

# Comparison of the effect of SMS training and on-the-job training on adherence to the drug regimen in chemotherapy patients referred to Zabol chemotherapy center in 2018

Gholamreza Gavan<sup>1</sup>, Mohammadreza Firouzkouhi<sup>2\*</sup>, Abdolghani Abdollahimohammad<sup>2</sup>, Zahra Rahdar<sup>3</sup>

<sup>1</sup> Student research Committee, Department of Nursing, School of Nursing, Zabol University of Medical Sciences, Zabol, Iran. <sup>2</sup> Faculty of Nursing and Midwifery, Zabol University of Medical Sciences, Zabol, Iran. <sup>3</sup> MSC, Department of Nursing, Zabol University of Medical Sciences, Zabol, Iran

**Correspondence:** Mohammadreza Firouzkouhi, Faculty of Nursing and Midwifery, Zabol University of Medical Sciences, Ferdosi Shargi St., Zabol, Iran, E-mail: firouzkouhi@gmail.com

## ABSTRACT

**Introduction & Objective:** Chemotherapy is one of the main options for cancer treatment and is important for the eradication of neoplastic cells through drug interventions. Compliance with treatment in patients is effective in the success of treatment. Therefore, the aim of this study was to compare the effect of SMS training and on-the-job training on adherence to the drug regimen in chemotherapy patients referred to Zabol chemotherapy center in 2018. **Materials and Methods:** This is a quasi-experimental study in which 30 patients undergoing chemotherapy were studied in two groups of 15 subjects. The intervention group received a text message for 3 months and the control group received only in-person training during this period. Adherence to the treatment of patients at the beginning and the end was assessed by a questionnaire on adherence to the Modanloo treatment and the data were analyzed by descriptive and inferential statistics (significant level less than 0.05). **Results:** The findings of this study showed that ANOVA test with repeated measurements did not show a significant difference in the mean scores of adherence to treatment. **Conclusion:** SMS instruction can have positive consequences in relation to compliance with the pharmaceutical regimen. Therefore, it is recommended to use this method to improve compliance with the chemotherapy regimen of patients.

**Keywords:** SMS training, in-person training, compliance with the drug regimen, chemotherapy, semi- experimental study

## Introduction

Chronic diseases involve people of any age, culture, race, social class and economics, and some of them, due to their disabilities, have a significant impact on the quality of life of the patients. Cancer, like other chronic diseases, is considered a major health care issue [1]. Cancer is one of the major health problems in many countries and has more than 14 million new cases and

more than 8 million annual deaths [2]. In developed countries, about one quarter of deaths occur because of cancer, and colon cancer after breast cancer is the second most common form in Europe, estimated at 13% [3-5]. Cancer treatment is a highly stressful experience in life that is associated with many mental, physical and social problems [2]. Crisis caused by cancer causes imbalance and inconsistency of thought, body and soul, but most of the time in this period is a sense of despair and despair. Other possible reactions to cancer are depression. Depression is very detrimental to cancer patients because it requires submission to disease. Other depressed people are no longer trying to survive and lose the better opportunities to live in the rest of their lives [6].

Chemotherapy is one of the main options for treating cancer and is used to eradicate neoplastic cells through drug interventions and can be accompanied by radiation therapy or surgery. The cytotoxic nature of chemotherapy will inevitably lead to the destruction of healthy tissue in addition to tumor cells. One third of the patients suffers from mild side effects and

### Access this article online

Website: [www.japer.in](http://www.japer.in)

E-ISSN: 2249-3379

**How to cite this article:** Gholamreza Gavan, Mohammadreza Firouzkouhi, Abdolghani Abdollahimohammad, Zahra Rahdar. Comparison of the effect of SMS training and on-the-job training on adherence to the drug regimen in chemotherapy patients referred to Zabol chemotherapy center in 2018. *J Adv Pharm Edu Res* 2019;9(S2):125-129.

**Source of Support:** Nil, Conflict of Interest: None declared.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

one third of the severe side effects that need to be stopped or corrected. As a result, anti-neoplastic drugs can cause organ toxicities and impose side effects such as fever, nausea, vomiting, fatigue, diarrhea, mucus inflammation, pain that affects at least one of these symptoms, or even severe, in patients with The tumor exists globally, and many of them have multiple symptoms. Death due to toxic reactions may also occur<sup>[2, 3]</sup>.

In the face of chemotherapy, bone marrow tissue, gastrointestinal mucosa and hair follicle have the most toxic side effects, and general toxicities include hematological toxicity (neutropenia, thrombocytopenia, peripheral blood and peripheral blood loss and anemia), digestive system (anorexia), Vomiting and nausea), skin and hair follicle (hair loss), nervous system (hand and foot paresthesia, loss of deep tendon reflexes and weakness), topical poisoning (accidental discharge of fluids from the vessel to the tissue), metabolic abnormalities (Increased uric acid caused by nucleic acid), liver toxicity (damage to parenchymal cells with necrosis, fibrosis and closure of the vein Diarrhea), urinary tract poisoning (bladder carcinoma and bladder bleeding inflammation), cardiac poisoning (cardiomyopathy, arrhythmia, pericardium inflammation, myocardial anemia), pulmonary poisoning (pulmonary fibrosis and acute pneumonia), gonadal poisoning, anaphylaxis, and hypersensitivity, etc.<sup>[7]</sup>. Patients undergoing chemotherapy are tired of following treatment and taking prescribed medications because of problems that occur after chemotherapy. As their treatment is affected and their problems are increased. Therefore, adherence to treatment in these patients and compliance with the instructions of the physician are required. In this regard, Simon et al. (2002) study, for all oral anxiety drugs, such as capecitabine, cyclophosphamide, and targeted drugs, a high degree of prescription is a prerequisite for the efficacy of treatment, and patient education by pharmacists can be Improving the efficacy of prescribed medications is effective<sup>[8-10]</sup>. In similar studies that Majlesi et al. Performed on treatment compliance, the lack of compliance with the diet was a problem for the vast majority of people with diabetes, and this would expose late complications of diabetes. Various studies have not yet succeeded in explaining why people are completely discontinued from their treatment regimen, but various studies have examined psychosocial factors that lead to undesirable adherence. Also, social factors can affect compliance. Social support improves compliance with treatment, and metabolic control improves. Some other studies have mentioned the economic conditions that have an effect on treatment compliance<sup>[11, 12]</sup>. In the treatment of children with cancer, their parents often fail to understand the cause and manner of treatment and care, the economic consequences of childhood illness, the suffering inflicted on the child during the illness, the change in the physical condition The child suffers from the emergence of complications from illness and treatment, and this can lead to stress and psychosocial problems, and adverse effects on the child and the process of adherence to treatment<sup>[13]</sup>.

Cancer patients are interested in receiving information that helps them better understand disease, decision-making and treatment, and in particular they want to get as much information as possible about side-effects management<sup>[2, 14]</sup>. Various educational methods are used to transfer knowledge and increase awareness of individuals<sup>[15]</sup>. In-person training is one of the most common educational methods in the health care system<sup>[16]</sup>. However, despite the numerous problems associated with the presence of experienced and trained educators, the presence of students in the classrooms and the presence of new educational facilities; the development of new teaching methods and non-attendance teaching using the technology<sup>[17]</sup>. The advancement of information and communication technology and its impact on teaching and learning science has provided opportunities for creating learning environments with good, learn-centered, interesting, interactive, efficient, flexible, meaningful and facilitated learning<sup>[18]</sup>. The use of technology and information tools offers new ways to improve the educational system, which is a virtual learning of the results. With the emergence of these types of learning, innovative practices such as e-learning and mobile learning (cellular) are used efficiently. The increasing need of people for education, the lack of economic facilities, the lack of qualified teachers and educators, and the high cost of training, has led professionals to innovate with the help of information and communication technology (New Technologies for Education)<sup>[19, 20]</sup>. Learning together brings about the mobility of scholars in the sense that learning is engaging with educational activities without any barriers or limitations that can have a physical environment<sup>[21]</sup>. Mobile phones are considered as the most accepted technology in the world. One of the most commonly used features in mobile communication technology is sending a message, which is one of the most common communication methods. Many studies have come to the conclusion that giving short messages can be used as a tool to support patient self-management. Short message service can be used to maximize the effectiveness, effectiveness, and reception of preventive measures and health promotion programs through the improvement of health communication. Therefore, SMS interventions are susceptible to positive change in preventive health behaviors<sup>[2, 22]</sup>.

As a result, due to the diversity of educational methods and differences of opinion, we compared the effect of SMS training and on-the-job training on adherence to the drug regimen in chemotherapy patients referred to the Zabol Center for Chemo in 2018.

## Materials and Methods

This is a semi-experimental study in a community of chemotherapy patients referred to the Zabol Hospital in 1397. The samples studied in this study, using the sample size formula, with a probability of dropping samples from the research population of 30 were determined. The sampling method was purposeful in this research. After approval of the draft plan and its approval by the Ethics Committee of Zabol University of Medical Sciences and obtaining the necessary

permissions and referring to the Zabul chemotherapy center, patients undergoing chemotherapy that have criteria for inclusion in the study include the diagnosis of cancer by an expert (the type of cancer is the same And homogeneous patients), satisfaction to participate in the study, having enough reading and writing skills, ability to communicate with the cell phone by the patient or a family member, having no problem communicating with the presenter, not attending another course During the research and the completion of the first course of chemotherapy, select Completing a written informed consent form, were randomly divided into two intervention and control groups (15 per group) were divided. The required explanations for the research objectives as well as the interventions to be performed were given to the participants in each group. Then, the participants completed two groups of demographic questionnaire and Adjunct Questionnaire for the Modanloo treatment. The demographic questionnaire has 7 questions including age, sex, level of education, occupation, marital status, type of cancer, duration of infection. Content validity of this questionnaire was verified by 10 faculty members of Zabul Nursing and Midwifery Faculty. The Adjunct Questionnaire of Modanloo Treatment includes 40 questions in 7 areas including treatment, willingness to participate in treatment, ability to adapt, combine therapy with life, adherence to treatment, commitment to treatment, and doubt in the implementation of treatment. The answer to each of the questions is Likert Five options include (5), very high (4), high (3), low (2), very low (1) and at all (0). Scoring is a number of inverse expressions, which means that at all, with a score of 5, it is fully accrued with a score of 0. Statements 33, 34, 35, 37, 38, 39 and 40 were scored in reverse. The degree of adherence to patient treatment in terms of scoring score is between 75-100 very good, 50-74 good, 26-49 median and weak 0-25, respectively. The internal consistency of the questionnaire was calculated with Cronbach's alpha of 0.921, and the stability of the questionnaire was confirmed by a retest with an interval of two weeks of 0.875 [23].

In the intervention group, in addition to in-person training, the follow-up was carried out at home and SMS was provided for awareness of compliance with treatment and management of complications of chemotherapy. Trainings were made in the form of messages via mobile phone (SMS service) according to the prepared training manual. In the course of 4 weeks, 2 short messages were sent each day at 8:00 am and 8:00 pm and a total of 140 short messages for each sample. It also teaches how to use the short message service and answers to bugs and questions. The content provided in SMS is similar to the content provided in in-person training, and sentences are presented in an appealing, clear, and orderly way. To ensure that the messages are sent, the researcher activated the delivered option on his mobile phone and received a message from the "received" message by samples, ensuring timely and accurate receipt of the messages by the participants. Has produced. During the study, the researcher was available to the samples and the patients, if necessary, were able to make phone calls or in person. The researcher has also contacted the

research units at least once or twice a month, and he has talked to patients when needed, and monthly reminders and explanations are given on each visit to patients. In the control group, nursing staff have been trained (in-person training) and no other interventions have been performed. Three months after the completion of chemotherapy, the knowledge and practice of the two intervention and control groups were measured by a questionnaire of adherence to the Modanloo treatment. Data were analyzed by SPSS software version 22 and descriptive and inferential statistics (meaningful level less than 0.05).

## Findings

From 30 patients: in the intervention group, 10 cases were male, 5 were female, and in the control group, 8 were male and 7 were female, and there was no significant difference in sex between the groups ( $P=0.519$ ). Also, in the intervention group, the mean age of patients was 59.85 years and in control group was 60.95 years, and there was no significant difference in age between the two groups ( $P = 0.726$ ).

The mean of total follow-up score in the intervention group was 134.80 and 142.60 control (Table 1), which after 3 months in the intervention group reached 139.47 and the control was 142.60. ANOVA with repeated measurements showed that there was no statistically significant difference between the mean of total scores and other variables, but ANCOVA test (covariance analysis) showed that the mean scores of adaptive ability in the two groups were different after the intervention, so that the scores The intervention group was more than the control group (Table 2).

**Table 1. Mean and standard deviation of follow-up scores before intervention in two groups of control and intervention**

Variable	Mean (SD)		Sig.
	Intervention	Control	
Adherence to treatment (total)	134.80 (1609)	142.60 (1651)	0.139
Focus on treatment	34.55 (5.51)	36.85 (6.42)	0.232
Inclination to participate in treatment	27.42 (4.29)	27.90 (3.93)	0.732
Ability to match	25.10 (3.88)	27.85 (3.67)	0.027
Combining treatment with life	19.00 (3.41)	2.35 (3.31)	0.033
Stick to cure	1445 (2.96)	1475 (2.69)	0.739
Commitment to treatment	1125 (2.67)	1085 (2.47)	0.626
Hesitation in the implementation of treatment	3 (5.75)	3(6)	0.769

**Table 2. The mean and confidence intervals of follow-up scores after intervention in two groups of control and**

intervention			
group	95% confidence limit		Sig.
	Control		
Adherence to treatment (total)	142.60 (135.60, 149.61)	0.527	0.527
Focus on treatment	36.77 (34.14, 39.40)	0.919	0.919
Inclination to participate in treatment	28.02 (26.28, 29.73)	0.804	0.804
Ability to match	26.85 (26.03, 27.67)	0.001	0.001
Combining treatment with life	20.51 (19.91, 21.11)	0.085	0.085
Stick to cure	14.71 (13.52, 15.91)	0.771	0.771
Commitment to treatment	10.92 (9.81, 12.03)	0.988	0.988
Hesitation in the implementation of treatment	2.95 (1/88, 4/01)	0.555	0.555

## Discussion

The results of the present study showed that the implementation of SMS instruction increased the coping ability score, one of the levels of treatment compliance in the intervention group compared to the control group by in-person training.

In this regard, Rakhsh Khorshid et al. (2014) concluded that the use of reminder SMS could be an effective way to improve the compliance of women with iron supplementation during pregnancy <sup>[24]</sup>. Kazemi Majd et al. (2017) demonstrated the importance of teaching SMS in adherence to the drug regimen of patients with epilepsy <sup>[17]</sup>. Jadid Milani et al. (2014) in their study showed that SMS tracking improves treatment following postoperative coronary artery bypass graft surgery <sup>[25]</sup>. Also, Lee et al. (2014) introduced the use of SMS as an efficient and cost-effective way to improve the participation of people in rural and suburban areas that have recently been developed and have limited access <sup>[26]</sup>, which are the results of the studies mentioned above. The results of this study were consistent with the results of the present study. The reason for matching results can be because of the use of SMS service.

SMS is one of the telemedicine services for increasing the quality and efficiency of electronic health to improve services for all, regardless of location and time <sup>[27]</sup>.

In a study by Van Riswick et al. (2015), SMS did not affect oral glucose tolerance testing in women who had recently been diagnosed with gestational diabetes <sup>[28]</sup>. Ali Hosseini et al. (2016) in their study showed that there was no significant difference between two SMS and in-person training in Kagel exercise in middle-aged women <sup>[16]</sup>. Also, in the study of Sadeghi Shermeh et al. (2013), SMS tracking did not have any effect on improving the quality of life of patients with heart

valve replacement <sup>[29]</sup>, which did not match the results of the present study. The reason for not having the results is that the research community is different.

## Conclusion

According to the results of the study, SMS education was more effective than chemotherapy in controlling the rate of compliance with the chemotherapy regimen. Therefore, it is advisable to use this low-cost, accessible method for a large number of patients in a wide geographical range, to be trained to improve compliance with the drug regime, in order to help complete their treatment. It also helps oncologists, physicians, and nurses who are in touch with patients to be able to plan for the more successful treatment of patients according to this method.

## Acknowledgement

This study was approved by the Zbmu.1.REC.1397.086 Code of Ethics Committee of Zabol University of Medical Sciences. All honorable authorities of Zabol University of Medical Sciences, Imam Khomeini Hospital, Zabol Hospital and all those who collaborated with the researcher in this study are sincerely grateful.

## References

1. Barandeh M, Mehdizadeh Toorzani Z, Babaei M, Sharifian R. Effect of Self-Care on Quality of Life in Women with Breast Cancer Undergoing Chemotherapy. *J Urmia Nurs Midwifery Fac.* 2017; 15 (3) :199-207.
2. Rico TM, dos Santos Machado K, Fernandes VP, Madruga SW, Noguez PT, Barcelos CRG, et al. Text Messaging (SMS) Helping Cancer Care in Patients Undergoing Chemotherapy Treatment: a Pilot Study. *Journal of medical systems.* 2017;41(11):181.
3. Larsen ME, Rowntree J, Young AM, Pearson S, Smith J, Gibson OJ, et al., editors. Chemotherapy side-effect management using mobile phones. *Engineering in Medicine and Biology Society, 2008 EMBS 2008 30th Annual International Conference of the IEEE;* 2008: IEEE.
4. Chung-Faye G, Kerr D. ABC of colorectal cancer: Innovative treatment for colon cancer. *BMJ: British Medical Journal.* 2000;321(7273):1397.
5. Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P. Estimates of the cancer incidence and mortality in Europe in 2006. *Annals of oncology.* 2007;18(3):581-92.
6. Bijari H, Ghanbari Hashem Abadi B, Agha Mohammadiyan Sherbaf H. The effectiveness of group therapy based on the promise of hope therapy on

- increasing the life expectancy of women with breast cancer. *Foundations of Education*.2000;10(1):172-184.
7. Remesh A. Toxicities of anticancer drugs and its management. *International Journal of Basic & Clinical Pharmacology*. 2017;1(1):2-12.
  8. Simons S, Ringsdorf S, Braun M, Mey UJ, Schwindt PF, Ko YD, et al. Enhancing adherence to capecitabine chemotherapy by means of multidisciplinary pharmaceutical care. *Supportive Care in Cancer*. 2011;19(7):1009-18.
  9. Parsad SD, Ratain MJ. Prescribing oral chemotherapy. *BMJ: British Medical Journal*. 2007;334(7590):376.
  10. Bedell CH. A changing paradigm for cancer treatment: the advent of new oral chemotherapy agents. *Clinical journal of oncology nursing*. 2003;7(6).
  11. Tol A, Majlessi F, Rahimi Foroshani A, Mohebbi B, Shojaezadeh D, Salehi Node A. Cognitive Adaptation among Type II Diabetic Patients Referring to Tehran University of Medical Sciences Hospitals in Adherence to Treatment. *Health system research*.2012;8(6):1068-1077.
  12. Murphy DJ, Williamson PS, Nease DE. Supportive family members of diabetic adults. *Family practice research journal*. 1994.
  13. elahi asgar abad H, behnam vashani H, heshmati nabavi F, badii Z. The Effect of Caregivers on The Children With Cancer Undergoing Chemotherapy to Prevent Gastrointestinal Side Effects of Chemotherapy. *J Urmia Nurs Midwifery Fac*. 2016; 14 (1) :39-46.
  14. Garcia S. The effects of education on anxiety levels in patients receiving chemotherapy for the first time: an integrative review. *Clinical journal of oncology nursing*. 2014;18.(5)
  15. Mazani M, Hamidzadeh Arbabi Y, Nemati A, Mash'oufi M, Mahdavi, R. Comparing the effectiveness of attendance and non attendance education of health workers on knowledge of mothers and anthropometric changes of infants. *journal of health*.2012; 3(1): 74-86.
  16. Hosseini A, Najjar SH, Afshari P, Haghighizadeh M. A Comparative Study on the Influence of Text Messaging with In-Focus Training on Kagel's Exercise in Middle-aged Women. *Iranian Journal of Obstetrics, Gynecology and Infertility*.2016; 19 (34): 18-25.
  17. Kazemi Majd R, Hosseini M A, Safi M H, Norouzi K, Hosseinzadeh .The effect of self-care education by SMS method on self-efficacy and adherence to drug regimen in adolescents with epilepsy .*Nursing education*.2017;6(4):48-55.
  18. Mosadegh H, Kharazi S K, bazargan A. The Feasibility Study for Implementation of Electronic Learning in the Gas Company of Yazd Province.2011; 26 (3) :547-569.
  19. Farhadi R. E-learning: A New Paradigm in the Information Age. *Research and Information Processing and Management*.2005;21(1):49-66.
  20. Karimi S B, Soltani A, No Zohoori R. The feasibility of implementing mobile-based (mobile) learning in the university (Case study of Payam Noor University of Bochan).2014;7(28):111-125.
  21. Yazdanpanah A, Bayat E. Explaining and evaluating the competitive indices of virtual machines. *Strategic Management Studies*.2013;3(12):101-122.
  22. Blake H. Mobile phone technology in chronic disease management. *Nursing Standard (through 2013)*. 2008;23(12):43.
  23. Mahnaz mondanloo m. Design and psychometric assessment of treatment follow-up in chronic patients. dissertation. Iran: Iran University of Medical Sciences and Health Services.2013.
  24. Khorshid MR, Afshari P, Abedi P. The effect of SMS messaging on the compliance with iron supplementation among pregnant women in Iran: a randomized controlled trial. *J Telemed telecare*.2014;20(4):201-206.
  25. Poshtchaman Z, Jadid Milani M, Atashzadeh Shoorideh F, Akbarzadeh Bagheban A. The effect of two ways of using the phone and SMS follow-up care on treatment adherence in Coronary Artery Bypass Graft patients. *Cardiovascular Nursing Journal*.2014;3(2):6-14.
  26. Lee HY, Koopmeiners JS, Rhee TG, Raveis VH, Ahluwalia JS. Mobile phone text messaging intervention for cervical cancer screening: changes in knowledge and behavior pre-post intervention. *J Med Internet Res*. 2014;16(8):e196.
  27. Torabi M, Safdari R. *Electronic Health*. Tehran: Secretariat of The High Council of Information;2008.
  28. Van Ryswyk E M, Middleton P F, Hague W M, Crowther C A. Postpartum SMS reminders to women who have experienced gestational diabetes to test for type 2 diabetes: the DIAMIND randomized trial. *Diabetic Medicine*.2015; 32(10): 1368-1376.
  29. Sadeghi Sharmeh M, Ghafoori F, Tadrissi D, Tayebi A. The effect of telephony and telephony surveillance on quality of life in postoperative patients after cardiac valve replacement in selected hospitals in Tehran.2013; 6(1):65-72.