

A Call for New Standard of Care: Impact of Enhanced Recovery after Surgery (ERAS) Programs

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Abstract: Objective. To study the effects of introducing an Enhanced Recovery After Surgery (ERAS) protocol modified for gynecological surgery, on length of stay and patient satisfaction following elective abdominal hysterectomy.

The aim was to apply Enhanced Recovery After Surgery (ERAS) protocol for elective abdominal hysterectomy.

Methods: the study used a quasi-interventional research design.

Setting: The study was conducted at the New General Mansoura Hospital, Mansoura city, Dakahlia Governorate from October 2017 to October 2018. The study sample was 60 participant women admitted to the previously mentioned setting.

Tools: I- Structured Interview Questionnaire: This tool included two parts: Part one: Patient's General Characteristics; included name, age in years, BMI kg/m², ASA classification, residence, marital status, educational level, job, and health insurance. Part two: includes two sections: Patient's Obstetrics history; included parity, gravidity, mode of previous delivery, abortion, and contraceptive methods. Patient's medical history, included Diagnosis, presence of cardiac disease or not or Diabetes Mellitus. The second tool: A structured Enhanced Recovery After Surgery (ERAS) Protocol. The third tool: Patients' satisfaction checklist after applying ERAS Protocol.

Results: showed that there was a significant relation between both groups regarding to better satisfaction and decreased their length of hospital stay after applying ERAS protocol. **Conclusions.** Introducing the ERAS protocol for abdominal hysterectomy reduced length of stay without increasing complications or readmissions.

Recommendation: study recommended applying ERAS protocol in order to have better satisfaction and reduce length of hospital stay.

Key words: abdominal hysterectomy, Enhanced Recovery After Surgery, length of stay

Date of Submission: 09-08-2019

Date of Acceptance: 23-08-2019

I. Introduction:

An enhanced recovery protocol (ERP) is a set of standardized perioperative procedures and practices applied to all patients undertaking a given elective operation. Generally, these protocols are not intended for emergent situations, but components of these protocols could definitely be applied to the emergent/urgent cases¹. These programs are designed to adjust psychological and physiological responses to major operations and have shown that complications and length of hospital stays are reduced, cardiopulmonary function improved, bowel functions returned early and normal activities resumed earlier². When the ERAS programs have been successfully implemented the length of stays in hospital have been decreased by 35-40 percent. This advantage was observed without a concurrent increase in complications or re-admission rate. Some studies have observed a decline in surgical (anastomotic leaks, etc.), and non-surgical complications (nosocomial infections, etc.) in the post-operative period. ERAS was also associated with an earlier return to work and productivity³. After the major surgeries with help of fast track protocols, the client will or will not have full energy to perform some of the activities as the basic human needs, will need help, support and/or will not be able to tend to him/herself because of movement restriction, unconsciousness etc. From this time, it will become the nurse role to identify those needs and disabilities and tend to them involving the physician therapeutic plan. Once the nurse has found the needs, she will need to establish a nursing care plan which will assist her to make patient a follow up and ensure that the needs have been covered and tended to that individual to accomplish the goal set and henceforth good health in the future⁴. The nurse's role within the enhanced recovery after surgery (ERAS) programs is clearly vital as part of the multidisciplinary team, as the individual responsible for inter professional communication, individualized education and self-care techniques training (among others) to empower the client, clarify doubts and avoid inaccurate beliefs. Numerous studies illustrate that nurses attain an important role in

better development and implementation of the ERAS programs in everyday clinical practice⁵. The enhanced recovery programs, which allow an earlier discharge, lead to the need for more careful supervision of clients at home, and telephone follow-up is an excellent tool for this purpose. The study also showed that roughly 50% of clients, after discharge, had contact with the nurse of the program and not only with the doctor, emphasizing the role of nurses in the follow-up of their clients, even outside the context of hospitalization⁶.

II. The study's aim:

apply Enhanced Recovery After Surgery (ERAS) protocol for elective abdominal hysterectomy.

III. Subjects & method:

1.1 - Research Design: A quasi-interventional (quasi-experimental) design was used in this study.

1.2 - Setting: This study was conducted at obstetrics and Gynecological surgery department, Mansoura New General Hospital in delta region,

1.3 Participants: It consisted of 60 participant women, who fulfilling the inclusion criteria admitted to the previously mentioned setting.

3.4 Tools: four tools were used in this study as the following:

3.4.1- Tool I: Structured Interview Questionnaire, it included two parts; This tool included two parts: Part one: Patient's General Characteristics; included name, age in years, BMI kg/m², ASA classification, residence, marital status, educational level, job, and health insurance. Part two: includes two sections: Patient's Obstetrics history; included parity, gravidity, mode of previous delivery, abortion, and contraceptive methods. Patient's medical history, included Diagnosis, presence of cardiac disease or not or Diabetes Mellitus.

3.4.2- Tool II: The second tool: A structured Enhanced Recovery After Surgery (ERAS) Protocol.

3.4.3- The third tool: Patients' satisfaction checklist after applying ERAS Protocol.

3.4.4- The fourth tool: Patients' length of stay in hospital after applying ERAS Protocol.

Methods:

- An official approval for conducting the study was obtained from the research ethics committee of faculty of Nursing of Mansoura University
- An oral consent was obtained from each participant in this study after explaining the study's aim. Participants were assured that the information is confidential and used for study purpose only.
- The participants had the right to withdraw from the study at any time without giving any reasons
- A pilot study was applied on 10% (6) participant of total number to test the simplicity, clarity of the questions. The participants of the pilot study were excluded from the study group. Minor modifications were done accordingly.

IV. Results

The data collected were analyzed statistically and the results are categorized as following parts: The collected data were analysed statistically and the results were categorized into the following parts:

Part I: Distribution of the Studied Patients According to Their General Characteristics (Table 5.1).

Part II: Distribution of The Studied Patients According to Their Overall Satisfaction after Applying ERAS Protocol in Relation Overall satisfaction I: (Table 5.2).

Part III: Distribution of The Studied Patients According to Their Length of Hospital Stay After Applying ERAS Protocol. (Table 5.3).

Table (5.1) shows the distribution of the studied patients according to their general characteristics. More than half (56.7%) of the intervention group aged 41-50 years compared to more than one third (36.7%) of the control group. Less than three quarters (73.3%) of the intervention group have body mass index (BMI) 25 to less than 30 kg/m² as compared to more than one third (36.7%) of the control group. In relation to ASA classification, more than half (56.7%) of the intervention group were class II compared to more than one two third (70.0%) of the control group. The table also showed that sixty percent of the intervention group were lived in rural area compared to more around one third (33.3%) of the control group. Around three quarters (73.3) of the intervention group were married compared to around two third (66.7%) of the control group. Regarding educational level, forty percent of the intervention group were highly educated compared to around one third (30.0%) of the control group. Around half of the intervention and the control group were house wife (53.3%, 50.0% respectively). Finally, forty percent of the intervention group reported that they have health insurance compared to half of the control group.

Table (5.1): Distribution of the Studied Patients According to Their General Characteristics.

Characteristics	Intervention		Control		Significance test
	No	%	No	%	
Age (Years)					
31- 40	7	23.3%	5	16.7%	FET:4.758 P: 0.06
41- 50	17	56.7%	11	36.7%	
>51	6	20.0%	14	46.7%	
Range					
Mean ± SD					
BMI					
< 25	4	13.3%	9	30.0%	FET:7.990 P: 0.023*
> 25and < 30	22	73.3%	11	36.7%	
> 30	4	13.3%	10	33.3%	
ASA classification					
Class I	13	43.3%	9	30.0%	X2:1.148 P: 0.284
Class II	17	56.7%	21	70.0%	
Residence					
Rural	18	60.0%	10	33.3%	X2:4.286 P: 0.037*
Urban	12	40.0%	20	66.7%	
Marital Status					
Married	22	73.3%	20	66.7%	FET:0.317 P:0.853
Divorced	4	13.3%	5	16.7%	
Widow	4	13.3%	5	16.7%	

Table (5.2.1) presents the distribution of the studied patients according to their overall satisfaction after applying ERAS protocol. It was observed that there is a significant relation between both groups regarding their overall satisfaction after applying ERAS protocol.

Table (5.2.1) Distribution of The Studied Patients According to Their Overall Satisfaction after Applying ERAS Protocol in Relation Overall satisfaction

Patients' satisfaction checklist after applying ERAS Protocol	Intervention		Control		Test of significance
	No	%	No	± SD	
Overall satisfaction				± 1.74	t=11.671, P0.000
very satisfied	2	6.7%	0	± 0.37	t=8.393, P0.000

Table (5.3) showed the distribution of the studied patients according to length of hospital stay after applying ERAS protocol. It was observed that there is a significant relation between both groups regarding their length of hospital stay after applying ERAS protocol.

Table (5.3): Distribution of the Studied Patients According to Their Length of Hospital Stay After Applying ERAS Protocol.

Patients' length of stay in hospital after applying ERAS Protocol	Intervention		Control		Test of significance
	No	%	No	%	
Total hospital length of stay from admission to discharge, (days)					
< 3 days	1	3.3%	0	0.0%	X ² :18.756 P: <0.001*
3-5 days	29	96.7%	16	53.3%	
> 5 days	0	0.0%	14	46.7%	
post procedure length of stay from end of procedure to discharge, (days)					
< 3 days	24	80.0%	2	6.7%	X ² :33.261 P: <0.001*
3-5 days	6	20.0%	25	83.3%	
> 5 days	0	0.0%	3	10.0%	
Readmission rate 30 day after surgery (all cause of readmission)					
<10%	25	83.3%	8	26.7%	X ² :19.604 P: <0.001*
10-30%	5	16.7%	21	70.0%	
> 30%	0	0.0%	1	3.3%	
Reoperation rate (reoperation for any indication within 30 days)					
<10%	27	90.0%	29	96.7%	X ² :4.071 P:0.131
10-30%	3	10.0%	0	0.0%	
> 30%	0	0.0%	1	3.3%	

V. Discussion

Applying ERAS protocol for elective hysterectomy women will decrease length of stay and increased patient satisfaction was accepted. The following discussion covered the findings related to the stated questions of the study.

Beginning with socio-demographic characteristics as a baseline for comparison, significant differences were not elicited in both groups as regarding age, ASA classification, Marital Status, Educational Level,

Occupation, and Health Insurance. Age ranged from 31 to 75 years in intervention group within Mean \pm SD (52 ± 13.13), but in the control group, it ranged from 32 to 73 years and the Mean \pm SD was 51.4 ± 12.27 .

More than half of the intervention group aged 41-50 years compared to more than one third of the control group. In relation to ASA classification, more than half of the intervention group were class II compared to more than one two third of the control group.

Around three quarters of the intervention group were married compared to around two third of the control group. Regarding educational level, less than half of the intervention group were highly educated compared to one third of the control group. About half of the intervention and the control group were house wives. Finally, less than half of the intervention group reported that they have health insurance compared to half of the control group.

This was on line with a study by **Spanjersberg, Van Sambeek, Bremers, Rosman & van Laarhoven, 2015**⁷ titled "Systematic review and meta-analysis for laparoscopic versus open colon surgery with or without an ERAS program" as the baseline characteristics within studies did not differ.

There was a statistically difference between the two groups regarding Body Mass Index (BMI) and their residence; less than three quarters of the intervention group have BMI 25 to less than 30 kg/m² as compared to more than one third of the control group. Finally, regarding their residence, about two thirds of the intervention group lived in rural area compared to one third of the control group.

This differs with the results of a prospective multi-centered study within an ERAS protocol per **Tiefenthal, Askliid, Hjern, Matthiessen & Gustafsson, 2016**⁸ named "Laparoscopic and open right-sided colonic resection in daily routine practice", as there was no difference between the two groups regarding BMI or residence.

By studying patients' satisfaction after applying ERAS protocol in relation to postoperative nutrition, mobilization and discharge related care. It was observed that there is a significant relation between both groups regarding their satisfaction after applying ERAS protocol in relation to postoperative nutrition, mobilization and discharge related care within p value $<0.001^*$.

This is similar to results of the study titled "Can Enhanced Recovery Pathways Improve Outcomes of Vaginal Hysterectomy? Cohort Control Study" done by **Yoong et al., 2014**⁹ who proved that implementing ERAS protocol improves patients' satisfaction regarding postoperative nutrition, mobilization and discharge related care.

The degree of coordination of the medical team that participated in the surgery, perceived by the patient, was not related in a statistically significant way with the satisfaction of the patients. Most patients considered that the multidisciplinary team that worked on their surgical procedure was very coordinated and would be re-operated according to the guidelines of this protocol and would recommend it to a friend. All these were the results of a study by **Olivares et al., 2018**¹⁰.

Concerning the length of stay, patients were tested after applying ERAS protocol. It was detected that there is a significant relation between both groups regarding their length of hospital stay after applying ERAS protocol. Near to all of the intervention group spent 3-5 days compared to half of the control group. More than three quarters of the intervention group spent < 3 days from end of procedure to discharge. The readmission rate was $<10\%$ after surgery for more than three quarters of the intervention group. Lastly, there was no statistically significant difference regarding reoperation rate as it was $<10\%$ for more than three quarters of both the intervention and the control groups.

Thiele et al., 2015¹¹; **Tiefenthal, Askliid, Hjern, Matthiessen & Gustafsson, 2016**⁸; **Rao, Howells & Haray, 2015**¹² have demonstrated a further decrease in hospital length of stay, while **Lindsetmo, Champagne & Delaney, 2009**¹³; **Kim, Kang, Lee, Oh & In, 2013**¹⁴ reported no decrease in hospital length of stay.

VI. Conclusion

- It could be concluded that the outcomes of the current research support its hypothesis; ERAS program is a simple tool that had no negative effects on patients.
- It seems to be effective and safe regardless of patient categories.
- Also, this program reduced the incidence of postoperative complications, increased patients satisfaction and shortened postoperative length of hospitalization.
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VII. Recommendations

According to the results of the current research work, the researchers suggested the upcoming recommendations:

- Further studies regarding ERAS and fast track protocols are needed, focusing on evaluations of more patient-related outcomes, such as patients' experience of the process, quality of life aspects and long-term consequences..

- When comparing the outcomes of minimally invasive procedures such as laparoscopic or abdominal surgery to abdominal surgery, the use of an enhanced recovery regimen should be employed to optimize perioperative care in both groups, to enable a fair comparison.
- Study should be applied for follow up longer than 30 days after surgery.
- Replicate the study on a larger sample for generalizing the findings.

Acknowledgments

Special thanks from the author to the participant in the current study, thanks also to hospital coordinators

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NohaLotfy Abdel-Aleem. " A Call for New Standard of Care: Impact of Enhanced Recovery after Surgery (ERAS) Programs" .IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 8, no.04 , 2019, pp. 07-11.