The Effects of Early Ambulation and Deep Breathing Exercise on Anxiety, Pain and Physiological Parameters in Patients Undergoing Abdominal Hysterectomy

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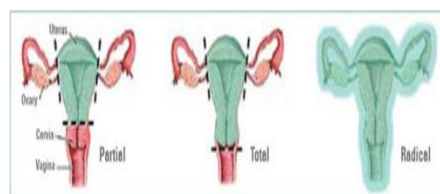[2] Medical Surgical Department, Faculty of Nursing, Fayoum University.

Abstract

Background: Anxiety and postoperative pain are the most common distressing adverse effects associated with abdominal hysterectomy. Providing pre-operative and postoperative instruction about early ambulation and deep breathing exercise are widely important for patient to reduce postoperative complication. **Aim**: To evaluate the effects of early ambulation and deep breathing exercise on anxiety, pain and physiological parameters in patients undergoing abdominal hysterectomy. **Design:** Quai-experimental research design was utilized in this study. **Setting:** This study was conducted in Obstetrics and Gynecology Department at Mansoura Old General Hospital affiliated to the Ministry of Health and Population. **Sample:** A purposive sample of 60 patients' undergone abdominal hysterectomy. The patients divided randomly into two group: study group (n=30) and the control group (n=30). **Tools:** It consisted of fours tools: **Part I:** Demographic Data and Medical Information Sheet, **Part II:** Physiological Data Collection Form, **Part III:** Numeric Pain Rating Scale and **Part IV:** Hamilton Anxiety Rating Scale. **Results:** There was a statistically significant decrease anxiety, pain, and enhanced physiological parameters mainly to blood pressure and oxygen saturation among patients in study group compared to the control group. **Conclusion:** The early ambulation and deep breathing had a positive effect in reducing anxiety and postoperative pain and enhance physiological parameters in study group compared to control group in patients undergoing abdominal hysterectomy. **Recommendations:** The hospital authority can practice ambulation and deep breathing with all surgical patients to help in promoting patient's relaxation, enhance the post-operative recovery and enhancing tissue healing.

Key words: Ambulation, Deep Breathing, Anxiety, Pain, Physiological parameters, Abdominal Hysterectomy

Introduction

Hysterectomy is the surgical removal of the uterus (womb). It is a major gynecological surgery in both developed and developing countries. There are three main types of hysterectomies namely; total hysterectomy, subtotal hysterectomy and radical hysterectomy. The different approaches to hysterectomies are abdominal, vaginal and laparoscopic hysterectomy **(Meenakshi , 2018).**

A hysterectomy removes the uterus and may also remove the cervix (total) and the vagina (radical)

Fig (1): Types of Hysterectomy, Women's health—hysterectomy, (2008), available at: http://brochures.mater.org.au/brochures/mater-mothers-hospital/women-s-health-hysterectomy

Hysterectomy is the second most common surgical operative procedure in gynecology performed worldwide following cesarean delivery. In the Egypt, approximately 165,107 women will have a hysterectomy performed annually all over governorates, divided between the Upper and Lower Egypt. **(Alshahrani et al, 2021; Ibrahim & Mohammed, 2020; Dawood, Atlam, & Borg, 2019).** Hysterectomy is the major operation to alleviate gynecological signs and symptoms as pain, abnormal uterine bleeding, dyspareunia, dysmenorrheal, hyper menorrhea and pelvic mass **(Ashrafi et al., 2016).**

All patients undergoing hysterectomy are at the risk of suffering short- and long-term complications after surgery **(Tan et al., 2013; Brandsborg et al., 2007).** The post-operative pain after abdominal surgery are a significant source of impaired respiration, disrupted sleep, loss of appetite, prolonged hospitalization. Earlier studies have reported that the mostly of post hysterectomy women undergoing hysterectomy at particularly high risk chronic post-hysterectomy pain **(Thomas, 2018; Montes et al., 2015).** However, Hysterectomy is associated with change to the physical, psychological, sexual or social ones and extend to the social life **(Kendall &Fairman, 2014; Clarke-Pearson, & Geller, 2013) .**

Some women report having a strong emotional reaction or feeling down, after a hysterectomy **(Cara et al., 2013).** The risk of depression and anxiety is higher among women with gynaecological surgeries because of

associated with an uncertain future and inability to predict a desired outcome **(Shen et al., 2020).** However, hospitalization for surgery is associated with increased anxiety and negative effects on postoperative recovery. **Pinto et al., (2015)** reported that preoperative anxiety has different impacts on postoperative pain .

Ambulation is one of the important things can do after surgery to prevent or reduce postoperative complications. Post-surgical walking provides large range of benefits for all patients to reduce the post-operative complications such as atelectasis, pneumonia, gastrointestinal discomfort, and circulatory problems. Therefore, pre-operative and post-operative education regarding deep breathing and early walking exercises is important in reduces post-operative pain and decrease anxiety, and help to minimize the development of post-operative complication **(Oetker-Black et al, 2003; Westerdhal et al., 2003).**

Recent studies focused on non-pharmacological methods. Early ambulation and deep breathing (CDB) is a technique used to keep the lungs clear during the first few days or weeks after surgery and decrease the incidence and severity of pulmonary complications, such as pneumonia, atelectasis, and hypoxemia **(Silva et al., 2013)**

Post-operative recovery is an important task for nurses involved in the plan of care for the patients. The maternity nurse today is increasingly called upon to improve both physical and psychological preoperative and postoperative intervention for patient undergoing hysterectomy **(Ahmed, 2001).** Non-pharmacologic interventions such as

breathing exercise and ambulation can be incorporated into the care plan to reduce pain, shorter period of hospitalization, reduce anxiety after surgery and improve postoperative outcomes. Post-surgical ambulation is recommended after surgery through the patient gets out of bed such as sitting, standing, or walking as soon as possible after an operation to reduce the risks of thrombosis, pulmonary problem and improved clinical outcomes **(Kaur, Kaur, & Siska, 2015; Pua & Ong , 2014).** Therefore, the aim of this study is to evaluate the effects of early ambulation and deep breathing exercise on anxiety, pain and physiological parameters in patients undergoing abdominal hysterectomy.

Significance of the study

In Egypt, hysterectomy incidence was estimated to be 165,107 annually all over governorates, divided between the upper and Lower Egypt **(Health grades, 2016).** Hysterectomy is one of the most common surgeries performed in gynecology. The incidence ranged 6.1 to 8.6 per 1000 female **(Ezzat & Salah, 2019).** AH is associated with a higher rate of complication than vaginal hysterectomy (VH). The evidence recommended of the practicing of ambulation and deep breathing exercises among postoperative period is mainly associated with reduced the risk of venous thromboembolism and improve postoperative outcomes **(Shashi and Rakesh, 2017).**

Aim of the study:

This study aim was to evaluate the effects of early ambulation and deep breathing exercise on anxiety, pain and physiological parameters among patients undergoing abdominal hysterectomy.

Research hypothesis:

H1: Patients who practiced early ambulation & deep breathing exercise have significantly less pain severity postoperatively than those used usual care.

H2: Patients who practiced early ambulation & deep breathing exercise have significantly less anxiety level postoperatively than who used usual care.

H3: patients who practiced early ambulation & deep breathing exercise have significantly physiological outcomes improve postoperatively than those did not.

Research Variables:

The research variables have been conceptualized as following:

A- Independent variables: Early ambulation and breathing exercise were using for the study.
B- Dependent variables: It included that: Pain severity, anxiety level, blood pressure, respiration rate, and temperature, pulse rate and oxygen saturation.

Operational definition:

Early Ambulation (EA):

It refers ability to walk or move from place to place independently, with or without assistive devices post operated abdominal hysterectomy patients in the ward for 2 to 5minutes and 3 times a day.

Deep Breathing Exercise (DBE):

It refers ability to take a breath in slowly through nose, holding breath for the count

of 1-5 and slowly breathe out through the mouth.

Abdominal Hysterectomy (AH):

It is a surgical procedure in which the uterus is removed through an incision in your lower abdomen. It is recommended for subjects diagnosed with gynecologic cancer, fibrosis, endometriosis, abnormal vaginal bleeding.

Subject and methods

Study design

A quasi- experimental research design, the pretest-posttest design. In this design, which uses two groups, one group receive the intervention program and the other group is control group receives usual care of hospital, over the same period of time, but undergoes exactly the same tests.

Study setting

This study was carried out in the Obstetrics and Gynecology Department (OGD) at Mansoura Old General Hospital (MOGH), Al Dakahlia Governorate, Egypt, affiliated to the Ministry of Health and Population.

Sample type: Purposive sampling was used.

Study subjects

A purposive sample of sixty patients had undergone abdominal hysterectomy. The patients assigned randomly into two groups: Thirty patients' received usual care of hospital (control group) and thirty in deep breathing exercise along with early ambulation (study group). The inclusion criteria: Participants have ages

between 18- 60 years, women undergoing AH., willing to participate. While, exclusion criteria patients with epidural analgesia, and vaginal surgeries, women with restricted movement of lower limbs.
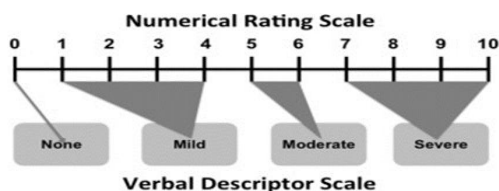
Tools of data collection:

It comprised of four parts:

Part I: Demographic Data and Medical Data Sheet: This sheet was formulated by the researcher to assess subjects: Gender, age, education, marital status, occupation status, and residence. The medical data sheet included the diagnosis, comorbidity, indication for surgery, type of anesthesia, duration of hospital stay, site of surgical pain, and pain control.

Part II: Physiological Data Collection Form: It includes assessment of patient's pulse, temperature, blood pressure, respiration rate, oxygen saturation.

Part III: Numeric Pain Rating Scale (NRS): This tool was adopted from **(Coll, Ameen, &Mead, 2004)** for assessing postoperative pain. The NRS are using a 10-point rating scale ranging from 0 (no pain) to 10 (worst pain). **Scoring system**: The pain scores are interpreted as: (0) represented no pain. (1-3) indicated a mild pain, (4-6) refereed a moderate pain, and (7-10) reflected the severe pain. The answer was computed then converted into percentage. The test–retest reliability coefficient for the PRS was 96.5. In addition, content validity was 0.90. This scale was chosen for its ease of administration and comprehensiveness. NRS requires approximately 5 -10 minutes to complete.

Part IV: Hamilton Anxiety Rating Scale (HARS): HARS is a psychological questionnaire adopted by **Hamilton (1959)** to assess the patient's anxiety. It consists of 14 psychological and somatic variables: anxious, tension, fears insomnia, intellectual, depressed mood, somatic general. The HARS is rated on 5-point scales from 0 (Not present) to 4 (Very severe symptoms).

Scoring system: The total score ranged from 0–56
- <18 refers mild severity
- 18–24 indicated mild to moderate anxiety
- 25–30 indicates moderate to severe anxiety.

Validity and Reliability:

The tools were reviewed by three experts from faculty of nursing and two experts from faculty of medicine to assess content coverage, comprehensiveness, relevancy and the modifications were done. The reliability of tools (3, 4) was estimated using the internal consistency. The reliability questionnaire using Chronbach's Alpha equation was (r =0.87, 0.85).

Ethical Considerations:

Official written permissions to conduct the study was obtained from the Director of Obstetrics and Gynecology Department at Mansoura General Hospital. Informed consents were obtained from women before data collection after explaining the purpose and nature of study. Women were informed about their voluntary right to accept or refuse participation in the study, personal preferences to withdraw from the study were also allowed and confidentiality was assured.

Pilot study;

A pilot study was administer on 10 % of women with abdominal hysterectomy to check the clarity of the questionnaire applicability, and feasibility of conducting the study as well as the time suitable for filling the sheets. The pilot study is excluded from the study.
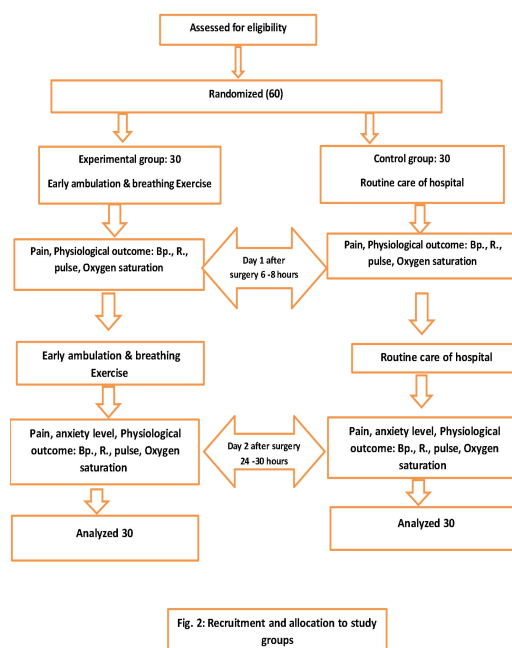
Field work phases:

- The study was performed between first October 2020 and September 2021.

- Permission was obtained from the Director of gynecology department. Informed patients consents were fulfilled before data collection after explaining the purpose and nature of study to the patient. At the beginning of the study, tool of data were collected by interviewing subjects individually, while medical information was obtained from patients' medical records.

- The nursing instruction about (definition of mobilization, deep breathing, benefits of them, the technique of breathing and instruction about mobilization and

the distance that patients walked was prepared and design on recent literature review. It was prepared by the researchers and designed in an Arabic language, the researcher gave a handout of instruction and audiovisual materials about early ambulation & deep exercise to the patients and advice the patients to practice it at any time.

- Preoperative patients' instructions given for study patients about practiced ambulation paired with deep breathing and patients were also advised to take deep breaths and exhale slowly throughout the ambulation session while the patients were just waking up from anesthesia. While the control group who received only routine postoperative care. Analgesics were given to patients in accordance with physician orders, ward routines for mobilized.

- The study group were exposed to the early ambulation & deep breathing exercise through 2 sequential sessions over 2 days while wait for surgery (2 sessions' practical and theory). Each session extend around 30 - 45 minutes; each patient met three times per week at morning shift. As regards the practical session, demonstration learned for patients about program. The researchers had periodical link with the patients out of telephone for refreshing the provided information. The experimental study was ambulated in the postoperative ward by the nurse, for 3 times a day one of surgery for a distance of 30–40 feet, continuously for discharge days.

- The postoperative daily monitoring sheet, Pain assessments were

performed twice: when the patients were alert enough to communicate after arrival at the postoperative care unit on day 1postoperative and after day 2 of surgery.

- All patients were assessed with a "Hamilton Anxiety Rating Scale" to evaluate anxiety state on day 1 before the operation (pre-test) and Assessment of post-test anxiety was done on day 2 of surgery. Also Pain assessments were performed twice using the "numerical rating scale" (NRS) on 1 day after the operation and after day 2 of surgery and data were recorded.

Fig. 2: Recruitment and allocation to study groups

Statistical Analysis

The data were entered, coded and analyzed by using Statistical Package for the Social Sciences (SPSS), version 20. Descriptive statistics including frequencies, percentage, Mean and SD

were used to describe the study sample. Chi square test was used for the comparison and Linear regression used appropriately to determine correlation among the variables. P < 0.05 was regarded as statistical significance.

Results:

Table (1): Clarifies that the demographic characteristics of patients in the study and control groups. It shows that more than half (60% and 56.6%) of both study and control groups respectively in age group (40-50 years) with no statistically significant difference between both groups (p>0.05). In relation to marital status, this table revealed that (60%) in the study group and (66.6%) in the control group were married. As regard to level of education, less than half (56.6% and 46.6%) of both study and control groups respectively had secondary education. In addition, occupation status this tables shows that nearly two thirds in the study group (63.3%) were employer compared to (53.3%) in the control. There is no statistically significant difference among the patients in the study and control groups regarding demographic data in both groups (p>0.05).

Table (2): Describes the distribution of the patients according to clinical characteristics. It shows that (66.6%) in study group compared with 56.6% in the control groups were uterine fibroid. While (6.6%) in study group compared with (10%) in the control groups were endometriosis. As regard to indication of surgery, this table presented that (66.6%) in the study group compared with (56.6%) of control group had total abdominal hysterectomy. In relation to type of anesthesia, (73.3%) of patients had general anesthesia in the

experimental group compared with (66.6%) of patients in the control group. Also this table shows that there were no statistically significant differences existed among the patients in the study and control group regarding site of pain and length of hospital stay (p>0.05).

Table (3): Shows mean and standard deviation of the physiological parameters among study group. There was a statistical significant difference in physiological parameters mainly in blood pressure and SPO2 with environmental air (p<0.05). While there no a statistical significant difference regarding the pulse rate and body temperature pressure (p>0.05).

Table (4): This table shows that the mean of pain intensity before and after early ambulation and breathing exercise in the study and control groups. Pain intensity on day 1, the mean pain intensity after intervention in the study group was (2.35) compared with and (2.87) in the control group. Also, the mean pain intensity after 2 days postoperative in the study group was (1.50) compared with (2.55) in the control group. There was a statistical significant difference in the pain intensity after implanting of program in the study group (p<0.05).

Figure (3): Illustrated that postoperative anxiety level scores were significantly higher in the control group than in the study group of early ambulation and breathing exercise (p<0.05).

Table (1): frequency distribution of demographic characteristics of patients in the study and control groups (No. 60):

Items	Study group (N=30)		Control group (N =30)		X^2	P- value
Age(years):	**No**	**%**	**No**	**%**		
• 30-40 years	4	13.3%	4	13.3%	3.23	P>0.05
• 40-50 years	18	60%	17	56.6%		
• >50 years	8	26.6%	9	30%		
• **Mean ±SD**	39.57± 5.6		38.84 ± 5.2			
Marital status:						
• Single	4	13.3%	1	3.3%	0.271	P>0.05
• Married	18	60%	20	66.6%		
• Widow/Divorced	8	26.6%	9	30%		
Educational status :						
• Primary	4	13.3%	6	25%	1.463	P>0.05
• Secondary	17	56.6%	14	46.6%		
• Graduate	9	30%	10	33.3%		
Occupation status:						
• Employer	19	63.3%	16	53.3%	0.176	P>0.05
• Housewife	11	36.6%	14	46.6%		
Residence :						
• Urban	12	60%	13	65%	0.251	P>0.05
• Rural	8	40%	7	35%		

Table 2: Frequancy distribution of medical data among patients in both groups (No. 60):

Items	Study group (N=30)		Control group (N =30)		X ^{2}	P- value
Indication for surgery:	**No**	**%**	**No**	**%**		
● Uterine fibroid	20	66.6	17	56.6		
● Ovarian tumor	4	13.3	3	10		
● Menorrhagia	4	13.3	7	23.3	2.21	P>0.05
● Endometriosis	2	6.6	3	10		
Type of surgery:						
● Total abdominal hysterectomy	20	66.6	17	56.6%		
● Bilateral salpingo-oophorectomy (BSO)	3	10	7	23.3%	1.65	P>0.05
● Subtotal abdominal hysterectomy	7	23.3	6	20%		
Type of anesthesia :						
● General	22	73.3	20	66.6%	2.25	P>0.05
● Regional	8	26.6	10	33.3%		
Site pain :						
● Abdomen	30	100	28	93.3	1.87	P>0.05
● Other sites*	10	26.6	16	53.3		
Mean of length of hospital stay/day Mean ± SD	2.98±.887		3.03+.0688			P>0.05

(*) Abdominal pain in other place in body system

Table (3) Mean and standard deviation of the physiological parameters of the study group during times intervals:

Physiological Signs	Times Assessment			
	Pre-test Mean± SD	Post –test 1 Mean± SD	Post-test 2 Mean± SD	Paired Samples Test (P-value)
Temperature	37.10±0.40	36.43±0.33	36.84±0.26	**-6.75 (p<0.001)**
Pulse rate	75.252±5.25	74.172±7.53	77.413±7.22	**-1.49 (p>0.05)**
Respiration rate(breath /minute)	22.18±2.339	20.318±1.56	19.262±1.38	**-4.27 (p>0.05)**
Blood pressure:				
Systole	128.12±35.4	110.1±9.9	117.9±10.31	**5.21 (p<0.05)**
Diastole	88.132±8.83	73.231±10.6	76.441±11	**5.87(p<0.05)**
SPO2 without mask	92.542±1.6230	98.288±.7409	99.175±.8620	**4.31(<0.05)**

Table (4): Comparison of pain intensity before and after Program implementation in the study and control groups (No. 60):

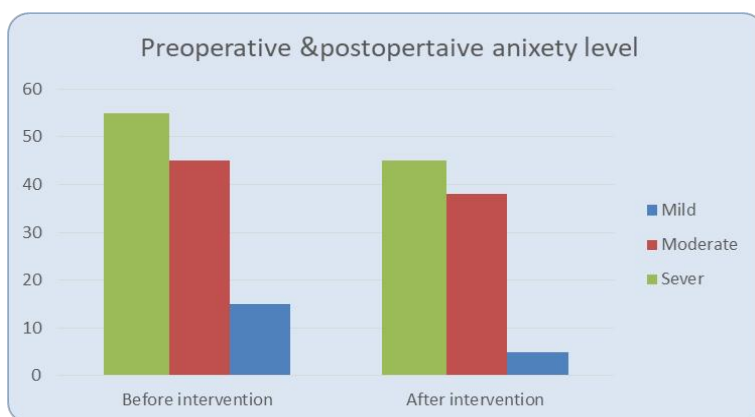| Items	Study group (n =30)		Control group (n=30)		t-test	P value
Pain after surgery (Day 1)	**Mean**	**SD**	**Mean**	**SD**		
• Before	3.85	0.366	3.60	0.598	1.532	**P<0.05**
• After	2.35	0.605	2.87	0.224	3.445	
Pain after surgery (Day 3)						
• Before	2.85	0.587	3.25	0.639	2.052	**P<0.05***
• After	1.50	0.513	2.55	0.605	. 3.101	

Figure (3): Preoperative & postoperative anxiety level among patients in both groups (No. 60):

Discussion

Hysterectomy is one of the oldest surgeries performed in gynaecology. It is common operation carried out in women for problems associated with reproductive organs. The aim of this study was to evaluate the effects of early ambulation and deep breathing exercise on anxiety, pain, and physiological parameters among patients undergoing abdominal hysterectomy.

The current study results reported that the demographic data of the studied sample illustrated more than half and of both study and control groups' respectively in age group (40-50 years). Also nearly two third in the study group and control group were married. A similar study done in Egypt by **Ibrahim & Mohammed (2020)** about effect of nursing instructional guideline on women's quality of life after hysterectomy the researchers found that, slightly two-thirds of them their age ranged between 40 to 49 years and all of them were married. **Rabiu and Habib (2017)** revealed that

elective abdominal hysterectomy is the most common among 40–49 years' age group. These result inconsistent with **Chander and colleagues (2019)** who finding that high hysterectomy among women in the older age groups (45-49) years.

In relation to indication for abdominal hysterectomy in this study, the most common was uterine fibroid. This study agrees with **Chale, Salim, & Leshabari (2021)** who reported that the majority (84.1%) of uterine leiomyoma was the leading indication for hysterectomy among study sample. Previous study by **Okafor et al., (2012)** revealed that the most common indication was uterine fibroid for abdominal hysterectomy.

The results of this study show that there was a statistically significant difference in pain intensity between the experimental group and control groups after the programme (early ambulation and breathing exercises) was implanted (p<0.05). This might be attributed to ambulation and deep breathing exercise enhances respiration, improve circulation lead to quick wound healing, reduce anxiety and also improved overall health.

 In our study there was a statistically significant difference in pain intensity between the experimental group and control groups after the programme (early ambulation and breathing exercises) was implanted (p<0.05).   (p<0.05). This might be attributed to ambulation and deep breathing exercise enhances respiration, improve circulation lead to quick wound healing, reduce anxiety and also improved overall health. These findings were consistent with **Priya et al., (2017)** who indicated that women in the experimental group experienced less post-operative pain discomfort and significantly improved performance in specified post-operative behaviours (p<0.001). This results is consistent with **Ferdoush et al., (2021)** who discovered that routine pain rating in the postoperative period is a critical component in reducing the incidence and severity of acute postoperative pain while also enhancing patient safety and satisfaction. **Gouda et al., (2018)** also found that the implemented nursing intervention program for the study group resulted in reduce postoperative pain and complications as well as increase of patients' satisfaction.

The present study showed that postoperative anxiety level scores were significantly in the experimental group compared with control group after early ambulation and breathing exercise (p<0.05). This attributable to education preoperative lead to reassurance and improve in emotional well-being after postoperative. These findings came in the same line with **Hussein & Taha (2018)** who revealed that the level of anxiety and distress was decreased among study group than compared with control group. **Shashi & Rakesh (2017)** showed that the reduction in anxiety and distress after education program among hysterectomy women. These findings are echoed by **Stessel et al., (2015)** who stated that physical problems and psychological problems was improved significantly improved in the intervention group than control group.

In the current study the physiological parameters revealed majority had normal vital signs among patients in both groups. There was significant difference

statistical in vital signs mainly blood pressure and oxygen saturation in the experimental group after the intervention (early amputation and deep breathing) compared to control group in postoperative hysterectomy. This findings were supported in a study conducted **Vahedian and colleagues (2021)** who revealed that the deep breathing exercise significantly reduced mean blood pressure and increased O2 saturation in the experimental group after the program (deep breathing exercise) compared to control group (P<0.05). **Tripathi & Sharma (2017)** also revealed that oxygen saturation stay constant in study group while there was a decrease in control group significantly.

The early post-operative ambulation and breathing exercise are integral part of all the post-surgical care, the nurses must be practiced for helping to reduce deep vein thrombosis (DVT) and improve lung function. **Taksande et al., (2021)** reported that post-operative breathing exercises help to improve pulmonary function and quality of recovery among postoperative patients.

Finally, early postoperative ambulation and deep breathing exercise should be integral part of all the post-surgical that must practice by nursing or physiotherapy for all postoperative gynecological patients in clinical setting.

Conclusion:

The present study concluded that early ambulation and deep-berating exercises among women undergoing abdominal hysterectomy may serve as an effectively intervention to improve pain, minimizing anxiety and enhance of physiological outcome mainly oxygen saturation after abdominal hysterectomy.

Recommendations

The results recommended that practice ambulation and breathing exercise postoperative surgery in clinical setting and further study replicated with a large sample size for better generalizations.

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