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The Effect of Guided Imagery and Music on the Level of Sexual Satisfaction of Women of Reproductive Age: A parallel cluster- Randomized Trial

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ABSTRACT

Background & aim: As one of the most influential factors of marital life, sexual satisfaction can significantly lead to peace and compatibility of couples. The present study investigated the effect of Guided Imagery and Music (GIM) on the level of sexual satisfaction in women of reproductive age.

Methods: In this parallel cluster-randomized trial which was conducted from Feb. 2019 to Apr. 2020, 72 women of reproductive age (two groups of 36 subjects) who had moderate or undesirable sexual satisfaction were sampled. The guided imagery music was presented for the intervention group for 6 weeks as twice a week. No intervention was performed for the control group. The data collection tool included fertility characteristics and Larson questionnaires, which was completed before, immediately and one month after the intervention. Data were analyzed by SPSS software (version 20) using independent t-test, chi-square, Mann-Whitney and variance analysis with repeated measurements.

Results: There was no statistically significant difference between the two groups in the sexual satisfaction score before the intervention. The mean sexual satisfaction score in the intervention group had a statistically significant difference between the baseline (91.1±9.1), immediately after intervention (112±4.46) and one month later (102±9.24) (P< 0.001). However, there was no significant difference between the changes in the sexual satisfaction of women in the control group between three times.

Conclusion: GIM technique improves women's sexual satisfaction. It is recommended to health care providers to use this behavioral technique to enhance the level of sexual satisfaction in women of reproductive age.

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Introduction

The available evidence shows that couples face many and various problems in establishing and maintaining intimate relationships and a satisfying marital life (1). Sexual intercourse in a young couple along with childbearing forms the basis and survival of marital life and strength of the family. Healthy sex prevents unhealthy sexual relationships and sexual deviations and reduces sexual crime in society (2). Statistics show that 20-30% of American men and 15% of American women turn to extramarital relationships due to lack of sexual satisfaction

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(3). The results of the study by Zegaya et al. (2020) in Ethiopia showed that half of the women (50.4%) had moderate sexual satisfaction, 11% had severe sexual dissatisfaction, and only 39% of them had high sexual satisfaction (4). According to the statistics center of the Ministry of Health, the prevalence of sexual problems among Iranian women is over 70% and among men is about 60% (5).The study of Mazinani et al. entitled "Prevalence of sexual dysfunction in women and its related factors, in Tehran University of Welfare and Rehabilitation Sciences", showed that the overall prevalence of sexual dysfunction is 31% among women. About half of these women had sexual dissatisfaction (6). The results of Mehrabi et al.'s study on women referring to Fatemiyeh Hospital in Hamadan showed the frequency of sexual dysfunction in women and decreased sexual satisfaction by 51.5% (7).The strength of marital relationships is jeopardized without satisfactory sexual relations, and subsequently, sexual dysfunction occurs, which also leads to a further decrease in sexual satisfaction (8). There are several definitions for marital satisfaction, one of the best is provided by Hawkins. He defines marital satisfaction as objective feelings of satisfaction and pleasure experienced by husband and wife when they consider all aspects of their marriage (9). Sexual satisfaction is obtained in response to the emotions arising from the positive and negative mental evaluations of a person about his sexual relationship with another person. Satisfaction with sexual relationship is one of the important factors of satisfaction with marital life and one of the important and effective factors in the health and quality of life of couples, and it is also considered one of the most important indicators of life satisfaction. Sexual satisfaction is particularly important in the fields of family and marital issues, and several studies have pointed out the effect of sexual satisfaction on marital satisfaction. These studies have shown that a desirable sexual relationship in a way that can provide the satisfaction of spouses plays an important and fundamental role in the stability of family center. Lack of sexual satisfaction can cause the feeling of failure, frustration and insecurity that threats the psychological health of spouses (2,10). Paying attention to psychological aspects affecting marital satisfaction and as a result sexual satisfaction should be considered as one of the important pillars of improving and promoting marital satisfaction. Today, therapeutic techniques of psychological field focus more on the neurological and psychological effects of music. Research has shown that music increases activity and stimulates neurochemical pathways by regulating the level of steroid hormones. Music appears to regulate steroid hormone levels through the auditory cortex and enter the limbic system and hippocampal regions and the hypothalamic-pituitary pathway.The most important research on the effect of music on the brain has shown that music regulates hormones such as cortisol, testosterone, estrogen and progesterone (11). Regarding the possible effect of music on sexual function, Darwin's elementary theory was first proposed in relation to animals; According to this theory, one of the biological functions of music is related to sexual issues and tendencies, because some female organisms are attracted to their opposite sex through music, and their selection for mating is made through these musical sounds produced by the male sex. In this context, according to the results of researches, there is evidence which can reflect the potential abilities and characteristics of music in choosing a sexual partner (12). Guided Imagery and Music (GIM) was first introduced in the 1970s by Dr. Bonny a musician and psychotherapist. It is a music-based approach to self-exploration, psychotherapy, and spiritual growth with physical and psychological effects. Guided mental imagery is a strategy which causes a feeling of strength and relaxation by concentration and using images, sights, sounds, music and words (13-15). In visualization, people are encouraged to do deep abdominal and diaphragmatic breathing and then muscle relaxation and imagine landscapes such as a forest, seashore, and pilgrimage site, and pay attention to surrounding sounds and smells. Visualization through a competitive focus reduces pain, tension, anxiety and depression and increases the feeling of health (12). Mental imagery is the main source of human personality and behavior. Mental image can

change personality and behavior (14). Also, all our actions, feelings, behaviors and even abilities can be influenced by this mental image (15).Considering the above, guided imagery music technique can be effective on many challenges and mental disorders, and therefore it is valuable to perform such interventions based on this behavioral technique. Sexual dissatisfaction is a part of psychological conflicts that can disrupt sexual function and subsequently quality of life and the current medical and traditional treatments have not been very helpful. The results of the mentioned studies (4, 6-7, 16) regarding the high frequency of dissatisfaction among couples and the lack of targeted interventions to resolve this problem have confirmed this claim.Therefore, the current study was performed aimed to evaluate the role of guided imagery and music (GIM) on the level of sexual satisfaction in women of reproductive age.

Materials and Methods

This parallel cluster-randomized trial was approved by the Ethical Committee of Isfahan University of Medical Sciences (IR.MUI.RESEARCH.REC.1398.505) and was registered in the Iranian Registry Clinical Trial (IRCT20190806044460N1).

$$n = \frac{(z_{1-\frac{\alpha}{2}}+z_{1-\beta})^2(2s^2)}{(d)^2} \qquad n = \frac{(1.96+0.84)^2(2s^2)}{(0.7s)^2} = 32$$

n=(z_1-_α/2+z_1-β)^2 2s^2/(d)^2

n= 1.96+0.84^2 (2s^2)/(0.7s)^2=32

z_1-α/2 = 95% confidence coefficient which is 1.96. z 1-β= test power factor of 80%, i.e. 0.84. d= the minimum difference in the mean score of sexual function among the three groups, which showed the difference to be significant and s was considered 0.7. According to the mentioned formula, the number of sample was at least 32 in each group, of course, considering 10% attrition, it was estimated to be 36 in each group and a total of 72 samples were determined.

The inclusion criteria were women with sexual dissatisfaction or moderate satisfaction, the absence of illness, no use of drugs affecting sexual satisfaction, the absence of any deprivation or experience of crisis based on the Holmes and Rahe stress measurement scale, and the absence of sexual impotence or premature ejaculation in the husbands of these women. The exclusion criteria were unwillingness to continue the study and occurrence of any psychological and physical problems affecting sexual satisfaction.

The questionnaires included the demographic characteristics questionnaire and the Larsson sexual satisfaction questionnaire, which were completed through self-report by the guidance of the researcher. Larson's questionnaire has 25 questions in 4 areas: willingness to sexual intercourse, sexual attitude, quality of sexual life and sexual compatibility that is scored on a 5-point Likert scale (never: 1, rarely: 2, sometimes: 3, most of the time: 4, always: 5). The range of scores is 25-125**.**

Women's sexual satisfaction is considered in four levels: no sexual satisfaction (25-50), low sexual satisfaction level (51-75), moderate sexual satisfaction level (76-100) and high sexual satisfaction level (101-125). The reliability and validity of Larson's questionnaire was measured in the study by Shams titled "Investigation of the effect of marital counseling on couples' sexual satisfaction" and the validity and reliability of this questionnaire was 90% and 86%, respectively (17). Also, in the Bahrami's research titled "Investigating the relationship between sexual satisfaction and depression between fertile and infertile couples", the reliability of this questionnaire using Cronbach's alpha coefficient method for the fertile group was 93% and for the infertile group was 89% (18).

Among all the health care centers in Isfahan (n=58), four centers with large coverage population were selected and then randomly and by drawing two health care centers were considered as the intervention and control groups. Then, the electronic records of women of reproductive age under the coverage of the centers were reviewed and they were selected according to the criteria for entering the study using convenient sampling method. The informed consent form was completed by the women, and while completing this form, their spouses were also present and the research process was explained to them.

The eligible subjects completed the demographic characteristics questionnaire and Larson's sexual satisfaction questionnaire through self-report. Among the subjects who completed the questionnaires, women with dissatisfaction or moderate sexual satisfaction entered the study. The guided imagery music was presented for the intervention group for 6 weeks (twice a week).

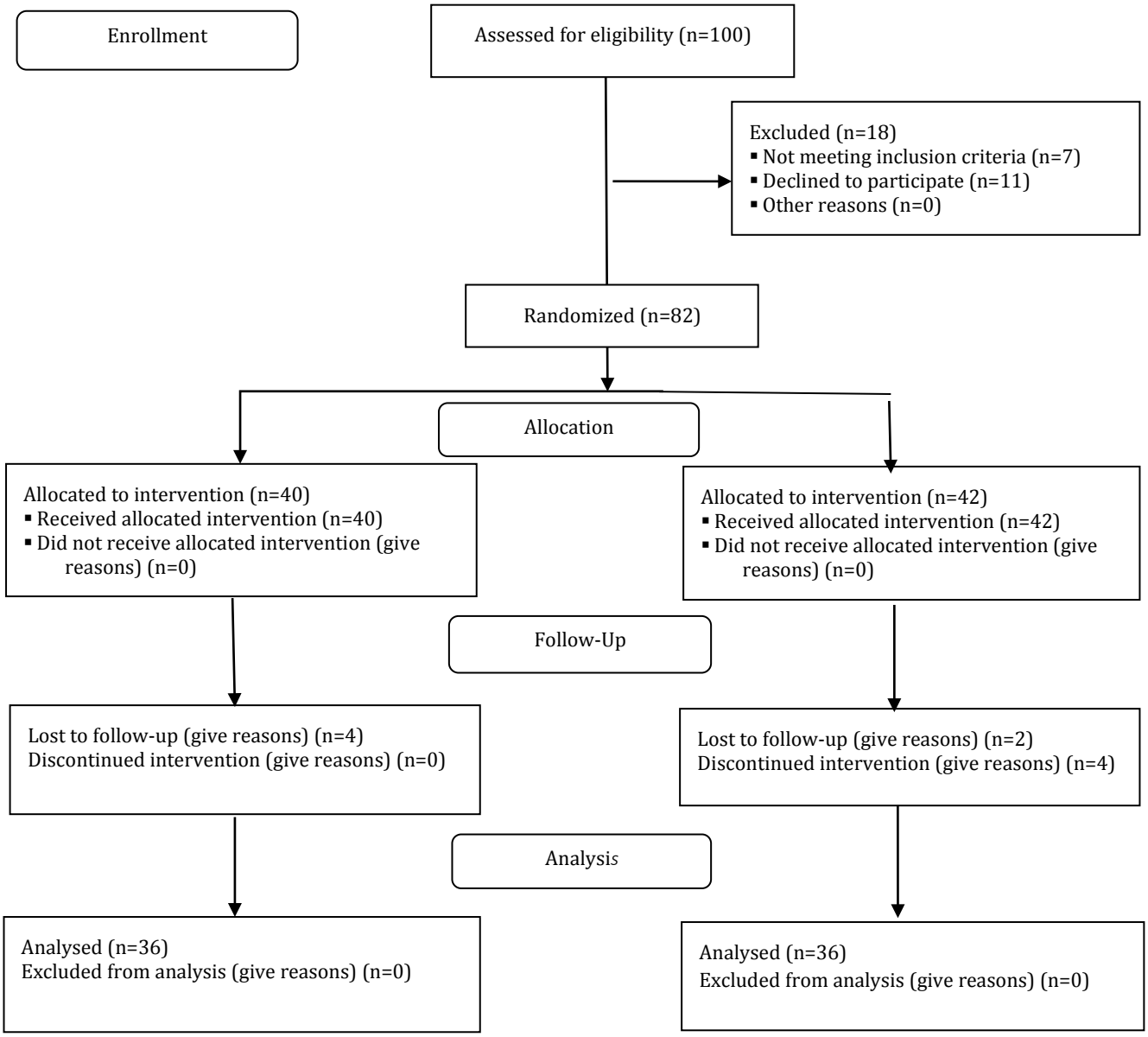

Figure 1. The CONSORT flow diagram of intervention in the two groups

The guided imagery and music (GIM) technique was performed as the intervention. The text and music (Voices of Spring- Waltz Opus 333 - Blue Danube Waltz) related to it was compiled through library study, scientific resources and consultation with experts in the field of music, psychology and sexual health (Bonny, 2001; Grocke & moe, 2015; Story, 2017; Montgomery, 2012) and was prepared by the researcher in an audio file in the studio. An audio file of the intervention was provided to the participants in 12 sessions of 30 minutes twice a week for 6 weeks at home. Before that the intervention, a brief session was held in person. The process of the intervention is derived from Bani's (2001) method (15) which is described below**:**

Prelude: The researcher asked the participants to focus on their own mind, emotions and energy.

Induction and Relaxation: The participants were trained about how to contract and relax muscles during inhalation and exhalation.

Music and imagery: Music is played for the participants and at the same time a mental image is presented as a starting point for visualization**.**

Postlude: By returning to the normal state of consciousness, the samples draw a report in the form of drawing or writing.

This two groups study was conducted on 72 Iranian women who attended to four comprehensive centers to receive health services. The sample size was calculated based on the following formula. Intra-cluster correlation coefficient, number of events, expected effect and study power were considered**.**

No intervention was performed for the control group. Immediately and one month after the intervention, the sexual satisfaction questionnaire was again completed in both groups. The findings of the three stages were analyzed**.**

The subjects were followed up by telephone once a week and the researcher answered the possible questions in the two groups and presented the recommendations of the meetings and asked the subjects to refer to complete the sexual satisfaction questionnaire. It should be noted that in order to comply with ethical considerations at the end of the intervention, an audio file containing music and guided imagery text was also provided to the control group. Also, these subjects were advised to refer to a sexual psychiatrist to improve sexual satisfaction.

Data were analyzed by SPSS software (version 20) and independent t-test, chi-square, Mann-Whitney and variance analysis with repeated measurements. Kolmogorov-Smirnov test was first used to evaluate the normality of the data**.** $P<0.05$ was considered statistically significant.

Results

Among 42 subjects in the intervention group and 40 in the control group, 36 samples in each group participated in the study. The age of the participants ranged 19 to 49 years (Figure 1).

The results of t-test, Mann-Whitney and Chi-square tests found no statistically significant difference between the intervention and control groups in terms of demographic and midwifery characteristics of the research units (age of wife and husband, age difference with husband, duration of marriage, number of pregnancies, number of children, employment status of the wife and husband and education level of wife and husband) ($p>0.05$).

The ANOVA Repeated Measures statistical test was used to measure the level of sexual satisfaction in the control and intervention groups during three times. As can be seen, there was no significant difference between the changes in the sexual satisfaction of women in the control group between three times, while based on the results, significant difference was observed for the changes in the sexual satisfaction of women in the intervention group between three times (Table 1).

The Tukey's post hoc test was used for two-by-two comparison of the sexual satisfaction scores in the women of the intervention group between the investigated times, and the changes were statistically significant (Table 2).

Table 1. Changes in sexual satisfaction score in control and intervention groups before, immediately and one month after intervention

Group	Before intervention M(SD)	Immediately after intervention M(SD)	1 month after intervention M(SD)	Test statistics	P-Value
Sexual satisfaction					
Control group	91.4 ± 7.7	92.8 ± 7.46	92 ±7.64	0.828	0.41
Intervention group	91.1 ± 9.1	112 ± 4.46	102 ± 9.24	62.6	0.0001

Table 2. Two-by-two comparison of the sexual satisfaction scores in the intervention group before, immediately and one month after intervention

Sexual satisfaction	Before intervention	Immediately after intervention	1 month after intervention
Before intervention	-	0.0001	0.0001
Immediately after intervention	-	-	0.0001
1 month after intervention	-	-	-

The results of the Independent t-test indicated statistically significant difference between the two groups in the mean score of women's sexual satisfaction immediately and 1 month after the intervention (Table 3) (Figure 2).

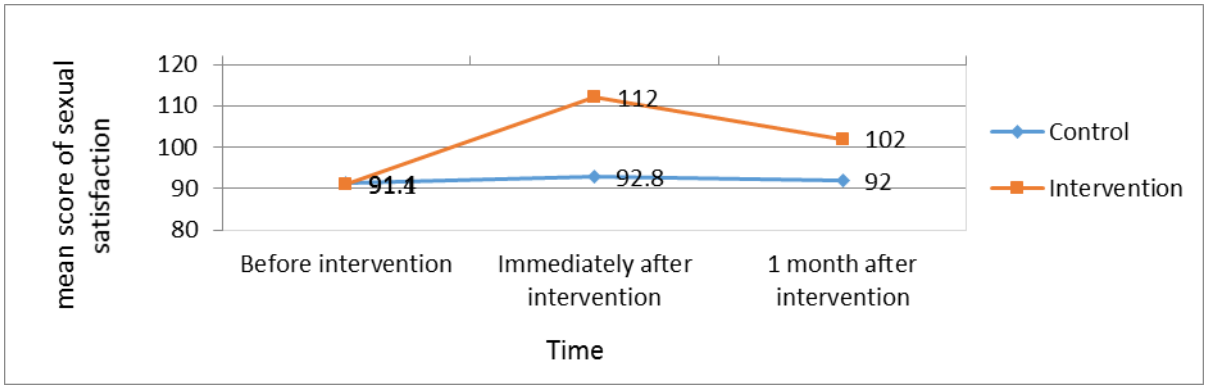

Figure 2. Changes in women's sexual satisfaction scores in the in control and intervention groups before.

Table 3. The effect of the intervention on the women's sexual satisfaction score before. immediately and one month after intervention

Group	Before intervention M(SD)	Immediately after intervention M(SD)	1 month after intervention M(SD)	p-value Intergroup changes
Sexual satisfaction				
Control group	91.4 ± 7.7	92.8 ±7.46	92± 7.64	0.0001
Intervention group	91.1 ±9.1	112 ± 46.4	102 ± 9.24	

In a general comparison between the intervention and control groups at three times of before, immediately after the intervention and also 1 month after the intervention using

the repeated measures ANOVA statistical test, the results indicated that there is a statistically significant difference in the mean score of women's sexual satisfaction between the two groups (Table 4).

Discussion

The current study was performed with aim to evaluate the effect of guided imagery music (GIM) on the sexual satisfaction of women at reproductive age. Before the intervention, the mean score of women's sexual satisfaction was not statistically different between the intervention and control groups.

The results of the current study showed that the mean sexual satisfaction score of women in the intervention group improved immediately and one month after the intervention, but this rate didn't change at different times in the control group.

In the present study, the overall score of women's sexual satisfaction before entering the research was reported to be moderate that is acceptable to some extent, but since the high prevalence of mood disorders due to dissatisfaction and low sexual satisfaction is undeniable, therefore, women need wide range of interventions to improve sexual satisfaction in order to improve the quality of life (1-2). Bahrami et al.'s study entitled "Investigating the relationship between sexual satisfaction and depression between fertile and infertile couples" showed that the level of sexual dissatisfaction of couples was high in both groups, and there was a significant negative correlation between sexual satisfaction and depression. The researchers in their study announced that due to the high prevalence of mood disorders in the Iranian society and according to the results of the study, it is expected that the sexual satisfaction of many couples in the society is not at a desirable and completely acceptable level (18-19).

The results of the present after the intervention showed that guided imagery music (GIM) increased the sexual satisfaction score.

Perhaps this technique increases the sexual satisfaction through reducing the intensity of pain during sexual intercourse, reducing perceived stress in daily activities and also improving the quality of life and social relationships of people (20). Of course, the role of endorphin hormones, Cortisol, serotonin and oxytocin cannot be ignored. The release of cortisol, serotonin and oxytocin hormones during sexual intercourse reduces stress and pain and therefore increases communication during sexual activity, and endorphins cause vitality, relaxation and remove functional anxiety (21).

During fear, restlessness, and anxiety, substances called catecholamines, or in other words, adrenaline and noradrenaline, are released from the adrenal glands, which rise blood pressure and heart rate (22-23). It is surprising that music reduces the release of this anxiety-causing substance, and therefore blood pressure and heart rate decrease and lead to muscle relaxation and functional satisfaction (24-25). Lawendowski and colleagues (2017) performed a study to identity and self-esteem in the context of music and music therapy; they reported that music can be a suitable way to improve sexual self-esteem, marital satisfaction and to reduce the conflicts in the life of these women. These researchers suggested that it is as a result of increasing the effective factor such as endorphin hormone and also the balance of serotonin, melatonin and dopamine hormones (26), which also confirmed the results of the present study.

Increased level of sexual satisfaction immediately after the intervention in the present study was due to the rapid and timely stimulation of nerve myelins, nerve mediators and appropriate hormonal stimulations, and therefore optimal brain responses. Moreover, depriving people of hormones and neurotransmitters during the passage of time decreased this improvement within 1 month after the intervention (24). It seems that music improves sexual satisfaction through quick and timely stimulation of nerve myelin, nerve mediators and appropriate hormonal stimulation. Meanwhile, imagery enables people to express their mental conflicts and thus analyze their suppressed feelings.

Many studies have reported the effect of any kind of music and music-guided imagination on improving sexual performance and satisfaction, as well as improving mood disorders.

For example, lin (2010) believes that guided imagery includes the whole body, senses and

emotions (25). Imagery mobilizes unconscious and semi-conscious processes to reach and guide conscious goals. He focused on creating a sense of satisfaction after using this technique in cases of mental and functional disorders (27).

Janquin (2020) in his study entitled "The effect of music intervention on the physical functions and mental health of patients with ankylosing spondylitis" showed that music therapy can help improve the physical and mental functions of patients. He especially emphasized on the improvement of sexual functions, which is the result of physical and mental health; music can provide the possibility of better and deeper communication of sexual activities (28). The study of Marin and colleagues (2017) indicated that music may affect human courtship behavior through induced arousal (29).

Wang (2018) stated that music therapy improves the symptoms of mental diseases and increases the quality of life, happiness and decreases anxiety, therefore it leads to improved sexual satisfaction and performance (30). Degata and colleagues (2010) stated that guided imagery help women with mental disorders. Women suffering from these disorders use this technique to communicate with their cognitive, emotional and physical resources and their creativity and imagination will increase, so their physiological processes will improve (31). The results of the present study also confirm the findings of the studies of these researchers.

Other researchers such as Garga et al. (2021) reported that music positively affect sexual arousal. It is a stimulation technique for the initiation of sexual objective tendencies (32). Miani (2016) evaluated the possible effect of vasopressin on Sexual arousal and rhythmic synchronization and concluded that vasopressin, a sexual dimorphic neuropeptide, engages its receptors in a part of the brain involved in the performance of music (basal ganglia), and its concentration increases during sexual arousal in men. The effect of music on increasing vasopressin was confirmed (33).

Considering the mentioned studies, GIM can be one of the reasons for improving sexual satisfaction. According to Colbins and Degata's study, this technique can focus on the senses and strengthen the emotional and cognitive resources, and subsequently improve mental, sexual and physical performance. In this context, imagery can be considered as a therapeutic tool which enables women to express their mental conflicts and concerns, and therefore to release suppressed emotions and increase inner satisfaction (34). The irreplaceable role of hormones and nerve mediators, which are stimulating factors in this field, are also added to the mentioned factors.

The limitation of the present research was the impossibility of face-to-face follow-up of women during the intervention due to the corona virus epidemic; therefore, all follow-ups were done by phone. The strength of this study was the companionship and participation of the spouses as well as their benefit from the GIM audio file. It is suggested that in another study, after evaluating the couples' sexual satisfaction, GIM behavioral intervention be conducted and its effect be measured.

Conclusion

The results of the current study indicate that music and guided imagery music (GIM) as an easy, low-cost and affordable behavioral technique improved the women's sexual satisfaction. This technique is also acceptable in Iranian culture and improves the mental health of the family and society. Therefore, this low-cost and affordable technique could be recommended to the healthcare professionals to apply it in private and government clinics and counseling centers.

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Conflicts of interest

The authors declared no conflicts of interest.

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