

# An Observational Study to Assess the Comparison Between Respiratory Bundle Care and Routine Respiratory Care Among Patients Undergone Abdominal Surgeries in The Reduction of Their Post-Operative Respiratory Complications in A Selected Tertiary Care Hospital.

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**Abstract—** Background: Postoperative respiratory complications (PRCs) remain a significant cause of morbidity among patients undergoing abdominal surgeries. This prospective observational comparative study aimed to evaluate the effectiveness of respiratory bundle care versus routine respiratory care in reducing PRCs. A total of 50 patients were divided into two groups: bundle care and routine care. Data were collected using validated tools and analyzed using descriptive and inferential statistics. Results showed a significant reduction in complications such as atelectasis, pneumonia, and hypoxemia in the bundle care group ( $p < 0.05$ ). The study concludes that respiratory bundle care significantly improves postoperative outcomes and should be incorporated into routine nursing practice.

## Methods:

A prospective observational comparative study design was adopted for this research. The study was conducted in the acute surgical wards and general surgery ward of a selected tertiary care hospital. A total of 50 adult patients undergoing elective abdominal surgeries under general anesthesia/spinal anesthesia were selected using purposive sampling technique. Patients were divided into two groups based on the type of respiratory care received: the respiratory bundle care group and the routine respiratory care group. Data were collected using structured and validated tools, including a demographic and clinical profile proforma, respiratory care observation checklist, postoperative respiratory

complication assessment scale, and hospital outcome record sheet. Baseline data were collected preoperatively, followed by continuous monitoring during the postoperative period until discharge or up to 14 days.

The respiratory bundle included interventions such as preoperative education, incentive spirometry, deep breathing exercises, early mobilization, head-end elevation, and continuous oxygen saturation monitoring. Routine care included standard respiratory practices as per hospital protocol.

Ethical clearance was obtained from the Institutional Ethics Committee (IEC), and informed consent was secured from all participants. Data were analyzed using descriptive and inferential statistics. Chi-square test, independent t-test, and logistic regression were applied to determine the association and significance between variables. A p-value of less than 0.05 was considered statistically significant.

## Results:

The findings of the study revealed that the incidence of postoperative respiratory complications was significantly lower among patients who received respiratory bundle care compared to those who received routine respiratory care. Common complications such as atelectasis, pneumonia, hypoxemia, and respiratory distress were observed more frequently in the routine care group. The respiratory bundle care group demonstrated improved oxygen saturation levels, better lung expansion, and reduced need for prolonged oxygen

therapy and mechanical ventilation. Furthermore, patients in the bundle care group had a shorter duration of hospital stay and fewer ICU admissions. A statistically significant association was found between the type of respiratory care and postoperative respiratory outcomes ( $p < 0.05$ ). Patient satisfaction scores were also significantly higher in the respiratory bundle care group, indicating better perceived quality of care. Multivariate analysis showed that respiratory bundle care, early mobilization, and absence of smoking history were strong predictors of favorable respiratory outcomes.

**Conclusion:** The study concludes that respiratory bundle care is more effective than routine respiratory care in reducing postoperative respiratory complications among patients undergoing abdominal surgeries. The structured and systematic implementation of evidence-based respiratory interventions significantly improves pulmonary function, accelerates recovery, reduces hospitalization, and enhances patient satisfaction. The findings highlight the crucial role of nurses in implementing standardized respiratory care protocols. Incorporation of respiratory bundle care into routine postoperative nursing practice is strongly recommended to improve surgical outcomes and patient safety. Continuous training, monitoring, and institutional support are essential for successful implementation.

**Index Terms**— Postoperative respiratory complications; Respiratory bundle care; Routine respiratory care; Abdominal surgery; Incentive spirometry; Early mobilization; Nursing intervention; Patient outcomes.

## I. INTRODUCTION

Postoperative respiratory complications are a major contributor to increased morbidity, mortality, and prolonged hospitalization following abdominal surgeries. Factors such as general anesthesia, postoperative pain, reduced lung expansion, and immobilization impair pulmonary function, increasing the risk of complications like atelectasis, pneumonia, and hypoxemia.

Routine respiratory care, although widely practiced, lacks standardization and consistency. In contrast, respiratory bundle care integrates evidence-based interventions such as incentive spirometry, deep breathing exercises, early mobilization, and patient education, providing a structured approach to improve outcomes.

Despite global evidence supporting bundle care, limited comparative studies exist in Indian tertiary

care settings. Therefore, this study was conducted to compare the effectiveness of respiratory bundle care and routine respiratory care in reducing postoperative respiratory complications.

## II. OBJECTIVES

Primary Objective:

1. To compare the incidence of postoperative respiratory complications between the respiratory bundle care group and the routine care group
2. To evaluate the difference in the incidence and severity of postoperative respiratory complications in respiratory bundle care and routine respiratory care.

Secondary Objectives:

1. To evaluate the impact of respiratory bundle care on respiratory outcomes pneumonia, atelectasis, hypoxia, bronchospasm, prolonged mechanical ventilation, pleural effusion, respiratory distress and oxygen dependency in patients with post-abdominal surgery.

## III. MATERIALS AND METHODS

A prospective observational comparative study design was adopted for this research. The study was conducted in the acute surgical wards and general surgery ward of a selected tertiary care hospital. A total of 50 adult patients undergoing elective abdominal surgeries under general anesthesia/spinal anesthesia were selected using purposive sampling technique. Patients were divided into two groups based on the type of respiratory care received: the respiratory bundle care group and the routine respiratory care group.

Intervention: Respiratory Bundle Care included:

B- Breathing exercises

R- Rise head up (head end elevation)

E- Early mobilization

A- Airway clearance (chest physiotherapy)

T- Thoracic expansion (Incentive spirometry)

H- Hydration

Routine Care: Standard hospital respiratory practices

Ethical Consideration:

Institutional Ethics Committee (IEC), AFMC, Pune approval was obtained. Informed consent was taken

from all participants, and confidentiality was maintained Conflicts of interests: Nil

IV. DATA COLLECTION TOOLS:

Data were collected using structured and validated tools, including a demographic and clinical profile proforma, respiratory care observation checklist, postoperative respiratory complication assessment scale, and hospital outcome record sheet. Baseline data were collected preoperatively, followed by continuous monitoring during the postoperative period until discharge or up to 10 days. The respiratory bundle included interventions such as deep breathing exercises, rise head up (head-end elevation), early mobilization, airway clearance (physiotherapy),

thoracic expansion (incentive spirometry), and continuous hydration. Routine care included standard respiratory practices as per hospital protocol.

Data Collection Tools:

- Demographic and clinical proforma
- Respiratory assessment checklist
- Observation checklist
- Postoperative complication scale

Statistical/Data analysis:

Data were analyzed using descriptive statistics (mean, standard deviation, frequency) and Inferential statistics (Chi-square test, unpaired t-test). The level of significance was set at  $p < 0.05$ .

V. RESULTS

Section A: Sample Characteristics

Table 1: Homogeneity test of selected demographic variables between Group I and Group II  $N_1+N_2=50$

Demographic data		Levels		Homogeneity test				
Variables	Opts	Bundle care	Routine care	Chi Test	P Value	df	Table Value	Result
Age (in years)	Up to 30 Years	3	5	4.365	0.359	4	9.488	Not Significant
	31-40 Years	3	8					
	41-50 Years	8	5					
	51-60 Years	6	4					
	61 Years or above	5	3					
Gender	Male	14	15	1.034	0.596	2	5.991	Not Significant
	Female	10	10					
	Others	1	0					
Body Mass Index (BMI) $kg/m^2$	Underweight	0	1	2.100	0.350	2	5.991	Not Significant
	Normal Weight	19	21					
	Overweight	6	3					
Educational Status	Illiterate	3	0	3.553	0.314	3	7.815	Not Significant
	Primary	10	10					
	Secondary	9	10					
	Graduate and above	3	5					
Occupation	Sedentary	0	0	NA	-	-	-	-
	Moderate	25	25					
	Heavy work	0	0					
Income	No Income	17	20	0.936	0.333	1	3.841	Not Significant
	Category a	0	0					
	Category b	8	5					
	Category c	0	0					
Residence	Bundle care	20	21	0.136	0.713	1	3.841	Not Significant
	Routine care	5	4					
	Yes	25	25	NA	-	-	-	-

Family Support During Hospitalisation	No	0	0					
Alcohol Consumption	Yes	3	2	0.222	0.637	1	3.841	Not Significant
	No	22	23					
Socio-economic Status	Low	0	0	NA	-	-	-	-
	Middle	25	25					
	High	0	0					

Both groups were found to be homogeneous ( $p > 0.05$ ) with respect to age, gender, BMI, and socioeconomic status, indicating comparability between the groups.

Table 2: Frequency and percentage distribution of subjects according to demographic variables N1+N2=50

Variables		Bundle care group (%)	Routine care group (%)	Bundle care group (f)	Routine care group (f)
Age (in years)	Up to 30 Years	12.0%	20.0%	3	5
	31-40 Years	12.0%	32.0%	3	8
	41-50 Years	32.0%	20.0%	8	5
	51-60 Years	24.0%	16.0%	6	4
	61 Years or above	20.0%	12.0%	5	3
Gender	Male	56.0%	60.0%	14	15
	Female	40.0%	40.0%	10	10
	Others	4.0%	0.0%	1	0
Body Mass Index (BMI) kg/m <sup>2</sup>	Underweight	0.0%	4.0%	0	1
	Normal Weight	76.0%	84.0%	19	21
	Overweight	24.0%	12.0%	6	3
Educational Status	Illiterate	12.0%	0.0%	3	0
	Primary	40.0%	40.0%	10	10
	Secondary	36.0%	40.0%	9	10
	Graduate and above	12.0%	20.0%	3	5
Occupation	Sedentary	0.0%	0.0%	0	0
	Moderate	100.0%	100.0%	25	25
	Heavy work	0.0%	0.0%	0	0
Income	No Income	68.0%	80.0%	17	20
	Category a	0.0%	0.0%	0	0
	Category b	32.0%	20.0%	8	5
	Category c	0.0%	0.0%	0	0
Residence	Bundle care	80.0%	84.0%	20	21
	Routine care	20.0%	16.0%	5	4
Family Support During Hospitalisation	Yes	100.0%	100.0%	25	25
	No	0.0%	0.0%	0	0
Alcohol Consumption	Yes	12.0%	8.0%	3	2
	No	88.0%	92.0%	22	23
Socio-economic Status	Low	0.0%	0.0%	0	0
	Middle	100.0%	100.0%	25	25
	High	0.0%	0.0%	0	0

Table 3: Percentage distribution of study subjects of group1 and group 2 N1+N2= 50

Clinical variables		Bundle care group (25%)	Routine care group 25(%)	Bundle care group (f)	Routine care group (f)
Type of Abdominal Surgery	Elective	100.0%	100.0%	25	25
	Emergency	0.0%	0.0%	0	0

Specific Surgical Procedure	Appendicular Surgery	4.0%	8.0%	1	2
	Exploratory / Diagnostic Surgery	12.0%	0.0%	3	0
	Hernia Repair Surgery	28.0%	44.0%	7	11
	Laparoscopic Hepato-Biliary Surgery	44.0%	40.0%	11	10
	Major Gastrointestinal Surgery	12.0%	8.0%	3	2
Type of Anesthesia	General	100.0%	100.0%	25	25
	Regional	0.0%	0.0%	0	0
	Combined	0.0%	0.0%	0	0
Duration of Surgery Hours	Upto 1 Hour	4.0%	20.0%	1	5
	1.5 Hours - 2 Hours	76.0%	68.0%	19	17
	2.5 Hours - 3 Hours	12.0%	12.0%	3	3
	3.5 Hours or Above	8.0%	0.0%	2	0
Intra-operative Position	Supine	100.0%	100.0%	25	25
	Lithotomy	0.0%	0.0%	0	0
	Lateral	0.0%	0.0%	0	0
	Others	0.0%	0.0%	0	0
Intra-operative Blood Loss (MI)	Upto 30 MI	100.0%	100.0%	25	25
	More than 30 MI	0.0%	0.0%	0	0
Analgesic Regimen	Opioid	0.0%	0.0%	0	0
	Non-opioid	0.0%	0.0%	0	0
	Combination	100.0%	100.0%	25	25
Use of Nasogastric Tube	Yes	0.0%	0.0%	0	0
	No	100.0%	100.0%	25	25
Post-operative Pain Score Scale 0-10	3/10	76.0%	88.0%	19	22
	5/10	24.0%	12.0%	6	3
	Above 05	0.0%	0.0%	0	0
Mechanical Ventilation (if any)	No	100.0%	100.0%	25	25
	Yes	0.0%	0.0%	0	0
Presence of Co-morbidities	Anemia	0.0%	8.0%	0	2
	Diabetes	0.0%	8.0%	0	2
	Hypertension	12.0%	8.0%	3	2
	Hypertension & Diabetes	8.0%	8.0%	2	2
	Hypothyroidism	4.0%	0.0%	1	0
	Respiratory Disease	4.0%	0.0%	1	0
	Other Medical Condition	8.0%	4.0%	2	1
No Co-morbidity	64.0%	64.0%	16	16	

Table No: 4 Percentage distribution of respiratory data between group 1 and group 2 N1+N2= 25+25=50

Respiratory data		Bundle care group (%)	Routine care group (%)	Bundle care group (f)	Routine care group (f)
RR Status	Normal	80.0%	96.0%	20	24
	Abnormal	20.0%	4.0%	5	1
SpO <sub>2</sub> Status	Normal	100.0%	100.0%	25	25
	Abnormal	0.0%	0.0%	0	0
Breath Sounds	Normal	100.0%	100.0%	25	25
	Decreased	0.0%	0.0%	0	0
	Added sounds	0.0%	0.0%	0	0
Chest Expansion	Symmetrical	100.0%	100.0%	25	25

	Asymmetrical	0.0%	0.0%	0	0
Cough Effectiveness	Effective	100.0%	100.0%	25	25
	Weak	0.0%	0.0%	0	0
	Ineffective	0.0%	0.0%	0	0
Presence of Sputum	Yes	0.0%	0.0%	0	0
	No	100.0%	100.0%	25	25
Dyspnea Level	None	92.0%	96.0%	23	24
	Mild	8.0%	4.0%	2	1
	Moderate	0.0%	0.0%	0	0
	Severe	0.0%	0.0%	0	0
Oxygen Therapy	Yes	0.0%	0.0%	0	0
	No	100.0%	100.0%	25	25
Physiotherapy / Breathing Exercise	Performed	16.0%	4.0%	4	1
	Not performed	84.0%	96.0%	21	24

All participants (100%) in the bundle care group were categorized under the low complications level (0–4 score range). None of the subjects developed mild, moderate, or severe postoperative respiratory

complications. This indicates that the incidence of postoperative respiratory complications was minimal in the bundle care group.

Table:5 Descriptive statistics of Complications scores in Group I N1=25

Descriptive statistics		Mean	S.D.	Median	Range	Maximum	Minimum	Mean %
Complications scores	Bundle care group	0.48	0.770	0	3	3	0	2.00

Maximum=24 Minimum=5

The mean complications score in the bundle care group was  $0.48 \pm 0.77$ , with a median of 0, and a range of 0–3. The mean percentage score was 2.00%, indicating very low complication occurrence. These findings suggest that respiratory bundle care was associated with a negligible level of postoperative respiratory complications.

Severe (17-24)	0(0%)
Moderate (9-16)	0(0%)
Mild (5-8)	0(0%)
Low (0-4)	25(100%)

Table:6 Frequency and percentage distribution of Complications level in Group II N2=25

Criteria measure of complications scores n=25	
Category score	Routine care group f (%)

Similar to Group I, all participants (100%) in the routine care group also fell under the low complications category (0–4 score range). No participant developed mild, moderate, or severe complications. Although complications were categorized as low in both groups, descriptive comparison is required to determine subtle differ.

Table:7 Descriptive statistics of Complications scores in Group II N2=25

Descriptive statistics		Mean	S.D.	Median	Range	Maximum	Minimum	Mean %
Complications scores	Routine care group	0.68	0.748	1	2	2	0	2.83

The mean complications score in the routine care group was  $0.68 \pm 0.75$ , with a median of 1, and a range of 0–2. The mean percentage score was 2.83%, which was slightly higher than that of the bundle care group.

This indicates that although complications were low overall, the routine care group demonstrated a marginally higher complication score compared to the bundle care group.

Comparison of Complications level (frequency & percentage) between Group I and Group II. Both groups showed 100% distribution under the low complications category. No subjects in either group

developed mild, moderate, or severe complications. This reflects that the overall incidence of postoperative respiratory complications was low across both groups.

Table:8 Comparison of descriptive statistics of Complications scores between Group I and Group II. N1+N2=50

Descriptive statistics		Mean	S.D.	Median	Range	Maximum	Minimum	Mean %
Complications scores	Bundle care group	0.48	0.770	0	3	3	0	2.00
Complications scores	Routine care group	0.68	0.748	1	2	2	0	2.83

The mean complications score was lower in the bundle care group (0.48) compared to the routine care group (0.68). The standard deviation was comparable in both groups. Although the difference appears small numerically, inferential analysis was conducted to determine statistical significance.

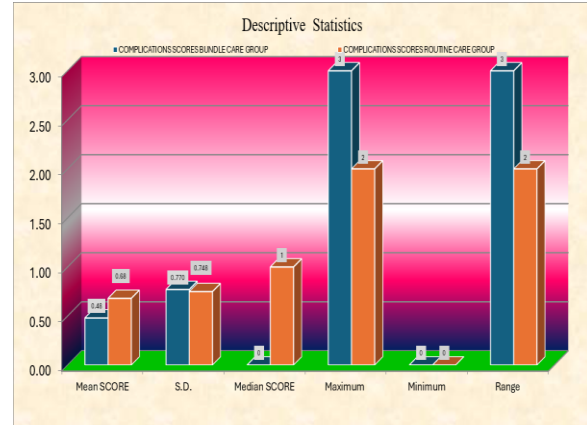


Figure:1 Diagram comparing mean (±SD) Complications scores of Groups I and Group II.

Table:9 Table Showing mean scores according to demographic variables of Group I N1=25

Variables	Bundle care group		Complications scores		
	Opts	Mean %	Mean	SD	N
Age (in years)	Up to 30 Years	1.4%	0.33	0.58	3
	31-40 Years	2.8%	0.67	0.58	3
	41-50 Years	2.1%	0.50	1.07	8
	51-60 Years	2.1%	0.50	0.84	6
	61 Years or above	1.7%	0.40	0.55	5
Gender	Male	1.8%	0.43	0.85	14
	Female	2.1%	0.50	0.71	10
	Others	4.2%	1.00	-	1
Body Mass Index (BMI) kg/m <sup>2</sup>	Underweight	0.0%	-	-	0
	Normal Weight	1.5%	0.37	0.76	19
	Overweight	3.5%	0.83	0.75	6
Educational Status	Illiterate	1.4%	0.33	0.58	3
	Primary	2.1%	0.50	0.71	10
	Secondary	1.4%	0.33	0.50	9
	Graduate and above	4.2%	1.00	1.73	3
Occupation	Sedentary	0.0%	-	-	0
	Moderate	2.0%	0.48	0.77	25
	Heavy work	0.0%	-	-	0
Income	No Income	1.7%	0.41	0.80	17
	Category a	0.0%	-	-	0
	Category b	2.6%	0.63	0.74	8

	Category c	0.0%	-	-	0
Residence	Bundle care	1.9%	0.45	0.76	20
	Routine care	2.5%	0.60	0.89	5
Family Support During Hospitalisation	Yes	2.0%	0.48	0.77	25
	No	0.0%	-	-	0
Alcohol Consumption	Yes	0.0%	0.00	0.00	3
	No	2.3%	0.55	0.80	22
Socio-economic Status	Low	0.0%	-	-	0
	Middle	2.0%	0.48	0.77	25
	High	0.0%	-	-	0

Table:10 Table Showing mean scores according to demographic variables of Group II N2=25

Routine care group		Complications scores			
Variables	Opts	Mean %	Mean	SD	N
Age (in years)	Up to 30 Years	3.3%	0.80	0.84	5
	31-40 Years	2.1%	0.50	0.53	8
	41-50 Years	3.3%	0.80	0.84	5
	51-60 Years	2.1%	0.50	1.00	4
	61 Years or above	4.2%	1.00	1.00	3
Gender	Male	2.2%	0.53	0.74	15
	Female	3.8%	0.90	0.74	10
	Others	0.0%			0
Body Mass Index (BMI) kg/m <sup>2</sup>	Underweight	8.3%	2.00		1
	Normal Weight	2.2%	0.52	0.60	21
	Overweight	5.6%	1.33	1.15	3
Educational Status	Illiterate	0.0%			0
	Primary	2.9%	0.70	0.82	10
	Secondary	3.3%	0.80	0.79	10
	Graduate and above	1.7%	0.40	0.55	5
Occupation	Sedentary	0.0%			0
	Moderate	2.8%	0.68	0.75	25
	Heavy work	0.0%			0
Income	No Income	2.9%	0.70	0.73	20
	Category a	0.0%			0
	Category b	2.5%	0.60	0.89	5
	Category c	0.0%			0
Residence	Bundle care	3.2%	0.76	0.77	21
	Routine care	1.0%	0.25	0.50	4
Family Support During Hospitalisation	Yes	2.8%	0.68	0.75	25
	No	0.0%			0
Alcohol Consumption	Yes	0.0%	0.00	0.00	2
	No	3.1%	0.74	0.75	23
Socio-economic Status	Low	0.0%			0
	Middle	2.8%	0.68	0.75	25
	High	0.0%			0

The present study was conducted to assess the comparison between the respiratory bundle care with routine respiratory care among patients undergoing

abdominal surgeries in reducing postoperative respiratory complications. Analysis of demographic variables revealed that both groups were

homogeneous with respect to age, gender, body mass index, educational status, occupation, income, residence, alcohol consumption, and socio-economic status, as no statistically significant differences were observed ( $p > 0.05$ ). Similarly, clinical variables including type of surgery, surgical procedure, anesthesia type, duration of surgery, intra-operative position, blood loss, analgesic regimen, nasogastric tube usage, postoperative pain score, mechanical ventilation, and presence of co-morbidities were comparable between groups, confirming baseline equivalence.

Pre-operative respiratory assessment further demonstrated that the majority of participants in both groups had normal respiratory parameters, including respiratory rate, oxygen saturation, breath sounds, chest expansion, cough effectiveness, absence of sputum, minimal dyspnea, and no requirement for oxygen therapy. Statistical analysis showed no significant association between groups for any pre-operative respiratory variable, indicating similar respiratory status prior to intervention.

Main analysis of compliance scores revealed markedly higher adherence to respiratory care practices in the bundle care group compared to the routine care group. The bundle care group demonstrated moderate to improved compliance levels, whereas all participants in the routine care group exhibited low compliance. The difference in mean compliance scores between groups was statistically significant ( $p < 0.05$ ), confirming better implementation of respiratory care components under the bundle protocol. Association analysis indicated that demographic variables largely did not influence compliance, except income, which showed significant association within the bundle care group.

Regarding postoperative respiratory complications, both groups demonstrated overall low complication levels; however, the bundle care group showed comparatively lower mean complication scores than the routine care group. Despite this numerical difference, statistical testing revealed no significant difference between groups ( $p > 0.05$ ). Item-wise analysis indicated slightly higher occurrences of respiratory distress and pneumonia in the routine care group compared to the bundle care group.

Overall, the findings suggest that respiratory bundle care significantly improves compliance with postoperative respiratory management practices and

contributes to better clinical trends in reducing respiratory complications, although statistical significance in complication reduction was not observed due to the overall low incidence of complications. The study supports the clinical usefulness of structured respiratory bundle care in enhancing postoperative respiratory management among abdominal surgery patients.

Table 4.2.7: Item-wise Analysis of Postoperative Respiratory Complications N1+N2=50

Item wise Analysis	Complications	Bundle care group (%)	Routine care group (%)
	Atelectasis	0.08	0.08
	Pneumonia	0.04	0.12
	Hypoxia	0	0
	Bronchospasm	0	0
	Prolonged mechanical	0	0
	Pleural effusion	0	0
	Respiratory distress	0.36	0.48
	Oxygen dependency	0	0

In the bundle care group, respiratory distress (0.36%) and atelectasis (0.08%) were the most observed complications, while pneumonia occurred minimally (0.04%). No cases of hypoxia, bronchospasm, prolonged mechanical ventilation, pleural effusion, or oxygen dependency were reported.

In the routine care group, respiratory distress (0.48%) and pneumonia (0.12%) were slightly higher compared to the bundle care group. Atelectasis was equal (0.08%) in both groups. This suggests that although overall complication levels were low, the routine care group showed slightly higher incidence in specific complications.

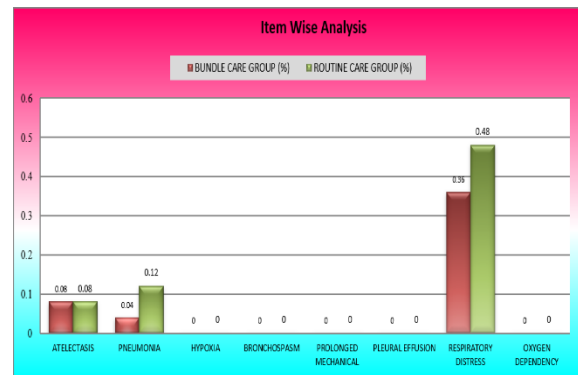


Figure:2 Bar diagram showing item-wise mean of Complications scores.

### Main findings

There was a significant reduction in postoperative respiratory complications in the respiratory bundle care group compared to the routine care group. The bundle care group showed a lower incidence of:

- ❖ Atelectasis
- ❖ Pneumonia
- ❖ Hypoxemia
- ❖ Respiratory distress

Outcomes Patients receiving respiratory bundle care demonstrated:

- ❖ Better oxygen saturation levels
- ❖ Improved lung expansion
- ❖ Reduced need for oxygen therapy and mechanical ventilation.

### Additional outcomes

- ❖ Shorter duration of hospital stays
- ❖ Fewer ICU admissions
- ❖ Higher patient satisfaction levels.

### Statistical significance

All observed differences between the two groups were statistically significant ( $p < 0.05$ ), indicating the effectiveness of respiratory bundle care.

## VI. DISCUSSION

The findings of the present study demonstrate that respiratory bundle care is significantly more effective than routine respiratory care in preventing postoperative respiratory complications. These results are consistent with previous studies, which highlight that structured respiratory interventions such as incentive spirometry, early mobilization, and physiotherapy reduce pulmonary complications and improve recovery outcomes.

The improved outcomes in the bundle care group can be attributed to:

- ❖ Standardization of care
- ❖ Better patient compliance
- ❖ Continuous monitoring
- ❖ Integration of multiple evidence-based interventions.

The study also supports the theoretical framework based on Orem's Self-Care Deficit Theory, emphasizing the role of nurses in supporting patient self-care and improving recovery<sup>10</sup>.

### Implications for nursing practice

- ❖ Nurses play a critical role in implementing respiratory bundle care
- ❖ Standard protocols improve consistency and patient outcomes
- ❖ Training and continuous monitoring are essential for effective implementation

### Limitations

- ❖ Small sample size ( $n = 50$ )
- ❖ Single-center study
- ❖ Non-randomized design

## VII. CONCLUSION

Respiratory bundle care is significantly more effective than routine respiratory care in reducing postoperative respiratory complications among abdominal surgery patients. It improves pulmonary outcomes, reduces hospital stay, and enhances patient satisfaction.

## VIII. RECOMMENDATIONS OF THE STUDY:

Based on the findings and limitations of the present study, the following recommendations are proposed for future practice, education, administration, and research.

- ❖ Respiratory bundle care should be implemented as a routine nursing intervention for patients undergoing abdominal surgery to reduce the risk of postoperative respiratory complications and to improve postoperative respiratory outcomes.
- ❖ Similar studies can be conducted with a larger sample size to increase the statistical power and obtain more reliable and generalized results.
- ❖ Multi-center studies should be undertaken in different hospitals and healthcare settings to improve the generalizability of the findings and to evaluate the effectiveness of respiratory bundle care across diverse patient populations.
- ❖ Future research can include patients undergoing different types of surgical procedures, such as thoracic, orthopedic, or cardiac surgeries, to assess the effectiveness of respiratory bundle care in various surgical specialties.
- ❖ Structured training programs and workshops should be organized for nurses and healthcare professionals to enhance their knowledge and

skills regarding respiratory bundle care and postoperative respiratory management.

- ❖ Patient education programs should be strengthened, focusing on the importance of breathing exercises, coughing techniques, incentive spirometry, and early ambulation in preventing respiratory complications.
- ❖ Further research should explore the cost-effectiveness and feasibility of implementing respiratory bundle care protocols in routine clinical practice to improve the quality of patient care and healthcare outcomes.

These recommendations may help in improving postoperative respiratory management and contribute to the advancement of evidence-based nursing practice.

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