result, one better accepts the facts.

Depression is often a cognitive process that can be explained in the form of mental rumination (Stahl et al., 2010) as a defense. If the error and failure to achieve the goal is compensable, it leads to an instructive action, and if it cannot be compensated, it will be experienced by tolerating excitements consistent with error and failure in an unstable and current form. Therefore, continuation of depression as a cognitive process is nothing but a defense to relieve the painful excitements of sin and regret (Brennan et al., (2014). It seems that MBCT exercises increase the consciousness of individuals in the present moment through such techniques as attention to the self and body, and influence the cognitive system and processing of information by focusing consciously on the here and now. Therefore, the effectiveness of this type of training is associated with advantages in the area of depression, stress, and anxiety. Moreover, considering that patients with MS are in a critical and tempestuous state, extensive use of this treatment is recommended for patients with MS (Kabat-Zinn, 2003).

One of the limitations of this research is that it was conducted on members of the the MS Society of Tehran. Based on our findings that implicate the effectiveness of MBCT training on life expectancy, the implementation of MBCT training to improve patients' living conditions in specialized centers and hospitals as well as by relevant physicians is recommended, in addition to existing medical services. This is because life expectancy and physical illness are mutually interacting, and life expectancy usually determines the patient's attention to his/her physical condition.

Conflict of Interests

Authors have no conflict of interests.

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References

Ahamadi Tahoor, M., Jafari, I., Karami Nia, R., & Akhavan, H. (2010). the effect of positive and negative perfectionism and type D personality on general health of the aged. *Avicenna J Clin Med*, *17*(3), 64-69.

Beck, A. T., Steer, R. A., & Carbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*, *8*(1), 77-100.

Bohlmeijer, E., Prenger, R., Taal, E., & Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: a meta-analysis. *J Psychosom.Res*, *68*(6), 539-544. doi:S0022-3999(09)00415-2 [pii];10.1016/j.jpsychores.2009.10.005 [doi]. Retrieved from PM:20488270

Brennan, M. A., Emmerling, M. E., & Whelton, W. J. (2014). Emotion-focused group therapy: Addressing self-criticism in the treatment of eating disorders. *Counselling and Psychotherapy Research*, *15*(1), 1-9.

Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, *13*(6), 353-379.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits. A meta-analysis. *J Psychosom.Res*, *57*(1), 35-43. doi:10.1016/S0022-3999(03)00573-7 [doi];S0022399903005737 [pii]. Retrieved from PM:15256293

Kabat-Zinn, J., & Hanh, T. N. (2009). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York, NY: Random House Publishing Group.

Kabat-Zinn, J. (2003). Mindfulness-Based Interventions in Context: Past, Present, and Future.

Clinical Psychology: Science and Practice, *10*(2), 144-156.

Kenner, M., Menon, U., & Elliott, D. G. (2007). Multiple sclerosis as a painful disease. *Int Rev.Neurobiol.*, *79*, 303-321. doi:S0074-7742(07)79013-X [pii];10.1016/S0074-7742(07)79013-X [doi]. Retrieved from PM:17531847

Kozak, A. (2008). Mindfulness in the management of chronic pain: conceptual and clinical considerations. *Tech Reg Anesth Pain Manag*, *12*(2), 115-118.

McCabe, M. P. (2005). Mood and self-esteem of persons with multiple sclerosis following an exacerbation. *J Psychosom.Res*, *59*(3), 161-166. doi:S0022-3999(05)00105-4 [pii];10.1016/j.jpsychores.2005.04.010 [doi]. Retrieved from PM:16198189

Melyani, m., Alahyari, A. A., Azadfallah, p., Fathi Ashtiani, A., & Tavoli, A. (2014). Miulness based Cognitive therapy versus Cognitive Behavioral therapy on predictors of relapse in recurent Depression. *Clinical Psychology and Personality*, *2*(10), 75-86.

Mousavi, A. S., & Ghorbani, N. (2006). Self-knowledge, self-criticism and mental health. *Journal of Psychological Studies*, *2*(3), 75-91.

Papageorgiou, C., & Wells, A. (2004). *Depressive Rumination: Nature, Theory and Treatment*. Chichester, UK: John Wiley & Sons.

Rajabi, G., & Abasi, G. (2012). An investigation of relationship between self-criticism, social interaction anxiety, and fear of failure with internalized shame in students. *Research In Clinical Psychology And Counseling (Studies In Education & Psychology)*, *1*(2), 171-182.

Rasova, K., Havrdova, E., Brandejsky, P., Zalisova, M., Foubikova, B., & Martinkova, P. (2006). Comparison of the influence of different rehabilitation programmes on clinical, spirometric and spiroergometric parameters in patients with multiple sclerosis. *Mult.Scler.*, *12*(2), 227-234. doi:10.1191/135248506ms1248oa [doi]. Retrieved from PM:16629428

Rickards, H. (2005). Depression in neurological disorders: Parkinson's disease, multiple sclerosis, and stroke. *J Neurol Neurosurg.Psychiatry*, *76 Suppl 1*, i48-i52. doi:76/suppl_1/i48 [pii];10.1136/jnnp.2004.060426 [doi]. Retrieved from PM:15718222

Stahl, B., Goldstein, E., Kabat-Zinn, J., & Santorelli, S. (2010). *A Mindfulness-Based Stress Reduction Workbook*. A new Harbinger publications self-help workbook. Oakland, CA: New Harbinger Publications.

Tepavcevic, D. K., Kostic, J., Basuroski, I. D., Stojsavljevic, N., Pekmezovic, T., & Drulovic, J. (2008). The impact of sexual dysfunction on the quality of life measured by MSQoL-54 in patients with multiple sclerosis. *Mult.Scler.*, *14*(8), 1131-1136. doi:1352458508093619 [pii];10.1177/1352458508093619 [doi]. Retrieved from PM:18632783

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: evidence of brief mental training. *Conscious.Cogn*, *19*(2), 597-605. doi:S1053-8100(10)00068-1 [pii];10.1016/j.concog.2010.03.014 [doi]. Retrieved from PM:20363650

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The Effectiveness of Metacognitive Therapy on Positive and Negative Affect and Brain/Behavior Systems of Patients with Migraine Headaches Referring to Clinics and Health Centers in Ahwaz, Iran

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Quantitative Study

Abstract

Background: The present study investigated the effects of metacognitive therapy (MCT) on the positive and negative affect and brain/behavioral systems (BBSs) of patients with migraine headaches referred to clinics and medical centers in Ahwaz city, Iran.

Methods: The participants consisted of 30 men and women with migraine selected using convenience sampling method and based on the diagnosis of a neurologist and the initial interview. The Gray-Wilson Personality Questionnaire (GWPQ) and Positive and Negative Affect Schedule (PANAS) were used in the pretest for all patients. The participants were randomly divided into the experimental (n = 15) and control groups (n =15). Metacognitive intervention was performed during 8 weekly sessions in the experimental group. The questionnaires were again administered to both experimental and control groups in the posttest to determine the effect of the treatment intervention. In this study, multivariate analysis of covariance (MANCOVA) was used to analyze the data in SPSS software. The significance level to test the hypotheses was considered as 0.05.

Results: The individual analysis of the variables illustrated that MCT is effective on negative affect and components of escape war in BBSs and there is a significant correlation between them.

Conclusion: It can be concluded that MCT is effective on positive and negative affect and BBSs of patients with migraine headaches.

Keywords: Metacognition, Affection, Brain, Systems, Migraine

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Introduction

The issue of the body and soul relationship has long been discussed, so that today most experts and those involved in scientific fields believe that a human is a mental, social, and physical being. To know a human being, all three aspects should be considered and it should be noted that the three dimensions

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interact with each other. Belief in the unity of the soul and body, and their interaction with each other has created a discipline in medicine called psychosomatics (Khodayarifard, Sadeghi, & Abedini, 2016).

Psychosomatic disorders such as asthma, stomach ulcers, blood pressure, bone and muscle pain, and headaches make up a group of physical ailments that are caused by psychological problems, or are influenced by extreme psychological stressors. Today, there is a dominant view that almost all physical illnesses are potentially associated with psychological stress. "Specific disorders" is a term that Kaplan and Sadock (2007) used for certain medical disorders in the pathology of which psychological factors have a role. These disorders are of the gastrointestinal system (mental anorexia, mental bulimia, gastric and duodenal ulcers, irritable bowel syndrome, impaired bowel control, diarrhea, and obesity), and cardiovascular system (coronary heart disease, essential hypertension, and mitral valve prolapse). Moreover, these disorders include the respiratory system (asthma, and hyperventilation syndrome), endocrine system (hyperthyroidism, hypothyroidism, thyroid sweet, hypercortisolism, and hyperprolactinemia), skin (atopic dermatitis, psoriasis, psychogenic skin peeling, itching, localized, and extreme sweating), musculoskeletal system (rheumatoid arthritis, systemic lupus erythematosus, back pain, and fibromyalgia), headaches (migraine, cluster, and tension), and cancer psychopathology (psycho-oncology) (Johari-Fard & Ghafourpour, 2015). Comorbidity between mental and physical disorders has a great negative effect on physical patients and it is usually considered a risk factor for their physical conditions (Sadock and Sadock, 2007).

Since stressful experiences, deep states of anxiety and tension, frustration, chronic depression, persistent insomnia, and other negative emotional states can lead to temporary or permanent reduction in the immune system response, and immune system defect or malfunction can result in various psychosomatic disorders, all walks of life and different age groups are vulnerable to these disorder (Liposky, 1985).

Perhaps the simplest definition for a headache is a feeling of pain and discomfort in any part of the head from the eye socket to the back of the head (Green, 2011). One of the most common headaches is migraine headaches that manifest as one-sided, and usually with a pulsating sensation accompanied by nausea, vomiting, and other symptoms of different neurological functioning (Gatchel, Peng, Peters, Fuchs, & Turk, 2007). This type of headache may initially be periodic and associated with stress, and in its chronic form occurs almost every day (Lackner & Quigley, 2005). The start of a migraine headache attack is often associated with severe frustration, stress, depression, oppressed anger, and other emotional factors (Johari-Fard & Ghafourpour, 2015).

Personality traits, as one of the most important psychological factors, have a special place in psychosomatic disorders.

In this regard, Eisler believes that it is more important to know what type of personality has the sickness rather than to understand what kind of disease the person has (Sun-Edelstein & Mauskop, 2009). In order to explain the relationships between personality traits and physical and psychological disorders, one can refer to multiple theories such as the theory of Gray. Based on a research conducted on animals in reinforcement of sensitivity theory, Gray offered a certain biological model of character that consists of three brain/behavior systems.

These brain/behavior systems include behavioral activation systems (BASs), behavioral inhibition systems (BISs), and fight-flight systems (FFSs). Behavioral tendency systems (BTSs), which sometimes are referred to as BASs, are responsible for regulating behavior in response to provocative stimuli (Corr, 2004). People who have high BTS activity are more prone to impulsivity disorders, secondary sociopathy,

bipolar disorder, and attention deficit disorder/hyperactivity disorder (Colder et al., 2011). Moreover, it was found that low BTS predicts depression (Fredrickson & Joiner, 2002). The main areas related to these systems have been reported to be the ventral striatum and orbital frontal cortex (OFC). BIS is responsible for the regulation of behavior in order to respond to stimuli that are associated with conditional aversive events, in particular stimuli associated with punishment, and removing or ending bonuses (Corr, 2004). In other words, this system mediates the response to conditional punishment (which becomes apparent in a passive avoidance in behaviors), non-chilling bonus (which leads to the cessation of the behavior), and negative effects, especially anxiety (Colder et al., 2011).

The overactivity of this system, which has been recognized as responsible for negative feelings, is associated with anxiety-related disorders and the low activity of this system brings about primary psychopathy. Regarding the biological basis of this system, increase in the amount of gray matter in the amygdala and hippocampus is connected with increase in the sensitivity scores related to aversive events. FFS in the Revised Reinforcement Sensitivity Theory (2000) is called perplexity FFS. It was believed that FFS regulated unconditioned aversive responses to stimuli that lead to fear and a quick escape or aggression defense (Colder et al., 2011). In fact, it was considered that FFS is responsible for unconditional bothering stimuli, unconditional punishment, or lack of unconditional reward (fight) or escape behavior (flight) is (Corr, 2004). In terms of its biological structure, this system is mostly modulated through the amygdala and hypothalamus; the high sensitivity and activity of this system is associated with discrete-oriented psychotherapy (Pompili, Cosimo, Innamorati, Lester, Tatarelli, & Martelletti, 2009). This system, despite being independent, interacts with other systems. Individual differences in the functioning of these systems and their interactions form the foundation of human mood.

Affect is defined as a fluctuating reaction that is constantly affected by thinking and cognition of the individual (Efklides, 2006). Research shows the lack of impact of positive affect on the negative affect. Moreover, often with a focus on the relationship between stress, pain, and negative mood, it has been highlighted that people with chronic pain experience negative mood such as depression and anxiety, and with increase in negative mood states, they show more sensitivity to painful stimuli (Efklides, 2011). Many studies have compared BBSs and positive and negative affect in normal and abnormal groups in physical and psychological areas. For example, comparing BBSs in patients with migraine and healthy volunteers showed significant differences between the two groups in terms of components of passive avoidance and silence, but showed no significant differences in the components of active avoidance and FFS (Turner, Jensen, & Romano, 2000). Evaluation of positive and negative affect as a sign of positive and negative functioning is of the utmost importance and is taken into account as one of the predictors of life satisfaction. Most people in their judgment of their level of satisfaction with their lives pay attention to the balance between positive and negative affect that represents the overcome of the positive feeling on their negative feelings (Price, Harkins, & Baker, 1987).

Fredrickson and Joiner (2002) found that negative affect increases the activity of the sympathetic system and the secretion of epinephrine in nerve terminals. It sensitizes pain receptors and leads to increased pain. Moreover, negative affect reduces the level of some of the neuropeptides or neutralizes the effect of opioids that are built in the body to moderate experience. This may lead to a decrease in pain tolerance and increase in pain intensity.

It has been proved that thoughts have a significant effect on psychological and

affectual well-being. The basic assumption of the metacognitive approach is that psychological disorders are the result of the expansion and spin of some thoughts and denial and cessation of some others. In fact, the way we respond to our thoughts can lead to affectual suffering (Papageorgiou & Wells, 2009). Metacognitive therapy (MCT), like the cognitive-behavioral model, considers psychological disorders to be the result of distorted thinking; however, these two approaches differ in the explanatory strategy of distorted thinking and its nature and causes. Negative beliefs do not necessarily lead to disruptive thought patterns and sustainable emotional suffering. Metacognitive theory suggests that psychological disorders are the product of sub-metacognitions that have many differences with other thoughts and beliefs emphasized in cognitive-behavioral therapy (CBT) (Papageorgiou & Wells, 2009). MCT, instead of considering emotional problems as the same as self-thoughts, considers a painful internal state as completely related to processes of ineffectiveness, concern, worrying, and mental control strategies. Metacognition always focuses on internal cognitive factors that have the duty of controlling, revising, monitoring, and evaluating thoughts. Metacognition can be divided into three general categories of metacognitive knowledge (for example, "to meet the requirements, I should be concerned"), metacognitive experiences (for example, the feeling of knowing), and metacognitive strategies (for example, ways to control the thoughts and beliefs protection). Based on the metacognitive approach, treatment should include elimination of worry and rumination, letting go of threat-seeking strategies, concern to people to experience intrusive thoughts without avoiding, their reacting through inefficient strategies or strategies including exaggeration of thoughts or worry. Since this treatment does not emphasize challenging thoughts or beliefs related to traumatic events or frequent confrontation with traumatic memories, it is different from the cognitive-behavioral approach (Papageorgiou & Wells, 2009). Patients with migraine headaches have certain personality traits that at the onset may have an effect on the severity of headaches. According to studies, migraine patients are mostly concerned, anxious, and obsessive. These traits lead to internalization of affects and headaches that can become migraine headaches with chronicity and lack of attention to personality traits of the person (Weeks, Baskin, Rapoport, Sheftell, & Arrowsmith, 1983).

Comparison of BBSs in patients with migraine and healthy people showed that the two groups have significant differences in the components of passive avoidance and silence; however, their differences in the components of active avoidance approach and FFS are not significant (Crombez, Eccleston, Van den Broeck, Van, & Goubert, 2002).

In a study, it was found that people with migraine headaches, due to headache, are sensitive to punitive symptoms with higher possibility. Therefore, it can be expected that the BIS, which has the responsibility to respond to punishment and its symptoms, is more active in these people. The results suggest that over time people with migraines learn to avoid these stimulants through the activity of the BIS; this results in the higher activity of BIS in people with migraine (BashiriNejadian, Heidari, & Bakhtiarpoor, 2014).

The comparison of anxiety, depression, brain-behavioral system, coping styles, anger, and hostility between women with asthma and non-infected individuals showed higher anxiety, depression, and activity of BIS, and lower activity of BAS in women with asthema (Colder et al., 2011).

In a study on people with high blood pressure, Corr (2004) found that sensitivity to punishment (which is a characteristic of BIS) and self-efficacy are interacting in elevated systolic blood pressure and heart rate. The results showed that sensitivity to punishment

and self-efficacy have a negative relationship with cardiovascular index. Balderson, Lin, and Von Korff (2004) have showed the role of positive and negative affect in pain. Some studies have shown that 40 to 50% of patients with chronic pain suffer from depression.

Depression is usually associated with pain through one's assessment of the impact of pain in life and ability to control pain, and the belief in one's ability to function. Increased autonomic arousal intensifies pain and reduces motivation for compliance with treatment and pain control. Anxiety can cause functional disability and intensification of pain in patients with chronic pain through the desire to avoid previous behavior and activities (Zautra, Smith, Affleck, & Tennen, 2001). It should be noted that the experience of pain has a negative relationship with positive affect such as happiness and optimism, so that these affects relieve pain in people with chronic pain (Sullivan, Tripp, & Santor, 2000).

In a study, the relationship between physical pleasure and positive and negative affects was evaluated in students of the University of Isfahan, Iran. The results showed that the higher the students' physical pleasure is, the higher their positive affect is. In addition, the pleasure of kindness has a relationship with positive affect in the past and total positive affect, and can significantly predict 6.8% of total positive affect. However, increasing physical pleasure had no relation with negative affect (Vervoort, Eccleston, Goubert, Buysse, & Crombez, 2010).

Higher weekly positive affect and higher average of positive affect, either directly or indirectly, in dealing with pain and stress resulted in lower levels of negative affect. Increase in weekly negative affect and higher average of negative affect were associated with greater levels of pain in the coming weeks. In contrast, a higher level of positive affect is a predictor of pain in the coming weeks.

Methods

The study population included all patients with migraine who referred to neurology clinics and centers in Ahvaz, Iran, in the fall of 2015. The number of subjects, according to research design and type, was 30 people, who were selected through convenience sampling.

These subjects were randomly assigned to two groups of 15 individuals (control and experimental groups). Since biopsychosocial factors have a facilitator role in the development and exacerbation of migraines- and each of them has a special relationship with personality traits and psychological factors of the person- the attempt to control the most common of these factors was the study inclusion criteria, so that a precise explanation of the activity of the study variables could be achieved. As a result, the inclusion criteria consist of the following:

1. The diagnosis of migraines by a neurologist
2. Lack of drug abuse
3. The lack of proven physical and mental diseases associated with migraine
4. The lack of use of hormones and oral contraceptives

The Gray-Wilson Personality Questionnaire (GWPQ): The Gray-Wilson Personality Questionnaire (GWPQ) assesses the activity of BBSs and their components, is a character self-assessment questionnaire designed by Wilson, Barrett, and Gary in 1989, and consists of 120 items. BBSs that are measured by this questionnaire include BAS, BIS, and FFS. Each of these systems are described at three levels: the behavioral level (analysis of internalization/externalization), neural level (brain functioning and structure), and cognitive level (the uses of information processing derived from the related neural processes) (Wilson, Gray, & Barrett, 1990).

BAS is sensitive to conditional signs of reward and punishment removal. Two behavioral components of this system are tendency (active seeking of reward) and active avoidance (showing special behavior to avoid punishment). BIS is sensitive to conditional signs of punishment and reward removal. Its two behavioral components include passive avoidance (avoiding punishment by inactivity

or surrender) and silence (cessation of behaviors that do not have rewards).

FFS is sensitive to unconditional aversive stimuli. Its two behavioral components include fight (aggression defensive rather than offensive aggression) and flight (flight from the source of the threat) (Wilson et al., 1990). Wilson et al. (1990) evaluated the validity of this questionnaire. They obtained Cronbach's alpha coefficients of 0.71, 0.61, 0.58, 0.61, 0.65, and 0.65 for men and 0.68, 0.35, 0.59, 0.63, 0.71, and 0.71 for women for the components of tendency, active avoidance, passive avoidance, silence, and fight and flight, respectively. These coefficients indicate the good internal consistency of the questionnaire. Moreover, using the correlation between GWPQ components and Eysenck Personality Questionnaire (EPQ), they showed the convergent validity of the GWPQ. In this study, the reliability of each of the subscales of GWPQ was calculated using Cronbach's alpha, which were, respectively, 0.74, 0.63, and 0.68 for the subscales of activation, inhibition, and fight and flight.

Positive and Negative Affect Schedule: The Positive and Negative Affect Schedule (PANAS) was prepared and presented by Watson, Clark, and Tellegen, and assesses 20 affects (10 positive and 10 negative affects) in the form of words, which are generally evaluated using a 5-point scale (ranging from 1 = not at all to very high = 5). The Cronbach's alpha coefficient of this scale has been reported to be 0.85, and the internal correlation coefficients of the scale and its components, which were in the range of 0.74-0.94 and all were meaningful, provided evidence of its construct validity. The validity of the test in terms of recovery with an interval of 8 weeks is 0.68 in the positive affect subscale and 0.71 in the negative affect subscale (Watson, Clark, & Tellegen, 1988). In terms of validity, the correlation of these subscales with some assessment tools that assess structures related to these affects such as anxiety and depression has been reported. The validity of the test has been reported by the Beck Depression Inventory as 0.23-0.58 (Watson & Tellegen, 1985). In this study, the reliability of each of the subscales was calculated using Cronbach's alpha; thus, the reliability of the positive and negative affect subscales was 0.70 and 0.75, respectively.

Results

The distribution of the participants in this study in terms of gender indicates that 3 (20%) experimental group participants were men and 12 (80%) were women. The control group consisted of 6 (40%) male and 9 (60%) female patients.

The contents of table 1 show that MCT has been effective on at least one of the dependent variables, i.e., positive affect, negative affect, and BBSs. For further examination, one-way analysis of covariance (ANCOVA) in the context of MANCOVA was conducted on each of the dependent variables. Table 2 shows one-way ANCOVA in the context of MANCOVA on the score of both dependent variables (positive and negative affect, BAS, BIS, and FFS).

Results in table 2 show that ANCOVA is significant in the negative affect variable (P = 0.301 and F = 1.117) and the fight-flight variable (P = 0.021 and F = 6.158).

Table 1. Multivariate analysis of covariance on the scores of dependent variables (positive and negative affect, behavioral activation system, behavioral inhibition system, and fight and flight system)

	Effect size	P	df error	The degree of freedom Hypothesis	F	Value
Pillai'sTrace	0.787	0.001	19	5	13.658	0.782
Wilks' Lambda	0.787	0.001	19	5	13.658	0.218
Hotelling's Trace	0.787	0.001	19	5	13.658	3.254
Roy’s Largest Root	0.787	0.001	19	5	13.658	3.594

Table 2. The results of one-way analysis of covariance in the context of MANCOVA on the score of the dependent variables

The dependent variable	Eta coefficient	P	F	Sum of squares	df	Sum of squares
Positive Affect	0.023	0.474	0.531	11.549	1	11.549
Negative Affect	0.556	0.001	28.762	925.748	1	925.748
Behavioral activation system	0.046	0.301	1.117	36.422	1	36.422
Behavioral inhibition system	0.095	0.134	2.412	140.329	1	140.329
Fight-flight system	0.211	0.021	6.158	226.023	1	226.023

Thus, it can be stated that MCT significantly reduced negative affect and fight-flight variable in migraine patients. ANCOVA was not significant in positive affect (P = 0.474 and F = 0.531), BAS (P = 0.301 and F = 1.117), and BIS (P = 0.34 and F = 2.412); thus, it can be stated that MCT has not created significant changes in positive affect, BAS, and BIS in migraine patients.

Discussion

The aim of this study was to investigate the effectiveness of MCT on positive and negative affect and behavioral and brain systems in migraine patients referring to clinics and medical centers in Ahvaz. In this regard, statistical analysis used was multivariate analysis of variance (MANOVA) with pretest scores control. The findings can be summarized in the significant reduction in negative affect and FFS as a result of the intervention in the experimental group compared to the control group (did not receive the intervention). In other words, the second and fifth hypotheses of the study were confirmed.

According to the results, the main research hypothesis was confirmed, and it can be said that MCT caused a significant change in the dependent variables (positive and negative affect, BAS, BIS, and FFS) in the posttest and the changes were statistically significant in relation to changes in the control group. In other words, the main research hypothesis was confirmed. Although a similar study simultaneously examining all these variables was not found, generally, this result is consistent with the findings of similar researches. The results show that MCT has not significantly changed positive affect in patients with migraine and hypothesis one was not confirmed. In other words, the process of treatment with MCT in patients with migraine, compared to the control group, has not been able to make significant changes in positive affect in the patients. This finding is inconsistent with the findings of other researches on the impact of MCT such as that by Ivory and Kambouropoulos (2012). The aim of MCT is not to influence positive affects, but to treat problematic thoughts and affects are taken into consideration. Even if positive affects are not included in the process of treatment, as patients with migraine deal with a chronic disease, they are more inclined to use any learned technique or method associated with negative and annoying thoughts and not is all their thoughts.

Moreover, MCT has significantly reduced negative affect in migraine patients, and therefore, the second hypothesis was confirmed. In the other words, the process of MCT has caused a significant reduction in negative effect in migraine patients compared to the control group. Negative affect increases the activity of the sympathetic system and the secretion of epinephrine in nerve terminals. It sensitizes pain receptors and leads to increased pain. Moreover, negative affect reduces the level of some neuropeptides or neutralizes the effect of opioids produced by the body to moderate the pain experience. This may lead to a decrease in pain tolerance and increase in pain intensity. According to said the abovementioned facts, the role of negative affect in the perception of pain in migraine patients is quite clear.

The results showed that MCT has not led to significant alterations in BAS in migraine patients, and the third hypothesis was not confirmed. In other words, the process of MCT in patients with migraine, compared to the control group, could not create significant changes in BAS. In this regard, a study that is exactly in line with the present study was not found. The overall results of this study are inconsistent with the results of studies on the efficiency of MCT on clinical symptoms or clinical disorders, such as the study by Tota-Faucette, Gil, Williams, Keefe, and Goli (1993). To explain these findings, we must first consider the fact that in many studies, no significant differences have been observed between patients and healthy subjects in terms of this BBS. Maybe treatments focus more on the negative aspects and avoiding losses, which are less involved in the activation system. Therefore, individuals in the experimental and control groups, most likely because of the activity of this system for removing obstacles, try to look for positive outcomes.

According to the results obtained, it can be said that MCT has not caused significant changes in BIS in migraine patients and hypothesis 4 was not confirmed. In other words, the process of treatment with MCT in patients with migraine, compared to the control group, has failed to make significant changes in BIS. In this regard, a study that is exactly in line with the present study was not found. The overall results are inconsistent with the results of previous studies on the effectiveness of MCT on clinical symptoms or disorders, such as the study by Tota-Faucette et al. (1993). Migraine sufferers, due to their migraine headache, are more likely to be sensitive to punitive signs. In patients with migraine with aura, symptoms such as nausea and fear of light can be seen as a sign of punishment or reward removal. Perhaps migraine sufferers, with time, learn that they should avoid these stimuli by BIS, the outcome of this process is that the activity of BIS is higher in people with migraine and the results of previous researches approve this (Pompili et al., 2009).

According to the results obtained, it can be said that MCT has significantly reduced FFS in migraine patients and hypothesis 5 was confirmed. In other words, the process of MCT has led to a significant reduction in FFS in migraine patients compared to the control group. In this regard, a study that is exactly in line with the present study was not found; however, the overall results of this study are consistent with the results of researches on the effectiveness of MCT on clinical symptoms or disorders, such as the study by Tota-Faucette et al. (1993). To explain this finding, the effects of cognitions on pain and pain perception should be considered. Assessments and cognitive beliefs regarding pain can have serious effects on the emotional and behavioral responses of the individual to pain. If a signal sign is interpreted as traumatic pain (threat assessment) and the individual believes that he/she has suffered an actual or potential injury, the sign may be perceived as intolerable and more elusive behaviors and avoidance may be recalled. For example, cancer-related pain is assessed as more intolerable than labor pain (Price et al., 1987). In addition, estimates and beliefs associated with pain are important determinants in coping with chronic pain (Jensen, Turner, Romano, & Karoly, 1991).

Conflict of Interests

Authors have no conflict of interests.

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References

Balderson, B. H. K., Lin, E. H. B., & Von Korff, M. (2004). The management of pain-related fear in primary care. In G. Asmundson, J. Vlaeyen, & G. Crombez (Eds.), *Understanding and Treating Fear of Pain* (1st ed., pp. 267-292). Oxford, UK: Oxford University Press.

BashiriNejadian, A., Heidari, A., & Bakhtiarpoor, S. (2014). The comparison of brain-behavioral systems and positive and negative affect between patients with migraine and healthy individuals. *Journal of Developmental Psychology (Iranian Psychologist), 11*(42), 195-208.

Colder, C. R., Trucco, E. M., Lopez, H. I., Hawk, L. W., Jr., Read, J. P., Lengua, L. J. et al. (2011). Revised Reinforcement Sensitivity Theory and Laboratory Assessment of BIS and BAS in Children. *J Res Pers., 45*(2), 198-207. Retrieved from PM:21603055

Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neurosci Biobehav Rev, 28*(3), 317-332.

Crombez, G., Eccleston, C., Van den Broeck, A., Van, H. B., & Goubert, L. (2002). The effects of catastrophic thinking about pain on attentional interference by pain: no mediation of negative affectivity in healthy volunteers and in patients with low back pain. *Pain.Res Manag., 7*(1), 31-39. doi:10.1155/2002/576792 [doi]. Retrieved from PM:16231065

Efklides, A. (2011). Interactions of Metacognition with Motivation and Affect in Self-Regulated Learning: The MASRL Model. *Educ Psychol, 46*(1), 6-25.

Efklides, A. (2006). Metacognition and affect: What can metacognitive experiences tell us about the learning process? *Educ.Res.Rev., 1*(1), 3-14.

Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychol Sci, 13*(2), 172-175. doi:10.1111/1467-9280.00431 [doi]. Retrieved from PM:11934003

Gatchel, R. J., Peng, Y. B., Peters, M. L., Fuchs, P. N., & Turk, D. C. (2007). The biopsychosocial approach to chronic pain: scientific advances and future directions. *Psychol Bull, 133*(4), 581-624. doi:2007-09203-002 [pii];10.1037/0033-2909.133.4.581 [doi]. Retrieved from PM:17592957

Green, M. W. (2011). Headaches: Psychiatric Aspects. *Neurol Clin., 29*(1), 65-80.

Ivory, N. J., & Kambouropoulos, N. (2012). Coping mediates the relationship between revised reinforcement sensitivity and alcohol use. *Pers Individ Dif., 52*(7), 822-827.

Jensen, M. P., Turner, J. A., Romano, J. M., & Karoly, P. (1991). Coping with chronic pain: a critical review of the literature. *Pain., 47*(3), 249-283. Retrieved from PM:1784498

Johari-Fard, R., & Ghafourpour, R. (2015). The Effectiveness of Unified Treatment Approach on Quality of Life and Symptoms of Patients with Irritable Bowel Syndrome Referred to Gastrointestinal Clinics. *Int J Body Mind Culture, 2*(2), 85-94.

Khodayarifard, M., Sadeghi, K., & Abedini, Y. (2007). Cognitive-behavioral family therapy combined with chiropractic in treatment of psychosomatic disorders. *Research in Psychological Health, 1*(1), 5-15.

Lackner, J. M., & Quigley, B. M. (2005). Pain catastrophizing mediates the relationship between worry and pain suffering in patients with irritable bowel syndrome. *Behav.Res Ther, 43*(7), 943-957. doi:S0005-7967(04)00177-9 [pii];10.1016/j.brat.2004.06.018 [doi]. Retrieved from PM:15896288

Papageorgiou, C., & Wells, A. (2009). A prospective test of the clinical metacognitive model of rumination and depression. *Int J Cogn Ther, 2*(2), 123-131.

Pompili, M., Di, Cosimo D., Innamorati, M., Lester, D., Tatarelli, R., & Martelletti, P. (2009). Psychiatric comorbidity in patients with chronic daily headache and migraine: A selective overview including personality traits and suicide risk. *J Headache.Pain., 10*(4), 283-290. doi:10.1007/s10194-009-0134-2 [doi]. Retrieved from PM:19554418

Price, D. D., Harkins, S. W., & Baker, C. (1987). Sensory-affective relationships among different types of clinical and experimental pain. *Pain., 28*(3), 297-307. doi:0304-3959(87)90065-0 [pii]. Retrieved from PM:2952934

Sadock, B. J., & Sadock, V. A. (2007). *Kaplan & Sadock's synopsis of psychiatry: Behavioral sciences/clinical psychiatry, 10th ed*. Philadelphia, PA: Lippincott Williams and Wilkins.

Sullivan, M. J. L., Tripp, D. A., & Santor, D. (2000). Gender Differences in Pain and Pain Behavior: The Role of Catastrophizing. *Cognit Ther Res, 24*(1), 121-134.

Sun-Edelstein, C., & Mauskop, A. (2009). Foods and supplements in the management of migraine headaches. *Clin.J Pain., 25*(5), 446-452. doi:10.1097/AJP.0b013e31819a6f65 [doi];00002508-200906000-00015 [pii]. Retrieved from PM:19454881

Tota-Faucette, M. E., Gil, K. M., Williams, D. A., Keefe, F. J., & Goli, V. (1993). Predictors of response to pain management treatment. The role of family environment and changes in cognitive processes. *Clin.J Pain., 9*(2), 115-123. Retrieved from PM:8358134

Turner, J. A., Jensen, M. P., & Romano, J. M. (2000). Do beliefs, coping, and catastrophizing independently predict functioning in patients with chronic pain? *Pain., 85*(1-2), 115-125. doi:S0304-3959(99)00259-6 [pii]. Retrieved from PM:10692610

Vervoort, T., Eccleston, C., Goubert, L., Buysse, A., & Crombez, G. (2010). Children's catastrophic thinking about their pain predicts pain and disability 6 months later. *Eur.J Pain., 14*(1), 90-96. doi:S1090-3801(09)00052-4 [pii];10.1016/j.ejpain.2009.03.001 [doi]. Retrieved from PM:19359203

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers.Soc Psychol, 54*(6), 1063-1070. Retrieved from PM:3397865

Watson, D., & Tellegen, A. (1985). Toward a

consensual structure of mood. *Psychol Bull., 98*(2), 219-235.

Weeks, R., Baskin, S., Rapoport, A., Sheftell, F., & Arrowsmith, F. (1983). A comparison of MMPI personality data and frontalis electromyographic readings in migraine and combination headache patients. *Headache., 23*(2), 75-82. Retrieved from PM:6853156

Wilson, G. D., Gray, J. A., & Barrett, P. T. (1990). A factor analysis of the Gray-Wilson Personality Questionnaire. *Pers Individ Dif., 11*(10), 1037-1045.

Zautra, A., Smith, B., Affleck, G., & Tennen, H. (2001). Examinations of chronic pain and affect relationships: applications of a dynamic model of affect. *J Consult.Clin.Psychol, 69*(5), 786-795. Retrieved from PM:11680555

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The Efficacy of Acceptance and Commitment Therapy on Psychological Well-Being and Optimism of Patients with Irritable Bowel Syndrome

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Quantitative Study

Abstract

Background: Despite the high prevalence and marked symptoms of irritable bowel syndrome (IBS), its cause is still not known. It seems that psychological factors play a significant role in the development and intensification of the symptoms of the disease, but there is still no definitive treatment for this disease. The purpose of the present study was to determine the effectiveness of admission and commitment therapy (ACT) on the psychological well-being and optimism of patients with IBS.

Methods: This study was conducted with a quasi-experimental and pretest-posttest design, control group, and follow-up period. The statistical population of this study included people with IBS referring to health centers in Tehran, Iran, in 2018. The study sample consisted of 60 individuals who were selected by through convenience sampling method and were divided into two groups (n = 30 people). The subjects were randomly assigned to the experimental and control groups. The data collection tools were the Ryff Scales of Psychological Well-Being Scale (RSPWB) (Ryff, 1989), and the Life Orientation Test (LOT) (Scheier, Carver, & Bridges, 1994). First, the pretest was performed in both groups. The experimental group was then placed in a test group for 9 sessions (90 minutes). The collected data were analyzed using multivariate covariance analysis (MANCOVA) and one-way analysis of covariance (ANCOVA).

Results: The results showed that ACT was effective on the psychological well-being and optimism of patients with IBS.

Conclusion: It can be concluded that interventions based on the acceptance and commitment approach help to improve the optimism of people with IBS.

Keywords: Acceptance and commitment therapy, Psychological well-being, Optimism, Irritable bowel syndrome

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Introduction

Irritable bowel syndrome (IBS) is a chronic functional disorder of the digestive tract. Patients experience abdominal pain and various intestinal symptoms in the absence of any structural or biological abnormalities. Symptoms of this syndrome may be associated with diarrhea, constipation, or the

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combination of both (Lembo et al., 2016). This disorder is common in all socioeconomic groups, causing absenteeism, interpersonal disturbance, avoidance of sexual intercourse, and even prevention of attendance due to fear of the onset of symptoms. The global prevalence of IBS is estimated at 11% (Distrutti, Monaldi, Ricci, & Fiorucci, 2016). The prevalence of this syndrome in Iran, in our review article, was reported to be between 1% and 25%. A recent study has revealed a prevalence of 21.5% for IBS in Iran (Keshteli, Dehestani, Daghaghzadeh, & Adibi, 2015). This syndrome affects both genders at different ages, although its prevalence in women is higher due to the potential role of sex hormones in IBS (Tap et al., 2017).

IBS is a distressing state that can damage a person's psychological well-being. Psychological bias refers to the experienced quality of life (QOL) and reflects the desired psychological performance and experience. Initially, this concept was studied in terms of the lack of depression and anxiety. Wellbeing is a state of satisfaction with happiness, health, and success, which refers to the desired psychological experience and practice. Well-being includes dimensions such as self-esteem, individual development, goal of life, positive relationships with others, environmental dominance, ability to effectively manage personal life and the surrounding world, and sense of autonomy (Frühauf, Niedermeier, Elliott, Ledochowski, Marksteiner, & Kopp, 2016). The essential part of living well is, from the point of view of scholars, an emotional, inner, and psychological well-being in which every individual loves his/her life. The feeling of well-being has two emotional and cognitive components. People with a high sense of well-being mainly experience positive emotions and are well aware of events and events surrounding themselves, while those with low levels of well-being assess incidents and situations more negatively, and present more negative emotions such as anxiety, depression, and anger (Lombardi et al., 2017).

One of the other components affected by IBS is the individual's optimism. Optimism or positive thinking, which is considered a positive personality trait, is one of the main categories of positive psychology approach that has gained prominence in the field of psychological development, and family and mental health psychology during the last decade (Sweeny & Falkenstein, 2017). Optimism or positive thinking refers to an orientation toward expecting positive outcomes and considering these consequences as fixed, general, and internal factors (Ramirez-Maestre, Esteve, Lopez-Martinez, Serrano-Ibanez, Ruiz-Parraga, & Peters, 2019). In other words, optimism or positive thinking is the most hopeful view of consequences and assessment of the outcomes of life, and a pre-emotional and cognitive prediction that good things are more important than bad things (Ruan, Wilson, & Mihalcea, 2016). Studies show that optimism and generally positive beliefs have a positive and significant relationship with different dimensions of health, and play an important role in the prevention of physical and psychological disorders and increased mental health (Burleson & Lewis, 2016). Taylor, Kemeny, Reed, Bower, and Gruenewald (2000) also argue that the normal perceptions of individuals with a positive concept of self, personal control, and an optimistic, even false, perspective on the future, not only control daily living issues, but also help them cope with extremely stressful and life-threatening events.

Considering the issues raised and the high prevalence of IBS patients who show a low level of psychological well-being and optimism, increasing these variables through different therapy methods seems necessary. One of these treatments is based on admission and commitment. Acceptance and commitment therapy (ACT) is rooted in a philosophical theory called functional context and based on a research program on language and cognition that is thought to be the framework for mental relationships

(Trompetter, Bohlmeijer, Veehof & Schreurs, 2015). The purpose of this therapeutic approach is to help individuals achieve a more valuable and satisfying life through increased psychological flexibility; ACT achieves psychological flexibility through the 6 central processes of acceptance, defusion, being present, self as context, values, and committed action (Crosby & Twohig, 2016). Cognitive defusion means that the individual sees himself and his thoughts as one. Faulting is to accept that our thoughts are separate from us and are nothing more than temporary private events. Admission is the creation of a space for feelings, senses, desires, and other unpleasant private experiences without trying to change them, escape from them, or re-focus on them. Being present is to bring the whole experience into consciousness here and now with openness, interest, acceptance, focus, and full engagement with what is being done (Simister, Tkachuk, Shay, Vincent, Pear, & Skrabek, 2018)). Self-observation is a constant awareness of the self, which does not change and is always present and resistant to damage. From this perspective, the experience of thoughts and feelings, memories, desires, senses, images, roles, or even the physical body is something different from the self. These phenomena are changing, but the individual remains constant. Values and engagement in practice mean that the individual identifies what is most important and deepest to him, sets goals based on them, and acts purposely and effectively to achieve them. Sadeghpour-Moradi, Nasirian, and Chabokinejad (2017) showed that ACT has a significant effect on the level of happiness and optimism of the spouses of men with multiple sclerosis (MS). ACT has an important role in increasing psychological flexibility in the psychological and cognitive structure of individuals and in decreasing many psychological symptoms (Walser, Garvert, Karlin, Trockel, Ryu & Taylor, 2015). Moreover, ACT was effective in improving mental distress, psychological flexibility, self-esteem in behavior management, and differences between couples with children with acquired brain injury (Brown, Whittingham, Boyd, McKinlay, & Sofronoff, 2015). The goal of the present study was to determine the effectiveness of ACT on the psychological well-being and optimism of patients with IBS.

Methods

This semi-experimental research was conducted with two groups (test group and control group) and consisted of 3 stages, pretest, posttest, and follow-up. The statistical population of this study included people with IBS referring to health centers in Tehran, Iran, in 2018. The study sample consisted of 60 people who were selected through convenience sampling method and were divided into two groups (30 subjects).

Ryff Scales of Psychological Well-Being (RSPWB): This scale was designed by Ryff in 1980 and reviewed in 2002. The questionnaire assesses the 6 factors of autonomy, environmental domination, personal growth, positive relationship with others, purposefulness in life, and admission. The total score of psychological well-being is calculated as the sum of the scores of these 6 subscales. In this form, each factor consists of 14 questions, which are scored on a 6-point scale ranging from completely agree to completely disagree. Higher scores in the RSPWB indicate greater psychological well-being (Shaghaghi & Rezaei Kargar, 2010). The validity and reliability of this scale have been reported in numerous studies. The validity coefficients of this questionnaire have been reported to be 0.88 and 0.87, respectively, using Cronbach's alpha and double-summing for the whole scale. Moreover, the coefficient of re-test for the whole scale was reported as 76% and for the sub-components in the range of 0.63-0.75 (Zanjani-Tabassi, 2004). Van Dierendonck (2004) found the internal consistency to be appropriate and Cronbach's alpha to be in the range of 0.77-0.90. The Cronbach's alpha coefficient for the subscales

of positive relation with others, autonomy, environmental domination, personal growth, purposefulness in life, and admission was 0.72, 0.81, 0.82, 0.71, and 0.82 (Shaghaghi & Rezaei Kargar, 2010). In this study, the reliability (using Cronbach's alpha) of the whole questionnaire was 0.79 and that of the subscales of self-acceptance, positive relationships with others, self-determination, purposefulness in life, environmental domination, and personal growth was 0.77, 0.85, 0.85, 0.77, 0.79, and 0.81, respectively.

Life Orientation Test: The Life Orientation Test (LOT) was designed and revised by Scheier, Carver, and Bridges (1994) with the aim of assessing optimism. The LOT consists of 10 questions and scored on a 5-point scale ranging from 0 (completely disagree) to 4 (I totally agree). Scheier et al. (1994) reported that the Cronbach's alpha coefficient of the LOT was 0.76 and its test-retest coefficient was 0.79 (for a period of 4 weeks) for a student group. In addition, the optimistic factor analysis and its related structures showed that optimistic nature is an independent and distinct factor, which shows the differential validity of this structure. This test has been translated into Persian by Khodabakhshi (2004) and has been validated in Iran. The reliability of the LOT using Cronbach's alpha and test-retest were 0.74 and 0.78, respectively. Furthermore, in the present study, the reliability coefficient of the LOT using Cronbach's alpha coefficient was 0.72.

Results

The null assumption for the equation of variance of the two groups was confirmed in the research variables. In other words, the equation of variance of the scores was confirmed in both experimental and control groups. The null assumption was confirmed for the normal distribution of the scores of the two groups in the research variables. That is, the assumption of the normal distribution of scores in the pretest was confirmed in both test and control groups. The F value of the interaction was not significant for the same slope of the regression line for any of the variables in the research. In other words, the homogeneity of the slope of the regression line is accepted.

Table 1. Mean ± standard deviation of the study variables in the pretest, posttest, and follow-up

Variables	Group	Pretest	Posttest	Follow-up
		Mean ± SD	Mean ± SD	Mean ± SD
Positive relationships with others	Experimental	11.1 ± 1.1	13.6 ± 1.1	14 ± 1
	Control	10.6 ± 0.97	10.8 ± 1.1	11 ± 0.84
Autonomy	Experimental	10.8 ± 0.67	13 ± 0.53	13.4 ± 0.63
	Control	11 ± 0.84	10.6 ± 1.1	11.1 ± 0.96
Environmental domination	Experimental	11.8 ± 0.74	14.9 ± 1.1	15.1 ± 0.88
	Control	12.2 ± 0.70	12.4 ± 0.91	12.5 ± 1.1
Personal growth	Experimental	10.1 ± 0.70	13.1 ± 0.74	12.8 ± 0.91
	Control	10 ± 0.84	10.1 ± 1.1	10.4 ± 0.99
Purposefulness in life	Experimental	10.4 ± 0.63	13.6 ± 0.89	13.8 ± 0.77
	Control	10.5 ± 0.51	10.6 ± 1.1	11.1 ± 1.1
Admission	Experimental	11.4 ± 1.7	13.2 ± 1.6	13.9 ± 1.3
	Control	10.4 ± 1.3	10.9 ± 1.3	11.2 ± 1.1
Psychological well-being	Experimental	65.7 ± 3.1	81.6 ± 2.8	82.1 ± 3.2
	Control	64.9 ± 2.3	65.6 ± 2.1	66 ± 2.1
Optimism	Experimental	7.3 ± 1.8	11.1 ± 2.1	11.7 ± 2.8
	Control	7.2 ± 1.1	8.2 ± 1.2	8.11 ± 1.1
Pessimism	Experimental	11.4 ± 1.1	8.4 ± 1.2	8.8 ± 1.2
	Control	12.2 ± 0.79	11.8 ± 0.67	11.4 ± 1.1

Table 2. Results of multivariate covariance analysis on the mean posttest scores of psychological well-being and optimism of the experimental and control groups with pretest control

Test	Value	df hypothesis	df error	F	P	Eta square
Pillai's effect	0.57	11	36	34.36	0.0001	0.57
Wilks' Lambda	0.01	11	36	34.36	0.0001	0.57
Hotteling effect	65.2	11	36	34.36	0.0001	0.57
Roy's Largest Root	65.2	11	36	34.36	0.0001	0.57

df: Degree of freedom

Table 2 indicates that the effect or difference is equal to 57.7, that is, 57% of the individual differences in posttest scores of psychological well-being and optimism is related to the impact of ACT (group membership).

Table 3 indicates differences between the experimental group and control group in terms of positive relationships with others ($P < 0.0001$, $F = 59.06$), independence ($P < 0.0001$, $F = 84.25$), environmental domination ($P < 0.0001$, $F = 65.13$), personal growth ($P < 0.0001$, $F = 124.25$), purposefulness in life ($P < 0.0001$, $F = 120.41$), admission ($P < 0.0001$, $F = 29.31$), psychological well-being ($P < 0.0001$, $F = 101.26$), optimism ($P < 0.0001$, $F = 85.53$), and pessimism ($P < 0.0001$, $F = 51.07$).

Discussion

The findings of this study showed that ACT has a significant effect on psychological well-being and optimism in patients with IBS. This finding was consistent with the findings of Sadeghpour-Moradi et al. (2017), Walser et al. (2015), and Brown et al. (2015).

Therefore, ACT helps individuals to accept existing conditions and avoid unnecessary conflicts and fusion with unwanted thoughts associated with it while at the same time it helps them realize other values of life. From the point of view of acceptance-based treatment and commitment-avoidance of experiences, the ACT treatment process creates harm that contributes to the creation and spread of controversy. Hofmann and Asmundson (2008) argue that admission leads to fundamental changes, and opens up space for individuals to think and feel their thoughts without trying to change, and thus, they feel that they have changed..

According to the findings, ACT has an effect on the improvement of optimism in patients with IBS. Cognitive separation is taught in counseling sessions based on admission and commitment, that is, psychological flexibility, psychological awareness, and cognitive separation. Cognitive separation makes people see their problems out of hand and talk about them more easily, and this helps them to clearly identify their personal values, and thus, to alter specific behavioral goals.

Table 3. Results of one-way analysis of covariance

Variables	SS	df	MS	F	P	Eta square
Positive relationships with others	49.9	1	49.9	59.1	0.0001	0.68
Autonomy	43.9	1	43.9	82.4	0.0001	0.75
Environmental domination	52.7	1	52.7	65.1	0.0001	0.70
Personal growth	64.9	1	64.9	124.2	0.0001	0.82
Purposefulness in life	73.4	1	73.4	120.4	0.0001	0.81
Admission	15.3	1	15.3	29.3	0.0001	0.52
Psychological well-being	160.3	1	160.3	101.2	0.0001	0.79
Optimism	100.6	1	100.6	85.5	0.0001	0.76
Pessimism	37.9	1	37.9	51.1	0.0001	0.65

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

In addition, in subsequent sessions that focus on increasing mental awareness, people reevaluate their positive and negative viewpoints and try to form a correct judgment about their problems. The acceptance and commitment approach, instead of focusing on the elimination and removal of harmful factors, helps clients to accept their controlled emotions and self-control. From the treatment perspective, acceptance and commitment to avoid experiences create a process of harm that contributes to the creation and spread of conflicts. ACT makes it possible to change relationships with experiences, reduce empirical avoidance, increase flexibility, and increase action in meaningful paths (Hayes, Strosahl, & Wilson, 2012).

Conflict of Interests

Authors have no conflict of interests.

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References

Brown, F. L., Whittingham, K., Boyd, R. N., McKinlay, L., & Sofronoff, K. (2015). Does Stepping Stones Triple P plus Acceptance and Commitment Therapy improve parent, couple, and family adjustment following paediatric acquired brain injury? A randomised controlled trial. *Behav Res Ther, 73*, 58-66. doi:S0005-7967(15)30008-5 [pii];10.1016/j.brat.2015.07.001 [doi]. Retrieved from PM:26255172

Burleson, W., & Lewis, A. (2016). Optimists' Creed: Brave New Cyberlearning, Evolving Utopias (Circa 2041). *International Journal of Artificial Intelligence in Education, 26*(2), 796-808.

Crosby, J. M., & Twohig, M. P. (2016). Acceptance and Commitment Therapy for Problematic Internet Pornography Use: A Randomized Trial. *Behav Ther, 47*(3), 355-366. doi:S0005-7894(16)00017-4 [pii];10.1016/j.beth.2016.02.001 [doi]. Retrieved from PM:27157029

Distrutti, E., Monaldi, L., Ricci, P., & Fiorucci, S. (2016). Gut microbiota role in irritable bowel syndrome: New therapeutic strategies. *World J Gastroenterol, 22*(7), 2219-2241. doi:10.3748/wjg.v22.i7.2219 [doi]. Retrieved from PM:26900286

Frühauf, A., Niedermeier, M., Elliott, L. R., Ledochowski, L., Marksteiner, J., & Kopp, M. (2016). Acute effects of outdoor physical activity on affect and psychological well-being in depressed patients - A preliminary study. *Mental Health and Physical Activity, 10*, 4-9.

Hallis, L., Cameli, L., Bekkouche, N., & Knäuper, B. (2017). Combining cognitive therapy with acceptance and commitment therapy for depression: A group therapy feasibility study. *J Cognit Psychother, 31*(3), 171-190.

Hayes, S. C. , Strosahl, K. D., & Wilson, K. G. (2012). Acceptance and commitment therapy: The process and practice of mindful change (2nd ed.). New York, NY, US: Guilford Press.

Hofmann, S. G., & Asmundson, G. J. G. (2008). Acceptance and mindfulness-based therapy: new wave or old hat? *Clin Psychol Rev., 28*(1), 1-16. doi:S0272-7358(07)00158-4 [pii];10.1016/j.cpr.2007.09.003 [doi]. Retrieved from PM:17904260

Keshteli, A. H., Dehestani, B., Daghaghzadeh, H., & Adibi, P. (2015). Epidemiological features of irritable bowel syndrome and its subtypes among Iranian adults. *Ann Gastroenterol, 28*(2), 253-258. Retrieved from PM:25831414

Khodabakhshi, M. (2004). *Standardization, Reliability and Validity of Optimism Scale in Isfahan [MSc Thesis]*. Isfahan, Iran: University of Isfahan.

Lembo, A. J., Lacy, B. E., Zuckerman, M. J., Schey, R., Dove, L. S., Andrae, D. A. et al. (2016). Eluxadoline for Irritable Bowel Syndrome with Diarrhea. *N Engl J Med, 374*(3), 242-253. doi:10.1056/NEJMoa1505180 [doi]. Retrieved from PM:26789872

Lombardi, C. P., Bocale, R., Barini, A., Barini, A., D'Amore, A., Boscherini, M. et al. (2017). Comparative study between the effects of replacement therapy with liquid and tablet formulations of levothyroxine on mood states, self-perceived psychological well-being and thyroid hormone profile in recently thyroidectomized patients. *Endocrine., 55*(1), 51-59. doi:10.1007/s12020-016-1003-9 [doi];10.1007/s12020-016-1003-9 [pii]. Retrieved from PM:27388589

Ramirez-Maestre, C., Esteve, R., Lopez-Martinez, A. E., Serrano-Ibanez, E. R., Ruiz-Parraga, G. T., & Peters, M. (2019). Goal Adjustment and Well-Being: The Role of Optimism in Patients with Chronic Pain. *Ann Behav Med, 53*(7), 597-607. doi:5090131 [pii];10.1093/abm/kay070 [doi]. Retrieved from PM:30184082

Ruan, X., Wilson, S., & Mihalcea, R. (2016). Finding Optimists and Pessimists on Twitter. Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers); 2016 Aug; Berlin, Germany.

Association for Computational Linguistics. 320-325.

Sadeghpour-Moradi, Z., Nasirian, M., Chabokinejad, Z. The effectiveness of acceptance and commitment therapy ACT On the happiness and optimism of the wives of men with MS. First International Conference of New Research In the field of Educational Science and psychology and social studies of Iran, Qom, Conference Official Secretariat. 2017.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers.Soc Psychol*, *67*(6), 1063-1078. Retrieved from PM:7815302

Shaghaghi, F., & Rezaei KARGAR, F. (2010). The effect of creative and critical thinking skills teaching on psychological well- being of adolescents. *Journla of Psychological Researches, 2*(5), 49-66.

Simister, H. D., Tkachuk, G. A., Shay, B. L., Vincent, N., Pear, J. J., & Skrabek, R. Q. (2018). Randomized Controlled Trial of Online Acceptance and Commitment Therapy for Fibromyalgia. *J Pain.*, *19*(7), 741-753. doi:S1526-5900(18)30084-1 [pii];10.1016/j.jpain.2018.02.004 [doi]. Retrieved from PM:29481976

Sweeny, K., & Falkenstein, A. (2017). Even Optimists Get the Blues: Interindividual Consistency in the Tendency to Brace for the Worst. *J Pers.*, *85*(6), 807-816. doi:10.1111/jopy.12289 [doi]. Retrieved from PM:27861913

Tap, J., Derrien, M., Tornblom, H., Brazeilles, R., Cools-Portier, S., Dore, J. et al. (2017). Identification of an Intestinal Microbiota Signature Associated With Severity of Irritable Bowel Syndrome. *Gastroenterology*, *152*(1), 111-123. doi:S0016-5085(16)35174-5 [pii];10.1053/j.gastro.2016.09.049 [doi]. Retrieved from PM:27725146

Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J. E., & Gruenewald, T. L. (2000). Psychological resources, positive illusions, and health. *Am Psychol*, *55*(1), 99-109. Retrieved from PM:11392870

Trompetter, H. R., Bohlmeijer, E. T., Veehof, M. M., & Schreurs, K. M. (2015). Internet-based guided self-help intervention for chronic pain based on Acceptance and Commitment Therapy: a randomized controlled trial. *J Behav Med*, *38*(1), 66-80. doi:10.1007/s10865-014-9579-0 [doi]. Retrieved from PM:24923259

van Dierendonck, D. (2004). The construct validity of Ryff's Scales of Psychological Well-being and its extension with spiritual well-being. *Pers Individ Dif*, *36*(3), 629-643.

Walser, R. D., Garvert, D. W., Karlin, B. E., Trockel, M., Ryu, D. M., & Taylor, C. B. (2015). Effectiveness of Acceptance and Commitment Therapy in treating depression and suicidal ideation in Veterans. *Behav Res Ther*, *74*, 25-31. doi:S0005-7967(15)30035-8 [pii];10.1016/j.brat.2015.08.012 [doi]. Retrieved from PM:26378720

Zanjani-Tabassi, R. (2004). *Construction and standardization of psychological well-being pilot test, [MSc Thesis]*. Tehran, Iran: University of Tehran.

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Investigating the Effect of Home Nursing Care on Lifestyle Modifications and Medication Compliance in Patients after Myocardial Infarction

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Quantitative Study

Abstract

Background: Nursing care leads to the continuation of healthcare and care services, reduces the risk of disease recurrence, and helps the patient to continue to lead a relatively normal life. The purpose of the present study was to determine the effect of home nursing cares on improving the lifestyle of patients after myocardial infarction (MI) in Farshchian Heart Hospital in Hamedan, Iran.

Methods: This research was a quasi-experimental study on 60 patients after MI. The participants were selected using convenience sampling method (30 individuals in the experimental group and 30 individuals in the control group). The experimental group received home nursing care for 3 months after hospital discharge. They were evaluated 6 months after intervention. However, the control group did not receive any interventions. Data were collected using the Lifestyle Questionnaire and analyzed using multivariate analysis of covariance (MANCOVA) in SPSS Software.

Results: The findings showed that patients with a history of MI who underwent home nursing care had significantly improved their lifestyle compared to the control group ($P < 0.01$).

Conclusion: It can be concluded that cooperation with the family and training patients with MI at home accompanied by drug therapy can effectively improve the lifestyle of these patients.

Keywords: Home nursing care, Lifestyle, Myocardial infarction

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Introduction

Due to the variations in people's lifestyle around the world, it seems that heart disease will surpass infectious diseases by 2020, and will be the chief cause of mortality and disability (Nishimura et al., 2014). Cardiovascular disease (CVD) is the most common cause of death throughout the world and in the United States (Dawber, Moore, & Mann, 2015). The World Health Organization (WHO) estimates that the number of deaths due to ischemic heart disease will increase from 1.7 million in 2002 to 11.1 million in 2020 (Dabek, Pyka,

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Piotrkowicz, Stachon, & Bonek-Wytrych, 2017), and it will be considered as the most important source of ill health, economic burden, and decreased production power by 2020 (Ye et al., 2016). According to the WHO, coronary, artery disease is considered as the prominent cause of death in Iran (World Health Organization, 2002). Ischemic heart disease is almost always chronic (Lie, Arnesen, Sandvik, Hamilton, & Bunch, 2010), and in addition to its effect on mortality rate, it affects the degree of disability, inability, and reduced productivity (Ye et al., 2016). There is a reverse relationship between physical activity and the risk of CHD and its resulting mortality (Runge, Patterson, Stouffer, & Netter, 2010). The adverse effects of immobilization include reduction of functional capacity, the risk of thrombosis formation, hemodynamic changes, and changes in the size and function of the heart (Mangiafico, Costello-Boerrigter, Andersen, Cataliotti, & Burnett, 2013). Immobilization is one of the modifiable factors of CHD (Runge et al., 2010). Lifestyle changing programs can help thwart and control heart disease (Todaro, 2010). Moreover, behavioral changes can improve the self-care process in patients, in particular those with heart diseases (Lie et al., 2010). The risk of death in individuals with high physical activity is 30% lower than that in individuals with very low physical activity (Runge et al., 2010). Lifestyle modification programs involve exercise, nutrition, stress management, psychiatric counseling, and social support programs (Todaro, 2010). We consider any kind of physical movement resulting from the contraction of skeletal muscles as physical activity such as exercise, gardening, dancing, and walking, which results in an increase in energy consumption from the base level (Runge et al., 2010). Exercise and activity intolerance is one of the clinical symptoms of CHD (Lie et al., 2010). In addition, patients are interested in returning to their previous daily physical activity levels (Adams, Cline, Reed, Masters, Ehlke, & Hartman, 2006). Cardiac rehabilitation can help the patient return to the previous level of activity, decrease risk factors, and lessen the incidence of heart attacks (Mangiafico et al., 2013). Similarly, cardiac rehabilitation improves the patient's performance (Lie et al., 2010), decreases mortality rate up to 20-25% in middle-aged people (Mangiafico et al., 2013), and improves the profile of risk factors for CHD (Kargarfard, Basati, Sadeghi, Rouzbehani, & Golabchi, 2011). The American Heart Association identifies the essential components of heart rehab as the following elements: controlling lipid levels, regulating blood pressure, quitting smoking, regulating body weight, controlling diabetes, and doing physical activity (Mangiafico et al., 2013). The diet has a major influence on the growth and development of cardiovascular diseases (CVDs). Having a low-fat diet, consuming unsaturated fats, vegetables, and fruits and cereals (Lie et al., 2010), and low-fat dairy products, and lowering the sodium intake are helpful in this regard (Wilson et al., 2009). In Iran, CVDs are also the principal causes of mortality (Ettehad et al., 2016). Moreover, during recent years, many researchers have focused on the family as the first and most important foundation of the social system. This system has special roles, culture, and structure that represent the physical, psychological, cultural, and social health of its members (Mega et al., 2015).

Treatment and control of a heart disease necessitate the use of appropriate therapeutic methods such pharmacotherapy, family therapy, community therapy, and rehabilitation. Therefore, providing a home care plan, in addition to reducing the length of hospitalization, leads to continuation of treatment and care services and reduction of the likelihood of disease recurrence, and the patient can continue to have a relatively normal life (Kitsiou, Pare, & Jaana, 2015). Home care programs have increased in response to an upsurge in the number of

heart patients in the community. One of the reasons for this rapid growth is the confirmed efficiency of home care among cardiac patients in dealing with the needs of these patients, which has been proven by the increasing efficiency and effectiveness of this method (Holden & Mickelson, 2013).

Nevertheless, it should be noted that the value of efficiency alone is not the basis for the provision of home care, but, in fact, the best reason for the provision of such care services is that this method is a humanitarian method whereby they can afford health care and support services (Chen, Tsai, Wu, Lin, & Lin, 2015).

Nursing is considered as maintaining, promoting, and optimizing health and capabilities, preventing diseases and harm, relieving suffering and pain during the diagnosis and treatment, and supporting individuals, families, communities, and humans through care. Care is a beneficial collaboration between the nurse and the patient, which is offered to the patient with the purpose of promoting awareness. The feeling of relief and comfort (Meleis, 2011), as a nursing principle and essence, has a superior status (McEwen & Wills, 2017), which leads to the high esteem, and sense of commitment and accountability of the nurse (Karaoz, 2005). The science of care consists of art and humanity. In fact, this science represents the experiences, phenomena, and process of care, and has biological, physical, psychological, cultural, social, and environmental dimensions that need to be studied in order to provide the patient with comprehensive care (Karaoz, 2005).

Nurses should understand their role in creating and expanding nursing care, provide nursing care based on qualitative documentation, and bring about a vibrant image of human experiences in the socio-cultural context of Iran. Valuable researches have been performed in relation to the process of nursing care; however, in Iran, no study has been conducted to explain the nursing care process. Consideration of and attention to the theoretical explanation of the nursing care process leads to the improvement of nursing care processes, especially regarding the cultural differences that exist with respect to nursing care in Iran. In addition, the production of professional knowledge, and promotion of patient health lead to greater satisfaction in patients and nurses.

Methods

This research was a semi-experimental study. The statistical population of this study consisted of all patients who had a history of it myocardial infarction (MI) and were hospitalized in Farshchian Heart Hospital in Hamedan, Iran. Through convenience sampling method, 60 patients were selected as the study participants after a heart attack (30 individuals in the experimental group and 30 others in the control group). Home nursing care was provided to the experimental group participants for 3 months after being discharged from the hospital. They were evaluated 6 months after the cessation of the intervention.

In the experimental group, patients with a history of MI after being discharged from the hospital were under nursing care for 3 months. Once in a week, the patient was examined by the nurse at home. The home nursing care program included patient assessment, provision of patient and family training programs, intervention in the environment including modification and improvement of the patient's living environment so that there is a treatment environment for the patient, and training on how to use drugs and monitor drug use. In order to evaluate the effect of home care for a longer period, the patients were also evaluated 3 months after the completion of home care (6 months after starting home care). In order to select the subjects in the control group, first, after homogenization in terms of demographic characteristics such as age, sex, education, occupation, and disease

duration, and they were evaluated 3 and 6 months after hospital discharge. In the control group, no special intervention was provided for the patients by nurses after discharge. The assessment criteria regarding the effect of home nursing care included the frequency of hospitalization, drug administration method, and the frequency of relapses. Furthermore, the control group was evaluated like the experimental group. The study inclusion criteria included ischemic disease or proven heart failure, age of less than 70 years, and low to moderate risk-taking, and an ejection fraction of more than 40-30%, and a ethical consent signature for participation in this research. The exclusion criteria were not being within the considered age range .

The cardiac rehabilitation course lasted for 8 weeks, 3 sessions a week, and each session lasted for 20-60 minutes. Each session included 5 minutes of warm-up, 10-30 minutes of the main exercise phase, and 5 minutes of cooling down exercises. The main phase of the exercise consisted of aerobic exercise and walking 3 times a week, and each time lasted 30 to 45 minutes. The exercise time and intensity were increased from the first to eighth week. Heart rate, blood pressure, and electrocardiogram (ECG) changes were controlled during exercise. The need for dietary change and modification was taught during the nutrition counseling before the beginning of this study. A psychiatrist provided the participants with advice regarding lifestyle and behavior modification, and smoking cessation before starting the study. Patients completed the demographic questionnaire and consent form before the beginning of the research.

Lifestyle Questionnaire: This questionnaire consists of 70 items and has been constructed and validated by Lali, Abedi, and Kajbaf in 2012 to evaluate 10 different dimensions of lifestyle (physical health, exercise and fitness, weight control and nutrition, prevention of diseases, psychological health, spiritual health, social health, avoidance of drugs and narcotics, prevention of accidents, and environmental health). The items are scored on a 6-point Likert scale ranging from *completely disagree* to *completely agree* (1-6, respectively). To obtain scores for each dimension, the total sum of the scores of the questions related to that dimension were calculated. In their research, Lali, Abedi, and Kajbaf confirmed the construct validity of the Lifestyle Questionnaire by using factor analysis as a multidimensional tool for assessing and measuring lifestyle. Cronbach's alpha coefficient for the whole instrument was 0.82 and for its subscales ranged from 0.64 to 0.91.

Data analysis was performed using multivariate analysis of covariance (MANCOVA) and in SPSS Software (version 22, IBM Corporation, Armonk, NY, USA).

Results

The results showed that the mean age (standard deviation) of the experimental group was 54.7 ± 6.1 and that of the control group was 52.5 ± 5.5. In terms of gender, 18 (60%) participants were women and 12 (40%) participants were men. In terms of education, the highest percentage (49.8%) had diploma and were unemployed. The duration of the disease in 50% of subjects under study was less than 1 year. Descriptive findings of lifestyle variables in the experimental and control groups are presented in table 1.

Levene's test was used to examine the assumption of equality of variances in the experimental and control groups for testing analysis of covariance (ANCOVA). The results of Levene's test show that, according to the significance level of this test ($P > 0.05$), the assumption for equality of variances is met.

MANCOVA was used to examine the differences between the two groups regarding lifestyle. The evaluation of the data feature showed that the statistical assumption of the variance-covariance matrices for lifestyle (Box's $M = 13.91$; $P > 0.05$) was established, and therefore,

Table 1. Descriptive findings of lifestyle variables in the experimental and control groups

Variables	Pretest		Posttest	
	Control group	Experimental group	Control group	Experimental group
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Physical health	29.73 ± 8.1	30.44 ± 8.2	31.65 ± 7.7	40.55 ± 4.66
Sport and fitness	22.36 ± 5.57	23.88 ± 6.31	23.46 ± 6.80	30.77 ± 4.96
Weight control	22.51 ± 4.86	23.11 ± 5.16	24.18 ± 5.62	29.70 ± 6.67
Prevention of disease	27.59 ± 5.23	28.40 ± 6.19	29.04 ± 6.28	37.90 ± 7.22
Psychological health	28.40 ± 8.53	27.27 ± 7.12	28.14 ± 8.72	35.50 ± 5.47
Spiritual health	24.63 ± 7.18	23.81 ± 6.95	24.97 ± 7.53	30.20 ± 8.97
Social health	27.76 ± 7.02	28.84 ± 7.02	27.78 ± 8.12	34.59 ± 7.75
Avoidance of drugs and narcotics	25.28 ± 5.97	26.18 ± 5.43	26.22 ± 6.16	33.91 ± 3.40
Prevention of accidents	33.72 ± 5.46	33.34 ± 5.68	34.40 ± 5.59	44.83 ± 4.02
Environmental health	25.69 ± 4.44	27.60 ± 4.71	26.87 ± 5.71	36.37 ± 6.87

Wilks' Lambda index was used to assess the significance of the multivariate effect. Wilks' Lambda index showed that the effect of the group on the linear combination of dependent variables was significant (partial $\eta^2 = 0.51$, $P < 0.001$, $F = 7.99$). In other words, there is a statistically significant difference between the experimental and control groups in at least one of the components of lifestyle.

The results presented in table 2 show a significant increase in the mean and standard deviation of different lifestyle domains in the experimental group compared to the control group; thus, it seems that home nursing care has led to the improvement of participants' lifestyles. The results presented in this table indicate that the mean scores of the participants in the experimental group were significantly increased compared to the control group in all of the lifestyle subscales including physical health, exercise and health, weight control, disease prevention, psychological health, spiritual wellbeing, social health, avoidance of drugs and narcotic, prevention of accidents, and environmental health. According to this table, the greatest difference in mean scores was, respectively, related to the subscales of physical health with an effect size of 0.52, weight control with an effect size of 0.5, prevention of diseases with an effect size of 49.9, exercise and well-being with an effect size of 0.48, spiritual health with an effect size of 0.44, psychological health with an effect size of 0.39, avoidance of drugs and narcotic with an effect size of 0.38, prevention of events with an effect size of 37.0, environmental health with an effect size of 0.35, and social health with an effect size of 0.34.

Table 2. The results of analysis of covariance of dependent variables scores in the experimental and control groups

Variables	SS	df	MS	F	P
Physical health	962.67	1	962.67	20.85	0.0001
Sport and fitness	82.10	1	82.10	5.00	0.0300
Weight control	2466.13	1	2466.13	47.97	0.0001
Disease prevention	168.03	1	168.03	7.26	0.0100
Psychological health	90.13	1	90.13	5.21	0.0100
Spiritual health	192.53	1	192.53	16.27	0.0001
Social health	2568.48	1	2568.48	48.11	0.0001
Avoidance of drugs	186.26	1	186.26	8.39	0.0100
Prevention of accidents	97.68	1	97.68	5.69	0.0100
Environmental health	204.53	1	204.53	16.98	36.37

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

Discussion

The present study results showed that home nursing care improved the lifestyle of in patients of Farshchian Hospital of Hamedan after MI. This finding is consistent with the results of the study by Farzadmehr, Fallahi Khoshknab, Hosseini, and Khankeh (2016) on the effect of nursing counseling on anxiety and satisfaction of the family members of patients in the cardiac care unit (CCU) for heart surgery. It is also in line with the results of the research by Farzadmehr, Fallahi Khoshknab, Hosseini, Khankeh, and NoorAbadi (2015) on the effect of nursing counseling on the satisfaction of family members of patients hospitalized in the special care unit for heart surgery.

In explanation of the findings of this research, it can be said that home nursing along with family training, emphasis on family therapy, and the assessment of patient's living conditions improves the patient's and his/her family's welfare and comfort, provides easy access to healthcare and counseling services, answers their questions, and increases their knowledge, and therefore, is better able to control the disease. Training programs for relatives of a patient during nursing care at home increase their awareness of heart disease as a disease, and make the way of dealing with it and their approach to this illness more optimistic. With more participation on the part of family members, the family's welfare and relief will increase. Moreover, lifestyle is the most important factor by which individuals regulate their life. It seems that changes in the lifestyle of heart patients have provided them with psychological and physical health. Nursing care at home leads to a regular, accurate, and scientific manner of continuation of the treatment, care, and rehabilitation of cardiac patients after hospital discharge, maintains the relationship between the healthcare team, family, and patient care, and maintains an easy access to and contact with healthcare and treatment services for heart patients (Farzadmehr et al., 2015). Various studies conducted in this regard also showed the efficiency and influence of nursing care at home.

In general, according to the results of the present study, it can be concluded that the expansion of nursing services at home for patients with heart disease is very effective because it reduces the length of hospitalization and risk of disease relapse, and renders the importance of the pharmacotherapy more comprehensible for the patients and their families. As a result, it prevents the cessation of and irregular medication intake. The use of this method in health planning can have valuable results. Nevertheless, presently, this service is not receiving much attention. Even in nursing training programs, despite the emphasis on a community-based nursing, the importance of nursing at homes is not well understood and students do not benefit from such educational programs. Regarding the results of this research and the existing statistics and figures in our country about the increase in the number of patients with MI, educational planning should be such that patients can be cared for at home and services can be provided easily to the different segments of the society (Varnfield et al., 2014). The growth of home nursing care results in easy access to care and provides follow-up, treatment, and rehabilitation services to heart patients. Nursing training in line with home care programs increases nurses' scientific and practical ability, and will be effective in the implementation of mental health programs in the community.

This research, like any other research, has some limitations. The first restriction of the present research was that the period of research implementation was limited to the posttest, and due to time constraints, a follow-up period was not considered. For this reason, it was not possible to examine and provide results after the posttest and the results' durability. Moreover, as the statistical population of this research was limited to patients who had a history of MI and were

hospitalized at Farshchian Heart Hospital, it is not logical to generalize the results to other patients. The next limitation was that other possible variables affecting the results were not controlled. Due to the limitations mentioned, it is suggested that, in subsequent studies, the follow-up phase be added to the study and the results be evaluated in intervals of several months after the end of the treatment. Furthermore, in future researches, through a review of literature, the potentially effective variables should be identified and, by timely evaluation of and attention to the impact of these variables, they should be controlled through one of the methods of research control or statistical analysis.

Conclusion

It can be concluded that cooperation with patients' families, the training of patients with MI, and administration of pharmacotherapy at home can improve patients' lifestyles.

Conflict of Interests

Authors have no conflict of interests.

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References

Adams, J., Cline, M., Reed, M., Masters, A., Ehlke, K., & Hartman, J. (2006). Importance of resistance training for patients after a cardiac event. *Proc.(Bayl.Univ Med Cent.)*, *19*(3), 246-248. doi:10.1080/08998280.2006.11928172 [doi]. Retrieved from PM:17252043

Anderson, L., Oldridge, N., Thompson, D. R., Zwisler, A. D., Rees, K., Martin, N. et al. (2016). Exercise-based cardiac rehabilitation for coronary heart disease: Cochrane systematic review and meta-analysis. *J Am.Coll.Cardiol.*, *67*(1), 1-12. doi:S0735-1097(15)07119-3 [pii];10.1016/j.jacc.2015.10.044 [doi]. Retrieved from PM:26764059

Chen, H. M., Tsai, C. M., Wu, Y. C., Lin, K. C., & Lin, C. C. (2015). Randomised controlled trial on the effectiveness of home-based walking exercise on anxiety, depression and cancer-related symptoms in patients with lung cancer. *Br.J Cancer*, *112*(3), 438-445. doi:bjc2014612 [pii];10.1038/bjc.2014.612 [doi]. Retrieved from PM:25490525

Dabek, J., Pyka, E., Piotrkowicz, J., Stachon, K., & Bonek-Wytrych, G. (2017). Impact of post-hospital cardiac rehabilitation on the quality of life of patients after surgical treatment for coronary artery disease. *Kardiochir.Torakochirurgia.Pol.*, *14*(2), 120-126. doi:10.5114/kitp.2017.68743 [doi];30240 [pii]. Retrieved from PM:28747944

Dawber, T. R., Moore, F. E., & Mann, G. V. (2015). II. Coronary Heart Disease in the Framingham Study. *Int J Epidemiol.*, *44*(6), 1767-1780. doi:dyv346 [pii];10.1093/ije/dyv346 [doi]. Retrieved from PM:26705414

Ettehad, D., Emdin, C. A., Kiran, A., Anderson, S. G., Callender, T., Emberson, J. et al. (2016). Blood pressure lowering for prevention of cardiovascular disease and death: a systematic review and meta-analysis. *Lancet.*, *387*(10022), 957-967. doi:S0140-6736(15)01225-8 [pii];10.1016/S0140-6736(15)01225-8 [doi]. Retrieved from PM:26724178

Farzadmehr, M., Fallahi Khoshknab, M., Hosseini, M. A., Khankeh, H. R., & NoorAbadi, Z. (2015). The effect of nursing consultation on satisfaction of patients' families at the Cardiac Surgery Intensive Care Units. *Iranian Journal of Rehabilitation Research in Nursing*, *2*(1), 35-44.

Farzadmehr, M., Fallahi Khoshknab, M., Hosseini, M. A., & Khankeh, H. R. (2016). The effect of nursing consultation on anxiety and satisfaction of patient's family in cardiac surgical intensive care unit. *Iranian Journal of Psychiatric Nursing*, *4*(2), 57-64.

Holden, R. J., & Mickelson, R. S. (2013). Performance barriers among elderly chronic heart failure patients: An application of patient-engaged human factors and ergonomics. *Proc Hum Factors Ergon Soc Annu Meet.*, *57*(1), 758-762.

Karaoz, S. (2005). Turkish nursing students' perception of caring. *Nurse.Educ Today.*, *25*(1), 31-40. doi:S0260-6917(04)00135-2 [pii];10.1016/j.nedt.2004.09.010 [doi]. Retrieved from PM:15607245

Kargarfard, M., Basati, F., Sadeghi, M., Rouzbehani, R., & Golabchi, A. (2011). Effects of a cardiac rehabilitation program on diastolic filling properties and functional capacity in patients with myocardial infarction. *J Isfahan Med Sch*, *29*(131), 243-252.

Kitsiou, S., Pare, G., & Jaana, M. (2015). Effects of home telemonitoring interventions on patients with chronic heart failure: an overview of systematic reviews. *J Med Internet Res*, *17*(3), e63. doi:v17i3e63 [pii];10.2196/jmir.4174 [doi]. Retrieved from PM:25768664

Lali, M., Abedi, A., Kajbaf, M.B. (2012). Construction and validation of the lifestyle questionnaire (LSQ). *Psychological Research* 15(1), 64-80.

Lie, I., Arnesen, H., Sandvik, L., Hamilton, G., & Bunch, E. H. (2010). Predictors for physical and mental health 6 months after coronary artery bypass grafting: a cohort study. *Eur.J Cardiovasc.Nurs., 9*(4), 238-243. doi:S1474-5151(10)00032-0 [pii];10.1016/j.ejcnurse.2010.02.001 [doi]. Retrieved from PM:20219433

Mangiafico, S., Costello-Boerrigter, L. C., Andersen, I. A., Cataliotti, A., & Burnett, J. C. (2013). Neutral endopeptidase inhibition and the natriuretic peptide system: an evolving strategy in cardiovascular therapeutics. *Eur.Heart J, 34*(12), 886-893c. doi:ehs262 [pii];10.1093/eurheartj/ehs262 [doi]. Retrieved from PM:22942338

McEwen, M., & Wills, E. M. (2017). *Theoretical Basis for Nursing*. Philadelphia, PA: Lippincott Williams and Wilkins.

Mega, J. L., Stitziel, N. O., Smith, J. G., Chasman, D. I., Caulfield, M., Devlin, J. J. et al. (2015). Genetic risk, coronary heart disease events, and the clinical benefit of statin therapy: an analysis of primary and secondary prevention trials. *Lancet., 385*(9984), 2264-2271. doi:10.1016/S0140-6736(14)61730-X [doi];S0140-6736(14)61730-X [pii]. Retrieved from PM:25748612

Meleis, A. I. (2011). *Theoretical nursing: Development and progress*. Philadelphia, PA: Wolters Lippincott Williams and Wilkins.

Nishimura RA. , Otto CM, Bonow RO, Carabello BA, Erwin JP, Guyton RA, O'gara PT, Ruiz CE, Skubas NJ, Sorajja P, Sundt TM. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Journal of the American College of Cardiology. 2014 Jun 10;63(22): e57-185.

Runge, M. S., Patterson, C., Stouffer, G. A., & Netter, F. H. (2010). *Netter's Cardiology*. Philadelphia, PA: Saunders.

Todaro, J. (2010). Lifestyle modification to control heart disease: Evidence and policy. Sudbury, MA: Jones and Bartlett.

Varnfield, M., Karunanithi, M., Lee, C. K., Honeyman, E., Arnold, D., Ding, H. et al. (2014). Smartphone-based home care model improved use of cardiac rehabilitation in postmyocardial infarction patients: results from a randomised controlled trial. *Heart, 100*(22), 1770-1779. doi:heartjnl-2014-305783 [pii];10.1136/heartjnl-2014-305783 [doi]. Retrieved from PM:24973083

Wilson, S. R., Scirica, B. M., Braunwald, E., Murphy, S. A., Karwatowska-Prokopczuk, E., Buros, J. L. et al. (2009). Efficacy of ranolazine in patients with chronic angina observations from the randomized, double-blind, placebo-controlled MERLIN-TIMI (Metabolic Efficiency With Ranolazine for Less Ischemia in Non-ST-Segment Elevation Acute Coronary Syndromes) 36 Trial. *J Am.Coll.Cardiol., 53*(17), 1510-1516. doi:S0735-1097(09)00403-3 [pii];10.1016/j.jacc.2009.01.037 [doi]. Retrieved from PM:19389561

World Health Organization. The Impact of Chronic Disease in the Islamic Republic of Iran. 2002. Access. https://www.who.int/chp/chronic_disease_report/media/impact/iran.pdf

Ye, X., Peng, L., Kan, H., Wang, W., Geng, F., Mu, Z. et al. (2016). Acute effects of particulate air pollution on the incidence of coronary heart disease in Shanghai, China. *PLoS.One., 11*(3), e0151119. doi:10.1371/journal.pone.0151119 [doi];PONE-D-15-42849 [pii]. Retrieved from PM:26942767

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The Effectiveness of Music Therapy on Anxiety Sensitivity and Self-Efficacy in Adolescents with Leukemia in Tehran, Iran

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Quantitative Study

Abstract

Background: Cancer is a chronic disorder due to which patients are faced with various psychological challenges; therefore, they ought to seek solutions to reduce the severity of their emotional problems. The aim of this research was to investigate the effectiveness of music therapy on anxiety sensitivity and self-efficacy in adolescents with leukemia.

Methods: The study participants consisted of 30 individuals who were selected using convenience sampling method. The subjects were randomly assigned to experimental and control groups (15 in each group). A quasi-experimental and pretest-posttest design was utilized with a control group and follow-up period. The data collection instruments used included the Anxiety Sensitivity Index (ASI). First, pretest was conducted in both groups. Then, the experimental group participants received the intervention in 14 sessions lasting 90 minutes, and then, posttest was performed in both groups. Moreover, one month later, the follow-up process was completed. Data analysis was performed using multivariate analysis of covariance (MANCOVA) and one-way analysis of covariance (ANCOVA).

Results: The results showed that music therapy was effective on anxiety sensitivity ($P < 0.001$) and self-efficacy ($P < 0.001$) in adolescents with leukemia.

Conclusion: It can be concluded that music therapy can improve self-efficacy and reduce anxiety sensitivity in adolescents with leukemia and reducing anxiety sensitivity can help patients to better cope with pain, eliminate negative emotions, and become more relaxed.

Keywords: Music therapy, Anxiety sensitivity, Self-efficacy, Adolescents, Leukemia

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Introduction

Leukemia is lymphatic neoplasia that, in view of the phase of the sickness in the season of diagnosis, and the type of harmful cells, pathologically leads to a patient's incapacity or mortality (because of bone marrow inadequacy or disease) as the short- or long-term outcome. Evidently, if there should be an occurrence of early conclusion

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and suitable treatment, the patient can return to sound life. However, regard for personal satisfaction, the effect of various mental contemplations, and lifestyle changes, if important, can altogether pacify manifestations of wretchedness, stress, and outrage, reduce the adequacy of patients, and increase patients' ability to control the reactions of various medications and resilience (Vizcaino, Lopera, Martinez, De los Reyes, & Linares, 2016).

Researchers have taken strides in conceptualizing and activity emotional vulnerability, a thought that generally results in the suffering of humans, and therefore, the anxiety of the sickness specifically. The vulnerability issue for anxiety and anxiety disorders, which has recently attracted abundant scientific attention, is anxiety sensitivity. Studies have shown that anxiety sensitivity increases the probability of tension development and acts as a risk factor in this regard. Recent theoretical models emphasize the importance of treating individuals with anxious experiences (Schmidt, Norr, Allan, Raines, & Capron, 2017). Anxiety sensitivity could be a structure of individual variations during which someone is terrified of physical symptoms related to anxiety arousal (increased pulse rate, metabolic process dyspnoea, and dizziness), and could be a consequence of this belief. Anxiety sensitivity results in biases within the retrieval and process of knowledge concerning anxiety triggers that provides the grounds for mental disorders. Existing analysis suggests that anxiety sensitivity is also thought of as a risk factor for anxiety issues. This cognition will increase the chance of developing anxiety symptoms, sudden panic attacks, in addition to anxiety disorders (for example, panic disorder) (Baker et al., 2017).

In adolescents, self-efficacy is also affected by cancer. Self-efficacy is a vital factor in the formation of human competency. Self-efficacy permits people to figure laborious by utilizing their skills to alter obstacles. Effective performance needs each skill and belief within the ability to perform those skills. Managing permanent, uncertain, unpredictable, and nerve-racking activities and circumstances requires multiple skills (Lee, Shin, Wang, Lin, Lee, & Wang, 2016). Self-efficacy is outlined because the belief in individual talents in organizing and death penalty a series of actions required to attain a goal. Self-efficacy plays a major role in most common psychological issues, still as in fortunate interventions in coping with these issues (Sleath et al., 2015). Individuals who have high confidence in their ability to use coping strategies under tough circumstances square measure sedately approaching those positions and do not seem to lose their spirit under these circumstances. Nevertheless, people who have very little confidence in their abilities and skills are overcome by apprehension, which reduces the chance of sensible performance (Hoffman, Brintnall, Given, von, Jones, & Brown, 2017).

In order to improve the anxiety and self-efficacy of adolescents with leukemia various strategies have been proposed, one of these therapeutic strategies is music therapy. Music therapy, like other therapies that have an artistic origin, can be useful in treating chronic diseases due to its attractiveness and ability to promote tranquility. Music therapists stimulate or calm their patients with music (Thornley, Hirjee, & Vasudev, 2016). Adolescents who have leukemia suffer from emotional stress, and the use of music reduces their heart rate and deepens their respiration, resulting in anxiety and decreased self-efficacy (Gallagher, Lagman, & Rybicki, 2018). Music can be associated with sadness, failures of sadness, and depression, and with the association of these memories, tragic emotions are more easily discharged (Liu, & Petrini, 2015). Clarke (2010) concluded in his research that music was explicitly responsible for the decline in aggressive behavior and anxiety. Elliott, Worrall-Carter, and Page (2013) concluded in their research that music therapy had a direct and significant effect on reducing pain and

aggression in cancer patients. Therefore, due to the increasing incidence rate of leukemia and the observed effect of psychological interventions on the reduction of symptoms of chronic diseases, the main aim of the present research was to determine the effectiveness of music therapy on anxiety sensitivity and self-efficacy in adolescents with leukemia.

Methods

This semi-experimental research was conducted with two groups (test group and control group) and in three stages, pre-test, post-test, and follow-up. The statistical population of this study included people with leukemia referring to health centers in Tehran, Iran, in 2018. The sample consisted of 30 people who were selected through convenience sampling method and were divided into two groups (15 subjects in each group).

Anxiety Sensitivity Index: The Anxiety Sensitivity Index (ASI) is a self-report questionnaire with 16 items. This questionnaire was developed by Reiss, Peterson, Gursky, and McNally (1986). The items are scored based on a five-point Likert scale ranging from 0-4 (very low = 0 to very much = 4). It reflects any belief that anxiety emotions are unpleasant experiences and can lead to harmful consequences. The degree of fear of anxiety symptoms is determined with higher scores. The total score ranges between 0 and 64. This questionnaire consists of the three subscales of fear of physical anxiety (8 items), fear of lack of cognitive control (4 items), and fear of observation of anxiety by others (4 items). The internal stability of the ASI has been determined through examining its psychometric properties (alpha ranging from 0.80 to 0.90). The test-retest validity of the ASI was 0.75 after 2 weeks and 0.71 after 3 years; this shows that anxiety sensitivity is a persistent personality construct. Its validity was calculated in an Iranian sample based on the three methods of internal consistency, test-retest, and spin-breaker. For the whole scale, the coefficients of validity were 0.93, 0.95, and 0.97, respectively. Concurrent validity was determined (correlation coefficient: 0.56) through the implementation of the Symptom Checklist-90 (SCL-90). The correlation coefficients with the total score were satisfactory and varied from 0.41 to 0.88. The correlation between subscales varied from 0.41 to 0.68 (Floyd, Garfield, & LaSota, 2005).

General Self-Efficacy Scale: This 17-item questionnaire was developed by Sherer et al. in 1982. The reliability of the General Self-Efficacy Scale was determined using Cronbach's alpha ($\alpha = 0.86$) (Maleki Pirbazari, Nouri, & Sarami, 2012). Each item is scored on a scale ranging from 1 to 5. Items number 3, 8, 9, 13, and 15 are reverse-scored items. In this study, the Cronbach's alpha of this scale was 0.79.

Results

Table 1 shows the mean (SD) of anxiety sensitivity and general self-efficacy in the experimental and control group. The null assumption for the equation of variance of the two groups was confirmed in the research variables. The null assumption was confirmed for the normal distribution of the scores of the two groups in the research variables, that is, the assumption of the normal distribution of scores in the pretest was confirmed in both test and control groups. The F value of the interaction for the same slope of the regression line for all of the variables in the research was not significant. In other words, the homogeneity of the slope of the regression line was confirmed.

Table 1. Mean ± SDof the research variables in the pre-test and post-test

Variables	Group	Pretest	Posttest
		Mean ± SD	Mean ± SD
Anxiety sensitivity	Experimental	43.1 ± 8.4	38.6 ± 5.9
	Control	43.6 ± 7.1	42.5 ± 6.7
General Self-Efficacy	Experimental	10.8 ± 0.67	13.0 ± 0.5
	Control	11.0 ± 0.84	10.6 ± 1.1

Table 2. Results of multivariate analysis of covariance on the mean posttest scores of anxiety sensitivity and self-efficacy of experimental and control groups with pretest control

Test	Value	df hypothesis	df error	F	P	Eta square
Pillai's trace	0.36	2	27	26.44	0.001	0.36
Wilks' Lambda	0.02	2	27	26.44	0.001	0.36
Hotelling's trace	46.7	2	27	26.44	0.001	0.36
Roy's largest root	46.7	2	27	26.44	0.001	0.36

As shown in table 2, the effect or difference is equal to 0.36, that is, 36% of the individual differences in posttest scores of anxiety sensitivity and self-efficacy is related to the impact of music therapy (group membership).

As shown in table 3, with pretest control between the experimental group and the control group, in terms of anxiety sensitivity ($P < 0.0001$; $F = 54.5$) and self-efficacy ($P < 0.0001$; $F = 45.5$).

Discussion

The findings of this study showed that music therapy has a significant effect on anxiety sensitivity and self-efficacy in adolescents with leukemia. This finding was consistent with the findings of Clark (2010) and Elliott et al. (2013).

Music therapy is a therapeutic remedy for individuals who are mentally, emotionally, perceived, and connected with others. Research results and clinical experience have illustrated that music therapy is effective for individuals who have not responded to other types of treatment. In other words, music is a form of stimulus that can heal through familiarity, and predicting and creating a sense of security (Tuinmann, Preissler, Bohmer, Suling, & Bokemeyer, 2017). Anxiety sensitivity is very common among cancer patients. Cancer causes anxiety in individuals. Cancer patients suffer from anxiety sensitivity due to the uncertainty of the outcome of treatment and breakthrough. In music therapy, as a non-pharmacological approach to psychotherapy, the reliving and controlling of pain, such as deviation of thought, relaxation, and skin irritation, is difficult. It reduces anxiety sensitivity and makes it tolerable for the patient. It creates a sense of control in the individual, which makes them more comfortable and improves their sleep and relaxation; in addition, therapeutic music creates a sense of optimism and relaxation that also creates a sense of optimism in controlling pain, anger, and aggression (Hohmann, Bradt, Stegemann, & Koelsch, 2017).

It can be said that music therapy can reduce anxiety sensitivity in adolescents with leukemia, and reducing anxiety sensitivity can help patients to better cope with pain, eliminate negative emotions, and be more relaxed. In other words, the benefit of these methods is the increase in the effectiveness of analgesic drugs, which, as a result, reduces the number of doses of the drug required. Because the simultaneous use of pharmaceutical and non-pharmacological strategies (preparation, self-control, path diversion, attention, massage, hypnosis, use of analgesics) are known from the general principles of pain management (Espi-Lopez, Ingles, Ruescas-Nicolau, & Moreno-Segura, 2016), and because of anxiety due to chronic disease complications, including cancer, is considered a sick child in children and is one of the most severe and worrying behaviors in adolescence with leukemia. Therefore, in such circumstances, it is necessary to identify those behaviors that threaten the adolescent.

Table 3. Results of one-way analysis of covariance in multivariate analysis of covariance on posttest

Variables	SS	df	MS	F	P	Eta square
Anxiety sensitivity	189.77	1	189.77	54.5	0.0001	0.47
Self-efficacy	146.9	1	146.9	45.5	0.0001	0.39

SS: Sum of squares; df: Degree of freedom; MS: Mean of squares

The change in attitudes, as a threat, in adolescents with leukemia seems necessary and threat because the adolescent is wrong anxiety is thought to be necessary to cope with problems. Communication with a teenager if based on love and affection and self-confidence, will promote his/her self-esteem and give him/her an optimistic view of life. Evidently, parental participation in anxiety control is useful and other psychotherapy strategies, such as music therapy and tone calm, are effective in reducing adolescent's anxiety sensitivity (Yaman & Karabulut, 2016).

It can also be said that the use of music can be useful in improving adolescents' self-efficacy because throughout history art has been a means of adaptability, flexibility, creativity, love, friendship, and peace. Among the arts, music is very penetrating due to its energy generation, stimulation, possibility of abstraction and intrinsic gravity. The positive impact of music on the performance of the human brain and its applications is not a new topic, especially in the area of attention that has been explored in recent decades (Kahloul et al., 2017). Music education has a significant effect on the morphology and activity of the cerebral cortex. In adolescents with leukemia, there are various sensory pathways, some of which are due to neurological limitations. The use of music increases the neural branches, and this can strengthen adolescents' self-efficacy. In other words, long-term sensory stimulation increases the magnitude of brain synapses and ultimately leads to high levels of sensory perception.

Conflict of Interests

Authors have no conflict of interests.

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References

Baker, A. W., Keshaviah, A., Goetter, E. M., Bui, E., Swee, M., Rosencrans, P. L. et al. (2017). Examining the Role of Anxiety Sensitivity in Sleep Dysfunction Across Anxiety Disorders. *Behav Sleep Med*, *15*(3), 216-227. doi:10.1080/15402002.2015.1120202 [doi]. Retrieved from PM:26788969

Clark, K. D. (2010). *The relationship of perceived stress and self -efficacy among correctional employees in close -security and medium -security -level institutions [PhD Thesis]*. Minneapolis, MN: Walden University.

Elliott, M., Worrall-Carter, L., & Page, K. (2013). Factors contributing to adverse events after ICU discharge: a survey of liaison nurses. *Aust.Crit.Care*, *26*(2), 76-80. doi:S1036-7314(12)00140-3 [pii];10.1016/j.aucc.2012.07.005 [doi]. Retrieved from PM:22948080

Espi-Lopez, G. V., Ingles, M., Ruescas-Nicolau, M. A., & Moreno-Segura, N. (2016). Effect of low-impact aerobic exercise combined with music therapy on patients with fibromyalgia. A pilot study. *Complement.Ther Med*, *28*, 1-7. doi:S0965-2299(16)30083-8 [pii];10.1016/j.ctim.2016.07.003 [doi]. Retrieved from PM:27670863

Floyd, M., Garfield, A., & LaSota, M. T. (2005). Anxiety sensitivity and worry. *Pers Individ Dif*, *38*(5), 1223-1229. doi:doi:10.1016/j.paid.2004.08.005. Retrieved from Elsevier Science.

Gallagher, L. M., Lagman, R., & Rybicki, L. (2018). Outcomes of Music Therapy Interventions on Symptom Management in Palliative Medicine Patients. *Am.J Hosp.Palliat.Care*, *35*(2), 250-257. doi:10.1177/1049909117696723 [doi]. Retrieved from PM:28274132

Hoffman, A. J., Brintnall, R. A., Given, B. A., von, E. A., Jones, L. W., & Brown, J. K. (2017). Using Perceived Self-efficacy to Improve Fatigue and Fatigability In Postsurgical Lung Cancer Patients: A Pilot Randomized Controlled Trial. *Cancer Nurs.*, *40*(1), 1-12. doi:10.1097/NCC.0000000000000378 [doi]. Retrieved from PM:27135752

Hohmann, L., Bradt, J., Stegemann, T., & Koelsch, S. (2017). Effects of music therapy and music-based interventions in the treatment of substance use disorders: A systematic review. *PLoS.One.*, *12*(11), e0187363. doi:10.1371/journal.pone.0187363 [doi];PONE-D-16-44617 [pii]. Retrieved from PM:29141012

Kahloul, M., Mhamdi, S., Nakhli, M. S., Sfeyhi, A. N., Azzaza, M., Chaouch, A. et al. (2017). Effects of music therapy under general anesthesia in patients undergoing abdominal surgery. *Libyan.J Med*, *12*(1), 1260886. doi:10.1080/19932820.2017.1260886 [doi]. Retrieved from PM:28452603

Lee, Y. J., Shin, S. J., Wang, R. H., Lin, K. D., Lee, Y. L., & Wang, Y. H. (2016). Pathways of empowerment perceptions, health literacy, self-

efficacy, and self-care behaviors to glycemic control in patients with type 2 diabetes mellitus. *Patient.Educ Couns.*, *99*(2), 287-294. doi:S0738-3991(15)30058-6 [pii];10.1016/j.pec.2015.08.021 [doi]. Retrieved from PM:26341940

Liu, Y., & Petrini, M. A. (2015). Effects of music therapy on pain, anxiety, and vital signs in patients after thoracic surgery. *Complement.Ther Med*, *23*(5), 714-718. doi:S0965-2299(15)00126-0 [pii];10.1016/j.ctim.2015.08.002 [doi]. Retrieved from PM:26365452

Maleki Pirbazari M, Nouri R, & Sarami G. (2012). Social support and depression symptoms: The mediating role of self-efficacy. *Contemporary Psychology*, *6*(2), 26-34.

Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behav Res Ther*, *24*(1), 1-8. doi:0005-7967(86)90143-9 [pii]. Retrieved from PM:3947307

Schmidt, N. B., Norr, A. M., Allan, N. P., Raines, A. M., & Capron, D. W. (2017). A randomized clinical trial targeting anxiety sensitivity for patients with suicidal ideation. *J Consult.Clin.Psychol*, *85*(6), 596-610. doi:2017-11100-001 [pii];10.1037/ccp0000195 [doi]. Retrieved from PM:28287798

Sleath, B., Blalock, S. J., Carpenter, D. M., Sayner, R., Muir, K. W., Slota, C. et al. (2015). Ophthalmologist-patient communication, self-efficacy, and glaucoma medication adherence. *Ophthalmology.*, *122*(4), 748-754. doi:S0161-6420(14)01047-1 [pii];10.1016/j.ophtha.2014.11.001 [doi]. Retrieved from PM:25542521

Thornley, J., Hirjee, H., & Vasudev, A. (2016). Music therapy in patients with dementia and behavioral disturbance on an inpatient psychiatry unit: results from a pilot randomized controlled study. *Int Psychogeriatr.*, *28*(5), 869-871. doi:S1041610215001866 [pii];10.1017/S1041610215001866 [doi]. Retrieved from PM:26572722

Tuinmann, G., Preissler, P., Bohmer, H., Suling, A., & Bokemeyer, C. (2017). The effects of music therapy in patients with high-dose chemotherapy and stem cell support: a randomized pilot study. *Psychooncology.*, *26*(3), 377-384. doi:10.1002/pon.4142 [doi]. Retrieved from PM:27146798

Vizcaino, M., Lopera, J. E., Martinez, L., De los Reyes, I., & Linares, A. (2016). Comprehensive guide for early detection, diagnosis, treatment and monitoring of acute leukemia lymphocytic leukaemiaid children and teens. *Revista Colombiana de Cancerología 20*(1), 37-39. Retrieved from scieloco.

Yaman, A. Y., & Karabulut, N. (2016). The effects of music therapy in endotracheal suctioning of mechanically ventilated patients. *Nurs.Crit.Care*, *21*(1), 44-52. doi:10.1111/nicc.12159 [doi]. Retrieved from PM:25721305.