

Effect of Preoperative practice of surgical position on postoperative pain and general comfort in patients undergoing kidney surgeries

Ass. Prof. Samah M.Abd Elgaphar^{*1}

Adult Health Nursing Department, Faculty Of Nursing, Menoufia, University, Egypt

Author email id: samah.mohamed2014@yahoo.com

Abstract: The efficacy of preoperative practice of surgical position for patients undergoing kidney surgeries is, questionable and there is no evidence of its benefit on pain and discomfort. This study aimed to evaluate the effect of preoperative practice of surgical position on postoperative pain and general comfort in patients undergoing kidney surgeries. A quasi-experimental research design was conducted to meet the aim of the study. The study was conducted in urology department of University hospitals at Menoufia governorate, Egypt. A purposive sample of 80 Subjects admitted for kidney surgeries were selected and randomly allocated into practice group (n=40), and control group (n=40). The practice group were instructed to practice the kidney surgical position 3 times daily for 7 days before surgery. The data gathering instruments were Pain Rating Scale and the Shortened General Comfort Questionnaire SGCQ. The main findings of the study were that, there was statistically significant reduction in low back pain and contralateral shoulder pain in practice group than the control one on postoperative days 1–3 ($P < 0.05$). The physical domain score on SGCQ was significantly higher in the practice group than in the control group ($P < 0.01$). The study concluded that preoperative practice of surgical position is effective for reducing postoperative low back pain and contralateral shoulder pain and improving the physical comfort in patients undergoing kidney surgeries.

Keywords: surgical position, kidney surgery, postoperative pain, comfort.

1. INTRODUCTION

The patient's surgical positioning is an important procedure in intraoperative nursing care. It refers to the practice of placing a patient in a particular physical position during surgery. The goal in selecting and adjusting a particular surgical position is to maximize anatomic exposure of the surgical site that causes the least physiological compromise of the patient, while also protecting the skin and joints. For this purpose, the patients' anatomic and physiological alterations need to be identified, associated with the type of anesthesia, procedure type and surgical time he/she will be submitted to, so that the positioning is adequate and does not cause postoperative complications (St-Arnaud and Paquin, 2008; Chui, Murkin, Posner & Domino, 2018).

The selection of a surgical position is made after considering relevant physical and physiological factors, such as body alignment, circulation, respiratory constraints, and the musculatory system to prevent stress on the patient. Physical traits of the patient must also be considered including size, age, weight, physical condition, and allergies. The type of anesthesia used also affects the decision. (St-Arnaud and Paquin, 2008; AORN, 2015; Jane and Rothrock, 2019).

Over the years comfort has been the main goal of nursing outcomes and many activities has been promoted to achieve this fate which in turn promote patient's recovery process. Comfort Needs are assessed in four contexts of patient's experience : physical, psychospiritual, environmental and social context of experience. According to comfort theory, patients experience comfort needs in stressful health care situations .These needs should be identified by a nurse who then implements comfort measures to meet the needs (**Kolcaba, Tilton, & Drouin, 2006 ; Kolcaba, 2010 ;Kolcaba cited in Alligood, 2014**).

Prolonged maintenance of surgical position often results in postoperative pain and discomfort in patients. All previous studies appointed that the patient's surgical positioning causes some negative impact on body systems and can entail several complications, such as: musculoskeletal pain, joint dislocation, peripheral nerve damage, skin injuries, cardiovascular and pulmonary problems and even compartment syndrome (**Feuchtinge et al.,2006 ; Murphy,2004; Ceyhan and Gulec, 2010 ; Hinkle, & Cheever, 2018**). The most common nerve injuries during surgery occur in the upper and lower extremities. Injuries to the nerves in the arm or shoulder can result in numbness, tingling, and decreased sensory or muscular use of the arm, wrist, or hand. Other causes of nerve or muscular damage to the extremities is caused by pressure on the body by the surgical team leaning on the patient's arms and legs. (**Hinkle, & Cheever, 2018 ; Jane and Rothrock ,2019**).

Indeed nurses had a crucial role in sharing the decision with the surgical team on how to best position the patient to facilitate activities during anesthesia and surgery and reduce pain and discomfort (**Cassorla, & Lee 2015 ;Practice Advisory for the Prevention of Perioperative Peripheral Neuropathies ,2018**). The kidney position is used for kidney surgeries and it is much like the lateral position except the patient's abdomen is placed over a lift in the operating table that bends the body to allow access to the retroperitoneal space. A kidney rest is placed under the patient at the location of the lift. However, the kidney position is associated with postoperative peripheral nerve, muscle, and skin injuries. These injuries can result in low back pain, shoulder pain, and general discomfort. The efficacy of Preoperative practice of surgical position for patients undergoing kidney surgeries is, questionable and there is no evidence of its benefit on pain and discomfort. Only one nonrandomized pilot study was made regarding this subject (**Cassorla, & Lee, 2015 ;Huang et al. 2018**).

This research is also motivated by the lack of Egyptian research about preoperative practice of surgical positioning and the importance of research to support decision making by perioperative nurses to apply it in clinical practice. Hence the present study aimed to evaluate the effect of preoperative practice of surgical position on postoperative pain and comfort in patients undergoing kidney surgeries.

Significance of the Study

Proper surgical positioning can have a dramatic effect on post-operative mobility, recovery and surgical complications & the surgical team should be familiar with the goals of achieving safe and effective positioning of the surgical patient. (**Hinkle, & Cheever, 2018**).

The kidney surgical position often results in postoperative pain and discomfort in patients.(**Huang et al. 2018; Hinkle, & Cheever, 2018**). Patient comfort, when using general anesthesia or when the patient is conscious, is important toward decreasing any undue physical and/or psychological stress. When the patient is unconscious, a good practice is to treat the patient as if he/she was conscious. (**Servant & Purkiss , 2016**).

When the patient has been administered anesthetic agents, the ability for the patient to communicate pain and pressure to the surgical team has been eliminated; therefore, the surgical team now becomes responsible for the patient to ensure the positioning has been conducted in a safe manner, and the integumentary, musculoskeletal, respiratory and circulatory system functions have been preserved . Additionally, it may be necessary to rehearse the surgical position with the patient prior to surgery to confirm, it is not placing any undue physical stress on the body (**Servant & Purkiss , 2016**). This intervention can be useful in abolishing pain , reducing complications, related to positioning and promoting holistic comfort in clinical practice in patients undergoing kidney surgeries.

Therefore this study could provide information that nurses & other healthcare workers (HCWs) in the perioperative setting can use to develop and implement policies and procedures for best practices, related to positioning the surgical patient on the operating room (OR) table.

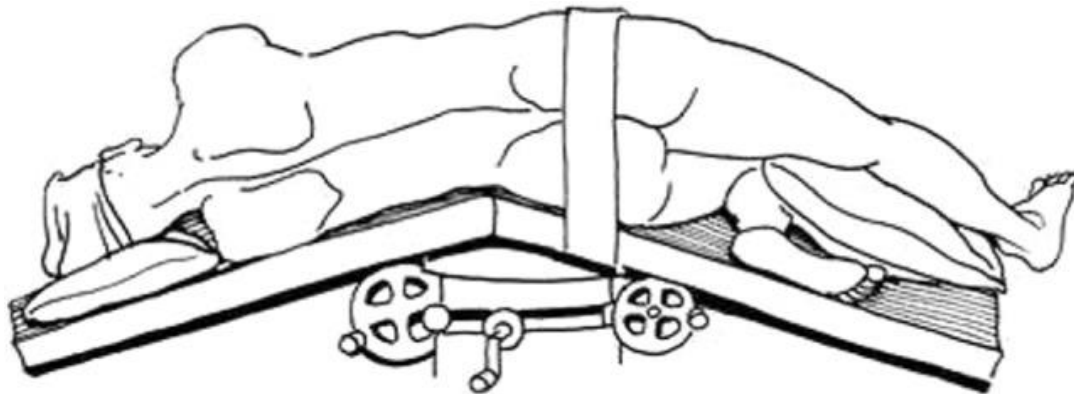


Figure (1) the kidney position

Adopted from : Jane C. Rothrock (2019). *Alexander's care of the patient in surgery* (16 ed.). Mosby. pp. 177-181

Aim of the Study

This study aimed to evaluate the effect of preoperative practice of surgical position on postoperative pain and general comfort in patients undergoing kidney surgeries.

Research hypothesis

The following research hypothesis was formulated to achieve the aim of the study:

Preoperative practice of surgical position in patients undergoing kidney surgeries will offer a potentially useful mean for reducing postoperative low back pain and contralateral shoulder pain and improving general comfort.

2. SUBJECTS AND METHODS

Research design: A quasi-experimental design was utilized.

Setting of the study: This study was conducted at Urology Surgical Department of Menofia University Hospitals in Egypt. This department divided into two sections one for males & other for females. Each of them consists of four rooms & one isolation room. Each room contain six beds and the isolated room contains two beds. The department has two nursing room one at male section & other at female section and also has supplies room.

Subjects: From April 2018 to September 2018, 80 patients undergoing kidney surgeries were selected using the purposive sampling method based on **Epi-Info program** to estimate sample size. Patients from ward 1 were assigned to the practice group (n=40), and those from ward 2 were assigned to the control group (n=40). The practice group were instructed to practice the surgical position 3 times daily for 7 days before surgery. They were selected according to the following criteria: (1) All patients received laparoscopic kidney surgery with the 90° kidney position and **under general anesthesia**, (2) aware and aged: 18-60 years. Exclusion criteria: Patients with (1) limb deformities, (2) vascular diseases of the extremities, (3) diseases of the major organs, (4) mental disorders and unwilling to participate in the study.

Tools

Pertinent data for this study were collected using the following instruments:

Tool (I) Interviewing questionnaire: This questionnaire was developed by the investigator. It was based on a thorough review of literature and included the following Sociodemographic and medical data including age, education, preoperative diagnosis, and body mass index (BMI). Each subject was personally interviewed by the investigator and asked to respond to each of the questions in the designed questionnaire.

Tool (II) The Numeric Pain Rating Scale: Adopted from (Mc Caffery, Beebe et al. 1989).

The patient is asked to indicate the intensity of current, best, and worst pain levels over the past 24 hours on a scale of 0 (no pain) to 10 (worst pain imaginable). The average of the 3 ratings was used to represent the patient's level of pain over the previous 24 hours (0 indicate no pain, 1-3 mild, 4-6 moderate, 7-10 severe).

Tool (111) Chinese version of the shortened General Comfort Questionnaire:

Shortened General Comfort Questionnaire (SGCQ) of Kolcaba , (2003) was modified by the researchers in order to measure comfort in this study. This tool consists of six positive and ten negative statements scaled in six responses (one to six) ranging from strongly disagree to strongly agree. The 16 items of SGCQ cover all contexts of comfort. The questionnaire comprises of **four items related to physical aspect** , **five items related to psychospiritual aspect**., **three items related to environmental aspect**, and four items related to sociocultural comfort aspect .Finally, the sum of scores was determined, so that the minimum score was 16 and the maximum score was 96. The higher score indicates a higher level of comfort. Content validity of the modified instrument and intervention was evaluated by a panel of five experts in medical surgical nursing . Afterwards, the modified SGCQ was translated into Arabic language. Next, the researchers tested the reliability of the modified SGCQ, which showed that the Cronbach's alpha coefficient was 0.81.

Data collection process

1- Ethics approval: permission to carry out the study from responsible authorities and participants was obtained after explanation of the purpose of the study. All procedures were approved by the Urology department head of Menoufia University Hospitals in Egypt . The researchers introduced themselves to every participant, explain the purpose of the study and assured them that confidentiality would be maintained throughout the study then informed consent was obtained from each subject before this study. Patient right to withdraw at any time of research participation was considered and respected

2- Development of study tools: previously mentioned in the tool section.

3- Validity :Tool (I) and (III) were submitted to five experts in the field of medical surgical nursing and the field of urology for content validity and the necessary modifications were carried out accordingly.

4- Reliability: Reliability of the tools was tested using **Cronbach's alpha**. Reliability coefficient for tool (I) was 0.76, tool (III) was 0.81

5- A pilot study was conducted on 10% of the study sample (8 patients) Prior to the actual study, to test feasibility and applicability of the tools and then necessary modifications were carried out accordingly. Data obtained from the pilot study were not included in the current study.

6- Intervention : Subjects of the practice group were instructed to practice the kidney position 3 times daily for 7 days before surgery, each for 20 minutes. They were shown a diagram of **the kidney position (Figure 1)** and instructed to take the 90° lateral position with the ipsilateral side upward. The two arms were straight forward. A very thin cushion was placed under the waist near the 11th and 12th ribs. The upper leg was straight, and the lower leg was bent.

7- Data collection:-Data collection was extended over a period of 6 months from April 2018 to September 2018. Patients who agreed to participate in the study and fulfilling the inclusion criteria were included in the study. The researchers initiated data collection by firstly collecting sociodemographic data ,then pain and comfort were assessed using the Pain Rating Scale and modified version of SGCQ (**Zhu et al.2006**). The questionnaires were administered for 3 days postoperatively.

8- Data processing and statistical analysis: Data were collected, tabulated, statistically analyzed using an IBM personal computer with Statistical Package of Social Science (SPSS) version 20. Categorical data were presented as frequencies or percentages. Continuous data were presented as mean \pm SD. Comparisons were made using the Chi-square test or the Student's *t*-test $P > 0.05$ was considered statistically significant.

3. RESULTS**Table (1): Illustrated Demographic Characteristics of the Subjects**

A total of 80 patients were included in the present study. All patients received general anesthesia during surgery (*According to inclusion criteria*) . There was no significant difference between the two groups (practice and control) as regard sex, age, BMI, and preoperative diagnosis ($P > 0.05$).

Table (II): Showed score of postoperative pain

On the immediate three postoperative days there was a significant reduction in low back pain and contralateral shoulder pain in the practice group than the control one. (P < 0.05). However the two groups did not differ significantly in wound pain on 3 postoperative days (P > 0.05).

Table (III): Illustrated scores of postoperative comfort

On the immediate postoperative three days, there was no significant difference in the general comfort between the two groups (P > 0.05). In the four domains of the modified version of SGCQ, the physical domain score was significantly higher in the practice group than in the control one. On the contrary the scores of the other three domains (psychospiritual, sociocultural, and environmental) were not significantly different between the two groups.

Table (1): Distribution of sociodemographic variables of study sample

	Practice group (n=40)	Control group (n=40)	Test of significance	P value
Age (years) Mean ±SD	36.22 ±9.323	37.12 ±8.27	t.test 0.94	0.35
Sex (percent)			Fisher's Exact Test	0.655
-Male	19 (47.5)	22 (55)	0.450a	
-Female	21 (52.5)	18 (45)		
BMI	23.1±2.9	22.5±3.2	t.test 0.69	0.49
Diagnosis (n)			X ² 0.27	0.87
-Renal cyst	14 (35%)	12(30%)		
-Renal stone	12 (30%)	14(35%)		
-Renal tumor	9(22.5%)	8 (20%)		
-Adrenal tumor	5(12.5%)	6(15%)		
Operation time (min)	154±72	136±24	t.test 3.4	0.051
Postoperative analgesia, n			X ² 1.15	0.56
- PCEA	5(12.5%)	6(15%)		
-PCIA	35(87.5%)	33(82.5%)		
-None	0(0%)	1(2.5%)		

* BMI(body mass index); PCEA(patient-controlled epidural analgesia); PCIA(patient-controlled intravenous analgesia).

Table (II): Pain Rating Scale Scores on Postoperative days (mean±SD)

Time	Practice group (n=40)	Control group (n=40)	T.test	P value
Postoperative day 1				
• Wound pain	1.54±0.49	1.82±0.75	1.31	0.32
• Low back pain	0.59±0.22	1.79±0.38	17.10	<0.001
• Contralateral shoulder pain	0.12±0.11	0.82±0.32	6.11	0.025
Postoperative day 2				
• Wound pain	3.39±1.07	3.62±1.65	1.1	0.61
• Low back pain	1.23±0.47	3.76±0.81	17.10	<0.001
• Contralateral shoulder pain	0.99±0.90	2.3±0.89	4.90	0.023

Postoperative day 3				
• Wound pain	2.00±0.63	2.21±0.98	1.21	0.21
• Low back pain	0.76±0.29	2.33±0.50	17.10	<0.001
• Contralateral shoulder pain	0.16±0.14	1.20±0.41	15.11	0.01

Table (III): Postoperative Comfort Scores of study sample on SGCQ (mean±SD).

Time	Practice group (n=40)	Control group (n=40)	T. Test	P value
Postoperative day 1				
• General comfort	79.70±2.57	78.13±3.65	2.23	0.07
• Physical domain	15.90±1.01	13.07±0.91	13.17	<0.001
• Psychospiritual domain	27.71±1.65	28.47±1.70	2.03	0.35
• Sociocultural domain	17.60±0.76	17.59±1.54	0.01	0.99
• Environmental domain	20.18±1.07	19.48±1.20	2.75	0.08
Postoperative day 2				
• General comfort	84.74±2.70	80.71±3.73	5.53	0.05
• Physical domain	17.81±1.13	13.99±0.98	16.21	<0.001
• Psychospiritual domain	32.42±1.93	29.89±1.78	3.09	0.06
• Sociocultural domain	19.71±0.85	18.47±1.62	2.27	0.08
• Environmental domain	21.99±1.16	20.45±1.26	3.68	0.08
Postoperative day 3				
• General comfort	85.58±2.73	83.32±3.80	4.41	0.05
• Physical domain	18.88±1.19	16.07±1.19	8.80	<0.001
• Psychospiritual domain	38.91±2.31	33.69±1.89	3.28	0.06
• Sociocultural domain	22.27±0.96	21.91±1.68	3.97	0.1
• Environmental domain	22.43±1.19	20.58±1.27	3.76	0.11

4. DISCUSSION

This study aimed to evaluate the effect of preoperative practice of surgical position on postoperative pain and general comfort in patients undergoing kidney surgeries.

The goal of the surgical position is to provide optimal visualization of, and access to, the surgical site that causes the least physiological compromise of the patient, while also protecting the skin and joints. Positioning the patient for a surgical procedure is a shared responsibility among the surgeon, the anesthesiologist, and the nurses in the OR. The optimal position may require a compromise between the best position for surgical access and the position the patient can tolerate. The chosen position may result in physiologic changes and can result in soft tissue injury (eg, nerve damage, pressure-induced injury or ulceration, or compartment syndrome)(Welch ,Brummett, Welch, et al. 2009).

Furthermore a patient under anesthesia is at their most vulnerable. They cannot feel or communicate pressure, pinched skin, numbness or discomfort of any kind. They cannot reposition themselves. Therefore, safe intraoperative patient positioning is crucial, and a clear protocol must be in place and followed by all members of the perioperative team(surgeon, anesthetist and nursing staff) (Jane and Rothrock ,2019; Marnie,2018).

There is no evidence explaining the specific relationship % kidney surgical position and postoperative pain and discomfort and this is a pioneer study in Egypt regarding this subject . A logical explanation for this relationship is that the prolonged maintenance of surgical position may exert extra pressure on the body leading to low back pain and general discomfort. Previous studies on postoperative experiences of patients during surgical procedure reported that post-operative pain remains the most widely associated experience by patients (*Ceyhan and Gulec, 2010 ; Subramanian et al.2016*)

Data generated by this study supported the hypothesis and demonstrated that preoperative practice of the surgical position significantly reduced postoperative low back pain and contralateral shoulder pain. This congruent with the result of Huang et al.(2018) who provide a logical explanation for these results and said that practicing of the surgical position for adequate time before surgery (about 7 days) may strengthen the muscles and tendons of the low-back area and the shoulders. This might help the patients to pre-operatively adapt to the surgical position and resist fatigue during the surgeries.

Concerning comfort : Comfort Care is a nursing art that entails the process of comforting actions performed by a nurse for a patient and improving the patient's experience of comfort is a crucial nursing role . (**Kolcaba, 2010**). Based on **comfort theory** comfort needs are assessed in four contexts of patient's experience : physical, psychospiritual, environmental and social context of experience. Physical context-pertaining to bodily sensations and homeostasis (Pain relief , Regular bowel function , Fluid/electrolyte balance , Adequate oxygen Saturation ,Turning and positioning) (**Kolcaba , Tilton and Drouin ,2006**)

The current study found that the practice group had significantly higher physical comfort than the control one for three postoperative days. pain is an important aspect of physical context and can cause significant discomfort of the patients. Therefore, the possible explanation is that the reduction in low back pain and shoulder pain resulted in the improvement of the physical comfort. Unsurprisingly, the postoperative scores of the psych spiritual, sociocultural, and environmental comfort were not increased significantly (**Huang et al., 2018**)

Comfort needs should be identified by a nurse who then implements comfort measures to meet the needs. Comfort care include , pain relief, positioning, monitoring, relieve anxiety, provide information, instill hope, plan for recovery and things that make patients/families feel cared for, strengthened and connected. (**Parker & smith, 2010**).

Safe surgical positioning requires planning and good communication between the anesthetist and surgical team and adequate numbers of skilled personnel are required at the beginning and at the end of a surgical procedure to facilitate safe positioning. Furthermore nurses should have adequate knowledge about physiological changes associated with the position .These data might be helpful to them in predicting potential problems, planning and implementing a design to reduce or prevent these problems . Thus, the design of the present study should be considered as an important choice in clinical practice since it is easy to perform and inexpensive.

Limitations : The fact of not finding enough studies conducted on these subjects.

5. CONCLUSIONS

The findings of the present study concluded that preoperative practice of surgical position is effective for reducing postoperative low back pain and contralateral shoulder pain and improving the physical comfort in patients undergoing kidney surgeries.

6. RECOMMENDATIONS FOR PRACTICE AND RESEARCH

Based on the findings of the current study, the following recommendations can be suggested:

- 1- Preoperative practice of the kidney surgical position should be included routinely in preoperative care since it is easy to perform and introduce in practice.
- 2- Further researches is recommended using a larger probability sample from different geographical areas to help for generalization of the results.
- 3- Surgical personnel should periodically complete continuing education (CE) on patient positioning in order to reinforce knowledge and skills about principles for positioning patients.

International Journal of Novel Research in Healthcare and Nursing

 Vol. 6, Issue 2, pp: (273-280), Month: May - August 2019, Available at: www.noveltyjournals.com
REFERENCES

- [1] St-Arnaud D, Paquin M. Safe positioning for neurosurgical patients. *AORN J.* 2008; 87(6):1156-72.
- [2] Chui J, Murkin JM, Drosdowech D. A Pilot Study of a Novel Automated Somatosensory Evoked Potential (SSEP) Monitoring Device for Detection and Prevention of Intraoperative Peripheral Nerve Injury in Total Shoulder Arthroplasty Surgery. *J Neurosurg Anesthesiol* 2018.
- [3] Association of perioperative registered nurses (AORN) .(2015).Guidelines for perioperative practice.Denver,CO: AORN
- [4] Jane C. Rothrock (2019). "5". *Alexander's care of the patient in surgery* (15 ed.). Mosby. pp. 177-181
- [5] Kolcaba K, Tilton C, Drouin C. Comfort theory: a unifying framework to enhance the practice environment. *J Nurs Adm.* 2006;36(11):538–544. [PubMed]
- [6] Alligood M, (2014). *Nursing theorists and their work.* (8th ed.): p.659 - 660. (Madeleine Leininger & Marilyn McFarland. P.417-441 and Katharine Kolcaba, p.657-671) Elsevier Mosby.
- [7] Feuchtinge J, Bie R, Dassen T, Halfens R. A 4-cm thermoactive viscoelastic foam pad on the operating table to prevent pressure ulcer during cardiac surgery. *J Clin Nurs.* 2006; 15(2): 162-7.
- [8] Murphy EK. Protecting patients from potential injuries. *AORN J.* 2004; 79(5):1013-6.
- [9] Ceyhan D and Gulec M (2010). Is postoperative pain only a nociceptive pain? *Journal of Turkish society of Algology.* Pg.47-52.
- [10] Hinkle, J., Cheever, K. (2018). *Brunner & Suddarth's Textbook of Medical Surgical Nursing*, 14th ed. Welter's Kluwer, Philadelphia
- [11] Cassorla, L, Lee, JW. "Patient positioning and associated risks". *Miller's Anesthesia.* vol. 41. 2015. pp. 1240-65.
- [12] Practice Advisory for the Prevention of Perioperative Peripheral Neuropathies 2018: An Updated Report by the American Society of Anesthesiologists Task Force on Prevention of Perioperative Peripheral Neuropathies. *Anesthesiology* 2018; 128:11.
- [13] Huang J, Zhang D, Jing Li S, Yan Cui L, and Li Gao F . Preoperative practice of surgical position reduces postoperative pain and discomfort in patients receiving kidney surgeries: a nonrandomized pilot study. *Ther Clin Risk Manag.* 2018 ; v.14: 1111–1114.
- [14] Servant C, Purkiss S. *Positioning Patients for Surgery.* Cambridge, NY: Cambridge University Press; 2016).
- [15] McCaffery, M., Beebe, A., et al. (1989). *Pain: Clinical manual for nursing practice,* Mosby St. Louis, MO
- [16] Kolcaba K. *Comfort Theory & Practice: A Vision For Holistic Health Care and Research* New York: Springer Publishing Company, Inc.; 2003.....medical-surgical
- [17] Zhu L, Gao F, Luo H, Deng H, Wang Q. Reliability and validity of the General Comfort Questionnaire. *Chin J Pract Nurs.* 2006;22(5):57–58.
- [18] Welch MB, Brummett CM, Welch TD, et al. Perioperative peripheral nerve injuries: a retrospective study of 380,680 cases during a 10-year period at a single institution. *Anesthesiology* 2009; 111:490.
- [19] Marnie B Welch. Patient positioning for surgery and anesthesia in adults,2018 .www.uptodate.com
- [20] Subramanian P, Ramasamy S, Ng KH, Chinna K, Rosli R. Pain experience and satisfaction with postoperative pain control among surgical patients. *International Journal of Nursing Practice* 2016; 22: 232–238
- [21] Parker, M. E., & Smith, M. C. (2010). *Nursing theories and nursing practice.* , 3rd (ed Philadelphia: F.A. Davis Co.