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Effects of home-based walking program on fatigue in patients with cancer

Efectos del programa de caminatas en el hogar sobre la fatiga en pacientes con cáncer

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: Introduction: Cancer and its treatments lead to various complications such as fatigue, which is one of the most common and most annoying complications in patients with cancer. Extreme fatigue may have a significant impact on daily performance and quality of life. Accordingly, this study aimed to investigate the effects of home-based walking program on fatigue in patients with cancer in Ilam in 2018.

Methodology: This was an experimental study, which was conducted on 95 patients with cancer; they were randomly assigned to two groups: A (visited on even days) and B (visited on odd days). The experimental group performed the home-based walking program 3 times a week for 12 weeks. The control group only performed its routine activities. The patients were followed up. The research tools included demographic information and Multi-dimensional Fatigue Questionnaire (MFI). The fatigue was measured at week 12th. The data was analyzed using independent and paired t-test and chi-square.

Findings: After the intervention, the mean score of fatigue in the experimental group (35.52 ± 5.68) was significantly lower than control group (84.68 ± 7.96) ($p < 0.001$). Besides, following the intervention, the mean score of fatigue in the experimental group (35.52 ± 5.68) was significantly lower than before the intervention (84.28 ± 7.17) ($p < 0.001$).

Conclusion: As a simple and low-cost exercise program, walking can reduce the fatigue in patients with cancer; it also plays an effective role in improving the health and rehabilitation of these patients.

KEYWORDS: Fatigue, cancer, walking program, home-based exercise.

RESUMEN:

Introducción: el cáncer y sus tratamientos conducen a diversas complicaciones, como la fatiga, que es una de las complicaciones más comunes y molestas en pacientes con cáncer. La fatiga extrema puede tener un impacto significativo en el rendimiento diario

AUTHOR NOTES

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y la calidad de vida. En consecuencia, este estudio tuvo como objetivo investigar los efectos del programa de caminatas en el hogar sobre la fatiga en pacientes con cáncer en Ilam en 2018.

Metodología: Este fue un estudio experimental, que se realizó en 95 pacientes con cáncer; se asignaron al azar a dos grupos: A (visitados los días pares) y B (visitados en días impares). El grupo experimental realizó el programa de caminata en el hogar 3 veces a la semana durante 12 semanas. El grupo control solo realizó sus actividades rutinarias. Los pacientes fueron seguidos. Las herramientas de investigación incluyeron información demográfica y cuestionario de fatiga multidimensional (IMF). La fatiga se midió en la semana 12. Los datos se analizaron utilizando t-test independiente y pareada y chi-cuadrado.

Resultados: Después de la intervención, la puntuación media de fatiga en el grupo experimental ($35,52 \pm 5,68$) fue significativamente más baja que en el grupo control ($84,68 \pm 7,96$) ($p < 0,001$). Además, después de la intervención, la puntuación media de fatiga en el grupo experimental ($35,52 \pm 5,68$) fue significativamente más baja que antes de la intervención ($84,28 \pm 7,17$) ($p < 0,001$).

Conclusión: como un programa de ejercicios simple y de bajo costo, caminar puede reducir la fatiga en pacientes con cáncer; También desempeña un papel eficaz en la mejora de la salud y la rehabilitación de estos pacientes.

PALABRAS CLAVE: Parto vaginal, Satisfacción, Estudio cualitativo.

INTRODUCTION

Over the past decades, despite successes in controlling and preventing contagious diseases, the incidence and prevalence of noncontagious diseases such as cancer has increased as one of the major challenges in health system¹. After the cardiovascular diseases, cancer is the second leading cause of death in the world². The number of people with cancer is expected to reach 75 million worldwide by 2030³. According to Iranian Cancer Center (2008), 51,000 new cases of cancer are detected in Iran every year and 35,000 deaths are occurred due to cancer⁴. According to cancer stage and medical history of patient, the surgery, radiation therapy, chemotherapy, or hormone therapy may be conducted for treatment. Although these treatments are effective, they may lead to various complications⁵. The fatigue is one of the most common and annoying complications in patients with cancer and severe fatigue may have a significant impact on daily performance and quality of life⁶. According to National Comprehensive Cancer Network (NCCN) guidelines, Cancer-Related Fatigue (CRF) is defined as “persistent physical, psychological, or cognitive fatigue related to cancer or its treatments which is not consistent with recent activities and causes normal functioning impairment”⁷. The fatigue of patients with cancer is a distressing symptom, which may be associated with cancer progress, or may occur during adjuvant treatments and even several years after treatment; it also influences the ability of individuals in conducting routine tasks such as cooking, home works, and social activity, and disrupts the ability to do things⁸.

The National Comprehensive Cancer Network (NCCN) has provided useful methods for managing cancer-related fatigue, which includes a combination of pharmaceutical and non-pharmaceutical support approaches⁹. The pharmaceutical handling of cancer-related fatigue includes the use of some mental stimulants (methylphenidate), erythropoietin, and antidepressants¹⁰. The evaluation of non-pharmacological interventions for managing fatigue, including psychological and activity-based interventions, suggests that the exercise programs, walking, restorative approaches, supportive expressions, and behavioral-cognitive psychosocial interventions may help reduce cancer-related fatigue¹¹.

The exercise is widely known as a non-pharmacological treatment of patients with cancer. The evidence suggests that increased physical activity has many benefits in increasing the psychological and physical well-being of patients with cancer¹². The exercise has been studied as a modern therapeutic intervention. It has been shown to reduce fatigue and improve physical performance, cardiovascular performance, and quality of life¹³. The exercise interventions include supervised programs and home-based exercise programs¹⁴. The supervised programs use well-equipped sport facilities and provide professional feedback; they may be safer and more effective, but may interfere with individuals' work and travel times. Therefore, the home-based

exercise plans should be considered as an option¹⁵. The benefits of home-based exercise programs include less resource-use and flexibility for patients¹⁶. The home-based interventions facilitate the living of patients with cancer in cities and countryside. The home-based exercise offers greater flexibility in scheduling, duration, and frequency of physical activities; this is very important for patients who are exposed to a number of acute and chronic complications during the anticancer treatment¹⁷. Most conducted studies have focused on supervised exercise sessions or exercise at the gym. Unfortunately, a limited number of studies have examined the unsupervised lifestyle approaches. Such approaches may be widely applied at a lower cost leading to significant improvements in the health of a vulnerable and growing population. However, this study aims to investigate the effects of a home-based walking program on the fatigue of patients with cancer in Ilam.

MATERIALS AND METHODS

This was a pretest-posttest experimental study, which examined the effects of a home-based walking intervention on fatigue in patients with cancer. All eligible patients participated in the study for one month. The objectives of study were explained to participants and informed consent was obtained. The patients were randomly assigned to two groups: A (visit in even days) and B (visit in odd days). The inclusion criteria included cancer being at stage 1-3, age from 18 to 65 years old, at least 2 months is passed after from cancer diagnosis, reading and writing ability, patient's previous awareness of his/her cancer diagnosis, not participation in other studies, conscious and written consent for participation in study, cancer diagnosis by the oncology specialist, not having physical constraints to participate in the exercise programs, and not performing other exercises along with this study. 95 patients who referred to oncology department of Shahid Mostafa Khomeini Hospital were included in study. The study groups were matched in terms of age, education level, duration of treatment, type of treatment, type of cancer, stage of cancer, and duration of disease. The walking program was trained on odd days. The experiment group was emphasized that the exercise program should not be given to the control group until the end of the intervention. The phone number was taken from participants for recalling and following-up the walking exercise. The experiment group conducted the home-based walking program for 12 weeks, 3 days a week with an average of 30-70% of maximum heart rate. The duration of exercise gradually increased from 15-25 minutes in weeks 1st to 4th to 25-35 minutes in weeks 5th to 8th, and 35-40 minutes in weeks 9th to 12th. The experimental group was called once a week to diagnose health problems, remove limits to the exercise, and encourage participants to walk. The phone calls were conducted to monitor participants' safety and increase their participation in walking program. During the phone calls, the participants talked about limitations and problems they encountered in walking program. The exclusion criteria included reluctance to participate in study, incompleteness of questionnaire, failure to complete two sessions of home-based walking exercise, announcement of exercise ban by physician, not responding to 2 phone follow-up calls, and death of patient. Each patient received a booklet containing recommendations for adherence to interventions, guidance, and encouragement to show the benefits of walking, and a checklist. The checklist included a table of weekdays on which the patients in the experiment group registered daily exercise times per day, starting hour, end hour, pulse rate at the end of exercise, and cause of not performing exercise. In pre-test stage, the data were obtained using a Demographic Characteristics Questionnaire and a Multi-dimensional Fatigue Questionnaire. The demographic characteristics questionnaire included age, gender, educational level, type of cancer, stage of cancer, employment status, duration of disease, place of residence, type of treatment, and family economic status. The Multidimensional Fatigue Questionnaire (20 items) evaluated five fatigue dimensions including general fatigue (4 items), physical fatigue (4 items), decreased activity (4 items), decreased motivation (4 items), and mental fatigue (4 items). The 5-point Likert Scale was used: "Yes, it is completely correct" to "No, it is completely wrong". The total score for each area was 4-20 and the total fatigue score was 20-100. The score

20-40 indicated low fatigue, score 40-60 indicated moderate fatigue, and score above 60 indicated high level of fatigue. The validity and reliability of MFI questionnaire was evaluated by Khani et al. in 2012 different groups. The confirmatory factor analysis showed that the questionnaire had a proper internal consistency. The Cronbach's alpha coefficient for general, physical, and mental fatigue was above 0.80 and for reduced activity and motivation was above 0.65¹⁸.

One week after last walking session, the posttest was conducted among the experiment and control groups. In order to observe the principles of ethics in research, the walking program was also provided to control group after the completion of research. The collected data were analyzed by SPSS software using chi-square and independent and paired t-test. The statistical significance level was considered 5%.

RESULTS

In this study, the majority of patients were female (58.5%) and married. Meanwhile, the most common type of cancer was breast cancer and they were mostly homemakers. The chemotherapy was the most common type of treatment. The chi-square test showed that there was no significant difference between the two groups in terms of gender, type of cancer, and place of residence. The chi-square test with likelihood ratio showed that there was no significant difference between the two groups in terms of the marital status, occupation, and type of treatment. Most patients were in stage 3 of cancer (54.7%) (Table 1). The independent t-test showed that there was no significant difference between the two groups in terms of age mean and duration of disease (Table 2).

TABLE 1.
Demographic characteristics of studied groups

Variable		Experimental group		Control group		P
		Number	Percentage	Number	Percentage	
Gender	Female	31	58/5	26	61/9	0/74
	Male	22	41/5	16	38/1	
	Single	7	13/2	7	16/7	
Marital status	Married	31	58/5	28	66/7	0/59
	Divorced	5	9/4	2	4/8	
	Widow	10	18/9	5	11/8	
Type of cancer	Breast	18	34	17	40/5	0/93
	Colorectal	8	15/1	5	11/9	
	Stomach	9	17	6	14/3	
	Blood	6	11/3	6	14/3	
	Others	12	22/6	8	19	
Job	Housewife	22	41/5	19	45/3	0/30
	Employee	14	26/4	5	11/9	
	Manual worker	2	3/8	5	11/9	
	Self-employed	9	17	8	19	
Place of residency	Unemployed	6	11/3	5	11/9	0/18
	City	30	56/6	18	42/9	
	Village	23	43/4	24	57/1	
Type of treatment	Chemotherapy	30	56/6	28	66/7	0/37
	Surgery	1	1/9	0	0	
	Others	22	41/5	14	33/3	

Education level	Under Diploma	24	45/3	21	50	0/92
	Diploma	14	26/4	8	19	
	Associate	5	9/4	4	9/5	
	Bachelor	8	1	6	14/3	
	MA	2	3/8	3	7/2	
Stage of cancer	Stage 1	2	3/8	2	8/4	0/42
	Stage 2	27	50/9	17	40/5	
	Stage 3	24	45/3	23	54/7	
Average monthly household income (Toman)	Less than 1 million	15	28/3	10	23/8	0/32
	2-1 million	21	39/6	15	35/7	
	2-3 million	16	30/2	13	31	
	5-3 million	1	1/9	4	9/5	

TABLE 2.
Mean of age and duration of disease in two groups

Table 2. Mean of age and duration of disease in two groups

Variable	Experimental group		Control group		P
	Mean	Standard deviation	Mean	Standard deviation	
Age (year)	49/77	11/59	45/46	12/44	0/18
Duration of cancer (month)	20/55	15/35	25/81	18/41	0/13

The independent t-test showed that after the intervention, the mean of total fatigue score and all of its dimensions was significantly lower in the experimental group (35.52 ± 5.68) than the control group (84.68 ± 7.96) ($P < 0.001$) (Table 3).

TABLE 3.
Comparison of two groups in terms of mean of fatigue and its dimensions after intervention

Table 3. Comparison of two groups in terms of mean of fatigue and its dimensions after intervention

Dimensions of fatigue	Experimental group		Control group		Experimental group
	Mean	Standard deviation	Mean	Standard deviation	
Total score	35/52	5/68	84/68	7/96	0/001>
General fatigue	6/33	1/62	18/05	2/19	0/001>
Physical fatigue	6/98	1/69	17/92	2/07	0/001>
Reduced activity	6/48	1/76	16/97	2/21	0/001>
Reduced motivation	6/83	2/01	18/24	1/72	0/001>
Mental fatigue	8/91	1/41	13/50	2/72	0/001>

The paired t-test showed that after the intervention, the mean of total fatigue score and all its dimensions was significantly lower in the experimental group (35.52 ± 5.68) than before the intervention (84.28 ± 7.17).

Before the intervention, the experimental group reported a high fatigue rate, while after the intervention, the fatigue was reported to be moderate ($P < 0.001$) (Table 4).

TABLE 4
Comparison of mean of fatigue score and its dimensions
in experimental group before and after intervention

Table 4. Comparison of mean of fatigue score and its dimensions in experimental group before and after intervention

Dimensions of fatigue	Before intervention		After intervention		P
	Mean	Standard deviation	Mean	Standard deviation	
Total score	84/28	7/17	35/52	5/68	0/001>
General fatigue	18/49	1/49	6/33	1/62	0/001>
Physical fatigue	17/72	1/86	6/98	1/69	0/001>
Reduced activity	16/21	2/01	6/48	1/76	0/001>
Reduced motivation	18/28	2/40	6/83	2/01	0/001>
Mental fatigue	13/58	2/79	8/91	1/41	0/001>

The paired t-test showed that in the control group, there was no significant difference in the mean of total fatigue score and its dimensions before and after the intervention (Table 5).

TABLE 5.
Comparison of mean of fatigue score and its dimensions in control group before and after intervention

Table 5. Comparison of mean of fatigue score and its dimensions in control group before and after intervention

Dimensions of fatigue	Before intervention		After intervention		P
	Mean	Standard deviation	Mean	Standard deviation	
Total score	84/17	8/03	84/68	7/96	0/43
General fatigue	17/83	2/22	18/05	2/19	0/22
Physical fatigue	17/74	1/95	17/92	2/07	0/32
Reduced activity	16/86	2/20	16/97	2/21	0/59
Reduced motivation	18/26	1/78	18/24	1/72	0/62
Mental fatigue	13/48	2/65	13/50	2/72	0/23

DISCUSSION

Discussion: The fatigue rate of patients with cancer in the experimental group who conducted the exercise program for 12 weeks was less than that of control group. In other words, the designed exercise program was effective in reducing the fatigue of studied patients.

These findings are consistent with a limited number of studies, which examined the effects of home-based physical activity on the fatigue in patients with cancer. For example, Cuesta et al. studied 60 men with **Testicular Germ** cell cancer who were under chemotherapy and found that the fatigue was significantly lower in the experimental group than control group^{19,33}.

Hospo et al. studied 67 women with breast cancer in Norway and showed that after exercise, the mean of fatigue decreased 6 months after the end of chemotherapy^{20,21}.

Baumann et al. studied 194 patients with cancer at German Restorative Center and found that the fatigue syndrome was lower in group received the exercise program than control group^{22,23,31}.

Schmitz et al. suggested that the patients with cancer should use moderate aerobic exercises such as walking and cycling for 20 to 60 minutes per session for 3-5 days a week to improve their mood and quality of life and reduce fatigue^{24,25,32}.

However, the findings of this study were not consistent with findings of Dodd et al. and Lin et al.; they showed that the home-based exercise or supervised exercise do not reduce cancer-related symptoms in patients with breast, colorectal, and ovarian cancer^{26,27}.

In general, other studies are needed to confirm the effects of home-based^{28,29} exercise program on the fatigue management in patients with cancer in future to determine the desired level of walking program for the effectiveness and acceleration of recovery in patients with cancer over years after completion of treatment period^{30,34}.

CONCLUSION

The findings of this study indicated that the home-based walking program could reduce fatigue related to cancer and its treatments. The members of health care team should consider walking as a supportive intervention for cancer treatment. The widespread use of home-based programs such as walking may significantly improve the general health of vulnerable population.

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REFERENCES

1. Dafei M, Dehghani A, Momeni Z, Kalanfarmanfarma K, Koohgard M, Jalali M. Study of breast cancer knowledge, attitude, and preventive behaviors among women referring to health treatment centers in Yazd, Iran, 2015. *Pajouhan Scientific Journal*. 2017;15(2):46-53.
2. Ardani r, Hosseini f, Moghani b, Saifi. The Effectiveness of Cognitive-Behavioral Stress Management Training on Negative Emotions and Quality of Life in Women with Breast Cancer. *Iranian Journal of Obstetrics, Gynecology and Infertility*. 2015;18(154):8-18.

3. Boyes AW, Girgis A, D'Este C, Zucca AC. Prevalence and correlates of cancer survivors' supportive care needs 6 months after diagnosis: a population-based cross-sectional study. *BMC cancer*. 2012;12:150.
4. Habibi M, Salmani K, Amani O, Rafezi Z, Mahani SSN. The Comparison of Spiritual Experience and Resilience Between Women with Breast Cancer and Healthy Women. *Journal of Science and Technology Research*. 2016;14(1):50-5.
5. Hasanvand S, Ashktorab T, Jafari Z, Salmani N, Safariyan Z. Cancer-related fatigue and its association with health-related quality of. *Advances in Nursing & Midwifery*. 2015;24(85).
6. Goedendorp MM, Peters ME, Gielissen MF, Witjes JA, Leer JW, Verhagen CA, et al. Is increasing physical activity necessary to diminish fatigue during cancer treatment? Comparing cognitive behavior therapy and a brief nursing intervention with usual care in a multicenter randomized controlled trial. *The oncologist*. 2010;15(10):1122-32.
7. Campos M, Hassan B, Riechelmann R, Del Giglio A. Cancer-related fatigue: a practical review. *Annals of Oncology*. 2011;22(6):1273-9.
8. Andrykowski MA, Donovan KA, Laronga C, Jacobsen PB. Prevalence, predictors, and characteristics of off-treatment fatigue in breast cancer survivors. *Cancer*. 2010;116(24):5740-8.
9. Ausanee Wanchai RN M, Armer JM. Nonpharmacologic supportive strategies to promote quality of life in patients experiencing cancer-related fatigue: a systematic review. *Clinical journal of oncology nursing*. 2011;15(2):203.
10. Posadzki P, Moon T-W, Choi T-Y, Park T-Y, Lee MS, Ernst E. Acupuncture for cancer-related fatigue: a systematic review of randomized clinical trials. *Supportive Care in Cancer*. 2013;21(7):2067-73.
11. Finnegan-John J, Molassiotis A, Richardson A, Ream E. A systematic review of complementary and alternative medicine interventions for the management of cancer-related fatigue. *Integrative cancer therapies*. 2013;12(4):276-90.
12. Meneses-Echávez JF, González-Jiménez E, Ramírez-Vélez R. Effects of supervised exercise on cancer-related fatigue in breast cancer survivors: a systematic review and meta-analysis. *BMC cancer*. 2015;15(1):77.
13. Blaney J, Lowe-Strong A, Rankin J, Campbell A, Allen J, Gracey J. The cancer rehabilitation journey: barriers to and facilitators of exercise among patients with cancer-related fatigue. *Physical therapy*. 2016;90(8):1135-47.
14. Berger AM, Gerber LH, Mayer DK. Cancer - related fatigue. *Cancer*. 2012;118(S8):2261-9.
15. Kim SH, Seong DH, Yoon SM, Choi YD, Choi E, Song Y, et al. The Effect on Bone Outcomes of Home-based Exercise Intervention for Prostate Cancer Survivors Receiving Androgen Deprivation Therapy: A Pilot Randomized Controlled Trial. *Cancer Nursing*. 2017.
16. Alibhai SM, O'Neill S, Fisher-Schlombs K, Breunis H, Timilshina N, Brandwein JM, et al. A pilot phase II RCT of a home-based exercise intervention for survivors of AML. *Supportive Care in Cancer*. 2014;22(4):881-9.
17. Donnelly C, Lowe-Strong A, Rankin J, Campbell A, Blaney J, Gracey J. A focus group study exploring gynecological cancer survivors' experiences and perceptions of participating in a RCT testing the efficacy of a home-based physical activity intervention. *Supportive Care in Cancer*. 2013;21(6):1697-708.
18. Jazani rK, Saremi m, Kavousi a, Shirzad h, Rezapour t. Different Scales of Fatigue in Traffic Policemen. *Applied Research Center of Behdad Deputy*. 2012;1(1):5-14.
19. Cuesta-Vargas AI, Carabantes F, Caracuel Z, Conejo I, Alba E. Effectiveness of an individualized program of muscular strength and endurance with aerobic training for improving germ cell cancer-related fatigue in men undergoing chemotherapy: EFICATEST study protocol for a randomized controlled trial. *Trials*. 2016;17(1):8.
20. Husebø AML, Dyrstad SM, Mjaaland I, Søreide JA, Bru E. Effects of scheduled exercise on cancer-related fatigue in women with early breast cancer. *The Scientific World Journal*. 2014;2014.
21. Baumann FT, Bieck O, Oberste M, Kuhn R, Schmitt J, Wentrock S, et al. Sustainable impact of an individualized exercise program on physical activity level and fatigue syndrome on breast cancer patients in two German rehabilitation centers. *Supportive Care in Cancer*. 2017;25(4):1047-54.

22. Schmitz KH, Courneya KS, Matthews C, Demark-Wahnefried W, Galvão DA, Pinto BM, et al. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Medicine & Science in Sports & Exercise*. 2010;42(7):1409-26.
23. Cho MH, Dodd MJ, Cooper BA, Miaskowski C. Comparisons of exercise dose and symptom severity between exercisers and nonexercisers in women during and after cancer treatment. *Journal of pain and symptom management*. 2012;43(5):842-54.
24. Lin K-Y, Shun S-C, Lai Y-H, Liang J-T, Tsao J-Y. Comparison of the effects of a supervised exercise program and usual care in patients with colorectal cancer undergoing chemotherapy. *Cancer nursing*. 2014;37(2):E21-E9.
25. Feili A, Kojuri J, Bazrafcan L. A dramatic way to teach clinical reasoning and professionalism. *Medical education*. 2018 Nov;52(11):1186.
26. Bazrafcan L, Takmil F, Shokrpour N. Assessing the Effectiveness of Problem-Based Learning as a New Approach on Health Care Provider Ethical Reasoning Development in Shiraz University of Medical Sciences. *The health care manager*. 2018 Jul 1;37(3):273-7.
27. Paknahad, M., Dehghani Nazhvani, A., Jarideh, S., Eslami, J., Mortazavi, S.M.J., *International Journal of Radiation Research*, Increased Mercury release due to exposure to electromagnetic radiation as a limiting factor for using dental amalgam, Volume 14, Issue 4, October 2016, Pages 355-359.
28. Mortazavi, S.M.J., Atefi, M., Bagheri, Sh., Besharati, A., Eslami, J. *Journal of Kerman University of Medical Sciences*, The ability of GSM mobile phone users in detecting exposure to electromagnetic fields and the bioeffects of these fields on their vital signs, Volume 17, Issue 3, June 2010, Pages 257-267.
29. Khosravani, M., Abedi, H.A., Lak, S., Rafiei, F., Rahzani, K. (2017). The association between conscience understanding and clinical performance among nurses working at education hospital of Arak *Annals of Tropical Medicine and Public Health*, 10(6), pp. 1587-1590.
30. Lak, S., Zahedi, S., Davodabady, F., Khosravani, M. (2018). Conscience understanding among nurses working at education hospital of Arak *Revista Latinoamericana de Hipertension*, 13(3), pp.246-250.
31. Nasiri, M., Rezghi, M., & Minaei, B. (2014). Fuzzy dynamic tensor decomposition algorithm for recommender system, *UCT Journal of Research in Science, Engineering and Technology*, 2(2):52-55.
32. Bahremand, A. (2015). The concept of translation in different teaching approaches and methods. *UCT Journal of Social Sciences and Humanities Research*, 3(1), 5-9.
33. Tel H, Ertekin Pinar S, Daglar G. Effects of Home Visits and Planned Education on Mothers' Postpartum Depression and Quality of Life. *J Clin Exp Invest*. 2018;9(3):119-25.
34. Bulgakov, A. V., Babieva, N. S., Levanova, E. A., Gridyaeva, L. N., Erofeeva, M. A., Sokolovskaya, I. E., & Davidyan, L. Y. (2018). Specific features of psycho-emotional states of working women during pregnancy. *Electronic Journal of General Medicine*, 15(6).