

Effect of psychological preparation on anxiety level before colonoscopy in outpatients referred to Golestan Hospital in Ahvaz

Hatam Boustani, Sirus Pakseresht, Mohammad-Reza Haghdoust, Saeid Qanbari, Hadis Mehregan-Nasab (✉)

Department of Psychiatry, Jundishapur University of Medical Sciences, Ahvaz, Iran

© Higher Education Press and Springer-Verlag Berlin Heidelberg 2017

BACKGROUND: Gastrointestinal disorders are common complaints for which endoscopy and colonoscopy are the most important diagnostic procedures. Anxiety is an unpleasant, ambiguous feeling of apprehension and fear of unknown origin that occurs during stressful situations or injury. Lack of sufficient information and fear of pain can cause anxiety prior to a colonoscopy, reducing the number of patients willing to undergo the procedure and increasing colonoscopy time. The aim of this study was to evaluate the efficacy of psychological preparation on anxiety before colonoscopy in patients presenting to Golestan Hospital during the years 1994 and 1995.

MATERIAL and METHODS: This study was a double-blind clinical trial of patients presenting to the colonoscopy unit in Golestan Hospital in 1994 and 1995. A total of 80 patients were divided into two groups: intervention and control. A primary assessment of anxiety was performed using Spielberger's State-Trait Anxiety Inventory. Before the colonoscopy, the State-Trait Anxiety Inventory was completed by the patients again. The effectiveness of psychological preparation before colonoscopy and its effect on anxiety were evaluated using statistical software SPSS 20.

RESULTS: The mean age of participants was 46.33 ± 12.2 years in the intervention group and 44.8 ± 12.26 years in the control group. In this study, there were 41 males (51.3%) and 39 females (48.7%); 15 patients (18.7%) were single and the rest married. In terms of demographic variables, there were no significant differences between the two groups ($p > 0.05$). The average scores of state and trait anxiety in the intervention group showed a statistically significant difference before and after the intervention ($p = 0.000$).

CONCLUSION: Trait and state anxiety levels after psychological preparation showed a statistically significant reduction. This indicates the effectiveness of intervention programs to reduce anxiety before colonoscopy.

Keywords anxiety, colonoscopy, Spielberger

Introduction

Colonoscopy is one of the most common gastrointestinal endoscopic procedures. In America, about 14 million colonoscopies are performed annually. While techniques such as stool DNA and computed tomography colonography are currently available, colonoscopy is still identified as a reference method in colon cancer screening (Ketwaroo and Sawhney, 2015). Colon cancer is the third most common cancer in men and women and the third leading cause of death caused by cancer in America. Due to colonoscopy screening

for the detection and removal of premalignant adenomatous colorectal polyps as well as early diagnosis of colon cancer, the incidence and mortality rates of this cancer have decreased in individuals over 50 years of age (Inra et al., 2016).

There are numerous obstacles reported by patients in relation to having a colonoscopy. In a recent systematic review, anxiety and stress were found to be the most important obstacles to colonoscopy (McLachlan et al., 2012; Grilo et al., 2016; Sargin et al., 2016). Several causes of anxiety in relation to colonoscopy have been identified: 1) fear of the unpleasant sensations during a colonoscopy; 2) fear of negative results of the colonoscopy examination; 3) lack of adequate information about colonoscopy; 4) lack of familiarity with the hospital environment; and 5) fear of side effects of the colonoscopy (McLachlan et al., 2012).

Received January 29, 2017; accepted April 15, 2017

Correspondence: Hadis Mehregan-Nasab

E-mail: hadis20011@gmail.com

There are two types of anxiety, state and trait, whose distinction is important. State anxiety involves experiencing anxiety during a fairly stable period, and is also known as personal anxiety. Trait anxiety is a temporary emotional state that includes a conscious mind or understanding, a feeling of tension, apprehension, nervousness, and concern along with activation and stimulation of the autonomic nervous system, and can be experienced by individuals several times a day (Hartley et al., 2013). The severity of state anxiety varies greatly between individuals. There are several factors that affect an individual's state anxiety levels, including fear, the environment, and external stressors (Mott, 1999). Several ways to reduce anxiety related to colonoscopy have been proposed, including playing music and video files, aromatherapy, hypnosis, and health education (Elkins et al., 2006; Xiaolian et al., 2015; Hsueh et al., 2016; Ko et al., 2016).

The effect of psychological preparation before surgery is well known (Dumas, 1963; Schoessler, 1985), and some studies have also shown the effects of this method on reducing anxiety caused by endoscopic procedures. Mahajan et al. showed that psychological preparation results in a significant decrease of anxiety in patients undergoing gastrointestinal endoscopy (Mahajan et al., 1998).

Unlike upper endoscopy, few studies have examined stress and anxiety in patients undergoing colonoscopy. In addition, there are few studies on the impact of providing information to patients before colonoscopy. Therefore, the aim of this study was to assess the effect of psychological preparation on the level of anxiety experienced by patients before a colonoscopy. This research may be able to help gastroenterologists and patients to find a suitable way to use psychological preparation in the control of anxiety before colonoscopy.

Materials and methods

In this double-blind clinical trial, 80 patients referred to Golestan Hospital as candidates for colonoscopy were evaluated. To control for confounding factors, patients were randomly divided into two groups: intervention and control (40 participants in each group). Inclusion criteria were age between 18 and 80 years, Farsi language conversation skills, ability to communicate verbally, lack of previous experience in colonoscopy, and consenting to participate in the study. Exclusion criteria included risk of dementia, mental disability, obvious physical problems interfering in the consultation, a history of major psychiatric disorders, lack of cooperation, and anxiety rendering the patient unable to cooperate. Randomization was based on the 4-way permuted blocks method. In this study, patients and nurses were not informed that every patient has taken which consultation. All patients signed the written consent form and entered the study voluntarily.

First, a clinical and demographic questionnaire was completed based on information obtained from the patient as well as their file, including age, education, marital status, occupation, income level, gender, smoking history, family history of colonoscopy, and presence of other conditions, including high blood pressure, high blood lipids, diabetes, chronic renal failure, and pulmonary disease. Subsequently, to measure the patient's level of anxiety, Spielberger's State-Trait Anxiety Inventory (STAI) was used, which includes separate self-assessment scales to measure state and trait anxiety. The State Anxiety Scale (Y-Form 1) of the STAI consists of 20 statements that evaluate a person's feelings at the time of completing the questionnaire. The Trait Anxiety Scale (Y-Form 2) of the STAI includes 20 statements that measure general and ordinary feelings of individuals. The STAI was completed by one of the researchers through interviews with patients. Answers to statements are based on a 4-point Likert scale (1 to 4), with total scores ranging from 20 to 80. Scoring of positive questions was 4 for too little; 3 for little; 2 for high; and 1 for too high. However, negative questions (10 questions) were scored in reverse. Higher scores indicate greater levels of anxiety and vice versa. The reliability and validity of the STAI were confirmed in a study conducted by Majidi (2003) in Iran, with reliability showing a value of Cronbach's alpha of 0.80 (48). Furthermore, the reliability and validity of the State Anxiety Scale of the STAI were previously evaluated in a study conducted on 600 people by Mahram in 1994. Its reliability also was confirmed using Cronbach's alpha and it was determined that the validity of the scale as the ratio of the variance of the scores observed is at the up and acceptable level. In addition, in this study, the reliability of the questionnaire was confirmed by Cronbach's alpha value of 0.80. Clinical and demographic information was collected on admission, and the STAI was completed by patients twice: when they referred to the gastroenterology clinic (3-5 days before colonoscopy); and 1 h before colonoscopy. In the intervention group, psychological preparation was performed by a psychiatric resident doctor in a separate room 2 to 3 h before colonoscopy; after evaluating the patient's concerns, amount of information, and beliefs about colonoscopy in three domains (information, cognitive, and behavioral), the intervention was conducted as follows.

1. Control Information: At this stage, the patient's inaccurate information was corrected and completed. Additional information about how to perform a colonoscopy, time, duration, and general details of the procedure was provided to the patient.

2. Cognitive control: According to the cognitive distortions found in patients, cognitive control was done for the patient (e.g., focusing the patient's attention on the benefits of colonoscopy and its positive aspects instead of its unpleasant and negative aspects).

3. Behavioral control: Patients were shown behavioral control methods, including special breathing exercises,

distraction techniques, and an explanation on how to use these methods in the event of experiencing anxiety while undergoing the colonoscopy.

In the control group, 0 to 3 h before the colonoscopy, an intervention was performed with more neutral content (properties of fruits and vegetables), which involved providing a pamphlet to patients. No other intervention was conducted in the control group.

Statistical analysis

Finally, differences in the parameters of the two groups receiving the colonoscopy were studied and analyzed using SPSS.

Results

The mean age of participants was 46.33±12.2 years in the intervention group and 44.8±12.26 in the control group. There were 41 males (51.3%) and 39 females (48.7%); 15 patients (18.7%) were single and the rest married. In terms of education, 22 patients (27.5%) had a diploma degree or less; 40 (50%) had an associate’s degree; 6 (7.5%) were bachelor graduates; and 12 (15%) had a master degree or above. In addition, 46 patients (57.5%) were employed and the rest unemployed; and 61 patients (76.3%) did not smoke cigarettes. Based on the results of chi-square and independent *t*-tests there were no significant differences for any of these variables between the two groups (*p* > 0.05) (Table 1).

The mean score of state anxiety before the intervention in the intervention and control groups was 49.3 and 46.6, respectively, and there was no statistically significant difference between the groups (*p* = 0.189). After the intervention, state anxiety in the intervention and control groups was 32.93 and 46.45, respectively. The decrease in anxiety levels was statistically significant in the intervention

group, but did not show a perceptible reduction in the control group. Additionally, before the intervention, there was no significant difference in trait anxiety between the intervention and control groups. After the intervention, trait anxiety in the control group decreased from 47.3 to 37.3, and in the intervention group, it went from 44.08 to 45.03. Therefore, unlike in the control group, the reduction of trait anxiety in the intervention group was statistically significant (Table 2).

In this study, the level of pain after colonoscopy in the control and intervention groups was also evaluated. The results showed that the difference in average pain level between the control and intervention groups after colonoscopy was not statistically significant. This suggests that the psychological intervention was not effective in reducing colonoscopy pain (*p* = 0.229).

Discussion

Gastrointestinal endoscopy and colonoscopy are main diagnostic tools for the evaluation and examination of the gastrointestinal tract (Brunner et al., 2010). These diagnostic methods, which are frequently used in clinical investigations, have obvious diagnostic benefits and many therapeutic applications. However, these procedures are stressful for most patients. Anxiety may be due to a lack of information about the procedures, and to fear of pain and discomfort associated with them (Monaban et al., 2007). Endoscopy and colonoscopy may actually generate anxiety that ultimately leads to patients’ avoidance of the procedure and a reduction in their satisfaction (Lewis et al., 2004).

Some demographic variables such as age, gender, education level, and economic status have been shown to be associated to the level of anxiety experienced by patients in relation to colonoscopy (Previti et al., 2016). Thus, in this study, participants were randomly assigned to two groups. As shown in Table 1, patient demographic variables, including,

Table 1 Patients’ characteristics

Variables	Control	Intervention	<i>p</i> value
Age (mean±SD)	44.8±12.26	46.33±12.2	0.674
Gender	Male	23(57.5%)	0.371
	Female	17(42.5%)	
Marital status	Single	9(22.5%)	0.568
	Married	31(77.5)	
Education	Illiterate	0	0.407
	Diploma and under	11(27.5%)	
	Associate	17(42.5%)	
	Bachelor	4(10%)	
	Master and above	8(20%)	
Job	Employed	23(57.5%)	0.589
	Unemployed	17(42.5%)	
Smoking	Yes	10(25%)	0.674
	No	30(75.%)	

Table 2 Comparison of anxiety levels between groups

Variable		Intervention	Control	<i>p</i> value
Clear Anxiety	Before	49.3±11.08	46.6±9.98	0.189
	After	32.93±11.143	46.45±8.99	< 0.0001
	<i>p</i> value	< 0.0001	0.818	
Hidden Anxiety	Before	47.3±11.03	44.08±10.15	0.178
	After	37.3±10.7	45.03±10.07	0.001
	<i>p</i> value	< 0.0001	0.249	

age, sex, education level, marital status, and smoking did not show significant differences between the two groups.

The findings show that the level of state and trait anxiety in patients who had undergone psychological intervention significantly reduced. Several psychological techniques focus on relieving anxiety caused by invasive medical procedures. Cognitive-behavioral preparation through pictorial models, respiratory exercises and... have been shown to be very effective in reducing anxiety in candidates for surgery (He et al., 2013).

The results of the present study are consistent with other studies. Eman et al., in a study on 70 children who were candidates for endoscopy, indicated that mental preparation caused a significant decrease in anxiety (Eman et al., 2016). Similarly, in a study with children and their parents, Riddhiputra et al. assessed the effect of psychological preparation using pictorial signs before gastrointestinal endoscopy on anxiety reduction. The results of this study indicated that this method caused a significant reduction in the level of parental anxiety (Riddhiputra and Ukarapol, 2006). In addition, Tanaka et al. also reported that the level of salivary chromogranin, a marker for the mental response to stress, significantly decreased in children who received psychological preparation before colonoscopy using a training book and were allowed to play with medical devices (Tanaka et al., 2011). Contrary to the above studies, the results of a study conducted by Van vilet et al. showed that providing information to patients before endoscopy based on their ability to catch up with the stress had no effect on reducing their anxiety, and those who had received information did not seem to experience any advantages compared to the other patients (van Vliet et al., 2004).

Conclusion

Since the psychological intervention used in this study reduced the anxiety of patients waiting to have a colonoscopy, nurses and doctors are recommended to use these low-cost and affordable methods to reduce anxiety if patients wish. The present study suggests the usefulness of educating patients in reducing their level of anxiety before performing colonoscopy. This low-cost intervention that can be implemented in a short period of time and, at the same time, can be extremely valuable for patients.

The psychological intervention used in this study can be implemented by nurses and doctors to control patients' anxiety along with other anxiety-lowering therapy methods. In addition to reducing anxiety in patients before invasive diagnostic procedures, it can also help to reduce the costs imposed on patients and health systems. Among the limitations of this study, the relatively small sample needs to be noted, which can affect the generalization of the study results to all patients who are candidates for colonoscopy. Therefore, it is recommended that further research be conducted using a larger sample.

Acknowledgments

We wish to thank all our colleagues in Golestan Hospital, Ahvaz, Iran.

Compliance with ethics guidelines

The authors declare that they have no conflict of interest. All procedures have been approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Informed consent was assessed prior to the intervention. Details that disclose the identity of the subjects under study have been omitted.

References

- Brunner L S, Smeltzer S C C, Bare B G, Hinkle J L, Cheever K H (2010). *Brunner & Suddarths textbook of medical-surgical nursing*: Philadelphia: Lippincott Williams & Wilkins
- Dumas R G (1963). Psychological preparation for surgery. *Am J Nurs*, 63(8): 52–55
- Elkins G, White J, Patel P, Marcus J, Perfect M M, Montgomery G H (2006). Hypnosis to manage anxiety and pain associated with colonoscopy for colorectal cancer screening: Case studies and possible benefits. *Int J Clin Exp Hypn*, 54(4): 416–431
- Eman S A, Youssria E Y, Nagla H Abu Faddan, Nagla A M (2016). Effect of preparation program on anxiety level of children undergoing endoscopy. *J Nurs Health Sci*, 5(4): 43–49
- Grilo B I, Herrera M P, Aguado Á M (2016). Prospective study of anxiety in patients undergoing an outpatient colonoscopy. *Revista espanola de enfermedades digestivas: organo oficial de la Sociedad Espanola de Patologia Digestiva*. Oct 27;10
- Hartley S, Barrowclough C, Haddock G (2013). Anxiety and depression in psychosis: a systematic review of associations with positive psychotic symptoms. *Acta Psychiatr Scand*, 128(5): 327–346
- He H G, Zhu L, Li H C, Wang W, Vehviläinen-Julkunen K, Chan S W (2013). A randomized controlled trial of the effectiveness of a therapeutic play intervention on outcomes of children undergoing inpatient elective surgery: study protocol. *J Adv Nurs*, 70(2): 431–442
- Hsueh F C, Chen C M, Sun C A, Chou Y C, Hsiao S M, Yang T (2016). A study on the effects of a health education intervention on anxiety and pain during colonoscopy procedures. *J Nurs Res*, 24(2): 181–189

- Inra J A, Naylor J, Rosenblatt M, Mutinga M, Reddy S I, Syngal S, Kastrinos F (2016). Comparison of colonoscopy quality measures across various practice settings and the impact of performance scorecards. *Dig Dis Sci*, 62(4): 1–9
- Ketwaroo G A, Sawhney M S (2015). Quality measures and quality improvements in colonoscopy. *Curr Opin Gastroenterol*, 31 (1): 56–61
- Ko C H, Chen Y Y, Wu K T, Wang S C, Yang J F, Lin Y Y, Lin C I, Kuo H J, Dai C Y, Hsieh M H (2016). Effect of music on level of anxiety in patients undergoing colonoscopy without sedation. *J Chin Med Assoc*
- Lewis S M, Heitkemper M, Dirksen S R, (2004). *Medical-Surgical Nursing*. 6th ed. Philadelphia: Elsevier Mosby
- Mahajan L, Wyllie R, Steffen R, Kay M, Kitaoka G, Dettorre J, Sarigol S, McCue K (1998). The effects of a psychological preparation program on anxiety in children and adolescents undergoing gastrointestinal endoscopy. *J Pediatr Gastroenterol Nutr*, 27(2): 161–165
- McLachlan S A, Clements A, Austoker J (2012). Patients' experiences and reported barriers to colonoscopy in the screening context—a systematic review of the literature. *Patient Educ Couns*, 86(2): 137–146
- Monaban F D, Sands G K, NeighBors M, Merek G F (2007). *Phipps Medical- Surgical Nursing*. 8th ed. Philadelphia: Elsevier Mosby
- Mott A M (1999). Psychologic preparation to decrease anxiety associated with cardiac catheterization. *J Vasc Nurs*, 17(2): 41–49
- Previti G, Bianchini O, Dipasquale S, Virzi A, Petralia A, Aguglia E, Signorelli M S (2016). Anxiety in patients undergoing endoscopic procedures: identifying people at risk. *Ann Depress Anxiety*, 3(1): 1072
- Riddhiputra P, Ukarapol N (2006). Effect of systematic psychological preparation using visual illustration prior to gastrointestinal endoscopy on the anxiety of both pediatric patients and parents. *J Med Assoc Thai*, 89(2): 231–235
- Sargin M, Uluer M S, Aydogan E, Hanedan B, Tepe M İ, Eryilmaz M A, Ebem E, Özmen S (2016). Anxiety levels in patients undergoing sedation for elective upper gastrointestinal endoscopy and colonoscopy. *Med Arch*, 70(2): 112–115
- Schoessler M (1985). Psychological preparation of patients for surgical procedures. *Dimens Crit Care Nurs*, 4(3): 191
- Tanaka K, Oikawa N, Terao R, Negishi Y, Fujii T, Kudo T, Shimizu T (2011). Evaluations of psychological preparation for children undergoing endoscopy. *J Pediatr Gastroenterol Nutr*, 52(2): 227–229
- van Vliet M J, Grypdonck M, van Zuuren F J, Winnubst J, Kruitwagen C (2004). Preparing patients for gastrointestinal endoscopy: the influence of information in medical situations. *Patient Educ Couns*, 52(1): 23–30
- Xiaolian J, Xiaolin L, Lan Z H (2015). Effects of visual and audiovisual distraction on pain and anxiety among patients undergoing colonoscopy. *Gastroenterol Nurs*, 38(1): 55–61