Research in Health & Medical Sciences *Original Article*

2023 December; 2(4)

Effect of Motivational Messaging via Mobile on Happiness in ACS Patients: A Clinical Trial

Mohammad Reza Nayeb[1], Esmat Nouhi[2], Tania Dehesh[3], Fahimeh Shojaeifar[4*]

[1] Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran
[2] Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran
[3] Department of Biostatistics and Epidemiology, School of Public Health, Kerman University of Medical Sciences, Kerman, Iran
[4] Research Center for Nursing and Midwifery Care, Comprehensive Research Institute for Maternal and Child Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

[*] **Corresponding author Email: fahimehshojaefar@yahoo.com**
Received: 2025/9; Revised: 2025/9; Accepted: 2025/10

Abstract

Coronary artery disease (CAD) remains the leading cause of morbidity and mortality worldwide. Its complications not only impose a major burden on healthcare systems but also profoundly impair patients' quality of life and overall well-being. This study was conducted to evaluate the effect of motivational messages delivered via mobile phone on the happiness of patients with acute coronary syndrome through a distance education approach. This randomized clinical trial was conducted on 91 patients with acute coronary syndrome in Yazd, Iran. Participants were randomly allocated to either an intervention group or a control group. The control group received routine educational training, while the intervention group, in addition to receiving routine educational training, was provided with motivational audio and video messages via WhatsApp over 12 weeks. The Oxford Happiness Questionnaire was administered at baseline and three months after the intervention. The two groups were homogeneous in terms of demographic characteristics ($P > 0.05$). Data were analysed using the Mann–Whitney U test and the Wilcoxon signed-rank test. Data were analyzed using STATA software version 17. The mean happiness score significantly increased in the intervention group, while no significant change was observed in the control group ($P < 0.001$). These findings suggest that motivational messages can be an effective, low-cost strategy to enhance patients' happiness. The findings indicate that sending motivational messages was effective in increasing the happiness of these patients. This simple and cost-effective approach can be integrated into routine care to enhance psychological well-being in clinical settings.

Keywords: Motivation, Happiness, Acute Coronary Syndrome, Distance Education

Introduction

Cardiovascular diseases (CVDs) are a major cause of morbidity and mortality worldwide and represent one of the most significant health challenges of the modern era (1). Among them, acute coronary syndrome (ACS)—a clinical manifestation of coronary heart disease (CHD)—is considered one of the most life-threatening conditions (2). In Iran, CVDs are highly prevalent and account for almost 90,000 deaths each year, making them the leading cause of mortality in the country (3). The increasing incidence of CVDs is strongly associated with lifestyle-related risk factors such as high consumption of unhealthy and processed foods, lack of physical activity, obesity, type 2 diabetes, hyperlipidemia, hypertension, and smoking (4, 5). These risk factors contribute not only to the onset of ACS but also to its severe complications, including high mortality, disability, and reduced quality of life (6). The considerable healthcare and economic burden caused by ACS underscores the urgent need for effective preventive and therapeutic strategies (7).

In addition to biological risk factors, psychological dimensions are increasingly recognized as critical determinants in the development and management of heart disease. Evidence suggests that stress, anxiety, depression, and emotional distress may exacerbate cardiovascular risk and negatively influence patient outcomes (8, 9). Conversely, psychological well-being—particularly positive emotions such as happiness—has been shown to improve resilience, support healthy behaviours and enhance treatment adherence (10, 11). Happiness has also been found to affect key lifestyle factors, including diet, physical activity, and sleep quality, which in turn influence cardiovascular health (12). Teaching positive thinking and mindfulness skills helps patients to reframe negative thoughts, reduce anxiety, and cope with illness more effectively (13). Therefore, psychological interventions are now viewed as an essential component of comprehensive care for ACS patients, complementing pharmacological therapy, surgery, and lifestyle modification (14).

In recent years, advances in digital health and information technology have provided new opportunities to support patients through remote education and care. Telenursing—defined as the use of information and communication technology to deliver nursing care at a distance—enables continuous patient monitoring, education, and motivation regardless of time and place (15). Mobile health interventions, including the use of text and video messaging, represent a cost-effective and scalable strategy to deliver health education and promote self-care among patients (16). The World Health Organization recommends the use of mobile communication as a suitable means of connecting patients with healthcare providers, particularly in chronic disease management (17). Research has shown that motivational short messages sent via mobile phones can improve patient adherence, encourage healthier behaviours, and reduce complications in a variety of chronic conditions (18). However, evidence on the effect of such mobile-based interventions on psychological outcomes—especially happiness—among ACS patients remains limited. This approach is cost-effective, easily scalable, and allows patients to engage in self-care and emotional support remotely, which is particularly valuable in situations where face-to-face contact is limited. Therefore, this clinical trial aimed to determine the effect of motivational mobile messaging on happiness levels among patients with acute coronary syndrome.

Methods

Study design

A Randomized Double-Blind Clinical Trial was registered under the number IR.KMU.REC.1397.308, and the manuscript was the output of the thesis. The participants in this study were patients with ACS admitted to the Critical Care Unit (CCU) of Afshar Hospital (Yazd, Iran) during 2018-2019.

Sample size estimation

Following a using G*Power software (version 3.1), based on similar studies and using the formula for comparing means between two independent groups, with a 95% confidence interval and 80% statistical power and according to ($Z_{1-\alpha/2}$=1.96, $Z_{1-\beta}$=0.84, $\sigma_{1,2}$=10, μ_1=10, μ_2=16, $\mu_1-\mu_2$=6)) the required sample size was estimated at 48 participants per group, although 40 patients were initially considered for each group (8).

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \ (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

Sampling procedure

Randomization was performed using block randomization with a 1:1 allocation ratio. Participants were randomly assigned to two groups: Group A (intervention) and Group B (control) using a permuted block randomization method. This is a method of allocating participants in clinical trials that divides them into small blocks to maintain balanced group sizes throughout the study. In this study, blocks were stratified to ensure homogeneity with respect to potential confounding variables such as age and sex. A double-blind procedure was applied, meaning that both the researchers and participants were unaware of group assignments.

Inclusion criteria

Diagnosis of acute coronary syndrome (ACS) by a cardiologist, age over 21 years, access to a mobile phone or landline, and the ability to read, write, and speak Persian.

Exclusion criteria

Participants included cognitive or motor impairments during the study, and experienced physical or mental conditions that could result in disability at any stage of the study.

Primary outcomes

To measure happiness, the Oxford Happiness Questionnaire was employed. This variable was also assessed at two time points: before the intervention and three months after the intervention.

The CONSORT flow chart reports the patient enrolment process (Figure 1). The researcher explained the study's objectives to the patients and obtained their informed consent. A colleague who was blinded to the study groups and objectives conducted the baseline questionnaire interviews. After collecting initial data, the patients' mobile numbers were recorded, and participants were randomly assigned to the intervention or control group. In addition to routine discharge training, a WhatsApp group was created for the intervention group, and participants were added. For 12 weeks, motivational messages were sent to the intervention group with careful scheduling to avoid message overload, ensuring that patients did not feel pressured. The messages included daily text messages, two daily voice messages or video messages, and guided meditation sessions three times per week (10 minutes each) covering topics such as stress management, deep breathing techniques, 10-minute mindfulness exercises, and effective communication skills. Patients self-reported whether they had seen or listened to each message, which allowed monitoring of adherence to the intervention. No messages were sent to the control group, which received only routine discharge training. The questionnaires were completed online by participants in both groups at baseline and three months post-intervention. All data, including mobile numbers and online responses, were handled confidentially and solely for research purposes.

Data collection tools and methods

A demographic questionnaire and the Oxford Happiness Questionnaire were the tools for data collection. Items in the demographic questionnaire included information about their sex, age, education level, and history of hospitalization with regard to the disease. The 29-item Oxford Happiness Questionnaire was first developed by Argyle et al. to measure personal happiness on a four-point Likert scale (0 to 3). The range of scores varies from 0 = not happy to 87 = happy. According to Cronbach's alpha, the internal reliability of the original questionnaire version was reported to be 94% (18, 19). Alipour and

Noorbala (1999) translated the Oxford Happiness Questionnaire for use in Iran. The questionnaire had a Cronbach's alpha of 0.98 and a split-half reliability of 0.92. Besides, the questionnaire had a test-retest reliability of 0.79 after three weeks (20). In the present study, the Cronbach's alpha of the scale was 0.82.

Statistical analysis

Data analysis was done using STATA software version 17. The data were described through the measures of descriptive statistics such as frequency (percent), mean, and standard deviation (SD). The normality of quantitative data was assessed by the Shapiro-Wilk test, and a significance level of 0.05 was considered for all statistical analyses. Between-group comparisons of categorical and numerical characteristics of participants were made using the Mann–Whitney U test. Moreover, between-group comparisons before and after intervention, their mean scores of happiness were made using the Wilcoxon signed-rank test.

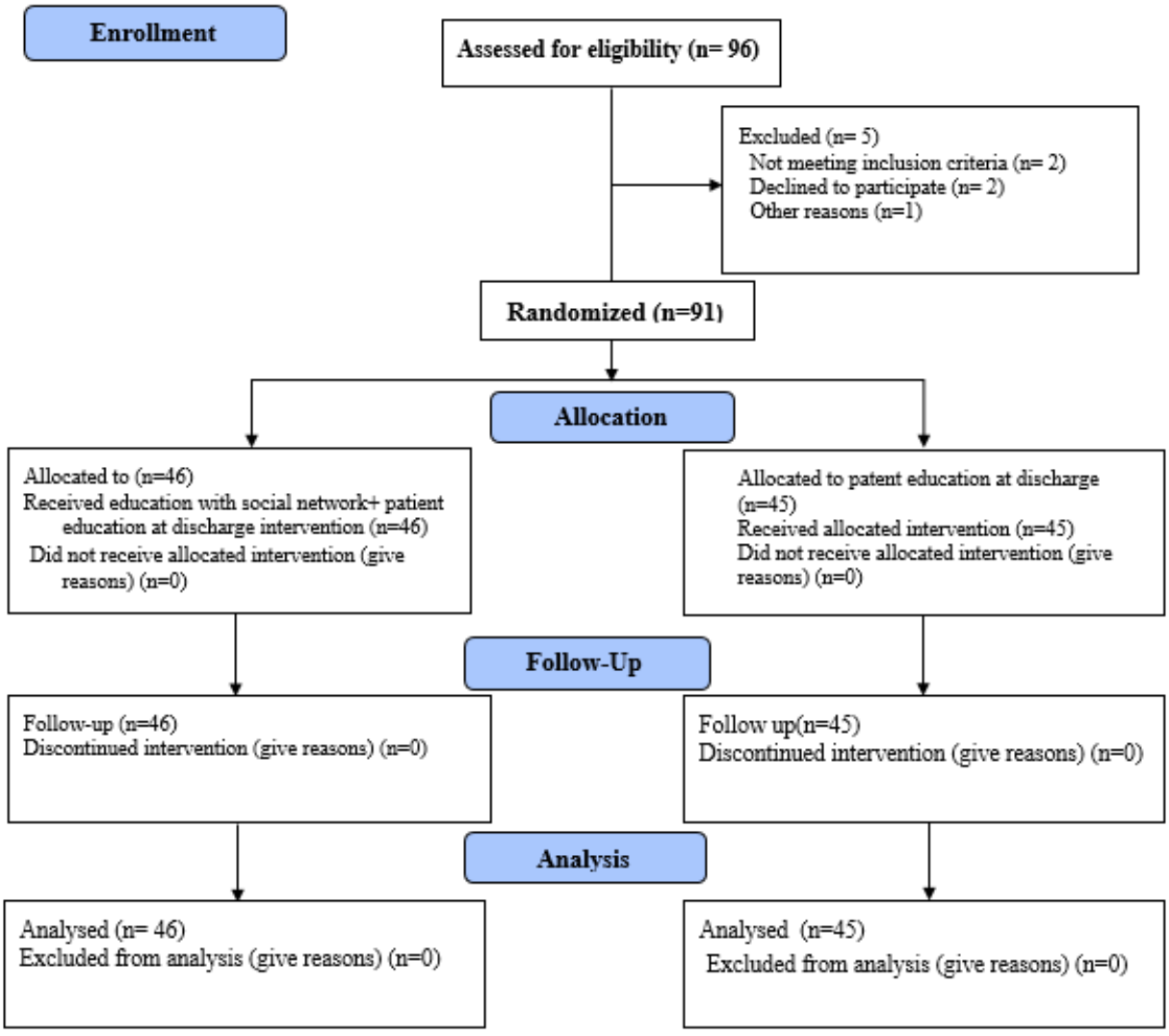

Figure1. Consort diagram showing enrolment and follow-up of participants

Results

The mean age of the intervention group participants was 55.98±8.1 years, and the mean age of the control group participants was 56.89±8.27 years. The independent t-test results revealed no meaningful difference between the groups in terms of mean age (P = 0.293). Similarly, the Mann–Whitney U test results showed no meaningful difference between the groups in terms of gender, education level, and history of hospitalization (Table 1), indicating the homogeneity of the groups in terms of demographic characteristics before the intervention. As can be seen, more than half of the participants in both groups were men (60% in the control group and 60.9% in the intervention group). Besides, more than half of the participants hold a diploma and lower education (53.3% in the control group and 58.3% in the intervention group), while the rest hold a bachelor's degree or higher education. Further, 48% and 54% of the participants in the intervention and control groups stated that they have a history of other diseases (Table 1).

The results show that the mean scores of happiness before (33.96±11.92) and after the intervention (34.73±11.56) are significantly different in the control group ($p<0.001$). Also, the results show that the mean scores of happiness before (32.63±10.76) and after (38.02±10.63) the intervention are significantly higher in the Intervention group ($p<0.001$) (Table 2).

Table 1. Baseline characteristics of randomized participants

Variable	Category	Control group		Intervention group		P-value
		percentage	frequncy	percentage	frequncy	
Age (Mean±SD)		56.89±8.27		55.98± 8.1		0.293*
Sex	Female	40	18	39.1	18	0.932#
	Male	60	27	60.9	28	
Education	High school	53.3	24	58.7	27	0.551#
	Bachelor's degree	44.4	20	41.3	19	
	Master's degree	2.2	1	0	0	
History of other diseases	Yes	48.9	22	54.3	25	0.677#
	No	51.1	23	45.7	21	

*** Mann–Whitney U test, # chi-square**

Table 2. Mean happiness scores compared between groups over time

Groups	Happiness score	Mean ± SD	P-value*
Control	Pre-intervention	33.96±11.92	< 0.001
	Post-intervention	34.73±11.56	
Intervention	Pre-intervention	32.63±10.76	< 0.001
	Post-intervention	38.02±10.63	

*** Wilcoxon signed-rank test**

Discussion

According to the results, the use of social media interventions can affect the happiness of patients with ACS. The results also revealed that the mean happiness score was significantly higher in the intervention group than in the control group three months post-intervention. Abdollahi et al.'s study on the effectiveness of Fordyce-style happiness training on happiness

and blood pressure in patients with hypertension in Iran showed that 8-week Fordyce-style happiness training among patients with hypertension increased happiness and decreased systolic blood pressure in comparison to a control group (21). An advantage of our study is the use of digital media for education, compared to traditional face-to-face training, which may offer greater accessibility and adherence.

A 2023 Cochrane review examined social-network and social-support interventions, including social media platforms, in patients with cardiovascular disease. Interestingly, this review reported mixed results, with some interventions showing limited or no significant effects on cardiac rehabilitation and psychosocial outcomes (22). Although these findings do not directly confirm our results, they highlight the variability in effectiveness of social-media–based interventions and underscore the need for well-designed studies to clarify their impact on psychological outcomes such as happiness. Similarly, Ying Wu et al. (2024) conducted a meta-analysis of mobile health (mHealth) programs for patients with coronary heart disease and reported improvements in quality of life and reductions in anxiety and depression, suggesting that motivational messages delivered via mobile platforms can positively influence happiness and mental well-being (23).

Several studies have specifically evaluated the impact of digital and psychosocial interventions in ACS patients. For example, Celano et al. (2023) in the Text4Health pilot trial demonstrated that adaptive text-message interventions promoted psychological well-being and reduced cardiac risk factors in patients at high cardiovascular risk. This supports the potential utility of mobile-based motivational strategies across diverse cardiac populations, including improving patient happiness (24). Furthermore, Wańczura et al. (2024) studied telemedical interventions in heart-failure patients and revealed significant improvements in quality of life and psychosocial adaptation, indicating that telehealth and messaging-based interventions can enhance both emotional and clinical outcomes (25).

Several studies have investigated the effects of digital and psychosocial interventions on psychological well-being and health outcomes in patients with acute coronary syndrome (ACS). Chow et al. (2022) in the TEXTMEDS randomized clinical trial conducted a multicenter RCT in post-ACS patients and demonstrated that text-message–based interventions improved follow-up adherence and certain psychological outcomes, which aligns with our observation that digital interventions can affect psychological and behavioral parameters (26). Furthermore, Ross et al. (2021) studied a 60-day SMS text messaging intervention (Txt2Prevent) for patients with ACS and revealed no statistically significant differences between the groups in self-management domains, suggesting that the intervention may not have had the desired impact on these outcomes (27). Nevertheless, the study suggested some positive impacts on self-management behaviors and psychological dimensions, which is generally consistent with our findings.

Other studies have explored happiness and psychosocial interventions in patients with chronic diseases. Ashoori et al. examined the life skill training effect on happiness and hope in type II diabetes patients, and concluded that life skill training significantly increased happiness and hope in the patients (28).

In their study, Panagi et al. found that happy people with type 2 diabetes had fewer inflammatory symptoms before and after acute stress (29). In this study, patients were stressed and found that happy people have fewer inflammatory markers against stress, which in turn improves health.

Abazari et al. (2017) examined the group hope therapy impact on type 2 diabetes patients' happiness and suggested that the mean happiness increased post-intervention compared to the control group, although it was not meaningful (30). Collectively, these findings reinforce our results, emphasizing that psychosocial interventions—including those delivered via social media—can positively

impact happiness and related health outcomes in cardiovascular populations.

Strengths and limitations of the study

This study provides new evidence on the effectiveness of social media–based telenursing in improving psychological well-being and happiness among patients with acute coronary syndrome. By addressing the psychosocial dimensions of care, which are often neglected in traditional clinical practice, the intervention contributes to a more holistic approach to patient management, and the findings suggest that integrating digital platforms into nursing practice may help mitigate negative cognitive patterns and prevent deterioration in mental health outcomes. However, the study had a relatively small sample size, which limits the statistical power and generalizability of the results, and differences in participants' educational levels may have influenced both comprehension of the intervention and responses to the questionnaires. Incomplete questionnaire data, limited access to social networks, and barriers related to electronic interaction also posed challenges during the study, while the extended duration resulted in attrition and reduced cooperation among some participants. Therefore, further studies with larger and more diverse populations, including different age groups and genders, are recommended to confirm and expand upon these findings.

Conclusion

This study demonstrates that social media–based interventions can significantly enhance happiness in patients with acute coronary syndrome. By addressing psychological well-being alongside standard medical care, such digital strategies offer a feasible and scalable approach to mitigate the emotional burden of cardiovascular disease. Incorporating these interventions into routine care could improve patient-centred outcomes, though further research is needed to optimize implementation and assess long-term effects in diverse clinical settings.

Acknowledgments

This paper was derived from a Master's thesis and approved by the Kerman University of Medical Sciences (the code IR.KMU.REC.1397.308). The authors would like to appreciate the Vice Chancellor for Research at the Kerman University of Medical Sciences, the coronary care unit (CCU) staff at the Afshar Hospital in Yazd, and ACS patients participating in the study

Authors' Contributions

Study design and conceptualization: FSH and EN, Data collection: FSH, Data analysis: TD and MRN, Initial draft preparation: FSH, EN, and MRN, Final approval: All authors.

Conflict of Interest

The authors report no competing or conflict of interest regarding this study.

References

1. Ghavidel A, Farokhnezhad-Afshar P, Bakhshandeh H, Ghorbanpour F. Effect of family-centered education on the quality of life of patients after coronary artery bypass graft surgery. Cardiovascular Nursing Journal. 2015;4(2):6-13.
2. Aalami H, Moghadam HM, Moghaddam MB, Bazeli J. Effect of hybrid aromatherapy on sleep quality of patients with acute coronary syndrome admitted to cardiac care unit. Middle East Journal of Family Medicine. 2018;7(10):268.
3. Shahsavari S, Nazari F, Karimyar Jahromi M, Sadeghi M. Epidemiologic study of hospitalized cardiovascular patients in Jahrom hospitals in 2012-2013. Iranian Journal of Cardiovascular Nursing. 2013;2(2):14-21.
4. Arab M, Mousavi SS, Borhani F, Rayyani M, Moniri SA. The Effect of Music Therapy on Anxiety and Vital Signs of Patients with Acute Coronary Syndrome: A Study in the Cardiac Care Unit of Vali-Asr Hospital, Eghlid, Iran. Journal of Health and Development. 2015;4(4):287-95.
5. Akhu-Zaheya LM, Wa'ed YS. The effect of short message system (SMS) reminder on adherence to a healthy diet, medication, and cessation of smoking among adult patients with cardiovascular diseases. International journal of medical informatics. 2017;98:65-75.
6. Kamrani F, Nikkhah S, Borhani F, Jalali M, Shahsavari S, Nirumand-Zandi K. The effect of patient education and nurse-led telephone follow-up (telenursing) on adherence to treatment in patients with acute coronary syndrome. Cardiovascular Nursing Journal. 2015 4(3):16-24.

7. Thombs BD, Bass EB, Ford DE, Stewart KJ, Tsilidis KK, Patel U, et al. Prevalence of depression in survivors of acute myocardial infarction. Journal of general internal medicine. 2006;21(1):30-8.
8. Moradi A, Moeini M, Sanei H. The effect of interactive text message follow-up on health promoting lifestyle of patients with acute coronary syndrome. Iranian journal of nursing and midwifery research. 2017;22(4):287.
9. Boroumand S, Moeini M. The effect of a text message and telephone follow-up program on cardiac self-efficacy of patients with coronary artery disease: A randomized controlled trial. Iranian journal of nursing and midwifery research. 2016;21(2):171.
10. Zarifsanaiey N, Jamalian K, Bazrafcan L, Keshavarzy F, Shahraki HR. The effects of mindfulness training on the level of happiness and blood sugar in diabetes patients. Journal of Diabetes & Metabolic Disorders. 2020:1-7.
11. Khayeri F, Rabiei L, Shamsalinia A, Masoudi R. Effect of Fordyce Happiness Model on depression, stress, anxiety, and fatigue in patients with multiple sclerosis. Complementary therapies in clinical practice. 2016;25:130-5.
12. Kalra S, Punyani H, Dhawan M. Creating happiness in the diabetes care clinic. Primary Care Diabetes. 2020;70(6):1099-100.
13. Steptoe A. Happiness and health. Annual review of public health. 2019;40:339-59.
14. Lim C, Putnam RD. Religion, social networks, and life satisfaction. American sociological review. 2010;75(6):914-33.
15. Pourfaraj M, Rezazadeh H. Effectiveness of positive Therapy on Happiness and Hope in cancer Patients. Counseling Culture and Psycotherapy. 2018;9(33):119-36.
16. Samadzadeh M, Shahbazzadegan B, Abbasi M. Study of Fordayce Happiness Model Effectiveness on quality of life in patients undergo Dialysis and patients who suffering from Cancer. Procedia-Social and Behavioral Sciences. 2013;83:644-9.
17. Noohi E, Khandan M, Mirzazadeh A. Effective of electronic education on knowledge attitude and self-care in patient's diabetic type 2 refer to diabetic center of Kerman University of medical science. Journal of Kermanshah University of Medical Sciences (Improvement). 2011;15(6):453-49.
18. Sadeghi sherme M, ghafori F, tadrisi S D, tayyebi A. The effect of follow-up care by telephone and short massage services on patient's quality of life after cardiac valve replacement surgery. jccnursing 2013; 6 (1) :65-72
19. Mohammadi Zeidi I, Pakpour Hajiagha A, Mohammadi Zeidi B. Reliability and validity of Persian version of the health-promoting lifestyle profile. Journal of Mazandaran University of Medical Sciences. 2012;21(1):102-13.
20. Mohammadi N, Aghayosefi A, Alipour A, Nikrahan G, Sadeghi M. The Comparison of Negative and Positive Psychological Factors in Patients with Coronary Heart Disease with and without Metabolic Syndrome. Journal Research Behavior Science. 1396;(50):480-7.
21. Abdollahi S, Honarmand M, Sodaie M. Effect of educational happiness program on blood pressure and happiness on hypertension patients. Journal of Social Psychology. 2012;7(23):61-79.
22. Boon MH, Matthews L, Palmer VJ, Thomson M, Smillie S, Simpson SA, Taylor RS. Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease. Cochrane Database of Systematic Reviews. 2023(6) :55-60.
23. Hou QL, Liu LY, Wu Y. The Effects of mHealth Interventions on Quality of Life, Anxiety, and Depression in Patients With Coronary Heart Disease: Meta-Analysis of Randomized Controlled Trials. Journal of Medical Internet Research 2024;7(11):45-52.
24. Celano CM, Healy BC, Jacobson LH, Bell M, Carrillo A, Massey CN, Chung WJ, Legler SR, Huffman JC. An adaptive text message intervention to promote psychological well-being and reduce cardiac risk: The Text4Health controlled clinical pilot trial. Journal of psychosomatic research 2024;7(10):60-70.
25. Wańczura P, Aebisher D, Wiśniowski M, Kos M, Bukowski H, Hołownia-Voloskova M, Przybylski A. Telemedical Intervention and Its Effect on Quality of Life in Chronic Heart Failure Patients: The Results from the Telemedicine and e-Health Solution Pilot Program. Journal of Clinical Medicine 2024;5(9):43-51.
26. Chow CK, Klimis H, Thiagalingam A, Redfern J, Hillis GS, Brieger D, Atherton J, Bhindi R, Chew DP, Collins N, Andrew Fitzpatrick M. Text messages to improve medication adherence and secondary prevention after acute coronary syndrome: the TEXTMEDS randomized clinical trial. Circulation. 2022;12(6):55-63.
27. Ross ES, Sakakibara BM, Mackay MH, Whitehurst DG, Singer J, Toma M, Corbett KK, Van Spall HG, Rutherford K, Gheorghiu B, Code J. The use of SMS text messaging to improve the hospital-to-community transition in patients with acute coronary syndrome (Txt2Prevent): results from a pilot randomized controlled trial. JMIR mHealth and uHealth. 2021;6(9):43-56.
28. Shirkavand N, Gholami HS, Arab SZ, Ashoori J. The impact of life skills training on happiness and hopefulness among patients with type ii diabetes. J Diabetes Nursing. 2015;3(3):8-19.
29. Panagi L, Poole L, Hackett RA, Steptoe A. Happiness and inflammatory responses to acute

stress in people with Type 2 diabetes. Annals of Behavioral Medicine. 2019;53(4):309-20.

30. Ilaghi T, Pouraboli B, Abazari F, Kazemi M. The Effect of Group Hope Therapy on Happiness of Patients with Type II Diabetes Who Referred To A Diabetic Clinic at Southeast of Iran. Journal of Nursing & Healthcare. 2017;2(2):1-5.