

1 SUBMITTED 16 MAR 21
2 REVISIONS REQ. 3 MAY & 21 JUN 21; REVISIONS RECD. 6 JUN & 3 JUL 21
3 ACCEPTED 14 JUL 21
4 **ONLINE-FIRST: AUGUST 2021**
5 DOI: <https://doi.org/10.18295/squmj.8.2021.109>
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7 **The Effect of Happiness Training on Psychological Well-Being in Patients**
8 **with Thalassemia Major**
9 *A quasi-experimental study*

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18

19 **Abstract**

20 **Objectives:** Thalassemia major (TM) is a chronic hematological disease that can have deep
21 effects on patients' mental health and psychological well-being. So, the present study was
22 conducted to determine the effects of happiness training on the psychological well-being of
23 TM patients. **Methods:** This quasi-experimental study with a pre/post-test design was performed
24 on 52 patients with TM in Zabol city (Iran) from August to December 2020. The patients were
25 randomly categorized into experimental and control groups. In the experimental group,
26 happiness training was performed in eight sessions, each for 60 minutes. The control group
27 received routine care. The data collection tool was the Ryff's Scale of Psychological Well-being
28 (RSPWB). Data were analyzed by SPSS 16 statistical software using descriptive (mean and
29 standard deviation) and inferential (paired and independent t-test) statistics. **Results:** Regarding
30 the psychological well-being score at the pre-test stage, there was no statistically significant

31 difference between the intervention (74.92 ± 6.36) and control (74.57 ± 5.83) groups ($p = 0.83$).
32 After the intervention; however, a statistically significant difference was observed between the
33 two groups in terms of psychological well-being ($p < 0.001$). Also, a statistically significant
34 difference was seen comparing the psychological well-being score between the pre- and post-
35 intervention phases in the experimental ($p = 0.01$) but not control ($p = 0.12$) group. **Conclusion:**
36 The results of this study showed that happiness training improved TM patients' psychological
37 well-being. Therefore, this type of training can be used as an appropriate educational strategy to
38 improve psychological well-being in these patients.

39 **Keywords:** Happiness; Education; Mental Health; Thalassemia.

40

41 **Advances in Knowledge**

- 42 • According to the results of this study, happiness training may improve the psychological
43 well-being of TM patients.

44 **Application to Patient Care**

- 45 • According to our findings, happiness training, as an easy, accessible, and safe method, can
46 improve patients' psychological well-being and therefore the quality of patient care.

47

48 **Introduction**

49 Thalassemia is a common inherited hematological disease.¹ Thalassemia major (TM) is
50 characterized by either the lack or reduced production of globin chains.² Around 200,000 TM
51 patients are currently seeking treatment worldwide.³ The prevalence of TM is particularly high in
52 the central Asia, Middle East, India, southern China, Mediterranean countries, and central
53 Africa.⁴ Iran is also among the countries with a high prevalence of TM, with more than 26,000
54 registered patients.⁵ The chronic nature of thalassemia affects patients' different aspects of life,
55 including physical and social activities, familial relationships, educational performance, leisure
56 activities, and communication with other people. There is also an increased risk of psychological
57 problems such as anxiety and depression in these patients.^{6,7} The psychosocial problems
58 experienced by these patients can severely affect their psychological well-being, quality of life,
59 and finally the disease's course.⁸

60

61 Psychological well-being reflects the desired psychological performance and refers to the

62 experienced quality of life. People with psychological well-being are satisfied with their health
63 and success, finally improving their quality of lives.⁹ Psychological well-being includes
64 dimensions such as self-acceptance, positive relationships with others, independence,
65 environmental dominance, having a purpose in life, and personal growth.¹⁰ The Reef model is
66 one of the most prominent models in the psychological well-being field, which considers
67 psychological well-being as an attempt to grow, progress, and accomplish one's potential
68 capabilities.¹¹ Ghorbani *et al.* reported that patients with thalassemia had low levels of
69 psychological well-being.¹²

70
71 Among the factors that seem to be effective in controlling and coping with chronic diseases are
72 happiness and cheerfulness.¹³ Happiness is a necessary element of quality of life and is
73 considered by the World Health Organization (WHO) as an important and vital component of
74 mental health and actually a part of the concept of health.¹⁴ One of the ways to increase
75 happiness is to train it through the Fordyce Happiness Program. Fordyce describes happiness as a
76 positive thrill or a feeling that is characterized with satisfaction and well-being. Fordyce
77 employed an educational approach which included both cognitive and behavioral aspects. In the
78 cognitive dimension, the role of specific thoughts and behaviors in creating happiness is deeply
79 discussed. In the behavioral dimension, a variety of techniques and solutions resulting from
80 cognitive and behavioral therapies are indicated.¹⁵ Research supports the fact that psychological
81 well-being leads to better lifestyle choices, such as avoiding fats and drug abuse, and helps cope
82 with conflicts or negative emotions without perpetrating drug abuse or self-destructive behaviors.
83 On the other hand, the likelihood of such negative health-related behaviors increases in those
84 exposed to stress or psychological distress.¹⁶ Moreover, psychological distress can have direct
85 negative effects on certain immunological responses and increase the release of cytokines, hence
86 facilitating chronic inflammatory responses that, in turn, promote depression or anxiety
87 disorders.¹⁷ In a study, Sobhani *et al.* reported a positive relationship between happiness and
88 psychological well-being.¹⁸

89
90 Multiple studies have shown that cognitive behavioral training through the Fordyce Happiness
91 program significantly increases happiness and quality of life.^{19,20} In the study of Fayazi *et al.*,
92 they noted that the Fordyce Happiness program improved psychological well-being in people

93 with physical and skeletal disabilities.²¹ Also, Ekrami *et al.* concluded that happiness training
94 affected the psychological well-being and positive and negative emotions of housewives.²²

95
96 Although advances in therapeutic approaches have improved TM patients' longevity and quality
97 of lives, studies on mental health status indicate a relatively high prevalence of psychological
98 problems in these patients, impairing their psychological well-being. Considering the important
99 role of education in improving and reducing TM patients' psychological problems, the aim of the
100 present study was to determine the effect of happiness training on the psychological well-being
101 of TM patients.

102

103 **Methods**

104 This quasi-experimental study was conducted with a pre/post-test design from August to
105 December 2020. The study population included TM patients referring to the thalassemia care
106 center of Imam Khomeini Hospital of Zabol city, Iran. Sampling was performed in a continuous
107 mode. The patients were randomly divided into the intervention and control groups by using the
108 table of random numbers. Inclusion criteria were definite diagnosis of TM, age above 12 years,
109 having no cognitive problems or physical disability, having reading and writing literacy, and
110 willingness to participate in the study. Missing one of the training sessions, unwillingness to
111 continue participation, and the patient's death were regarded as exclusion criteria.

112

113 **Sample size**

114 Considering a confidence interval of 95%, power of 80%, the means of psychological well-being
115 scores reported by Ghazavi *et al.*²³, and finally regarding the possibility of a ratio of sample loss,
116 sample size was determined as 26 subjects per group (a total sample size of 52).

117

118 **Data collection**

119 The data collection tool included the Ryff's Scale of Psychological Well-Being (RSPWB).
120 Demographic data including age, gender, marital status, occupation, education, economic status,
121 parents' consanguineous marriage, number of blood transfusions per month, and having other
122 affected family members were also recorded.

123

124 **RSPWB tool**

125 In this study, a short 18-question version of this scale with six subscales (three statements per
126 subscale) was used. Ryff designed the initial form of the psychological well-being scale at the
127 University of Wisconsin in 1989 and modified it in 2002. In Iran, Khanjani *et al.* translated the
128 scale and assessed its psychometrics.²⁴ The subscales included self-acceptance (items 2, 8, and
129 10), positive communication with others (items 3, 11, and 13), independence (items 9, 12, and
130 13), having a purpose in life (items 5, 14, and 15), personal growth (items 7, 15, and 17), and
131 environmental dominance (items 1, 4, and 6). The score of each subscale ranged from 3 to 18.
132 The participants responded to the questions on a 6-point scale from complete disagreement
133 (score 1) to complete agreement (score 6). The total score of psychological well-being was
134 calculated by summing up the scores of the subscales (ranging from 18 to 108, a higher score
135 indicating a better psychological well-being).¹¹ The internal consistency of the 18-item scale was
136 assessed, showing the Cronbach's alpha coefficients of 94% for the whole questionnaire and
137 63% to 89% for the subscales.²¹ Van Dierendonck confirmed the reliability of this questionnaire
138 with the Cronbach's alpha of 90%.²⁵ In the present study, by calculating a Cronbach's alpha
139 coefficient of 77%, the reliability of the questionnaire was also approved.

140
141 After approval by the ethics committee of Iran University of Medical Sciences and receiving a
142 referral letter, we referred to Imam Khomeini Hospital in Zabol and acquired permission from
143 the hospital's authorities to conduct the study. Then we referred to the care center to recruit
144 patients. After providing introductory explanations, obtaining written consent, and allocating the
145 patients into the study groups, RSPWB was completed by them at pre-test. To avoid sharing of
146 information between the two groups, first the control group and then the experimental group
147 were studied.

148
149 Happiness training based on the cognitive-behavioral Fordyce happiness training protocol²⁶ was
150 performed for the experimental group in eight sessions of 60 minutes (once a week) in groups of
151 five to six people. These programs covered the following topics in each session:
152 Session 1: After introducing and acquainting the members with each other, explanations were
153 provided about the protocol (i.e., the number and time of sessions). The importance of happiness
154 in life was highlighted by presenting some evidence in this regard. The technique of how to be

155 more active was taught to the patients. At the end of this session, feedback was taken from the
156 participants.

157 Session 2: The techniques of boosting social communications and increasing intimacy were
158 explained.

159 Session 3: The technique of increasing creativity was discussed.

160 Session 4: It was explained how to have better planning and organization.

161 Session 5: Discussions were presented about how to cope with and stop thinking about worries
162 and concerns.

163 Session 6: How to have lower expectations and be oneself.

164 Session 7: The techniques of developing positive thinking, being optimistic, and living in the
165 present.

166 Session 8: Expressing emotions and appreciating the value of happiness.

167 The content of the program was presented by lectures along with questions and answers and
168 expressing the participants' experiences. In each session, a 15-minute period was considered for
169 rest and feeding. No intervention was performed for the control group. For the post-test, the
170 questionnaire was completed by the members of both groups one month after training. After this,
171 the training booklet was provided to the control group as well.

172

173 *Statistical analysis*

174 Data analysis was performed in SPSS software (version 16) using descriptive (mean \pm standard
175 deviation) and inferential (Chi-square, Fisher's exact test, and independent and paired samples
176 student t-test) statistics. One-way ANCOVA was used to adjust post-intervention well-being
177 score for the effects of the pre-intervention score and age covariates. The statistical significance
178 level was considered $P < 0.05$.

179

180 **Results**

181 The mean age of participants in study was 20.52 ± 6.04 years old ($P = 0.4$). Overall, 42.3 and
182 53.8 percent of the patients in experimental and control groups, respectively, were under the age
183 of 18 years. There were no significant differences between the two groups regarding
184 demographic and disease-related variables ($p > 0.05$, Table 1).

185

186 There was no statistically significant difference between the two groups comparing the
187 psychological well-being score at pre-test ($p = 0.83$). However, a statistically significant
188 difference in the psychological well-being score was observed between the experimental and
189 control groups after the training ($p < 0.001$). Furthermore, a statistically significant difference
190 was observed comparing the pre- and post-test psychological well-being scores in the
191 experimental ($p = 0.01$) but not the control group ($p = 0.12$, Table 2). Considering psychological
192 well-being subscales before and after the intervention, statistically significant differences were
193 noticed in the self-acceptance, positive communications with others, purposefulness, personal
194 growth, and dominance dimensions in both groups ($p < 0.05$). However, there was no statistically
195 significant difference regarding the independence dimension in none of the groups ($p = 0.54$,
196 Table 3).

197

198 **Discussion**

199 The present study was conducted to assess the effect of a happiness training program on
200 psychological well-being in patients with TM. Data analysis showed a significant difference
201 comparing the mean psychological well-being score between the experimental and control
202 groups after the happiness training intervention. Our results also showed the positive effects of
203 happiness training on the self-acceptance, positive communications with others, purposefulness,
204 personal growth, and environmental dominance dimensions, as well as total psychological well-
205 being score in patients with TM. On the other hand, the impact of this training program on the
206 independence dimension was not statistically significant. These findings were consistent with the
207 results of a study by Babaei *et al.* who showed that stress management and resilience training
208 improved the psychological well-being of TM patients.²⁷ Dustkafi *et al.* assessed the
209 effectiveness of positive psychotherapy training on the psychological well-being of women with
210 lung cancer and showed that this training program improved the psychological well-being of
211 these patients.²⁸ Furthermore, Khayeri *et al.* in their study showed that happiness training
212 improved depression, stress, anxiety, and fatigue in patients with multiple sclerosis.²⁹ According
213 to another study by Samadzadeh *et al.*, happiness training improved the quality of lives of the
214 cancer patients undergoing hemodialysis.²⁰

215

216 The effectiveness of happiness training on the psychological well-being of patients with TM can

217 be explained by a number of reasons or mechanisms. Happiness training and rational thinking
218 can help patients to understand their problems and then learn strategies to cope with and adapt to
219 these problems. This in turn increases their self-esteem and psychological well-being. From the
220 perspectives of the people who feel happier in life, unpleasant experiences and problems are
221 valuable and meaningful. Also, these people believe that they have appropriate resources to deal
222 with problems and the ability to use these resources to manage stressful situations.³⁰ In this
223 regard, Hoseini *et al.* reported that the Fordyce happiness training program increased the feeling
224 of happiness and psychological consistency in diabetic patients.³¹ Happiness training, by
225 influencing personal thoughts, beliefs, and feelings, would free people from norms and social
226 pressures and improve personal growth (through learning) and self-acceptance (via creating a
227 positive attitude towards oneself and the past history).³²

228

229 Patients with TM, due to the nature of their disease, are exposed to several physical and
230 psychological problems.³³ Because happiness training based on the Fordyce approach has a
231 cognitive-behavioral aspect, it can help these patients to first identify their uncomfortable
232 thoughts and behaviors and then employ cognitive-behavioral management programs to change
233 the situation. Besides, focusing on life's negative aspects and persistent emotional unhappiness
234 can have destructive effects on the body's physiological system and disrupt the immune system
235 functionality.²¹

236

237 Limitations of the present study were the limited space used for the training and the fact that we
238 conducted the study in a single center. In addition, continuous sampling, which is a non-random
239 method, may compromise the generalizability of the results. Another limitation on this study was
240 the simultaneous measurement of the psychological well-being of adolescents and adults, so it is
241 suggested to examine these age groups separately in future studies. Considering the positive
242 impact of happiness training on the psychological well-being of TM patients, it is suggested that
243 care centers and supportive associations pay special attention to the important role of
244 psychological interventions and counseling sessions in improving TM patients' psychological
245 well-being. Also, these patients should be more frequently provided with exciting and
246 entertaining programs.

247

248 **Conclusion**

249 According to the results of the present study, it seems that happiness training can improve TM
250 patients' psychological well-being. Considering that this type of training is safe and accessible to
251 patients and their families and is easy to be implemented, it is recommended that psychologists,
252 nurses, and mental health specialists and officials use this strategy to improve the psychological
253 well-being of these patients.

254
255 **Authors' Contribution**

256 MSS and APN conceptualized and designed the study as well as the sampling process. MSS,
257 APN, AB and MGS drafted the manuscript. JA and AB analyzed the data. MGS provided critical
258 revision of the manuscript. All authors approved the final version of the manuscript.

259
260 **Acknowledgements**

261 We would like to thank the esteemed authorities of Imam Khomeini Hospital of Zabol, the
262 members of the Thalassemia Supporting Association of the hospital, and all the patients who
263 contributed to this study.

264
265 **Conflict of interest**

266 The authors declare no conflicts of interest.

267
268 **Funding**

269 This was the result of a research project approved by the Student Research Committee of Iran
270 University of Medical Sciences and was financially supported by the university.

271
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373

374 **Table 1:** The distribution of demographic variables in the control and experimental groups (N =
375 52)

Variables		Groups		P value
		Experimental N= 26 n (%)	Control N= 26 n (%)	
Age	<18	11(42/3)	14(53/8)	0.40 †
	>18	15(57/7)	12(46/2)	
Gender	Male	15 (57.7)	13 (50)	0.57 †
	Female	11 (42.3)	13 (50)	
Marital status	Single	24 (92.3)	24 (92.3)	1 †
	Married	2 (7.7)	2 (2)	
Education	Illiterate	3 (11.5)	1 (3.8)	0.69 †
	Lower than diploma	16 (61.5)	17(65.4)	
	Diploma and higher	7 (26.9)	8 (30.8)	
Occupation	Self-employment	6 (23.1)	5 (19.2)	0.94 †
	Unemployed	7 (26.9)	6 (23.1)	
	Housewife	3 (11.5)	4 (15.4)	
	Student	10 (38.5)	11 (42.3)	
Economic status	Poor	9 (34.6)	5 (19.2)	0.09 †
	Moderate	11 (42.3)	9 (34.6)	
	Good	6 (23.1)	12 (46.1)	
Number of transfusions per month	1	5 (19.2)	6 (23.1)	0.94 †
	2	18 (69.2)	17 (65.4)	
	3	3 (11.5)	3 (11.5)	
Parents' consanguineous marriage	Yes	18 (69.2)	20 (76.9)	0.53 †
	No	8 (30.8)	6 (23.1)	
Having another affected family member	Yes	11 (42.3)	8 (30.8)	0.56 ‡
	No	15 (57.7)	18 (69.2)	

376 †Calculated using the Chi-squared test. ‡Calculated using the Fisher's exact test.

377

378 **Table 2:** The psychological well-being score in the experimental and control groups before and
 379 after happiness training

Groups/Phase	Pre-intervention (mean ± SD)	Post-intervention (mean ± SD) †	Mean difference (mean ± SD)	P value [§]
Intervention	74.92 ± 6.36	80.7 ± 6.47	5.69 ± 10.47	0.01
Control	74.57 ± 5.83	71.13 ± 8.32	3.34 ± 10.77	0.12
P value*	0.83	<0.001	0.003	

380 *SD = standard deviation. * Calculated using the independent samples student t-test. § Calculated*
 381 *using the paired samples student t-test, †: One-way ANCOVA was used to adjusted for age and*
 382 *pre-intervention well-being score.*

383
 384 **Table 3:** The scores of psychological well-being dimensions in the experimental and control
 385 groups before and after happiness training

Dimensions/Phase		Before intervention (mean ± SD)	After intervention (mean ± SD)	P value [§]
Self-acceptance	Experimental	13.53 ± 1.98	14.53 ± 1.63	0.06
	Control	12.57 ± 2.51	11.50 ± 2.21	0.14
P value*		0.13	<0.001	
Positive communication with others	Experimental	12.30 ± 2.09	13.65 ± 2.93	0.08
	Control	11.88 ± 2.43	11.57 ± 2.35	0.62
P value*		0.5	0.007	
Independence	Experimental	12.34 ± 1.46	12 ± 2.28	0.001
	Control	11.76 ± 1.81	11.65 ± 1.76	0.88
P value*		0.21	0.54	
Purposefulness	Experimental	10.73 ± 2.70	10.26 ± 2.16	0.42
	Control	11.50 ± 1.65	11.84 ± 2.64	0.5
P value*		0.22	0.02	
Personal growth	Experimental	12.73 ± 1.3	14.73 ± 1.84	<0.001
	Control	13.80 ± 1.52	12.11 ± 2.55	0.002
P value*		0.009	<0.001	
Environmental dominance	Experimental	13.26 ± 2.64	15.42 ± 2.23	0.007
	Control	13.03 ± 2.19	12.53 ± 2.38	0.47
P value*		0.73	<0.001	

386 *SD = standard deviation. * Calculated using the independent samples student t-test. § Calculated*
 387 *using the paired samples student t-test*