ปัจจัยทำนายอาการอ่อนล้าหลังผ่าตัดในผู้ป่วยที่ได้รับการผ่าตัดช่องท้อง

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บทคัดย่อ

การศึกษานี้เป็นการวิจัยเชิงพรรณาเพื่อศึกษาความสัมพันธ์เชิงทำนายระหว่างความวิตกกังวลก่อนการผ่าตัด ความแปรปรวนของการนอนหลับ ภาวะโภชนาการ และอาการปวดหลังผ่าตัด กับอาการอ่อนล้าหลังผ่าตัดของผู้ป่วยที่ได้รับการผ่าตัดช่องท้องในโรงพยาบาล Dak Lak ประเทศเวียดนาม โดยใช้แนวคิดทฤษฎีอาการไม่พึงประสงค์เป็นกรอบแนวคิดในการศึกษา กลุ่มตัวอย่างเป็นผู้ป่วยที่ได้รับการผ่าตัดช่องท้อง จำนวน 90 ราย โดยใช้การสุ่มอย่างง่าย เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย 6 ชุด เก็บรวบรวมข้อมูลระหว่างเดือนกรกฎาคมถึงสิงหาคม พ.ศ.2558 วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา และการวิเคราะห์ถดถอยพหุคูณ ผลการศึกษาพบว่า ผู้ป่วยที่ได้รับการผ่าตัดช่องท้องมีอาการอ่อนล้าหลังผ่าตัดอยู่ในระดับสูง (M= 95.94, SD= 14.72) ความวิตกกังวลก่อนผ่าตัด ความแปรปรวนของการนอนหลับ ภาวะโภชนาการ และอาการปวดหลังผ่าตัด มีความสัมพันธ์กับอาการอ่อนล้าหลังผ่าตัด และสามารถร่วมทำนายอาการอ่อนล้าหลังผ่าตัดได้ร้อยละ 52.4 ($p < .001$) โดยปัจจัยทำนายอาการอ่อนล้าหลังผ่าตัดที่ดีที่สุดคือ อาการปวดหลังผ่าตัด ($\beta = .35$, $p < .001$) ผลการศึกษาเสนอแนะว่า พยาบาลควรประเมินและวางแผนจัดการอาการวิตกกังวลก่อนผ่าตัด ความแปรปรวนของการนอนหลับ ภาวะโภชนาการ และอาการปวดหลังผ่าตัด เพื่อป้องกันอาการอ่อนล้าหลังผ่าตัดในผู้ป่วยที่ได้รับการผ่าตัดช่องท้อง

คำสำคัญ: ผู้ป่วยที่ได้รับการผ่าตัดช่องท้อง อาการอ่อนล้าหลังผ่าตัด ความแปรปรวนของการนอนหลับ ภาวะโภชนาการอาการปวดหลังผ่าตัด

Introduction

Abdominal surgery is currently one of the most frequent surgical procedures in hospital worldwide[1]. It entails surgical access to the abdominal cavity and other organs for various purposes. In 2010, seven nations accounted for 7.4 million major abdominal surgeries, and this could increase to 8.1 million surgeries by 2020[1]. Existing data show high prevalence in Asean countries, including Vietnam[2,3]. In Dak Lak province in Vietnam, the number of abdominal surgery patients accounted for 41% of all surgical patients in 2014.

Although surgery is an effective form of treatment, it can significantly impact the patient's health and well-being. Patients report various unpleasant postoperative symptoms, such as nausea and vomiting[4], pain[5], fatigue[6], anxiety or depression[7], sleep problems[8], and discomfort[9]. Despite advances in symptom management, postoperative fatigue still occurs with highly prevalence, especially in abdominal surgery patients. One review suggested that 92% of abdominal patients complained about increasing fatigue in the postoperative duration[6]. In addition, previous studies showed that most

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participants suffered moderate fatigue during the first three postoperative days[10,11].

Postoperative fatigue is defined as a feeling of debilitating tiredness, loss of energy, or malaise following surgery[12]. The condition may lead to the patient's loss of ability to engage in normal work or daily life activities[13]. Postoperative fatigue can lead to reduced mobility, delayed rehabilitation, decreased overall performance status immediately following surgery, declining physical functioning, and delayed return to normal work or daily life activities after discharge[6,14]. Moreover, fatigue may also have psychological consequences; one study associated it with feelings of frustration (52% of participants), depression (37%), and difficulty in concentrating or being attentive (42%)[15].

Additionally, patients may report loss of income, in one study missing nearly six weeks of work due to fatigue following abdominal surgery[14]. Thus postoperative fatigue significantly affects one's quality of life due to slower recovery, prolonged hospitalization, and reduced social interaction. Postoperative fatigue may also increase the burden on the family's caregiver. In one study, 69% of patients reported requiring two or more weeks of assistance from their caregiver[16]. Furthermore, patients with postoperative fatigue often place greater demands on their primary health care teams, and increase overall costs to the health service[6,14].

In sum, postoperative fatigue is one of the most common after effects among surgical patients, with multiple significant consequences for the client's physical and mental health. In the case of abdominal surgery patients, several factors may contribute to the development and results of the fatigue experience, factors found from preoperative to postoperative phases[12]. Much literature focuses on factors like preoperative anxiety[16], sleep disturbance[17], nutrition status[12,18], and postoperative pain[11,19].Thus postoperative fatigue should be considered an important issue affecting patients' overall postoperative recovery.

Dak Lak General Hospital is the biggest hospital in the Central Highlands of Vietnam. Many patients undergo major abdominal surgery each year in its general surgical ward. Postoperative fatigue is thus a challenge in serving this group of patients. It is likely that better, targeted nursing care, through good preoperative and postoperative management, could alleviate fatigue and enhance quality of recovery in postoperative abdominal patients. Conducting a study to determine and assess factors influencing postoperative fatigue after abdominal surgery in Dak Lak General Hospital, Vietnam should provide useful insights and recommendations.

Objectives

1. To describe levels of preoperative anxiety, sleep disturbance, nutrition status, postoperative pain, and postoperative fatigue among patients undergoing major abdominal surgery in Dak Lak General Hospital, Vietnam.

2. To examine the relative influence of preoperative anxiety, sleep disturbance, nutrition status, and postoperative pain on postoperative fatigue among patients undergoing major abdominal surgery in Dak Lak General Hospital, Vietnam.

Research design

Design and setting:

A descriptive predictive research design was employed for this study. Data collection was performed at the general surgical ward, Dak Lak General Hospital, in the Central Highlands of Vietnam, from July to September, 2015.

Sample:

A sample of 90 patients who were waiting for major elective abdominal surgery was recruited using simple random sampling technique. Sample size was calculated following Tabachnick and Fidell's[20] formula. In this study, 10% of patients were added to reduce the risk patient withdraw out of the research[21]. Inclusion criteria were: 1) age 18-60, 2) being able to read, write, and communicate orally in Vietnamese, 3) no history of anxiety disorder or depression, 4) no previous diagnosis of serious illness. Patients who currently had any postoperative complications were excluded.

Instruments

1) The Patient's Profile Record Form was developed by the researcher. It was used to collect socio-demographic information (age, gender, marital status, educational level, occupation, income), and patient's disease and treatment (length of waiting time for operation, diagnosis, co-morbidity, the organ or other target of the surgery, medications used postoperatively).

2) The State-Trait Anxiety Inventory for Adults Questionnaire Form Y-1 (STAIQ Form Y-1), developed by Spielberger[22], was used to measure preoperative anxiety. This instrument is comprised of 20 four-point Likert Scale, from "not at all" (score = 1) to "very much so" (score = 4). The total score range is 20- 80. Score of 20 is deemed to be not anxious; 21- 40 as mild anxiety, 41- 60 as moderate anxiety, and 61 - 80 as severe anxiety. In this study, the Cronbach's alpha coefficient was .86.

3) The Verran Snyder-Halpern (VSH) Sleep Scale, developed by Snyder-Halpern and Verran[23], was used to measure patients' sleep disturbance. It consists of 15 items divided into three subscales. Each item is assessed by a 10 cm visual analogue scale with word descriptors as the endpoints. The sleep effectiveness items were reverse scored. The total scores were sum of 15 items, ranged from 0 to 150. The higher scores indicating higher levels of sleep disturbance. In this study, Cronbach's alpha coefficient was .84.

4) The Nutrition Alert Form (NAF), developed by Komindr, Tangsermwong and Janepanish[24], was used to assessing the nutrition status of patients before abdominal surgery. The form consists of eight sections, and the total score is the sum of all eight sections. Based on the recommendation of Komindr et al.[24], total scores were interpreted as normal nutrition (0), mild malnutrition (1-5), moderate malnutrition (6-10), and severe malnutrition (11+). Cohen's kappa coefficient was k = .89.

5) The Numeric Pain Rating Scale (NPRS), developed by McCaffery and Beebe[25], was used to measure postoperative pain. It is an 11-point scale ranging from "no pain" (0) to "worst possible pain" (10). Patients chose the number that best matched their pain intensity. Scores were interpreted as follows: 0 (no pain), 1- 3 (mild pain), 4 - 6 (moderate pain), 7 - 10 (severe pain).

6) The Identity–Consequence Fatigue Scale (ICFS), developed by Paddison, Booth, Hill and Cameron[26], was used to measure fatigue and its impact on patients after surgery. The 25 items are divided into two dimensions with five subscales. ICFS items are rated on 6-point adjectival scales, from "not at all" (score = 1) to "all of the time" (score = 6). The total score ranged from 25 to 150, with higher scores indicating higher levels of fatigue and the impacts of fatigue. In this study, Cronbach's alpha coefficient was .82.

Ethical Considerations: Prior to data collection, the study protocol was approved by the Institutional Review Board, Faculty of Nursing, Burapha University, and permission to collect data

was obtained from the Director of Dak Lak General Hospital. Patients were clearly informed about the study's aims, benefits, data collection procedure, and of their rights. All data was stored in a secure place and utilized only for this study.

Data collection procedures

Data collection was performed between July and September, 2015 as follows:

1) The name of patients who had the schedule for elective abdominal surgery, after applying inclusion/ exclusion criteria, were assigned as numerical labels which wrote on slips of paper, put in a box. The researcher was drawn out 50% of cases per day until reach the sample size. 2) After participants signed the informed consent form, the Patient's Profile Record Form, the STAIQ Form Y-1, and the VSH Sleep Scale questionnaire were distributed for patients' self-report the day before surgery. Completion took about 20 minutes. 3) The NAF questionnaire was then administered via interview. Completion took about five minutes. 4) Once per day, on day one and day two after surgery, the NPRS questionnaire was administered to assess pain level. 5) On the third postoperative day, patients completed the NPRS and the ICFS self-report questionnaires. 6) During data collection, if patients were undergoing some procedure or otherwise occupied, questionnaire administration was postponed until they felt calm and comfortable answering. 7) Other necessary information was obtained from patients' medical records. All data collection forms were then checked for completeness and prepared for analysis.

Data Analysis : Data were entered into and analyzed by the Statistic Package for Social Science (SPSS) program version 17.0. The alpha level for significance was set at .05. Descriptive statistics were used to describe preoperative anxiety, sleep disturbance, nutrition status, postoperative pain and postoperative fatigue. Standard multiple regressionwas used to determine the relative influence of factors of postoperative fatigue.

Results

For characteristics of the samples, the mean of age was 41.37 years (*SD* = 8.86, Range = 22- 60). Most of subjects were married (n = 78, 86.7%). Forty percent of samples had completed high school. Farmer was the major common occupation of the samples. The majority of samples earned income around 150-200 US dollars per month (43.3 %). This study found that 43.3% of samples undergone intestinal tract surgery. Nearly 17 percent of patients (n = 15) had co-morbidities. Mean length of waiting time for the surgery was 4.82 days (*SD* = 1.14, Range = 3-7).

Regarding characteristics of postoperative pain, 100% of the sample reported pain during the first three days after surgery. On the first postoperative day, 56.7% of the sample had severe pain, and 43.3% reported moderate pain. On the second postoperative day, 61.1% of participants had moderate pain, 25.6% reported severe pain, and 13.3% had mild pain. On the third postoperative day, 57.8% of the sample reported pain as mild, while 42.2% claimed moderate pain. (Table 1)

Participants reported moderate levels of preoperative anxiety (*M* = 52.03, *SD* =9.04). In addition, preoperative sleep disturbance was moderate (*M* = 88.08, *SD* = 18.4). The mean nutrition status score was 7.88 (*SD* = 3.84), indicating a moderate level of malnutrition. The mean postoperative pain score three days after surgery was 5.19 (*SD* = 1.39), also considered moderate. (Table 2)

In regard to postoperative fatigue, the mean score of sample's postoperative fatigue was 95.94 (*SD* = 14.72) which was considered as high. In fatigue-identity dimension, the mean score of sample's was 33.35 (*SD* = 7.5), and in fatigue-consequences dimension was 62.59 (*SD* = 10.88). (Table 3)

Standard multiple regression analysis was conducted with four independent factors: preoperative anxiety, sleep disturbance, nutrition status, and postoperative pain. Postoperative fatigue was the dependent variable. All required assumptions were met. The results revealed that model significantly explained 52.4% of the variance in the postoperative fatigue ($R^2 = .524$, $F_{[4,85]} = 23.35$, $p < .001$). Postoperative pain explained the most variance in postoperative fatigue ($\beta = .35$, $p < .001$), followed by nutrition status ($\beta = .32$, $p < .001$), preoperative anxiety ($\beta = .25$, $p < .01$), and sleep disturbance ($\beta = .19$, $p < .05$). (Table 4)

Discussion

Postoperative fatigue among abdominal surgical patients

In the current study, the sample had high level of postoperative fatigue by the mean score of 95.94 (*SD* = 14.72). There are several possible reasons for the observed level of postoperative fatigue in this sample. Of course, patients had symptoms of and experienced internal changes due to their gastrointestinal diseases, often for a long time. This can lead to nutrition deficits and reduced muscle strength. Second, during the operation, tissue damage can result from opening the abdominal wall, and the use of general anesthesia evokes an integrated physiological response with hormonal, metabolic, haematological and immunological components. Both factors might well create and be related to the pathogenesis of postoperative fatigue[12]. Lastly, postoperative patients often experience negative changes regarding maximal oxygen uptake and the adaptability of the heart. Combined with and perhaps exacerbated by immobilization and deficient nutrition follow major surgery, patients may need to use a greater proportion of available energy to perform given activities; this clearly can lead to perceived fatigue[6].

These results are consistent with previous studies which indicated that postoperative fatigue is common in surgical patients, especially abdominal surgery. In the same population, Long[11] reported that 100% of patients suffered from tiredness throughout the three days following their operations. In addition, Yu et al.[13] found mean gastrointestinal surgery postoperative fatigue scores of 7.14 (*SD* = .72) on the first day and 4.23 (*SD* = .72) on the 10thday. Trang[27], also using the ICFS questionnaire, reported a mean fatigue score of 86.58 (*SD* = 15.06) in postoperative orthopedic patients. It was also noted that postoperative fatigue might be greater after abdominal surgery than after orthopedic surgery.

Predictors of postoperative fatigue among abdominal surgery patients

This study found that preoperative anxiety, sleep disturbance, nutrition status and postoperative pain explained 52.4% of postoperative fatigue among patients who had abdominal surgery in Dak Lak General Hospital, Vietnam. These results support and can be interpreted by the Theory of Unpleasant Symptoms, which suggests that not only psychological factors (preoperative anxiety) but also physiological factors (sleep disturbance, nutrition status, postoperative pain) can directly influence a patient's symptom experiences, such as postoperative fatigue.

The current study found, first, that preoperative anxiety was positively and significantly related to postoperative fatigue (β = .25, p < .01), a finding with supported from both theory and the literature. Lenz et al.[28] argued that psychological factors, including the patient's mental state or mood, affective reaction to illness, and psychological response to stress, can affect the symptoms experienced. Furthermore, patients who were waiting for surgical treatment had high levels of preoperative anxiety[29]. This can trigger the physiologic response by increasing epinephrine released into the circulatory system, which causes blood vessel constriction, increased heart rate and force of contractility, elevated blood pressure and temperature, flushing and sweating[30]. In addition, anesthesia medications and/or dosage may need to be adjusted [31]. Thus preoperative anxiety can be a cause of postoperative fatigue.

This is consistent with previous research. In the abdominal surgery population, Long[11] showed that pre-operative anxiety was positively associated with first-day postoperative symptoms, including fatigue (r = .16, p < .05). Montgomery et al.[16]asserted that psychological distress prior to surgery uniquely contributed to patients' fatigue experience (p < .003) one week after surgery. Ai, Wink and Shearer[32] noted that preoperative anxiety was related to both mental fatigue and physical fatigue among patients after cardiac surgery. The findings of the present study suggest that if nurses alleviate pre-surgical anxiety, they can reduce postoperative fatigue. This might be more feasible than postoperative intervention, since after surgery both nurses and patients might will be rapidly coping with many symptoms and related events.

Second, this study revealed that sleep disturbance is also a significant predictor of postoperative fatigue (β = .19, p < .01). Sleep disturbance might cause physiological changes resulting in negative effects on patients' health. During sleep the body is capable of repairing tissue and restoring energy loss from the previous day's events. Thus a loss of sleep or sleep disturbance increases an individual's susceptibility to fatigue; the more severe the sleep disturbance, the greater the likelihood of fatigue.

Indeed, Rosenberg[33] reviewed previous research in patients who underwent non-cardiac surgery and confirmed that sleep disturbance could be a contributing factor to postoperative fatigue. Bunnag[10] showed that insufficient sleep was related to postoperative fatigue within 24-96 hours among 50 adult patients receiving abdominal surgery. In the Vietnamese population, Long[11] mentioned that sleep disturbance positively correlated with patients' fatigue experience in the first three days after surgery (r = .25, r = .64 and r = .39, p < .01, respectively). Unsal and Demir[17] also positively correlated sleep problems with high levels of fatigue during hospitalization.

Third, the present study found that nutrition status affected postoperative fatigue (β = .32, p < .001). Regarding the pathology of postoperative fatigue, Zargar-Shoshtari and Hill[12] mentioned the role of nutrition status. Abdominal surgery patients, due to the nature of their diseases, might have suffered from gastrointestinal problems like abdominal pain, nausea/vomiting, and dyspepsia for a long time before surgery. Thus patients may have poor nutritional status due to inadequate food intake, non-monitored lack of appetite, or metabolic stress related to the severity of the disease[34]. Furthermore, the nature of their surgery required patients not to eat for several days. Patients need a high nutrient supply after their operations, yet most patients ingested nothing by mouth. Lack of

sufficient and nutritious caloric intake left patients feeling tired due to the lack of available energy. It is also likely that poor nutritional status in the preoperative period can intensify postoperative fatigue.

Prior research supports the nutritional findings of the present study. Schroeder and Hill[35] mentioned that the best predictors of postoperative fatigue were preoperative weight, particularly total body protein (r = .317; p < .01), weight loss (r = .29; p < .03), and grip strength (r = .352; p < .01). Christensen and colleagues[18] demonstrated that pre-operative body weight was significantly correlated with postoperative fatigue (r = - 0.3, p < .05) among patients with uncomplicated abdominal surgery. Furthermore, Yu et al.[13] showed that gastrointestinal surgery patients with high risk of malnutrition had a higher relative risk of severe postoperative fatigue.

Finally, results of this study suggest that postoperative pain is a significant predictor of postoperative fatigue (β = .35, p < .001). The theoretical work of Lenz et al.[28] can be used to argue that physiological factors, including the quality of functioning body systems, the presence of any pathology or trauma, or an individual's energy level can affect symptoms and how they are experienced. In this case, postoperative fatigue is an unpleasant symptom influenced by physiological factors, in this case pain. Thus the greater the patients' pain, the more likely and more severe the occurrence of postoperative fatigue. Ineffective pain management can well lead to sleep disturbance, anxiety, fear and depression[36]. And peri-operative anesthesia as well as postoperative analgesics to reduce pain can be a reason for the postoperative fatigue.

Prior studies confirm the influence of pain on postoperative fatigue. Long[11] indicated that pain level was associated with postoperative fatigue at day one (r = .39, p < .01), and day 2 (r = .19, p < .05). A study by Zalon[19] of patients recovering from major abdominal surgery indicated that the severity of pain was associated with more fatigue during hospitalization (p < .01). In addition, Montgomery et al.[16] showed a positive correlation between pain severity and fatigue (r = .36, p < .001). Moreover, Puranasamriddhi[37] indicated that pain was a significant predictor of postoperative fatigue (β= .28, p < .01) in hysterectomy patients. Finally, studying the orthopedic population, Trang[27] found that postoperative pain was a significant predictor of postoperative fatigue (β = .35, p < .01).

Suggestions

1. Effective nursing interventions or programs should be designed that focus on reducing preoperative anxiety, improving sleep quality, enhancing nutrition status, and managing postoperative pain in order to reduce prevalence and severity offatigue in postoperative patients.

2. Future research on reducing postoperative fatigue should employ experimental design to control other potentially influencing factors and to add to the postoperative fatigue knowledge base.

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Table 1 Reported pain on the first three postoperative days (*n* = 90)

Level of pain	Pain in day 1		Pain in day 2		Pain in day 3	
	n	%	n	%	n	%
No pain	0	0	0	0	0	0
Mild pain	0	0	12	13.3	52	57.8
Moderate pain	39	43.3	55	61.1	38	42.2
Severe pain	51	56.7	23	25.6	0	0

Table 2 Range, mean, and standard deviation of preoperative anxiety, sleep disturbance, nutrition status, and third postoperative day pain (*n*= 90)

Variables	Range		*M*	*SD*	*Level*
	Possible	Actual			
Preoperative anxiety	20 - 80	32 - 70	52.30	9.04	Moderate
Sleep disturbance	0 - 150	44 -122	88.08	18.4	Moderate
Nutrition status	_	0 - 15	7.88	3.84	Moderate
Postoperative pain in 3 days	0 - 10	3 - 10	5.19	1.39	Moderate

Table 3 Range, mean, and standard deviation of sample's postoperative fatiguescores (*n* = 90)

Postoperative fatigue	Range		*M*	*SD*
	Possible	Actual		
Total score	25 - 150	65 – 126	95.94	14.72
Fatigue-Identity dimension	9 - 54	19 – 47	33.35	7.5
Fatigue-Consequences dimension	16 - 96	33 - 85	62.59	10.88

Table 4 Standard multiple regression analysis for variables predicting postoperative fatigue (*n* = 90)

Predictors	*B*	SE	β	t	*P*-value
Preoperative anxiety	.41	.13	.25	3.26	.002
Sleep disturbance	.15	.07	.19	2.26	.026
Nutrition status	1.26	.30	.32	4.26	.000
Postoperative pain	3.74	.88	.35	4.25	.000
Constant = 31.98					
R^2 = .524 ; Adjusted R^2 = .501;					
$F_{(4,85)}$ = 23.35					

Factors Influencing Postoperative Fatigue Among Patients Undergoing Major Abdominal Surgery In Dak Lak, Vietnam

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Abstract

This study examine the relative influence of postoperative fatigue and preoperative anxiety, sleep disturbance, nutrition status, and postoperative pain among patients undergoing abdominal surgery in Dak Lak General Hospital, Vietnam. The Theory of Unpleasant Symptoms provided a conceptual framework for this study. Ninety patients were recruited by simple random sampling between July and September 2015. Data were collected via six instruments. Data were analyzed via descriptive statistics and standard multiple regression. The mean postoperative fatigue score for abdominal surgery patients was 95.94 (range = 25-150, *SD* = 14.72). Standard multiple regression analysis indicated that preoperative anxiety, sleep disturbance, nutrition status, and postoperative pain were significantly related to postoperative fatigue and explained 52.4% of the postoperative fatigue variance ($p < .001$). The strongest predictor of postoperative fatigue was postoperative pain ($\beta = .35$, $p < .001$). The findings suggest postoperative fatigue in abdominal surgical patients can be reduced by controlling preoperative anxiety, sleep disturbance, nutrition status and postoperative pain. Nurses are logical health care professionals to develop and administer such preventions and interventions.

Keywords: postoperative fatigue, preoperative anxiety, sleeps disturbance, nutrition status, postoperative pain, patients undergoing abdominal surgery.

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