

# The Role of Mobile-based Cognitive Intervention on Happiness among First-grade High School Students in Shiraz

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## ABSTRACT

**Background:** Happiness is one of the major feelings and psychological needs playing a vital role in providing the health of individual and community. Happiness is also a shield against stress and anxiety; therefore, utilizing appropriate educational methods to increasing it is essential. In-person educational methods have faced obstacles like time limits and ignoring the learners' differences. Thus, this article aimed to investigate the effectiveness of mobile-based cognitive negotiation on happiness among female adolescence students.

**Methods:** This study is an educational intervention, and pre-test, post-test research project. The research community included 13-15-year-old female adolescents in first-grade high school of public schools in district 2, Shiraz. The sample size was determined 120 students (60 in the control and 60 in the intervention group). Sampling was done using the random clustering method. The research phases included content preparation, application design, and the intervention phase. The content was activated by installing the Fordyce model on the students' cell phones and one training session a week, and then the students were provided with this content. The data were collected using the Oxford Happiness in both groups in two phases before and immediately after gathering; we also used Mann-Whitney test through SPSS software.

**Results:** According to the findings, the average score of students in the intervention group reached 98.48 from 53.98, after the intervention ( $P < 0.000$ ). However, in the control group, this average score changed from 58.06 to 58.90; therefore, there was no significant difference ( $P = 0.983$ ).

**Conclusions:** The results of this study indicated the importance of teaching happiness and the effectiveness of the mobile-based educational technique; therefore, it is recommended that this method should be used in educational settings.

**Keywords:** Online learning, Happiness, Cognitive intervention, Fordyce model, Mobile-based education, Students

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## Introduction

Happiness, as an exciting phenomenon, is necessary for human beings and gives light to life (1). Positive emotions cause the expansion of attention scope, hence increasing conscience of physical and environmental circumstances. Happiness is the mental euphoria, a set of emotions (particularly the delightful ones), attitudes (life satisfaction), beliefs (for instance, believing that everything will be all right), and other mental states (1, 2).

In various investigations, it is revealed that adolescents who experience a high level of happiness are more active in their school performance (2). Adolescents with high levels of happiness also experience fewer emotional and behavioural problems. In other studies, it has been concluded that interventions that create positive moods could effectively reduce depression in children and adolescents (3). The importance of this issue is such that in the original document of the educational system, training happy people is mentioned as one of the important goals of the system. In fact, with the happiness of students, a dynamic, vibrant, and successful society can be achieved (4). In today's industrial world, with the increase of failure and psychological pressures of people, new needs have emerged in the range of previous ones, among which students are no exception; the current statistics show the prevalence of depression in adolescents and children compared to previous years (5) {McNamara, 2000, Stress in young people: What's new and what to do}. Happiness rates in Iranian schools are very low (6).

The results of epidemiological studies have shown that 8.2% of patients with depression at the age of 15 (early adolescence) develop the first symptoms (7). Research shows that 85% of students' academic failure and behavioral abnormalities, before it has an intelligence and cognitive aspect, are related to emotional factors such as lack of happiness; hence, their academic motivation is reduced and they become indifferent to lessons and study (8). Perhaps this is why the educational environment is not fresh enough, and students are doomed to take courses without

active and spontaneous attendance. To get rid of this crisis, we must have access to the newly emerging developments and turn to education in which the process of dynamism, freshness, and vitality is manifested in all its dimensions (9, 10).

Given the importance of the subject and knowing that happiness is contagious and the interpretation of accidents and events causes happiness, to create happiness, we can teach the individuals cognitive and motivational techniques that cause happiness (11). One of these methods is Fordyce Happiness Training.

Fordyce is one of the experts in the psychology of happiness who has done numerous researches. He has also developed a program called Happiness Fordyce. The Fordyce Happiness Program is a cognitive-behavioral intervention (a combination of 8 cognitive elements and six behavioral elements) (12).

Fordyce Cognitive-Behavioral Interventions include two components: Cognitive and Behavioral. In the cognitive section, the underlying issues discuss the reasons for the involvement of certain thoughts and behaviors in creating happiness; in the behavioral section, it has used the collection of techniques and strategies derived from it that can be effective in applying any of life principles. These interventions are provided by the nurse and based on his information, using intelligent educational systems through mobile devices such as mobile phones to change the thinking and behavior of adolescents. Mobile-based learning is a new way of accessing educational content via mobile (2). The above education can be used as an educational intervention in harmony with Iranian culture to change inappropriate lifestyles and encourage people to improve their lifestyles and ways of controlling stress (13).

The dynamism of the educational process relates to the need, question, curiosity, and enthusiasm for progress. If we place students in such educational spaces, most of the current problems in the education system will be eliminated (8).

Paolo Freire's theory strongly criticizes traditional school education, which he calls banking education, and compares it to storing information in students' minds. Since a medium, like mobile, plays a role in shaping and changing the attitude, thought and behavior of the audience, it is necessary to educate, recognize, and apply it. In such a situation, we must prepare our education to meet this global challenge. Undoubtedly, with the advent of technologies such as mobile phones, the educational process has moved beyond the monopoly of schools and colleges, and the wider world has become the field of education (14).

The use of mobile phones is effective in the learning process because while the student is free to use technology, teachers can focus on the learning process (15). Mobile-based education is more effective than other teaching methods. Some of the advantages of using mobile-based education are as follows: increase in motivation and interest in learning; significant increase in the impact of mobile-based education on e-learning; promotion of learning and teaching; significant impact on metacognitive regulation and learner's attitudes toward mobile-based learning; enhancement of the desire to learn and control behavior (14); increase in the level of awareness, mentality, and intention to learn; portability and ease of access; convenience and easy adaptability (16); more flexibility in the process of education and lifelong learning growth through various applications (17); more communication with society; better learning; socialization; improved learning skills (16); Saving of time and money; travel; better learning; more convenience, and increase in the depth of learning through words and pictures. According to Richard Meyer's multimedia cognitive model, mobile-based technology can support the learning process and strengthen teaching and learning; mobile-based learning will change to a norm from an exception (18).

Since the use of mobile phones has increased among Iranian people, and according to studies, this trend is still ongoing, it is not

surprising that most research conducted in this regard reveals that the majority of users in Iran belong to the adolescent generation (19).

Because girls are more prone to depression and decreased happiness due to premenstrual syndrome in adolescence and since various benefits of teaching happiness are significant, this article aimed to examine the effect of mobile-based cognitive negotiation on happiness among adolescence students.

## Methods

### *Study Design*

This is an educational intervention of pre-test, post-test type with a control group which was conducted from 2018 to 2019.

**Participants:** Participants of this study were high school female student's aged 13-15 years old who were studying in public schools in the second district of Shiraz.

**Inclusion criteria:** All high school females aged 13-15 years who had a smartphone, ability to work with the Internet, and willingness to participate in the study. Any participants with physical or mental illness, simultaneous participation in other treatment and counseling programs, experience of trauma, or stressful events during the study were excluded from the study.

### *Intervention*

The study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1398.436), and Clinical Trial Registration Center (IRCT20190428043412N1); then, the following steps were followed:

In the planning phase: the original content (8 modules) was prepared based on learning objectives. Then, it was submitted to the virtual school, center of excellence for e-Learning in medical sciences. This center started the development process based on standards, which included nine implementation steps: planning, text authoring, text design, multimedia, scenario, development, final evaluation, metadata and storage, and technical evaluation and presentation (20). At the same time, an application was designed

based on Fordyce model to be a platform for content delivery. After installation of the software on the students' mobile phones, one training session was activated and provided to the students weekly (two modules in a week); the objectives and equal subjects were: teaching the technique of increasing activity, increasing social relations, planning technique, stopping worry, developing positive thinking, and learning the techniques of living a good life, expressing emotions and the value of happiness.

In the intervention phase: a written informed consent was obtained from the participants in the study in the implementation phase of the project along with the necessary permissions after sampling in each class of adolescents and their parents. Then, they were taught how to use the application, goals, and content to create the necessary insight and motivation. For each student, a special username and password were sent through a message, which was different for each person. The control group filled out the Oxford Happiness Questionnaire (OHQ) and did not have access to the educational content; however, the intervention group received training in the form of a predetermined schedule. After answering the OHQ, the sessions started immediately, and after eight sessions (mean 15 minutes), both groups filled out the OHQ again immediately after the last session. Also, blindness in this study was one-sided.

### Sample Size

Using the article on the effectiveness of group training in a rational-emotional-behavioral manner on reducing identity crisis and increasing happiness of adolescents (21) with an average of 39.8 and 54.46 and standard deviation of 12.77 and 10.24 in both experimental and control groups and taking into account the first type error of 5% and power of 90% as well as considering the probability of 20% attrition, we calculated a total of 120 participants (60 in each group).

$$n_1 = n_2 = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2 (\sigma_1^2 + \sigma_2^2)}{d^2}$$

Sampling method: At first, out of 23 first secondary schools for girls in District 2 of Shiraz, eight schools were randomly selected using the cluster sampling method; then, they were randomly divided into intervention and control groups. One class was selected from each school using a cluster random method; then, using stratified sampling, we determined and randomly selected the number of samples in each class.

### Data Collection Tools

In this study, happiness refers to the scores obtained based in the OHQ. The OHQ was developed by Argyle and Martin based on the Beck Depression Inventory at the University of Oxford in the United Kingdom (22). It has 29 items and is a widely-used scale for the assessment of personal happiness. While its psychometric properties are acknowledged to be acceptable, it presents scores on an ordinal scale. Each item contains four sub-items scored between 0 and 3. It is scored based on the Likert scale, and the scores range from 0 to 87. The higher the score, the happier the subject is. The lowest score on this scale is zero, which indicates that the subject is dissatisfied with the person's life and depression.

Argyle and Lu (1998) reported an alpha coefficient of 90%, and Farenham and Browning (1999) reported an alpha coefficient of 87% and confirmed the reliability of this questionnaire.

In Iran, Nouri (2002) Cronbach's alpha was 84%. Alipour et al, (2006) estimated the reliability of this questionnaire to be 93% using Cronbach's alpha method. Also, for the face and content validity of this questionnaire, eleven experts (psychologists and psychiatrists) confirmed the ability of this scale to measure the subjects' happiness.

### Statistical Method

The normality of the variable was checked using Kolmogorov-Smirnov in all four groups (before and after in the control and intervention groups).

Data analysis was performed using the two-sample t-test using SPSS IBM v.16 (Figure 1).

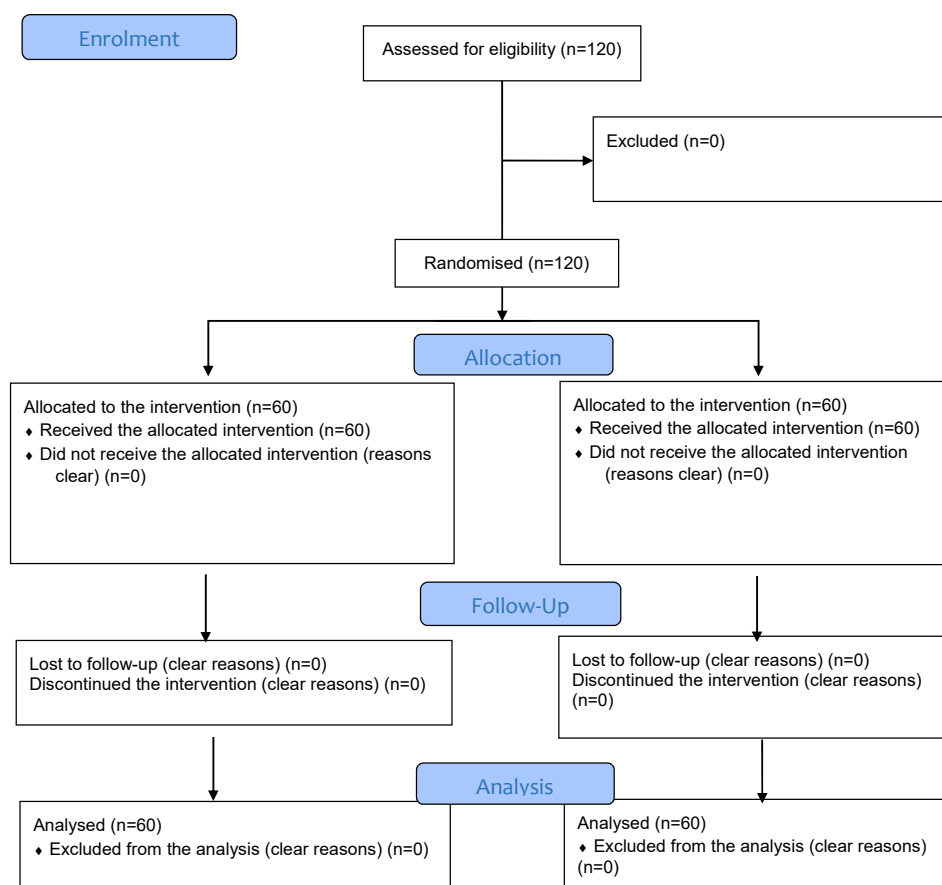


Figure 1: Recruitment of the participants in two groups

## Results

The aim of the present study was to investigate the effectiveness of mobile-based cognitive-behavioral intervention on the happiness of adolescent female students. In this research, the OHQ was examined in both groups in two stages before and immediately after the intervention, and a comparison was made between the effect of education on the control and intervention groups. In order to achieve the objectives of the research, we analyzed the data using SPSS software version 16. The level of significance in this research was  $P=0.05$ . The total number of samples was 120, and during the implementation of the intervention, there was no drop in statistics and 120 participants remained until the end. Finally, there were 60 people in each group. Table 1 shows the demographic information in both groups.

As shown in Table 1, the participants were studying in equal numbers in the seventh, eighth, and ninth grades. The maximum

education in parents was a bachelor's degree, and there was no significant difference between happiness, the number of children in the family, father's education, and mother's education.

Table 2 shows the comparison of happiness scores in both groups.

Table 2 shows that before the intervention the mean score of happiness in the intervention and control groups was 53.98 and 58.06, respectively, but after the training, the average in the intervention group reached 98.48 ( $P<0.001$ ), which means that the intervention had a significant effect on students. In the control group, the average was 58.90 ( $P=0.98$ ), which means that there was no significant difference.

Also, the relationship of happiness score with the birth rank, father's education, mother's education, age, and grade point average was investigated; the results showed that there was no significant difference between any of these variables and happiness score.

**Table 1:** Demographic information of the participants (N=120)

| Variable           |                | Intervention (60) |            | Control (60) |            | P value |
|--------------------|----------------|-------------------|------------|--------------|------------|---------|
|                    |                | Number            | Percentage | Number       | Percentage |         |
| Grade              | Seventh        | 20                | 33.3       | 20           | 33.3       | 0.58    |
|                    | Eighth         | 20                | 33.3       | 20           | 33.3       |         |
|                    | Ninth          | 20                | 33.3       | 20           | 33.3       |         |
| Order of birth     | First          | 24                | 40         | 35           | 58.3       | 0.47    |
|                    | Second         | 24                | 40         | 21           | 35         |         |
|                    | Third and more | 12                | 20         | 4            | 6.7        |         |
| Father's education | High school    | 3                 | 5          | 1            | 1.7        | 0.62    |
|                    | Diploma        | 13                | 21.7       | 10           | 16.7       |         |
|                    | AS             | 8                 | 13.3       | 6            | 10         |         |
|                    | BS             | 31                | 43.3       | 33           | 50         |         |
|                    | MS             | 7                 | 11.7       | 8            | 13.3       |         |
| Mother's education | High school    | 3                 | 5          | 5            | 3          | 0.49    |
|                    | Diploma        | 13                | 21.7       | 16           | 26.7       |         |
|                    | AS             | 7                 | 11.7       | 11           | 21.7       |         |
|                    | BS             | 26                | 43.3       | 21           | 35         |         |
|                    | MS             | 9                 | 6.7        | 6            | 10         |         |
|                    | PhD            | 2                 | 3.3        | 1            | 1.7        |         |

AS: Associate's degree; BS: Bachelor of sciences; MS: Master of science; PhD: Doctor of philosophy

**Table 2:** Comparison of mean±SD happiness score between the control and intervention groups (N=120)

| Group          | Before     | After      | Difference | Within group |
|----------------|------------|------------|------------|--------------|
|                | Mean±SD    | Mean±SD    | Mean±SD    |              |
| Control        | 58.06±4.90 | 58.90±5.21 | 0.83±3.82  | P=0.98       |
| Intervention   | 53.98±5.47 | 98.48±6.01 | 50.50±8.86 | P<0.001      |
| Between groups | P=0.07     | P<0.001    | P<0.001    |              |

## Discussion

In this study, after implementing mobile-based training programs in eight sessions, the results showed that the educational intervention was effective on happiness scores.

In the same line, mobile training and Fordyce happiness training both had positive results, but, the use of mobile reduced the academic performance. Seligman's happiness training was more effective than Fordyce. Abedi, in a study with groups of 20, 10, and 70 students in Tehran implemented a Fordyce training program and concluded that using this program could increase the students' happiness. The implementation of this program reduced anxiety and depression (23). Teaching happiness and changing

positive and negative emotions in adolescent female students were the subject of another study conducted by Mirzaei et al. The results showed that teaching happiness in the Fordyce method increased positive emotions among school students in Isfahan. The aim of this research was to investigate and compare the effectiveness of mental well-being program and Fordyce's cognitive behavioral method in reducing depression among 150 high school students with depression who were randomly selected (24).

The study of Rostami et al. in Tehran on the psychological effectiveness based on positive thinking skills training on the increase of deaf adolescents' happiness showed that positive thinking skills training increased the happiness of deaf adolescents. The main

objective of this research was to investigate the effectiveness of a mental rehabilitation program based on teaching positive thinking skills on increasing the happiness of a group of hearing impaired boys and girls. They were randomly selected; it was found that teaching positive thinking skills increased the happiness scores of deaf teenagers (25).

The results of Patterson have shown that happiness can improve mental and physical health. Happy people are healthier and much more successful and have more engagement and social commitment. Also, they have more security, make easier decisions, and have a more participatory spirit. This article examined the relationship between leisure time and positive moods and the effect of positive moods on health. In addition, this paper reviews the related literature and presents a theoretical model to explain the relationship between leisure time, positive affect, and good health. This study finally revealed the effect of leisure time on health as a means of modulating stress and/or the effects of stress and by directly strengthening the health and well-being of the individual (26).

Hossein et al. in their study examined the use of mobile phones in the classroom and its relationship with academic performance among high school students in Sanandaj; the results showed that there was a negative relationship between taking mobile phones to school, reading, sending, and receiving text messages in the classroom, and using SMS system in the classroom with academic performance. This negative relationship may be due to the simultaneous use of two different spaces during education. The purpose of the present research was to determine the effect of mobile phone use on academic performance among male and female students of Jahangirnagar University, Bangladesh. A survey was conducted among 274 students and the result of this study showed that mobile phones were undoubtedly a useful tool for studying, and depending on the student's attitude and usage pattern, they could be a harmful source of distraction (27).

Comparison of the effectiveness of

Seligman, Lyubomirsky, and Fordyce happiness training programs in heart patients with a neuropsychological evaluation showed that all three happiness programs had positive and significant effects on the cognitive variable. However, Seligman's happiness effectively reduced inflammatory markers in patients with coronary artery disease. The aim of this study was to investigate and compare the effectiveness of three happiness interventions on the risk biomarkers and psychological variables of coronary arteries (28).

Given the prevalence of mental health problems and the fact that adolescents are involved in the underlying cycles of the future society and as an efficient force play a vital role in society, increasing the level of happiness and education to live happily in this age group seems highly significant. Therefore, due to the promising findings of the study, it is recommended that new methods should be used to teach happiness to adolescents.

#### *Limitations and Suggestion*

From the education point of view, because it is more economically probable for students in this district to have more advanced mobile phones, we used this district for our study.

#### **Conclusion**

The results of this study indicated the importance of teaching happiness and considering the effectiveness of the mobile-based educational technique; therefore, it is recommended that this method should be used in educational settings.

#### **Authors' Contribution**

SHY, FG, and MM contributed to conceptualization and study design, FG did the experimentation and data acquisition, SHY and FG contributed to statistical analysis. FG prepared the manuscript. All authors read and approved the final manuscript.

**Conflict of Interest:** None declared.

#### **Ethical Considerations**

Proposal was approved and the

necessary permits were obtained from the Vice Chancellor for Research, Ethics Committee (IR.SUMS.REC.1398.436), and Clinical Trial Registration Center (IRCT20190428043412N1). Authors declare that they have obtained written informed consent from each participant. The researchers were properly introduced before the research, and the participants understood the objectives of the research. Consent was not obtained under coercion and the participants had the choice to withdraw at any stage of the research. The participants were assured of confidentiality regarding the information provided.

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