Postoperative Discomfort Among Laparotomy Patients from a Selected Hospital at Mangaluru: An Observational Study

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Abstract

Background Factors causing postoperative discomfort after laparotomy are numerous and must be explored in depth. The postoperative distress may significantly affect the patient's state of well-being. Hence, the present study aims to assess the factors contributing to discomfort after laparotomy.

Aim The aim was to assess and compare the discomfort between open and laparoscopic abdominal surgery.

Objectives of the Study

1. To analyze the causes of patient's discomfort after abdominal surgery.
2. To compare the discomfort between open and laparoscopic abdominal surgery.
3. To determine the association between pain and selected variables among open and laparoscopic abdominal surgery.

Materials and Methods An exploratory approach with a prospective observational design was adopted for this study. Using the purposive sampling technique, 100 patients were selected to open and 100 to laparoscopic abdominal surgery groups. Data were collected using demographic and clinical proforma and standardized postoperative discomfort inventory 6 and 24 hours after the surgery. The assessment focused on the study variables such as symptoms after the surgery and the factors contributing to the postoperative discomfort.

Statistical Analysis The collected data were analyzed using descriptive and inferential statistics using the SPSS software version 20.

Results Among 200 participants, most of the open (68%) and laparoscopic abdominal surgeries (42%) belong to 25 to 35 years of age. Also, 54% and 13% were diabetic in open and laparoscopic abdominal surgery groups, respectively. Most samples (56% in open and 68% in laparoscopic surgery) stayed 5 and 10 hours in postoperative ICU. In

Keywords

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open and laparoscopic abdominal surgeries, pain is the primary (100%) cause of postoperative discomfort after 6 hours of surgery. Movement restriction is also the reason for significant discomfort both in open (98%) and laparoscopic (100%) abdominal surgeries.

In contrast, pain (99% and 100%), movement restriction (92% and 95%), and abdominal distention (61% and 34%) were the major problems contributing to the patient's discomfort after 24 hours of both open and laparoscopic surgeries too. There was a significant difference in causes of patient discomfort between open and laparoscopic abdominal surgery after 6 hours ($P < 0.05$), except for discomfort related to IV drip ($P = 0.852$), constipation ($P = 0.2$), and chills ($P = 0.6$).

Conclusion Even though pain is the major distressing factor both in open and laparoscopic surgeries, the current study highlights a few other factors that affect postoperative recovery. Nurses' attention to such distressing factors will fasten patients' recovery and quality of life after abdominal surgery.

Introduction

Recent advances in the medical field have proven surgery as the treatment of choice for many diseases. Surgical procedures in the abdomen are common due to the increasing incidence of problems such as hernia, appendicitis, cholelithiasis, and peptic ulcer disease.Surgery induces a lot of physical and psychological stress on the individual. Traditionally, open surgical techniques are used for the treatment of various diseases. However, laparoscopic surgery is a better option than most open surgeries. Patients undergoing laparoscopic surgery resume activities of daily living, bowel movement, and oral intake earlier than those after open surgery. They had a shorter operative duration and hospitalization stay (8.5 ± 1.9 vs. 11.2 ± 1.8 d, $p < 0.05$).[1] Laparoscopic colectomy was associated with a shorter average hospital stay and fewer complications, and the length of hospitalization was significantly shorter in the laparoscopic group ($p = 0.001$)[2]. The risk of complications for patients who underwent laparoscopic colectomy is 2.4% compared to open colectomy, which was 42.9%. Keller et al also reported that the duration of hospital stay was significantly shorter in laparoscopic compared to open abdominal surgery (mean 5.78 vs. 7.80 days, $p < 0.0001$). The laparoscopic group had significantly lower readmission (5.82 vs. 7.68%, $p < 0.0001$), complication (32.60 vs. 42.28%, $p < 0.0001$), and mortality rates (0.52 vs. 1.28%, $p < 0.0001$)[3].

During the postoperative period, patients experience much distress that adversely affects their well-being. Discomfort in the postoperative period is common and may hinder patients' recovery[4] Patients experience much distress after surgery other than pain. The distress in the postoperative period may affect the patient's well-being and, thus, the postoperative recovery.[5] Postoperative nausea, vomiting, and pain are most commonly experienced after surgery[6] Postoperative pain is one of the leading causes of patient discomfort, which reduces patient satisfaction with surgery and postoperative care. In addition to pain, postoperative nausea and vomiting (PONV) are frequent causes of distress and may even extend the stay of patients in the postoperative units. Similarly, movement restriction and dry mouth cause discomfort. Patient comfort is an essential concern in patients receiving surgery; however, the seriousness of discomfort during recovery is unknown.[7] Therefore, all symptoms causing discomfort should be considered to improve the well-being of patients after abdominal surgery.

As pain is one of the most distressing symptoms, much attention is paid to managing postoperative pain. However, little attention has been focused on other factors contributing to discomfort after the surgery. Besides pain, other symptoms can affect patients' physical well-being during the postoperative period. Alleviating some symptoms and using medical devices only when needed may help reduce the discomfort in the postoperative period and improve the well-being of patients after surgery. With the shift of emphasis from traditional hospitalization to ambulatory surgery and enhanced recovery after surgery, patient safety and comfort are essential to clients' overall well-being.[8] Nursing practice interventions that prevent the discomfort associated with surgery and help patients effectively adapt to the postoperative situation are cost-effective and can be independently performed by nurses who observe the patient's condition and closely monitor the patient from time to time.[9]

Aim of the Study

The present study aims to identify the causes of patient's discomfort after abdominal surgery and compare the discomfort after open and laparoscopic abdominal surgery.

Materials and Methods

Ethical Consideration

- The Institutional Ethics committee approved the study (NUINS/CON/NU/IEC/2019-20/1481). Written permission

was obtained from the authorities, and informed consent was taken from each participant after explaining the patient information sheet in their local language. The researcher also obtained written permission to use the questionnaire for assessing the discomfort after surgery-the postoperative discomfort inventory from the author.[4]

Design and Settings

- This exploratory survey was designed as an observational and cross-sectional study. It was carried out in the selected tertiary care hospital with 1200 beds in Mangaluru. The data were collected from surgery wards, urology wards, gynecology wards, and postoperative ICUs from January 2020 to April 2020. A total of 200 patients were selected after open abdominal and laparoscopic surgeries using the purposive sampling technique based on the prevalence of the previous study. The inclusion criteria for the sampling were patients aged 25 to 65 years admitted to the postoperative ICU in the first 2 hours after surgery and available for assessment at 6 hours and 24 hours after surgery. Patients who needed respiratory support for more than 2 hours and had preexisting severe musculoskeletal problems, and confused patients due to delirium, dementia, psychoses, were excluded from the study. The tools used for the study include demographic proforma, clinical proforma, and a postoperative discomfort inventory. The demographic proforma consisted of seven items, and the clinical proforma had five items. A postoperative discomfort inventory is a standardized tool prepared and validated by Joseph E Banos and consists of 11 items such as pain, nausea, vomiting, movement restriction, sleepiness, dry mouth, insomnia, abdominal distention, constipation, intravenous line-related problems, and chills. A score of one was given if the discomfort was present and zero if there were no discomfort. The degree of discomfort is rated further on a 10-point scale, with the least score of 1 and a maximum of 10, denoting the degree of distress experienced by the patient.
- Eleven experts established the content validity of the instruments. Pretesting of the tools was conducted, and the reliability of the postoperative discomfort inventory was established with Cronbach's alpha value of 0.8. The pilot study was conducted. The tools were administered in the local language Kannada. The baseline demographic proforma and clinical data were assessed. The postoperative discomfort questionnaire was administered to identify the symptoms causing discomfort 6 hours and 24 hours after the surgery. If the distress/discomfort was present, a score of 1 was allotted, and the absence of discomfort was denoted with 0. Those who had discomfort were asked to rate the discomfort further on a 10-point scale-the postoperative discomfort inventory with the least score of 1 and a maximum of 10, depending on the degree of distress experienced. The time taken for each participant is approximately 15 minutes twice a day at 6-hourly and 24-hourly assessments.

Results

The collected data were analyzed using descriptive and inferential statistics using the SPSS software version 20. Mann–Whitey *U* test was used to compare the causes of discomfort at 6 hours and 24 hours after surgery. The association was analyzed using the Chi-square and likelihood ratio. The hypotheses were tested at a 5% significance level, and the p-value < 0.05 was considered significant.

Most participants from open (68%) and laparoscopic abdominal surgeries (42%) were 25 to 35 years of age. The majority, 85% and 52% of the participants, were females. Most of the study population comprised 34% with secondary education in the open surgery group, and 40% of participants had primary and secondary education in the laparoscopic group.

Thirteen percent were hypertensive, and 54% were diabetic. COPD was not elicited among the study subjects. A few participants were smokers (2% from open and 8% from laparoscopic surgery) and alcoholics (5% from the open group and 2% from laparoscopic) among the study groups. The majority, 56%, and 68% stayed 5 to 10 hours in the postoperative ICU.

Frequency Distribution of Clinical Characteristics

In open and laparoscopic abdominal surgeries, most participants (52%) were 150 to 160 cm in height, and 51% and 47% of participants weighed 51 to 60 kg. The respiratory rate was in the normal range of 17 to 24 beats/minute (among 60% of open and 53% of laparoscopic abdominal surgeries). More than half of the subjects had regular bowel movements (52% in open surgery and 61% after laparoscopic surgery). The bladder function was also regular among most participants (69% in the open and 75% in laparoscopic abdominal surgeries).

Assessment of Factors Causing Discomfort after Open and Laparoscopic Abdominal Surgeries

►**Table 1** shows that both in open and laparoscopic abdominal surgeries, pain is the most common (100%) cause of postoperative discomfort after 6 hours of surgery. Movement restriction is also the reason for significant discomfort both in open (98%) and laparoscopic (100%) abdominal surgeries. Intravenous line-related problems (81% and 79%) and abdominal distension (77% and 51%) also contribute to postoperative discomfort 6 hours after surgery.

In contrast, pain (99% and 100%), movement restriction (92% and 95%), and abdominal distention (61% and 34%) were again found to be the major problems contributing to patient's discomfort after 24 hours of both open and laparoscopic surgeries too. Intravenous line-related problems show an almost 40% reduction in open abdominal surgeries and a 10% reduction in laparoscopic surgeries compared with 6 hours after surgery.

Table 1 Percentage distribution of factors causing discomfort after open and laparoscopic abdominal surgeries

Items	6 hours after surgery		24 hours after surgery	
	Open ($n = 100$)	Laparoscopic ($n = 100$)	Open ($n = 100$)	Laparoscopic ($n = 100$)
	Percentage (%)	Percentage (%)	Percentage (%)	Percentage (%)
Pain				
Yes	100	100	99	99
No	00	00	01	01
Nausea				
Yes	51	37	24	19
No	49	63	76	81
Vomiting				
Yes	42	31	16	16
No	58	69	84	84
Movement restriction				
Yes	98	100	92	95
No	02	0	08	05
Sleepiness				
Yes	59	49	30	28
No	41	51	70	72
Dry mouth				
Yes	56	36	30	09
No	44	64	70	91
Insomnia				
Yes	68	53	40	23
No	32	47	60	77
Abdominal distention				
Yes	77	51	61	34
No	23	49	39	66
Constipation				
Yes	46	38	36	24
No	54	62	64	76
IV-related problems				
Yes	81	79	48	67
No	19	21	52	33
Chills				
Yes	53	58	14	03
No	47	42	86	97

►**Table 2** states that distress due to pain after 6 hours of postoperative period among the open abdominal surgery was significantly different from the laparoscopic surgery ($p = 0.006$). Significant differences were also observed among the other factors such as nausea ($p = 0.016$),vomiting ($p = 0.039$),movement restriction ($p = 0.029$), sleepiness ($p = 0.009$), dry mouth ($p = 0.000$), insomnia ($p = 0.000$) and abdominal distention (median (IQR) ($p = 0.000$). However there was no change in distress caused by constipation ($p = 0.204$), IV-related problems ($p = 0.817$), and chills ($p = 0.611$) as these p-values were > 0.05.

►**Table 3** emphasizes that pain among open abdominal surgeries after 6 hours was higher as the mean difference was 0.80 (95% CI =0.26–1.34), but that is statistically highly significant with a t-value = 2.91, p =0.004.

►**Table 4** depicts that pain after 24 hours of surgery became almost similar for both groups as the median was 4 and the p-value = 0.14. However, discomfort caused by

Table 2 Comparison of discomfort after 6 hours of surgery using Mann–Whitney *U* test

Items	Median (IQR)		Mann–Whitney *U* test value	Z value	*p*-Value
	Open ($n = 100$)	Laparoscopic ($n = 100$)			
Pain	8 (5-9)	6(5-8)	3899.50	-2.74	0.006*
Nausea	1(0-4)	0(0-3)	4103.50	-2.42	0.016*
Vomiting	0(0-4)	0(0-2)	4271.50	-2.07	0.039*
Movement restriction	4(3-6)	4(3-5)	4123.50	-2.18	0.029*
Sleepiness	2.50 (0-4)	0(0-3)	3993.00	-2.60	0.009*
Dry mouth	1(0-3)	0(0-1)	3612.00	-3.70	0.000*
Insomnia	3(0-5)	2(0-3)	3278.50	-4.37	0.000*
Abdominal distention	2(1-3)	1(0-2)	3216.50	-4.50	0.000*
Constipation	0(0-3)	0(0-2)	4535.00	-1.27	0.204
IV related problems	2(1-3)	2(2-3)	4908.50	-0.23	0.817
Chills	1(0-3)	1(0-2)	4803.00	-0.51	0.611

*-significant.

Table 3 Comparison of distress caused by pain among open and Laparoscopic surgery after 6 hours using an independent *t*-test

Items	Mean ± SD		Mean Difference	*t*-Value	*p*-Value	95% CI of the difference (lower to upper)
	Open ($n = 100$)	Laparoscopic ($n = 100$)				
Distress caused by pain	7.08 ± 2.04	6.28 ± 1.84	0.80	2.91	**0.004**	0.26 to 1.34

Table 4 Comparison of postoperative discomfort after 24 hours of surgery using Mann–Whitey *U* test

Patient discomfort	Median (IQR)		Mann–Whitney *U* test value	Z-Value	*p*-Value
	Open ($n = 100$)	Laparoscopic ($n = 100$)			
Pain	4 (3-5.75)	4 (3-5)	4418.00	-1.48	0.138
Nausea	0 (0-0)	0 (0-0)	4743.00	-0.87	0.382
Vomiting	0 (0-0)	0 (0-0)	4932.50	-0.26	0.796
Movement restriction	3 (2-3)	2 (2-3)	4068.00	-2.36	**0.018**
Sleepiness	0(0-1)	0(0-1)	4971.00	-0.09	0.929
Dry mouth	0(0-1)	0(0-0)	3868.50	-4.00	**0.000**
Insomnia	0(0-2)	0(0-0)	4169.00	-2.47	**0.014**
Abdominal distention	1(0-2)	0(0-0)	3451.00	-4.12	**0.000**
Constipation	0(0-1.75)	0(0-0)	4266.00	-2.22	**0.027**
IV related problems	0(0-2)	1(0-2)	4325.50	-1.74	0.082
Chills	0(0-0)	0(0-0)	4453.50	-2.76	**0.006**

movement restriction continues to be slightly higher among open abdominal surgeries as median (IQR = 3 [2–3], $p = 0.018$. Similar effects continued for dry mouth (median [IQR = 0 [0–1] , $p \leq 0.001$), insomnia (median IQR = 0 [0–2] , $P = 0.014$) and abdominal distention (median IQR = 1 [0–2] , $P = 0.000$). In contrast, discomfort caused by constipation ($p = 0.027$) and chills ($p = 0.006$) become statistically significant after 24 hours of surgery.

Table 5 Comparison of distress caused by pain among open and Laparoscopic surgery groups after 24 hours using an independent t-test

Items	Mean ± SD		Mean difference	*t*-Value	*p*-Value	95% CI of the difference (lower to upper)
	Open ($n = 100$)	Laparoscopic ($n = 100$)				
Distress caused by pain	4.53 ± 2.01	3.92 ± 1.01	0.61	2.71	**0.007**	0.17 to 1.05

Findings from ►**Table 5** explain that the pain among open abdominal surgeries after 24 hours of surgery was higher as the mean difference was 0.61 (95%CI = 0.17–1.05), with a (*t*-value = 2.71, p =0.007); hence a statistically significant difference was found between the groups.

Association between Pain Level with Selected Variables among the Open and Laparoscopic Abdominal Surgery.

The above ►**Table 6** depicts that the '*p*' values are < 0.05 for the variables hypertension (0.049) and diabetes mellitus (0.017). Hence, there is an association between pain level in open abdominal surgeries with hypertension and diabetes mellitus.

Similarly, the association between the level of pain with selected variables among the laparoscopic abdominal surgery was also analyzed using chi-square and likelihood ratio, which revealed that the *p*-value for the variable diabetes mellitus is (0.023); as depicted in ►**Table 7** hence, there is an association between the level of pain and diabetes mellitus.

Discussion

The present study showed that the major causes of discomfort after surgery was pain, movement restriction, and

Table 6 Association between pain with selected variables using chi-square test and likelihood ratio among open abdominal surgery

Demographic characteristics ($n = 100$)	Level of pain				Likelihood ratio	*p*-Value
	None	Mild (1-3)	Moderate (4-6)	Severe (7-10)		
Age						
25-35	2	28	32	6	9.024	0.435
36-45	0	4	3	0		
46-55	0	5	3	1		
56-65	0	5	6	5		
Gender						
Male	0	3	10	2	4.95	0.176
Female	2	39	34	10		
Educational status						
No formal education	0	4	3	1	15.47	0.217
Primary	2	12	11	5		
Secondary	0	19	11	4		
Pre-university	0	6	15	2		
Graduation and above	0	1	4	0		
Hypertension	0	7	2	4	7.88	0.049
Diabetes Mellitus	2	29	18	5	10.18	0.017
Smoking	0	1	1	0	0.61	0.894
Alcoholism	0	1	4	0	3.44	0.328
Time in postoperative ICU						
< 5	0	5	11	2	9.16	0.423

Table 6 (*Continued*)

Demographic characteristics ($n = 100$)	Level of pain				Likelihood ratio	*p*-Value
	None	Mild (1-3)	Moderate (4-6)	Severe (7-10)		
5-10	2	27	23	4		
10-15	0	5	5	2		
>15	0	5	5	4		

Table 7 Association between the pain with selected variables using chi-square and likelihood ratio among the laparoscopic abdominal surgery

Demographic characteristics ($n = 100$)	Level of pain				Likelihood ratio	*p*-Value
	None	Mild (1-3)	Moderate (4-6)	Severe (7-10)		
Age						
25-35	1	23	15	3	8.23	0.511
36-45	1	16	6	2		
46-55	1	9	2	0		
56-65	0	10	10	1		
Gender						
Male	0	27	18	3	4.55	0.208
Female	3	31	15	3		
Educational status						
No formal education	0	2	1	0	14.86	0.249
Primary	1	21	15	3		
Secondary	1	21	16	2		
Pre University	1	13	0	1		
Graduation & above	0	1	1	0		
Hypertension						
Yes	1	10	2	0	5.04	0.169
No	2	48	31	6		
DM						
Yes	0	4	9	0	9.49	0.023*
No	3	54	24	6		
Smoking						
Yes	0	4	4	0	2.27	0.519
No	3	54	29	6		
Alcoholism						
Yes	0	1	1	0	0.54	0.910
No	3	57	32	6		
Length of stay in postoperative ICU						
<5	1	6	1	0	8.22	0.513
5-10	2	36	26	4		
10-15	0	7	4	1		
>15	0	9	2	1		

*Significant.

abdominal distention. Similar findings were reported by other researchers (11,12,13,14,15,1,17). The rate of patients with maximal pain scores > 3 was 70% for all patients, 77% for the laparoscopic surgical procedure, and 68% for an open surgical procedure.[10] A prospective observational study on the causes of distress following abdominal surgery showed that the foremost causes of distress at 24 hours were pain (82%), movement restriction (79%) and dry mouth (70%). No significant differences were observed among clients who had undergone open or laparoscopic surgical procedures[11] A similar survey on the causes of decreased physical welfare in the postoperative phase among patients, nurses, and physicians discovered that nurses scored pain (8.48) a nasogastric tube (7.13), and nausea (7.10) at the top whereas patients rated pain (5.41), and movement restriction (4.62) as the maximum.[12] Gasparini et al also revealed that the main reason for the patients to avoid phase II procedures was the concern of more severe postoperative discomfort.[13]

In a survey on postoperative distress (other than pain) among 431 clients, 93 (22%) expressed distress. The chief discomfort was the urinary catheter (43%), followed by the throat and gastric tube hurting the nostril (11% each).[14]

This agrees with earlier reports that pain and non-pain symptoms contributed 0.084 and 0.074 to the overall discomfort level in the postoperative period. Dry mouth was the most common non-pain symptom in the postoperative period.[15] A cross-sectional study on patient discomfort after abdominal surgery also showed that the perception of discomfort between patients undergoing open surgery and those undergoing laparoscopic surgery; differed significantly. The most common types of discomfort after open surgery were pain (7.1 ± 1.8), movement restriction (7 ± 1.75), and dry mouth (6.6 ± 2.6), whereas, after laparoscopic surgery, the most common types were dry mouth (5.85 ± 2.8), abdominal bloating (5.3 ± 2.5), and pain (5 ± 2.2). There was a relationship between the variable dry mouth and the open surgery group ($r = 0.40$).[16] Further study can be conducted with an intervention to relieve the discomfort after the surgery.

Postoperative pain was not related to gender in the present research. However, MH et al found that women experienced more severe complaints than men after surgery. Also, postoperative pain, nausea, and dry mouth/thirst were symptoms with the highest effective load.[17] The difference could be attributed to a large number of females (85% vs. 52%) in the present study whose perception of symptoms differs from males.[18]

Also, 54% of the high-risk group and 13% of the low-risk group had nausea twice or more in the early postoperative period ($p < 0.0001$).[19] The comparison of postoperative nausea and vomiting after abdominal surgery revealed that the mean score of nausea was 0.68 ± 1.61 versus the vomiting mean score of 0.05 ± 0.22.[9] Kenan et al also reported that 20.5% of children experienced discomfort due to nausea and vomiting after dental rehabilitation.[20]

The risk factors of nausea derived from the study were female gender ($p = 0.01$) and history of nausea and vomiting ($p = 0.03$). Our study found no significant difference in nausea 24 hours after surgery. This could be due to the decreasing side effects of drugs after 24 hours compared to 6 hours. The current research was limited to a small population in a specific hospital area . The study revealed all the causes of discomfort and distress after surgery. Apart from pain all other aspects causing discomfort are usually neglected among postoperative patients. The study revealed a need to focus on all areas of discomfort apart from pain to enhance recovery after laparotomy with fewer complications.[21] Further study can be conducted with an intervention and a control group to relieve the discomfort.

Conclusion

Pain is the primary cause of discomfort after both open and laparoscopic abdominal surgeries. Restriction of movement and distention of the abdomen also add to discomfort in the postoperative period. While comparing the degree of discomfort, the study findings depict that the patients after laparoscopic surgery were comfortable and at ease. Hence, laparoscopic surgeries can be recommended for patients whenever possible to enhance the recovery from surgery.

Ethical Approval

The study is approved by the Institutional review board approval (NUINS/CON/NU/IEC/2019-20/1481).

Conflict of Interest

None declared.

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