

# Effectiveness of Preoperative Visitation on Postanesthesia Complications

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**Purpose:** *The purpose of this study was to evaluate the effect of preoperative visitation on postanesthesia complications after hernia surgery.*

**Design:** *In this quasi-experimental study, 70 patients receiving elective hernia surgery were purposefully selected.*

**Methods:** *In the evening preceding surgery, the surgical technologist visited the patient in the surgical ward. Data were collected by checklist of vital signs and postanesthesia complications.*

**Findings:** *A greater increase is observed in the systolic blood pressure of the experimental group at the moment of entering the postanesthesia care unit. A significant difference was found between groups in the intensity of postanesthesia agitation in the postanesthesia care unit patients, with a higher incidence among the experimental group.*

**Conclusions:** *According to the findings, preoperative education programs for operating room staff and other behavioral and mental interventions to manage surgery and its consequences in elective surgical patients is recommended.*

**Keywords:** *hernia, operating room staff, postanesthesia complications, preoperative visit.*

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**SURGERY IS A COMMON TREATMENT** method in many hospitals.<sup>1,2</sup> Physiological responses to stress and surgical trauma include the secretion of cortisol, catecholamines, cytokines, antidiuretic hormone, and glucagon. Some metabolic and physiological responses to surgery cause an imbalance in essential physiological functions. At the same time, delayed effects of anesthetics and muscle relaxants weaken natural ability of the body in re-establishing the patient homeostatic status and maintaining the patient health, resulting in postanesthesia and postoperative complications in the postanesthesia care unit (PACU).<sup>3,4</sup>

Familiarization of patients with the surgical procedure not only improves their awareness and knowledge, but also is helpful in reducing psychological stress from surgery.<sup>5</sup> Today, familiarization with the procedure and education are a fundamental health care program in medical and health care systems. In addition, education of patients is

considered to be the best method to respond to patient needs.<sup>6</sup> Patients are given the chance to express their concerns and fear of surgery through preoperative education and an interpersonal relationship with a focus on patients' needs. This measure results in the stimulation of the anxiety-reduction mechanism and the creation of the sense-of-control in patients.<sup>7</sup>

According to different studies, a considerable percentage of the patients who are hospitalized in PACUs, develop postanesthesia complications.<sup>8,9</sup> Tarrac<sup>9</sup> reported that one-third of patients in PACU developed complications and required therapeutic intervention. In a study on 18,473 patients entering the PACU, Hines et al<sup>8</sup> demonstrated a PACU complication rate of 23.7%, with an overall intraoperative complication rate of 5.1%. Nausea and vomiting (9.8%), the need for upper airway support (6.9%), and hypotension requiring treatment (2.7%) were the most frequently encountered PACU complications.

Regardless of the type of postanesthesia complication, structural evaluation of patients before, during, and after general anesthesia is considered an important and fundamental solution for early diagnosis and treatment of anesthesia-caused problems and complications. Rosiek et al<sup>10</sup> found that some patients reported a poor relationship with medical personnel and felt that some nurses dismissed their concerns and did not treat them as patients who were going to have surgery. According to the study of Vermisli et al,<sup>11</sup> 74.5% of elective surgical patients say that they received inadequate preoperative information, and 87.8% of them asked for preoperative information in relation to their surgical procedure. Therefore, it is concluded that the lack of information in the field of surgery and anesthesia can be important in postanesthesia complications occurrence or worsening.

Disconcerting results and effects were produced despite using different medicines to reduce the complications of surgery.<sup>12,13</sup> At present, there is a growing interest in nonpharmacological interventions, with the intent to reduce unwanted complications of surgery.<sup>14</sup> In this regard, many techniques such as providing psychological counseling sessions and educational videos,<sup>15,16</sup> visiting those who had surgery before,<sup>17,18</sup> managing preoperative music

therapy-based interventions,<sup>19,20</sup> and familiarizing patients with the staff and equipment of operating room<sup>10</sup> (OR) have been examined. However, in some cases, aforementioned methods are very aggressive and costly, and need a host of equipment for use.<sup>21</sup>

## Aim of Study

This study has been conducted to evaluate the effect of visitation by OR staff on postanesthesia complications in the elective surgical patients.

## Methods

### *Sample and Setting*

This quasi-experimental study was conducted to evaluate the effect of visitation by operating room staff on postanesthesia complications after hernia surgery in Imam Hossein Hospital of Shahroud city. In this study, 70 patients receiving elective hernia surgery were selected purposefully on the basis of previous studies.<sup>11</sup> Inclusion criteria were: hospitalization for elective ventral hernia repair (inguinal [direct and indirect], femoral and umbilical hernia), age group of 15 to 65 years, and able to speak in Persian. We excluded patients with previous history of surgery in the OR, psychiatric disorders that were diagnosed by a physician, dependence on antidepressants and analgesics, and being a member of a medical or paramedical team.

### *Data Collection and Measures*

In the present study, data collection instruments included a demographic questionnaire (eg, information about age, gender, job, educational level) and the postanesthesia complications checklist (for assessing the presence or absence of postanesthesia complications such as nausea, vomiting, shivering, and agitation, as well as vital signs such as systolic and diastolic blood pressure, heart rate, and respiratory rate).

In the evening preceding surgery, the surgical technologist visited the patients in the surgical ward and obtained written informed consents after introducing himself and explaining the research objective. Then, patients were randomized into the experimental and control groups

based on the patients' arrival to the study. The first patient was assigned to the experimental group and next patient to the control group and so on.

Afterward, brief information about the surgeon, type of surgery, place of surgery, time of surgery, duration of surgery, OR setting, and duration of PACU stay were provided to the patients in the experimental group by using a simple and understandable language to ensure them that the researcher (surgical technologist) would be present in the OR on the day of surgery. Through this interaction, patient had the opportunity to ask questions about the surgery from surgical technologist and receive answers from him. After transferring the patient to the OR, the surgical technologist visited the patient and remained at the patient's bedside until the induction of anesthesia.

Patients in the control group were scheduled only for conventional preoperative nursing care. The vital signs of the patients in both groups were measured at the evening preceding surgery, when transferring to the OR, and after transferring the patient to the PACU. In addition to vital signs, the post-anesthesia complication checklist was completed for both groups.

It is worth mentioning that both groups received similar medical care (type and method of anesthesia, anesthetic depth, and type and method of endotracheal intubation) from the night preceding surgery to the morning on the day of surgery.

### ***Ethical Considerations***

This study was approved by the Research Committee of Shahrood University of Medical Sciences with the code of ethics: IR.SHMU.REC.1395.11. Written consent was obtained from all participants.

### ***Data Analysis***

Data were analyzed using descriptive-inferential statistics ( $\chi^2$  test, Kolmogorov-Smirnov test, and Greenhouse Geisser correction) by SPSS 19 (IBM, Armonk, NY).

### **Results**

To determine the normal distribution of research variables, the Kolmogorov-Smirnov test showed a

normal distribution ( $P > .05$ ). There were no significant differences in baseline demographic variables (age, gender, marital status, educational status, and occupation) between two groups before the intervention. The mean age of the sample was  $41.2 \pm 13.4$  years.

**Table 1** shows the mean and standard deviation of systolic and diastolic blood pressure, pulse rate and respiration rate at different times of study. The Greenhouse-Geisser test showed significant differences in terms of systolic blood pressure differences and pulse differences between the experimental and control groups, at different times: before intervention in the ward, after the intervention when the patient was transferred to the OR, and when the patient was transferred to the PACU. In this regard, the Greenhouse-Geisser test did not reveal significant differences in terms of diastolic blood pressure and respiratory.

The  $\chi^2$  test showed a significant difference ( $P < .05$ ) in terms of the intensity of postintervention agitation in the PACU between the experimental and control groups, with a higher incidence among the experimental group; whereas, a greater, but not significant, reduction was observed in the experimental groups in other post-anesthesia complications such as nausea, vomiting, and shivering (**Table 2**).

### **Discussion**

This study was intended to investigate the effect of preoperative visitation by OR staff on postanesthesia complications in patients receiving elective hernia surgery. No other studies of this population of patients was found, so comparisons shown are with different patient populations receiving various preoperative interventions to prevent postanesthesia complications.

The increases in systolic blood pressure and pulse rate over time found in this study may reflect preoperative anxiety. Blood pressure and pulse rate increase caused by preoperative anxiety can be an expected physiologic phenomenon. Preoperative anxiety stimulates the autonomic nervous system and endocrine,<sup>22</sup> negatively affects the patient's physiological parameters,<sup>10</sup> and increases heart rate, blood pressure, and cardiac irritability, resulting in arrhythmia.<sup>22</sup> Preoperative anxiety can also

Table 1. Mean and Standard Deviation of SBP, DBP, Pulse, and Respiration in Intervention and Control Groups

Variables	In Surgery Ward		Entering OR		Entering PACU		Greenhouse-Geisser Test
	Experimental	Control	Experimental	Control	Experimental	Control	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
SBP	120 ± 11	117 ± 10	121 ± 13	120 ± 11	134 ± 20	123 ± 15	$P = .003$ ; $df = 1,2$ ; $F = 8,2$
DBP	77 ± 8,8	76 ± 9	78 ± 9,3	78 ± 8	85 ± 13	80 ± 12	$P = .12$ ; $df = 1,3$ ; $F = 2,4$
Pulse	81 ± 10	76 ± 7	82 ± 9	79 ± 7	92 ± 11	82 ± 8	$P = .001$ ; $df = 1,3$ ; $F = 9,4$
Respiration	19 ± 2	19 ± 2	20 ± 2	21 ± 2	17 ± 3	18 ± 2	$P = .79$ ; $df = 1,5$ ; $F = 0,15$

DBP, diastolic blood pressure; SBP, systolic blood pressure; OR, operating room; PACU, postanesthesia care unit; SD, standard deviation.

lead to the emergence of postoperative disorders, greater incidence of postoperative complications, and longer hospital stay.<sup>10</sup> Among the common postoperative complications are cardiovascular problems, more commonly in the form of blood pressure and heart rate changes.<sup>5</sup> Babin-Ebell<sup>23</sup> also reported the prevalence of 30% for tachycardia. Higher incidence of hypertension in the present study may be due to the higher prevalence of postoperative shivering or agitation.

Results of this study showed that preoperative visitation by the OR staff did not have any impact on the expected elevation of systolic blood pressure and heart rate of the patients at different times. In line with the results of the present study, Bahrami et al<sup>21</sup> in a clinical trial investigated the effect of anxiety reduction training on preoperative physiological indices and cortisol levels of 60 patients. They concluded that despite training in anxiety reduction, physical signs such as systolic blood pressure and heart rate increased at the moment of entering the OR.

With respect to the effect of preoperative visitations on physiological indices of elective surgical patients, results of some studies on postanesthesia complications are inconsistent with the present study. Mirbagher Ajorpaz et al<sup>24</sup> investigated the effect of music therapy on anxiety and some physiological indices of patients before having a general surgery. They found that the levels of anxiety and average systolic blood pressure in the case group were significantly lower than the control group after music therapy based intervention; whereas, there was no significant difference between groups in terms of heart and respiratory rates. It seems that because factors such as age, gender, history of a previous surgery, type of the surgery, objective of the surgery, location of the surgery, culture, and other factors have important role in the effectiveness of preoperative interventions on physiological changes of patients, these disconcerting findings can be attributed to culture, type of surgery, and content of the intervention differences.

According to the results of this study, the between-groups difference in diastolic blood pressure increased with time; however, this difference was not significant. The respiratory rate was increased and decreased at the moments of

**Table 2. Frequency (%) of Postanesthesia Complications in Intervention and Control Groups**

Variables	Experimental				Control			
	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe
Nausea	74.3	25.7	0	0	68.6	20	8.6	2.9
Vomiting	97.1	0	0	2.9	94.3	5.7	0	0
Shivering	45.7	37.1	17.1	0	31.4	42.9	25.7	0
Agitation*	20	40	34.3	5.7	48.6	34.3	17.1	0

\* $P < .05$ ,  $\chi^2$  test.

entering the OR and PACU, respectively. In addition, this between-groups difference was not significant. In other words, results of this study showed that preoperative visitation by OR staff did not have any impact on the natural elevation of diastolic blood pressure and respiratory rate of the patients at different times.

In this regard, Bahrami et al<sup>21</sup> showed that despite education in anxiety reduction, the physiological indices of elective surgical patients (preoperative diastolic blood pressure, respiratory rate) increased before entering the OR as compared with when the patients were admitted. Some physiological indices like systolic blood pressure, diastolic blood pressure, and heart rate change during a stressful condition.<sup>25</sup> Preoperative anxiety may produce negative impacts on these physiological parameters pre- and perianesthesia, and prolong the recovery.<sup>26</sup>

In the present study, the short interval between the intervention and surgery (< 24 hours) may be one cause of ineffectiveness of the intervention in the improvement of vital signs (systolic and diastolic blood pressure, and respiratory and heart rates) in the intervention group. The results may be related to the small sample size and not representative of all patients. Perhaps the provision of preoperative education during the initial checks in clinics and before admission to the ward may have better results in controlling the vital signs of the elective surgical patients before the surgery.

Results of this study showed a significant difference between groups in the intensity of postanesthesia agitation in the PACU patients, with a higher incidence among the experimental group; whereas, a greater, but not significant, reduction was observed in the experimental groups in other

postanesthesia complications such as nausea, vomiting, and shivering. According to previous studies, agitation is a highly prevalent postanesthesia complication. In some studies, the postoperative prevalence rates of agitation, shivering, and nausea/vomiting have been reported as 26%, 22%, and 12%, respectively.<sup>4</sup> Entezari et al<sup>27</sup> also observed the prevalence of 21% for agitation. The findings of reduced nausea and vomiting after preoperative education in this study support those by Blay and Donoghue.<sup>28</sup> The preoperative anxiety is a common phenomenon in surgical patients, which may increase the need for anesthetic equipment, and heighten the risk of pain, nausea, and vomiting.<sup>29</sup>

The present study showed that the visitation of elective surgical patients 24-hour before surgery by the OR staff has no impact on vital signs of patients (systolic blood pressure, diastolic blood pressure, heart rate, and respiratory rate), but it may reduce most of their postanesthesia complications. Nevertheless, a relatively high prevalence of complications studied indicate a need for skillful and aware staff and advanced monitoring equipment for early prevention, identification, and control of possible complications.

One strength of this study design was the systematic approach on the basis of patients' involvement and needs, and their willingness to participate, and employed both an experimental and control groups.

### Limitations

However, there were some limitations to our study, including small sample size, only one type of surgery and limited complications examined. Among postoperative complications, this study

investigated only blood pressure changes, nausea, vomiting, shivering, and agitation. Future studies on the effect of preoperative visitation by OR staff on preoperative anxiety and postanesthesia complication in elective surgical patients are recommended to use larger, broader, and include more complications such as pain, delay in awakening. Also, future studies should include a direct measure of anxiety using a valid and reliable questionnaire.

## Conclusion

We found in this small study indications that preoperative visitation was effective in reducing nausea, vomiting, and shivering with patients receiving elective hernia surgery. An increase in

agitation was also found in comparing the experimental and control groups. The study findings support including preoperative education as a valuable intervention. The complications examined are uncomfortable and distressing to patients and may lead to prolonged hospital stay. The study also highlights the frequency of postanesthesia complications that perioperative nurses should be alert to identify and report. Future studies are needed to validate these findings.

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