

RAPID COMMUNICATION

Listening to Turkish classical music decreases patients' anxiety, pain, dissatisfaction and the dose of sedative and analgesic drugs during colonoscopy: A prospective randomized controlled trial

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Abstract

AIM: To determine whether listening to music decreases the requirement for dosages of sedative drugs, patients' anxiety, pain and dissatisfaction feelings during colonoscopy and makes the procedure more comfortable and acceptable.

METHODS: Patients undergoing elective colonoscopy between October 2005 and February 2006 were randomized into either listening to music (Group 1, $n = 30$) or not listening to music (Group 2, $n = 30$). Anxiolytic and analgesic drugs (intravenous midazolam and meperidine) were given according to the patients' demand. Administered medications were monitored. We determined their levels of anxiety using the State-Trait Anxiety Inventory Test form. Patients' satisfaction, pain, and willingness to undergo a repeated procedure were self-assessed using a visual analog scale.

RESULTS: The mean dose of sedative and analgesic drugs used in group 1 (midazolam: 2.1 ± 1.4 , meperidine: 18.1 ± 11.7) was smaller than group 2 (midazolam: 2.4 ± 1.0 , meperidine: 20.6 ± 11.5), but without a significant difference ($P > 0.05$). The mean anxiety level in group 1 was lower than group 2 (36.7 ± 2.2 vs 251.0 ± 1.9 , $P < 0.001$). The mean satisfaction score was higher in group 1 compared to group 2 (87.8 ± 3.1 vs 58.1 ± 3.4 , $P < 0.001$). The mean pain score in group 1 was lower than group 2 (74.1 ± 4.7 vs 39.0 ± 3.9 , $P < 0.001$).

CONCLUSION: Listening to music during colonoscopy helps reduce the dose of sedative medications, as well as patients' anxiety, pain, dissatisfaction during the procedure. Therefore, we believe that listening to music can play an adjunctive role to sedation in colonoscopy. It is a simple, inexpensive way to improve patients' comfort during the procedure.

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Key words: Colonoscopy; Turkish classical music; Sedative medications; Anxiety; Pain; Satisfaction

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INTRODUCTION

Anxiety and pain are common problems associated with colonoscopy procedure and most endoscopy units prescribe some form of sedation and analgesia for patients undergoing this procedure^[1]. Although the use of sedation is both risky and costly^[2,3], performing colonoscopy without sedation may adversely affect both the outcome and patients' tolerance and is therefore not universally accepted practice^[4-6]. It is imperative that ways be found to reduce the use of sedation without affecting patients' tolerance and satisfaction^[1]. To reduce a patient's anxiety during invasive procedures like endoscopy, various approaches have been used to distract the patient's attention, such as therapeutic communication, visualization, aroma therapy, therapeutic touch, and listening to music^[7,8].

Use of music to promote relaxation has a long history in medicine^[1,9]. Music has been acknowledged as a cheap, safe and effective non-pharmacological anxiolytic agent due to its effect on the perception of pain and anxiety,

reducing the regular pharmacological sedative doses^[10]. The role of music as an adjunct to standard treatment has been studied in several disorders^[9]. There are a few studies that analyse the effect of music on the anxiety suffered by patients who undergo invasive procedures^[10]. Some studies suggest that music alleviates anxiety and improves patients' tolerance during gastrointestinal (GI) endoscopy^[9].

In this study, we aimed to assess whether listening to Turkish classical music may decrease the dose of sedative and analgesic medication required during the colonoscopy procedure and improve anxiety and dissatisfaction of the patients.

MATERIALS AND METHODS

Between October 2005 and February 2006, 60 patients scheduled for elective colonoscopy consecutively agreed to participate in the study. Patients aged below 18 or above 75 years, those who have hearing problems due to any cause, patients with overt or borderline psychiatric illnesses, presence of senile dementia, treatment with anxiolytic medication in the 72 h prior to the examination and those with considerable cardiopulmonary morbidities were excluded. Patients were randomized into two groups (group 1: listening to music, group 2: not listening to music) using computer-generated random numbers. All examinations were performed by an expert endoscopist who performed at least 200 full-length colonoscopic procedures previously using the Olympus CV-145 video-colonoscopy. All patients provided written informed consent for participation in the study. The study protocol was approved by local ethical committee of Gaziantep University.

In this study, in the first part of the questionnaire in order to obtain demographic characteristics of the patients, questions related to age, gender, educational level, marital status, occupation, monthly income, having previous non-formal information about colonoscopy were asked. Doses of sedatives and analgesics were determined by the endoscopist performing the procedure according to patients' demand and anxiety status. Initial intravenous doses of meperidine at 10 mg and initial midazolam at 1 mg were given. Additional doses were titrated based on assessments of the patient by the endoscopist and nurse. Increments of meperidine (10 mg) and midazolam (1 mg) were given if patients showed signs of discomfort, pain, restlessness, or agitation that were not related to hypoxemia. After the procedure, the patients were asked several questions using a visual analog scale ranging from 0 (very much) to 100 (none) for pain (0 = Very much 100 = None), satisfaction (0 = none, 100 = very much), procedure evaluation (0 = unpleasant, 100 = pleasant) and willingness to do the procedure again (0 = never, 100 = happily)^[11].

The State Trait Anxiety Inventory (STAI) was used to determine the anxiety level of the patients. STAI was developed by Spielberger *et al* in 1970 and adapted to Turkish population by LeCompte *et al* in 1976 and confirmed for reliability and validity by Oner in 1977^[12]. This instrument has been used extensively in clinical settings to measure feelings of apprehension, tension, and nervousness. STAI is a two-part 40-item self-report.

The Trait Portion (20 items) measures a person's general disposition and the State Portion (20 items) measures how a person feels at the time of the operation. The instrument is rated on a four-point scale. Scores are added to obtain an overall score (higher scores indicate higher levels of anxiety). The internal consistency alpha coefficients of the state portion range from 0.86 to 0.92. It is simple to use, generally taking < 5 min to complete, and easy to score^[13,14].

Patients in the study group before and during the procedure were exposed to approximately 30 min of music therapy broadcasting from the central system of the endoscopy unit. The decision about the type of music was given by consultations with the specialist working in the Turkish Music Department of State Conservatory of Gaziantep University. During the research, music of a *ney* (reed flute) that is played using a traditional Turkish classical music instrument was found. It has been theorized that classical Turkish music, a slow and relaxing type of instrumental music, has the most recreative effect on people's psychological state^[15] and *ney* is considered the most suitable instrument for this purpose. It has been known that Uygur Turks use music in the treatment of patients. Especially in the Mevlevi stories, it is told that psychologically ill people become relaxed when they listen to the sound of the *ney*. This application of music therapy was also seen in the Ottoman Empire period^[16,17].

Statistical analysis

Statistical Package for Social Sciences (SPSS 10.0 for Windows) was used for the analysis of the data. We performed Student's *t* test to compare means for two groups of cases. $P < 0.05$ was considered as significant.

RESULTS

No significant difference was found between the two groups with respect to their age, gender, urban residence or not, educational and marital status, occupation, monthly income and having non-formal information about colonoscopy ($P > 0.05$) (Table 1).

Drug doses in group 1 (midazolam: 2.1 ± 1.4 , meperidine: 18.1 ± 11.7) was lower than group 2 (midazolam: 2.4 ± 1.0 , meperidine: 20.6 ± 11.5), but the difference was not statistically significant ($P > 0.05$) (Figure 1). Anxiety levels were significantly lower in the study group ($P < 0.05$) (Figure 2).

Patients in group 1 experienced less pain, were more willing to repeat the procedure, perceived the procedure more comfortable and were more satisfied with the procedure. All these parameters in group 1 and group 2 were significantly different ($P < 0.05$) (Figure 3).

DISCUSSION

Colonoscopy is an uncomfortable and painful endoscopic procedure^[4]. The use of various relaxing techniques to reduce pain and anxiety has been reported in medical literature^[1]. Music therapy is one of the relaxing techniques and the beneficial effects have been recognized for many years^[18]. Several studies reported that the use of music

Table 1 Sociodemographic characteristics of patients

	Group				Total		Significance
	Music (+)		Music (-)				
	n	%	n	%	n	%	
Age (yr)							
20-39	10	33.3	5	16.7	15	25.0	$\chi^2 = 2.754$
40-59	11	36.7	11	36.7	22	36.7	
60 and over	9	30.0	14	46.6	23	38.3	$P = 0.252$
Gender							
Female	16	53.3	16	53.3	32	53.3	$\chi^2 = 0.000$
Male	14	46.7	14	46.7	28	46.7	$P = 0.602$
Marital status							
Married	23	76.7	26	86.7	49	81.7	$\chi^2 = 1.002$
Single	7	23.3	4	13.3	11	18.3	$P = 0.253$
Educational status							
Primary school	20	66.7	21	70.0	41	68.3	$\chi^2 = 1.714$
High school	8	26.7	6	20.0	14	23.3	
University	2	6.7	3	10.0	5	8.4	$P = 0.634$
Monthly income							
< minimum wage (MW)	12	40.0	6	20.0	18	30.0	$\chi^2 = 4.118$
MW up to 2 times MW	16	53.3	18	60.0	34	56.7	
Between 2-3 times MW	2	6.7	6	20.0	8	13.3	$P = 0.128$
Having non-formal information about colonoscopy							
Yes	6	20.0	10	33.3	16	26.7	$\chi^2 = 1.364$
No	24	80.0	20	66.7	44	73.3	$P = 0.191$
Total	30	100.0	30	100.0	60	100.0	

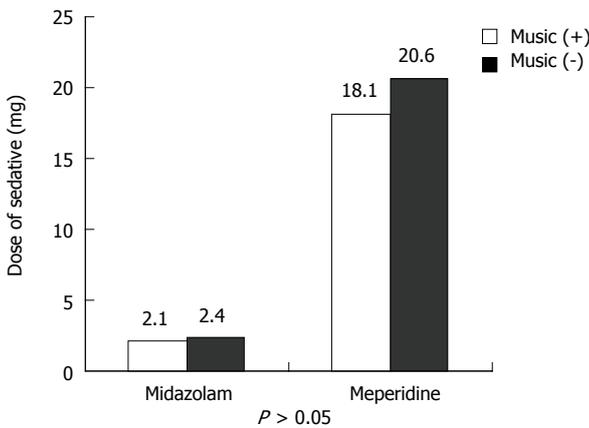


Figure 1 Patients' mean dose of sedative drugs.

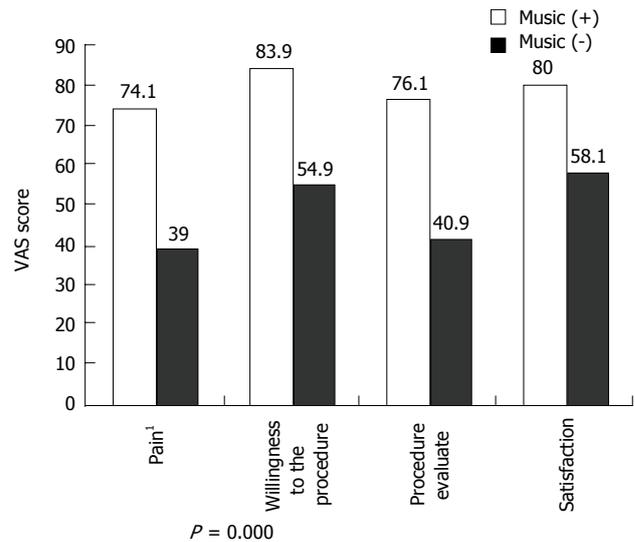


Figure 3 Patients' mean VAS scores of pain, willingness to do the procedure, procedure evaluation and satisfaction. ¹(0 = Very much, 100 = None)

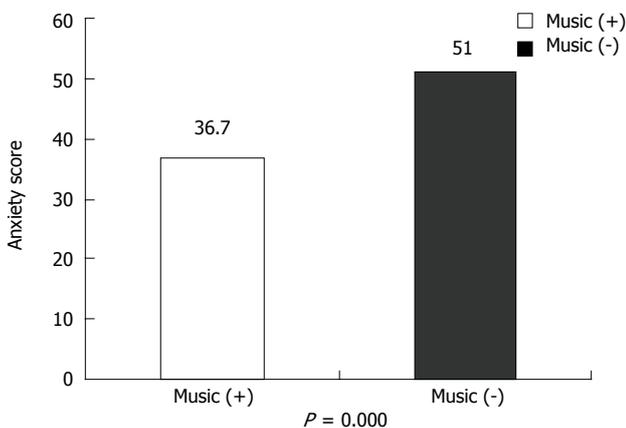


Figure 2 Patients' mean anxiety scores.

during endoscopy could alleviate anxiety and improve tolerance and compliance^[17,18,19]. The results of clinical studies suggest that listening to music has a positive effect on psychological and physiologic status, and thus music has been used as an anxiolytic for relieving discomfort in stress-related interventions^[20].

Lee *et al*^[20] found that listening to music decreased the dose of sedative drugs that were used during colonoscopy. Harikumar *et al*^[9] revealed that the dose of midazolam was lower in music group. In our study, we also found the dose of sedatives was lower; however, probably due to small

sample size, the difference was not statistically significant. Nevertheless, this prospective randomized controlled trial demonstrated that music can decrease the dose of sedative medication required for colonoscopy. The use of music as an adjuvant to sedation can potentially reduce dose-related complications associated with the use of sedative and analgesic drugs.

Many studies in different fields of medicine revealed beneficial effects of music on anxiety and discomfort^[7,21-23]. Palakanis *et al.*^[18] determined that music decreased anxiety levels in sigmoidoscopy patients. Andrada *et al.*^[10] also found that anxiety levels were lower in music group in colonoscopy patients. In our study, we also clearly showed that listening to music decreased anxiety significantly. Many of the beneficial effects of music are linked to its anxiolytic capacity and its action on the perception of pain. This painful perception, however, is correlated with the levels of anxiety perceived during the procedure; therefore, an increase of this anxiety results in a more painful perception. Our study allows us to affirm that listening to music during colonoscopic procedures decreases the levels of anxiety linked to this invasive procedure.

Music therapy is widely used in treatment of acute and chronic pain^[24]. Some studies showed decrease of pain by music^[1,24-26]; however, some showed no effect^[9,11,20]. In our study, pain perception was significantly decreased by listening to music.

Most studies revealed that music increased patients' satisfaction^[1,19,27-29]. Our results are consistent with the literature. Although the doses of sedative drugs were not different between the two groups in our study, the satisfaction score was higher in group 1. The use of music in addition to sedative drugs had a favorable effect on patients' satisfaction. Moreover, most patients who underwent colonoscopy with a combination of music plus sedative drugs were willing to repeat the procedure. Thus, in the present study, music improved patients' acceptance of and tolerance to colonoscopy.

CONCLUSION

This randomised trial demonstrates that music decreases the dose of sedative and analgesic medication required by patients undergoing colonoscopy, but not significantly. Listening to music decreases anxiety levels and pain scores significantly and increases satisfaction scores and patients' comfort and tolerance. Since it is a readily available, noninvasive, inexpensive, simple, and nonpharmacological method without any side effects, listening to relaxing music is highly recommended as an adjunct to sedatives and analgesics for patients undergoing elective colonoscopy.

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