



# The effect of video education on anxiety and vital signs in patients undergoing colonoscopy


*El efecto de la educación en video sobre la ansiedad y los signos vitales en pacientes sometidos a colonoscopia*

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## Abstract

**Introduction & Background.** Colonoscopy is one of the most important diagnostic methods for gastrointestinal disorders that due to its invasiveness, can cause fear and anxiety in patients. This increase in anxiety may be associated with decreased patient tolerance, changes in vital signs, and physiological complications. The aim of this study was to investigate the effect of video training on patients' anxiety as well as their vital signs in the colonoscopy procedure.

**Methods.** This study was a one-group study before and after that was performed on a colonoscopy candidate referred to the colonoscopy unit of Sabzevar Vasei Hospital in 1399. the demographic information questionnaire and the Spielberger anxiety questionnaire were completed one day before the colonoscopy, and were recorded the patients' blood pressure, heart rate and respiration. then was shown to patients a ten-minute instructional video on laptop colonoscopy in a quiet environ-

## Resumen

ment. The patients' anxiety and vital signs were measured and recorded again on the day of the colonoscopy and immediately before the procedure, all steps of data registration and analysis were performed in SPSS software version 25. Results. The mean anxiety score of the study participants was 52.1 11 11.30 before the video training, which it was decreased to 45.6 10 10.8 ( $p < 0.05$ ) after the training (on the day of the colonoscopy procedure). also, blood pressure and pulse rate was decreased significantly after the intervention ( $p < 0.05$ ), but there was no significant difference in the number of breaths before and after the intervention ( $p > 0.05$ ). Conclusion. as for the effectiveness of video training on reducing anxiety and vital signs in patients undergoing colonoscopy, it is recommended that be included video training as a non-pharmacological method in the care program of these patients.

**Keywords:** Anxiety, Education, Colonoscopy, Vital Signs.

## Resumen

**Introducción y antecedentes.** La colonoscopia es uno de los métodos de diagnóstico más importantes para los trastornos gastrointestinales que, por su invasividad, pueden causar miedo y ansiedad en los pacientes. Este aumento de la ansiedad puede estar asociado con una disminución de la tolerancia del paciente, cambios en los signos vitales y complicaciones fisiológicas. El objetivo de este estudio fue investigar el efecto del entrenamiento por video sobre la ansiedad de los pacientes, así como sus signos vitales en el procedimiento de colonoscopia. Méto-

dos. Este estudio fue un estudio de un grupo antes y después de que se realizó en un candidato a colonoscopia remitido a la unidad de colonoscopia del Hospital Sabzevar Vasei en 1399. El cuestionario de información demográfica y el cuestionario de ansiedad de Spielberger se completaron un día antes de la colonoscopia, y se registraron la presión arterial, la frecuencia cardíaca y la respiración de los pacientes. luego se mostró a los pacientes un video instructivo de diez minutos sobre la colonoscopia portátil en un ambiente tranquilo. La ansiedad y los

signos vitales de los pacientes se midieron y registraron nuevamente el día de la colonoscopia e inmediatamente antes del procedimiento, todos los pasos de registro y análisis de datos se realizaron en el software SPSS versión 25. Resultados. La puntuación media de ansiedad de los participantes del estudio fue 52,1 11 11,30 antes del entrenamiento con video, que se redujo a 45,6 10 10,8 ( $p < 0,05$ ) después del entrenamiento (el día del procedimiento de colonoscopia). además, la presión arterial y la frecuencia del pulso disminuyeron significativamente después de la intervención ( $p < 0,05$ ), pero no hubo diferencia significativa en el número de respiraciones antes y después de la intervención ( $p > 0,05$ ). Conclusión. en cuanto a la efectividad del video entrenamiento para reducir la ansiedad y los signos vitales en pacientes sometidos a colonoscopia, se recomienda que se incluya el video entrenamiento como método no farmacológico en el programa de atención de estos pacientes.

**Palabras clave:** Ansiedad, Educación, Colonoscopia, Signos Vitales.

## Introduction

Colonoscopy is a type of endoscopic procedure in the lower gastrointestinal tract that is used specifically to examine the colon, diagnose and follow colon diseases and disorders<sup>1</sup>. In addition, colonoscopy is the best and most standard method for screening colorectal cancer. It is defined; the Insert a flexible tube called a colonoscope in the anal area and moving it forward, so that be visible the entire length of the large intestine and the end of the small intestine. according to the results of studies, people who have experienced colonoscopy, have complained of problems such as anxiety, severe pain, discomfort and long waiting time for the procedure<sup>2</sup>. This diagnostic method, due to its invasive nature, can cause fear and anxiety in patients, which may lead to a person refusing to do it. In addition, it can lead to adverse effects on the process of performing the technique, acceptance and adherence to the protocol in screening<sup>3</sup>.

Various studies on the anxiety of patients undergoing colonoscopy; Yang et al. (2018) reported that more than 50% of patients waiting for colonoscopy have moderate to severe anxiety<sup>4</sup>. a study conducted, by Maghaminejad et al In Iran, (2016) entitled "Predictors of anxiety in patients before endoscopy", on 400 patients undergoing endoscopy, the results showed that 82.7% of patients had moderate to severe anxiety<sup>5</sup>. Anxiety when performing invasive procedures can cause the procedure to be incomplete, Increased need to use sedatives, anti-anxiety, analgesics drugs (And the side effects that follow them), Low patient satisfaction and negative physiological manifestations such as high blood pressure and heart rate<sup>6</sup>.

One way to assess anxiety or relaxation is to pay attention to the patient's vital signs (temperature, pulse, blood pressure, and respiratory rate)<sup>7</sup>. There are various influential factors such as illness, anxiety, and anxious environments which can affect vital signs. In such a way that these changes may cause irreparable damage to individuals<sup>8</sup>. Much research has been done to prevent the causes that change anxiety and vital signs in invasive procedures, Including the use of sedatives to reduce anxiety

and relieve pain in patients, however, prescribing these drugs increases patient tolerance to 80%, satisfaction to 90%, and decrease anxiety to 50%<sup>9</sup>. But, their use causes side effects such as lightheadedness, imbalance, drowsiness, hypotension, nausea, vomiting, sometimes allergic reactions, and most importantly, life-threatening side effects<sup>10</sup>.

It can be justified the use of non-pharmacological methods in nursing care, regarding the cost of pharmaceutical methods, their negative effects on various body systems, also in order to maintain the patient's ability to live with chronic disease<sup>11</sup>. Anxiety can be relieved by nursing care, including giving information and explanations about how to work with different models and educational tools, including oral and written training, as well as calming the environment or playing music and displaying natural images<sup>12</sup>. Although some believe that giving information improves patients' cooperation and reduces their anxiety, however, in some studies, the results have shown that giving information has caused concern and refusal of a number of clients to perform clinical procedures, including colonoscopy<sup>13</sup>.

Different studies have shown different results regarding the method of providing information, content and also the time interval between the procedure, the traditional method of providing information is oral education for patients, which focuses more on the method of doing work and its side effects, which often ignore the management of patients' feelings and expectations<sup>14</sup>. On the other hand, this information is sometimes provided before the procedure, which is very stressful and they are not able to control their emotions. Therefore, providing oral information at the wrong time when the patient has a high level of anxiety, is not effective or may even increase the level of anxiety<sup>15</sup>.

Another way is to provide written information (including pamphlets, brochures and books). Because in this method, the educational content is usually provided to the patient the day before, the patient can read many times and understand the content, but if the principles of patient education and simplicity are not followed, patients may not read or be able to understand the contents<sup>16</sup>. Another way to provide information is video training, which can be used to convey basic concepts to educate patients in a short time, this method is more useful than instant training because it has predefined content<sup>17</sup>. Video enhances and improves interpersonal skills and therefore improves the relationship between nurse and patient. Another advantage of video is the use of different colors, movements and scenes, which together with audio and video make learning more inclusive. Due to the ubiquity of smartphones, people can easily access video files and it is also more suitable for people who are not able to read educational booklets. Also, this method is cheaper and more cost-effective than other methods<sup>18</sup>.

Due to the high prevalence of anxiety as one of the major problems of patients undergoing colonoscopy and the importance of controlling it, complications of drug treatments and related costs, the importance of the role of the nurse in controlling anxiety and vital signs of patients and also due to the existence of different results in different studies on the effect of video training on anxiety and vital signs of patients before diagnostic procedures, this

study aimed to determine the effect of video training on anxiety and vital signs in patients undergoing colonoscopy.

## Materials and methods

### type of study

This study is an analytical descriptive study that was performed with the aim of assessing the severity of anxiety and vital signs including blood pressure, pulse and respiration rate before and after video training on colonoscopy. The study population included patients who had been referred to the colonoscopy unit of Sabzevar Vasei Hospital for colonoscopy.

### Inclusion criteria

- Willingness to participate in the research
- being 18 to 70 years old
- living in Sabzevar
- needing a colonoscopy according to the diagnosis of a specialist.

### Exclusion criteria

#### Exclusion criteria before entering the study

- Having a history of previous colonoscopy
- obtaining information and watching educational videos about how to perform the colonoscopy procedure by the patient himself in the days before the procedure
- urgency of the patient's condition for colonoscopy
- psychological problems or known anxiety disorders (according to the patient's medical record)
- Taking sedatives and calming the day before colonoscopy
- Narcotic addiction or strong painkillers
- Visual or auditory disorders
- severe pain due to the nature of the disease (such as cancer)
- high blood pressure, or a history of taking antihypertensive drugs.

#### Exclusion criteria during the study

- The occurrence of a crisis or unforeseen event that affects the patient's anxiety
- The patient's unwillingness to continue cooperating and canceling the colonoscopy.

### Data collection tools

#### Demographic information questionnaire

Standard Spielberger Manifest Anxiety questionnaire: It was

used to measure anxiety, including 20 questions with a four-part Likert scale; very few, few, many and very many options, which were completed through interviews with patients. Scores from the questionnaire are 20 to 80, with a score of 20-31 as mild anxiety, 32-42 as moderate-to-low anxiety, 43-53 as moderate anxiety, 54-64 as severe anxiety, and above 64 is considered as extreme and life-threatening anxiety.

A form for recording patients' vital signs: including blood pressure, pulse, and respiratory rate, which were measured and recorded by the researcher the day before and immediately before colonoscopy.

Validity of Spiel Anxiety Questionnaire: Its validity has been studied in various studies, in different countries and on a wide range of patients and healthy individuals. In a study conducted by Torkian in 2016 to standardize the Spielberger test in Iran, the reliability coefficient of the test based on Cronbach's alpha was reported to be 0.91. The reliability of the test was calculated through the ratio of variance of real scores to the observed variance and its value was recorded as 0.94<sup>20</sup>.

In order to use this index in the present study, the reliability was measured using two methods of internal consistency and test-retest method. The reliability of this index was calculated 86% using internal consistency method (Cronbach's alpha) and 79% using the test method – Retest. To determine the validity of researcher-made tools, content validity was used, the relevant form was prepared after studying the sources and books related to the research topic and then using the scientific opinions of ten esteemed faculty members of the School of Nursing and Midwifery of Sabzevar University of Medical Sciences, necessary corrections were made. The ANA UA-1020 sphygmomanometer made in Japan was used to measure blood pressure and the Chois Mod C29 pulse oximeter made in China was used to measure heart rate.

After selecting the research units by the available method and applying the inclusion and exclusion criteria, the day before the colonoscopy, first the demographic information questionnaire and the Spielberger anxiety questionnaire for patients were completed and blood pressure, heart rate and respiration rate were recorded. In addition to the routine care, a ten-minute instructional video in simple and understandable language contains how to perform the procedure, preparations before the colonoscopy, showing the colonoscopy environment, possible complications during, after the procedure, and the benefits of performing the procedure with the laptop was presented to patients in a quiet environment. On the day of the colonoscopy, the Spielberger Anxiety Inventory was completed again before the procedure, and blood pressure, heart rate and respiratory rate were recorded also. During the study period, 120 patients with gastrointestinal disorders underwent colonoscopy, of patients 93 met the study criteria. According to the sample size required for the study, 72 people entered the study with informed consent. The sample size was calculated based on the mixed variance of 99.13265, the standard deviation of 9.96 u the effect size of 0.67, the 95% confidence level and the power of 80%, of the total number of 72 people without calculating the drop, which was calculated based on G\* Power.

Regarding statistical tests

Data were analyzed using SPSS software version 25. First, data tables were presented to report data descriptions in which the mean and standard deviation of research variables were presented. Then, inferential statistics were used to analyze the research hypotheses, which included paired t-test with a significance level (PV) of less than 0.05.

## Results

In this study, anxiety and vital signs of 72 patients underwent colonoscopy. Subjects included 37 females (51.4%) and 35 males (48.6%). The mean age of the subjects was 49.7 ± 5.6. Most of them were married (77.8%) and housewives (29.2%). The majority of subjects (38.9%) had a history of hospitalization at least once. Most of subjects had a diploma (30.6%) (Table 1).

**Table 1. Demographic characteristics of the subjects**

Index variable	Standard deviation	Frequency	percent
Age	49.7± 5.6	-	-
Gender	Female	37	51.39
	Man	35	48.61
Marital status	Married	56	77.78
	Single	4	5.56
	Deceased wife	9	12.5
	divorced	3	4.17
Job status	manual worker	19	26.39
	Employee	12	16.67
	Free	15	20.83
	housewife	21	29.17
	Retired	4	5.56
	Unemployed	1	1.39
Level of Education	Literacy for reading and writing	7	9.72
	Primary	6	8.33
	Cycle	13	18.06
	Diploma	22	30.56
	Associate Degree	10	13.89
	Bachelor	13	18.06
Hospital history	Masters degree and higher	1	1.39
	No hospitalization history	2	2.78
	once	30	41.67
	Twice	27	37.5
	three times	11	15.28
Four times and more	2	2.78	

The mean score of patients' overt anxiety before video training was 52.1 ± 11.30 which decreased to 45.6 ± 10.8 after the intervention. The results indicate that this decrease in anxiety score is significant (p < 0.05). In the study of the effect of video training on the vital signs of patients also, the results showed that the mean scores of systolic and diastolic blood pressure decreased significantly (p < 0.05). The mean scores of systolic and diastolic blood pressure before the intervention were 122.2 ±

7.3 and 78.6 ± 3.7 respectively, which decreased after the intervention to 119.3 ± 5.4 and 77.2 ± 3.54 respectively. Also, the heart rate before the intervention was 83.3 ± 10.8, which after video training was significantly reduced to 80.6 ± 10.2 beats per minute (P < 0.05). In the number of breaths, there was no significant decrease (P > 0.05) (mean number of breaths before the intervention was 15.1 ± 1.9, after the intervention was 14.8 ± 1.6 breaths per minute) (Table 2).

**Table 2. Comparison of mean anxiety scores and vital signs, before and after intervention**

index variable	Standard deviation ± mean		Significance level
	Before the intervention	After the intervention	
Anxiety	52.1 ± 11.30	45.6 ± 10.8	0.00
Systolic blood pressure	122.2 ± 7.3	119.3 ± 5.4	0.00
Diastolic blood pressure	78.6 ± 3.7	77.2 ± 3.54	0.00
Heart rate	83.3 ± 10.8	80.6 ± 10.2	0.00
Breathing rate	15.1 ± 1.9	14.8 ± 1.6	0.06

## Discussion

This study investigated the effect of video training on anxiety and vital signs as related to colonoscopy. The mean anxiety score before colonoscopy and video training was 52.1 ± 11.30, which indicated that he wanted to have moderate to high anxiety. This finding is consistent with the results of a study by Yang<sup>4</sup> and Maghaminejad<sup>5</sup> that reported high levels of stress and anxiety before colonoscopy. Although there may be anxiety due to the diagnosis of the disease, the lack of knowledge about the colonoscopy method causes much anxiety for patients. Because anxiety affects physical and psychological responses to diagnostic procedures, colonoscopy units should employ strategies to minimize this anxiety. The present study results showed that video training could significantly reduce the mean score of anxiety, blood pressure, and heart rate, but could not significantly reduce the number of breaths.

Due to the importance of anxiety and its control in invasive procedures, various studies have been performed with different interventions to reduce anxiety in these patients. In general, these studies are either based on face-to-face and verbal training or are based on interventions with the help of written and audio-visual aids such as pamphlets, multimedia software, or a combination of the two.

The present study results are consistent with the studies of Orujlu et al.<sup>21</sup>, which showed that performing nursing educational interventions such as providing information before endoscopy significantly reduces patients' anxiety, pulse rate, and systolic blood pressure. But it has no significant effect on diastolic blood pressure and moderate arterial pressure. Nikbakht Nasrabadi et

al.<sup>22</sup> also showed that counseling before upper gastrointestinal endoscopy leads to a significant reduction in anxiety immediately before endoscopy in the intervention group compared to the control group. In the study of Jabbar and Wright<sup>23</sup> entitled "The effect of video information on anxiety and pre-colonoscopy knowledge", the results showed that providing information to the patient via video increases awareness and reduces anxiety in patients. Some studies have also compared these methods and stated the advantages and disadvantages for each. For example, Arabul et al.<sup>24</sup> compared the effect of lecture and video training on reducing anxiety in patients undergoing colonoscopy, It has been stated that although both methods reduce the level of anxiety in patients, But providing information with video predicts lower anxiety and the success of the procedure.

Poursharifi et al. (2013) also compared the effect of oral, written and combined education that in all three groups there was a statistically significant decrease in patients' anxiety. But, in the oral training group, where the information was generated and transmitted to the patient, she was more affected by anxiety, although this difference was not significant<sup>25</sup>. The results of a study by Bitzer et al. (2007) in Denmark showed that displaying information about colonoscopy through video in preparation for colonoscopy did not have a significant effect on patients' tolerance during colonoscopy and patients' anxiety before the procedure. In addition, film screening had no effect on increasing satisfaction and reducing anxiety in colonoscopy patients<sup>26</sup>. These results are not consistent with the findings of the present study. It is an important point in the study of Bitzer et al. presentation of information in the form of a video in the morning of the procedure, which did not provide a good opportunity for patients to receive and understand information, review and create possible questions and try to find answers. Also, the results of a study by Pearson et al. (2005) conducted in Australia with the aim of interacting with preoperative information and patient selection in compatibility with colonoscopy, showed that video information has no effect on the patient waiting for colonoscopy<sup>27</sup>. However, in this study, information was provided to patients about 3 to 4 weeks before colonoscopy, It may have led to forgetting educational content in clients in this long interval. Wang et al. (2002) also noted a weak relationship between anxiety reduction and vital signs in their study. The results of their study showed that despite the reduction of anxiety due to music, none of the parameters of heart, systolic and diastolic blood pressure, cortisol, epinephrine and norepinephrine levels in the samples were not significantly different before and after from Intervention<sup>28</sup>.

According to the results of the mentioned studies and the present study, it is important to pay attention to the nature of the intervention. For example, face-to-face communication is one of the main reasons for reducing patient anxiety, and if is not given this information to the patient in a structured way, it may be a incomplete method which may even lead to scattering, incomplete information and anxiety becomes ill<sup>15</sup>. Education and counseling is an important component of nursing services, and since nurses are more in touch with patients than physicians, therefore have more time to counsel and provide information to the patient. Performing these procedures by the nurse can

cause Improvement trust between patient and nurse and promote the position of nurse in the health care system. On the other hand, performing these low-cost and high-risk measures by nurses is of particular importance in order to pave the way for gaining professional independence<sup>21</sup>. According to the results of the present study, despite receiving sedation, performing diagnostic procedures such as colonoscopy, patients still experience anxiety before performing this procedure, so it is necessary to make appropriate decisions and use non-invasive relaxation methods and non-pharmacological such as video training to reduce their anxiety.

## Conclusion

Lack of knowledge about performing invasive procedures such as colonoscopy, pre- and post-care and its complications is one of the main reasons for anxiety in patients that can affect the proper performance of this procedure and its after results. Therefore, it is necessary to take measures to increase patient awareness before colonoscopy. According to the results of the present study, video training method can be used as one of the non-drug and low-cost methods to reduce patients' anxiety before performing invasive procedures. In addition, it seems to be a good time, one day away from the procedure to provide information to patients via video. Given that this study was performed during the Covid-19 epidemic and had limitations such as fear and anxiety for patients that could affect the results of the study, it is suggested that similar studies be performed in a non-epidemic situation. Future studies can be in the form of clinical trials and review of results after the implementation of training courses for patients, also, training in different ways can be compared in patients undergoing colonoscopy.

## Limitations

Was the concurrence of the study with the Covid-19 disease pandemic, which resulted in fewer patients referring to the colonoscopy unit and Less access to samples than normal.

Patients' dissatisfaction to participate in research or lack of necessary cooperation in this field patient's personal characteristics such as unwillingness to express emotions such as anxiety lack of physical space to provide video education individual and cultural differences of patients

Also, due to the fact that patients' anxiety was assessed through a questionnaire, patients' mental state at that time may affect their anxieties.

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