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A Study to Assess the Risk Factors & Develop a Protocol on Prevention and Management of Postoperative Hypothermia on Patient Admitted at Selected Hospital, Lucknow, U.P.

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ABSTRACT

Postoperative hypothermia is a common complication after surgery which requires close monitoring and proper interventions during the perioperative phase. Scores of the pre-test, out of 60 samples, 60.00% (36) had inadequate level, 33.33% (20) had moderate and 06.67% (4) had adequate knowledge level, and that of post-test was 1.67% (1) had inadequate, 31.66% (19) had moderate and 66.67% (40) had adequate knowledge level on postoperative hypothermia. Overall findings of pre-test attitude, 51.76% (31) had inadequate, 38.33% (23) had moderate and 10.00% (6) had adequate practice level, and that of post-test was 5% (3) had inadequate, 50.00% (30) had moderate and 45.00% (27) had adequate on postoperative hypothermia. Chi-square was computed for the association between pre-test level of knowledge with selected variables. In that, age, family type, father's education, father's occupation, family income, and prior knowledge of antenatal mothers were significantly associated at $P < 0.005$ level; hence, it is tested and proved hypothesis.

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INTRODUCTION

Body temperature is tightly regulated with hormonal and cellular metabolism for normal functioning; however, perioperative hypothermia is common secondary to anaesthesia and surgical exposure.

Prevention and maintaining body temperature should be started 1–2 hrs before induction of anaesthesia. To do this, both active and passive warming systems are effective to prevent complications associated with perioperative hypothermia.

Hypothermia is a core body temperature less than 36 °C (96.8 °F). It is a common incident in the immediate postoperative period. Postoperative hypothermia is associated with prolonged hospital, post-anesthetic care unit or intensive care unit (ICU) stay, surgical site infection, postoperative blood transfusions, pressure ulcers, decreased patient comfort and satisfaction, subjective discomfort and mortality, cardiovascular complications, and increased cost. In an effort to decrease the occurrence of postoperative hypothermia, it would be helpful to identify and correct significant associated factors.

Post-operative hypothermia is a common and clinically significant complication in surgical patients, defined as a core body temperature below 36°C (96.8°F) occurring during or after surgery. It results primarily from exposure to cold operating room environments, impaired thermoregulation due to anaesthesia, and redistribution of body heat from the core to the periphery. Even mild hypothermia can adversely affect patient recovery and increase the risk of complications, making its prevention and management an essential component of peri-operative care.

Anaesthetic agents, both general and regional, interfere with the body's thermoregulatory mechanisms by reducing metabolic heat production and impairing vasoconstriction and shivering responses. Surgical exposure, administration of cold intravenous fluids, prolonged operative time, and evaporation from open surgical wounds further contribute to heat loss. If not promptly recognized and managed, post-operative hypothermia can lead to delayed wound healing, increased risk of surgical site infection, cardiac complications, coagulopathy, prolonged drug metabolism, discomfort, and extended hospital stay.

Several risk factors predispose patients to post-operative hypothermia. These include advanced age, low body mass, pre-existing medical conditions, long or major surgeries, regional or general anaesthesia, large fluid replacement, and inadequate peri-operative warming. Environmental factors such as low operating room temperature and lack of active warming devices also play an important role. Identifying these risk factors helps healthcare providers implement timely preventive strategies.

Prevention of post-operative hypothermia focuses on maintaining normothermia throughout the peri-operative period. This includes pre-warming patients before surgery, maintaining appropriate operating room temperature, using forced-air warming systems, warming intravenous fluids and irrigation solutions, minimizing unnecessary exposure, and continuous temperature monitoring. Preventive measures are more effective and safer than treating established hypothermia.

Management of post-operative hypothermia involves early detection through regular temperature monitoring and prompt rewarming interventions. Treatment may include passive external warming (blankets, covering exposed areas), active external warming (forced-air warming devices, radiant heaters), and active internal warming methods such as warmed IV fluids or oxygen. Management also includes monitoring for complications such as shivering, cardiac instability, and delayed recovery from anaesthesia.

However, to date there has been no systematic review of effectiveness with high quality randomised controlled trials to identify effective strategies for the prevention and/or management of hypothermia in the perioperative environment.

Surgical interventions, while essential for diagnosing and treating various health conditions, often pose significant physiological stress on the patient. Among the multiple perioperative complications, post-operative hypothermia stands out as a frequently occurring, yet under-recognized clinical condition that can negatively impact patient outcomes.

Hypothermia in the post-operative setting results from a combination of factors. These include anesthesia-induced impairment of thermoregulation, exposure to cold operating room environments, administration of unwarmed intravenous fluids and blood products, and evaporative heat loss from surgical wounds. In addition, individual patient characteristics—such as age (pediatrics and geriatrics), nutritional status, low body mass index (BMI), and co-morbidities—can increase the susceptibility to hypothermia. The thermoregulatory dysfunction associated with anesthetic agents plays a central role by lowering the hypothalamic temperature set point and inhibiting vasoconstriction and shivering, which are the body's primary mechanisms for conserving heat.

While hypothermia may initially present with nonspecific signs such as shivering, pale or cold extremities, or altered mental status, its clinical consequences can be profound. Post-operative hypothermia has been associated with delayed anesthetic recovery, increased risk of cardiac complications, elevated oxygen consumption, coagulopathies, impaired wound healing, increased risk of surgical site infections (SSIs), and prolonged hospital stays. These complications not only compromise the quality of patient care but also contribute to higher healthcare costs and resource utilization.

Thermal regulation is an essential component of perioperative care, yet in many clinical settings, it is not given the attention it deserves. The literature suggests that between 50% to 90% of surgical patients may experience some degree of hypothermia during the perioperative period, particularly when active warming measures are not employed. Given the magnitude of this issue, the current study seeks to explore the risk factors contributing to post-operative hypothermia and to formulate a comprehensive, standardized protocol for its prevention and management in patients admitted at a selected hospital.

This study is particularly relevant in the context of resource-limited settings, where access to advanced warming equipment or temperature-monitoring devices may be restricted. It emphasizes simple, practical interventions that can be implemented by nursing staff and surgical teams, such as the use of pre-warmed IV fluids, warming blankets, patient education, and monitoring temperature at regular intervals. The development of a hospital-specific protocol will serve to enhance clinical outcomes,

reduce complication rates, and improve patient comfort and satisfaction.

NEED OF THE STUDY:

Although perioperative hypothermia is common, less emphasis is given to monitoring complications during anaesthesia and surgery. Even with modern supportive care, hospital mortality of patients with moderate or severe accidental hypothermia approaches 40%. Maintaining a normothermic patient is quite challenging for clinicians, especially for anesthetists and nurses, since it is their responsibility to install and monitor the devices in order to prevent hypothermia.

Post-operative hypothermia remains a frequent and preventable complication in surgical patients despite advancements in anaesthetic and peri-operative care. Unintentional drops in body temperature during or after surgery are associated with significant adverse outcomes, including delayed wound healing, increased risk of surgical site infections, coagulopathy, cardiac complications, prolonged recovery from anaesthesia, and extended hospital stay. These complications not only affect patient safety and comfort but also increase healthcare costs and burden on hospital resources.

Many surgical patients are exposed to multiple risk factors such as anaesthesia-induced thermoregulatory impairment, cold operating room environments, administration of unwarmed intravenous fluids, prolonged surgical procedures, and inadequate temperature monitoring. In clinical practice, hypothermia is often under-recognized or insufficiently managed, especially in settings where standardized warming protocols are not consistently followed. This highlights the need for greater awareness and effective preventive strategies among healthcare professionals.

Maintaining peri-operative normothermia is now recognized as an essential indicator of quality surgical care. However, variations in knowledge, practice, and availability of warming techniques may influence patient outcomes. A systematic understanding of the risk factors, preventive measures, and management approaches is necessary to reduce the incidence and severity of post-operative hypothermia.

Studies show that if hypothermia is left untreated, it results in many adverse effects on the patient (prolonging anaesthetic drug action, impairing coagulation and platelet function, increasing blood loss and transfusion requirements, increasing wound infections, prolonging hospital stay, causing postoperative discomfort and shivering, increasing oxygen consumption, and increasing heart rate, blood pressure, and plasma catecholamine levels).

A multicenter prospective observational study involving 4516 surgical patients reported an overall intraoperative hypothermia incidence of 23.82%. Major independent risk factors included type of anaesthesia, ASA status, volume of cold IV fluids, blood transfusion, and duration of surgery. The study emphasized the importance of early risk assessment and individualized temperature management.

A study conducted in a tertiary care hospital reported that postoperative hypothermia occurs worldwide in 6% to 80% of surgical patients. Important predictors include age, emergency surgery, type of surgery, duration of anaesthesia, operating room temperature, and preoperative body temperature. The study highlighted that hypothermia prolongs recovery, increases complications, and raises healthcare costs.

A cohort study conducted at U.P. on patients undergoing major abdominal surgery found that 57.3% developed postoperative hypothermia. Advanced age (above 60 years) was significantly associated with hypothermia. The authors emphasized the need for further research across different surgical types to understand contributing factors.

A retrospective study on malignant tumor surgery patients reported that advanced age, laparoscopic surgery, and longer duration of surgery increased hypothermia risk. Patients with hypothermia also had longer PACU stays. The study stressed improving intraoperative temperature monitoring and adherence to warming guidelines.

The goal of preserving a patient's body temperature during anesthesia and surgery is to minimize heat loss by reducing radiation and convection from the skin, evaporation from exposed surgical areas, and cooling caused by the introduction of cold intravenous fluids.

Therefore, this study is needed to assess the extent of post-operative hypothermia, identify contributing factors, and evaluate preventive and management practices. The findings will help improve clinical guidelines, enhance nursing and medical interventions, promote patient safety, and support evidence-based peri-operative care. Ultimately, the study aims to improve recovery outcomes and reduce complications associated with post-operative hypothermia.

OBJECTIVES OF THE STUDY

The objectives of study are to:

1. To assess the risk factors on prevention and management of hypothermia.

2. To Develop & Evaluate the Protocol on Prevention of Hypothermia among patients who are undergoing surgery.
3. To associate the risk factors of Hypothermia among patients with their selected demographic variables.

OPERATIONAL DEFINITIONS

1. **Risk factors:** A risk factor is a variable or characteristic that increases the likelihood of an individual developing a specific disease, condition, or adverse outcome.
2. **Develop:** To bring out or expand the capabilities or potential of something.
3. **Protocol:** A set of guidelines and procedures for medical professionals to follow in various clinical situations.
4. **Prevention:** Prevention is the act of taking steps to reduce the risk of getting a disease or condition. There are several types of prevention, including primary, secondary, and primordial.
5. **Management:** Management is the process of managing healthcare costs and improving clinical outcomes. It involves the use of systems and programs to treat diseases, injuries, and disorders.
6. **Post-operative:** The time after surgery when a patient recovers and returns to their normal life. It's a time when patients need extra care and monitoring to manage complications and ensure recovery.
7. **Hypothermia:** Occurs when your body temperature drops dangerously low, usually due to prolonged exposure to cold temperatures.

ASSUMPTIONS

The study is based on the assumption that:

1. After implementation of protocol on prevention and management of post-operative hypothermia on patients, the post-operative patients may be protected from hypothermia.
2. Protocol on prevention and management of hypothermia may help to protect the patient from post-operative complications.

HYPOTHESIS

All hypothesis will be tested at 0.05 level of significance.

H1: There will be significant difference in the knowledge regarding utilization of protocols of hypothermia among patients who are undergoing surgery.

H2: There will be significant association between the knowledge regarding utilization of protocols of hypothermia among patients who are undergoing surgery with their selected demographic variables.

DELIMITATIONS

1. The study is limited to only postoperative patients.
2. The study period is limited to 4–6 weeks.
3. The hospital protocols may have an effect on researcher protocols on prevention of hypothermia among post-operative patients.

RESEARCH APPROACH:

Research approach is a systemic, controlled empirical and critical investigation of hypothetical propositions and guided by theory and hypotheses about the presumption relations among the natural phenomena. **Kerlinger**

Quantitative evaluative research approach is an applied form of research that involves finding out how well a programme, procedure or policy is working. Its goal is to assess and evaluate success of planned teaching programme/protocols. In view of the nature of the problem under study and to accomplish the objectives of the study, quantitative research approach, evaluative approach was found to be appropriate to describe the effectiveness of protocols on prevention of post-operative hypothermia. So, evaluative research approach has been adopted for the present study. 61

RESEARCH DESIGN:

The research design has two purposes: one is to provide answer to research question and second is to control variance. **Kerlinger**

The term research design refers to the plan or organization of specific investigation. Research design refers to the overall plan for obtaining answers to the research problems. It spells out the basic strategies that the researcher adopts to collect information that is accurate, objective and interpretable. The research design for this study was experimental research design.

SETTING

The setting is where the population or portion of that is being studied, is located and where study is carried out. The setting of the study is hospital, Lucknow. This hospital is selected as per the convenience of the investigator. Formal permission would be obtained from the concerned authorities for conducting the study.

VARIABLES

Research variables are the concept of various levels of abstraction that are measured, manipulated and controlled in the study.

Independent variable is the presumed causes for the resulting effects on the dependent variables. In this study, the independent variable is **Protocols on Prevention of Hypothermia**.

Dependent variable: is the variable, the researcher is interested in understanding, expressing or predicting. In this study, the dependent variable is the patients who all are undergoing for major surgeries will be dependent variables.

Demographical Variable:
Age, type of family, mother occupation, family income, socio-economic status are the demographic variables.

POPULATION

Population represents the entire group under study. The population is defined as in a more general and broader sense and includes not only the common place meaning as groups or aggregate of people. The population selected for this study comprised patients undergoing surgeries and admitted at selected hospital, Lucknow.

SAMPLE AND SAMPLE SIZE

Sample is a small portion of the population selected for observation and proper technique. The present study was conducted among 60 patients of selected hospital, Lucknow.

SAMPLING TECHNIQUE

Samplig is the process of selecting representative units of a population for the study. Purposive sampling technique was used to select 60 patients of selected hospital at Lucknow and who met the inclusion criteria for the study.

CRITERIA FOR SELECTION OF SAMPLE

Inclusion for Sample Selection:

1. The patients who all are willing to participate and also who are undergoing major surgeries.
2. The patients who are available during data collection.

Exclusion Criteria for Sample Selection:

1. The patients who are not available during data collection.
2. The patients who all are not willing to participate and also who are undergoing major surgeries.

DATA COLLECTION TECHNIQUE & TOOL

Description of the Research Tool

The instrument selection in a research must be the vehicle that obtains the best data for drawing conclusions to the study. To fulfill the objective of the study, an observational checklist was developed. The first draft of the tool was multiple-choice questions and the second was checklist.

A. Scoring Pattern:

The knowledge regarding prevention of postoperative hypothermia among patients was measured in items of knowledge scores. Each response was given a score of one. The maximum score was 50 and the minimum score was 0.

Table (a): Interpretation of Risk Score

Sl. No.	Level of knowledge	Score%
1	Inadequate	0 – 50
2	Moderate	51 – 75
3	Adequate	76 – 100

RESULT

The description of the result is the heart of a research project. It is the communication of measurements, and derivation gathered by the research worker. For achieving the results the collection of data must be processed and analyzed in an orderly coherent fashion. Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis can be tested.

Table–1 FREQUENCY&PERCENTAGEDISTRIBUTIONOFDEMOGRAPHICVARIABLES N=60

Socio-demographic variable	*Frequency*	*% of respondents*
Age group		
21-25years	21	35
26-30years	18	30
31-35years	13	21.67
35-40years	8	13.33
Family Types		
Joint family	25	41.67
Extended family	14	23.33
Nuclear family	21	35
Blended family	0	00

Education status		
Primary education	17	28.33
Secondary	19	31.67
Graduation	13	21.67
Post-graduation	11	18.33
Occupation		
Agriculture	11	18.33
Business	19	31.67
Labour	12	20
Other	18	30
Family income		
<10000	16	26.67
10000-20000	24	40.00
20000-30000	15	25.00
>30000	5	8.33
Previous Knowledge regarding post operative hypothermia		
Yes	8	13.33
No	52	86.67

A. AGEWISECLASSIFICATIONOFRESPONDENTS

S. No.	VARIABLE		FREQUENCY	PERCENTAGE
1	Age	21-25 years	21	35
		26-30 years	18	30
		31-35 years	13	21.67
		35-40 years	8	13.33

B. FAMILY TYPES WISE CLASSIFICATION OF RESPONDENTS

S. No.	VARIABLE		FREQUENCY	PERCENTAGE
2.	Family Types	Joint family	25	41.67
		Extended family	14	23.33
		Nuclear family	21	35
		Blended family	0	00

C. EDUCATIONSTATUSWISECLASSIFICATIONOFRESPONDENTS

S.NO.	VARIABLE		FREQUENCY	PERCENTAGE
3.	Education Status	Primary education	17	28.33
		Secondary	19	31.67
		Graduation	13	21.67
		Post-graduation	11	18.33

D. OCCUPATIONWISECLASSIFICATIONOFRESPONDENTS

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
4	occupation	Agriculture	11	18.33
		Business	19	31.67
		Labour	12	20
		Other	18	30

E. FAMILYINCOMEWISECLASSIFICATIONOFRESPONDENTS

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
5	Family Income	<10000	16	26.67
		10000-20000	24	40.00
		20000-30000	15	25.00
		>30000	5	8.33

F. PRIORKNOWLEDGEWISECLASSIFICATIONOFRESPONDENTS

S. NO.	VARIABLE		FREQUENCY	PERCENTAGE
6.	Prior Education	YES	8	13.33
		NO	52	86.67

Table–2 FREQUENCY AND PERCENTAGE DISTRIBUTION OF PRE-TEST LEVEL OF KNOWLEDGE N= 60

Level of knowledge	*Max Score*	*In-adequate*		*Moderate*		*Adequate*	
		F	%	F	%	F	%
Knowledge about post operative hypothermia	17	35	58.33	24	40.00	1	1.67
Knowledge about Prevention of post operative hypothermia	17	28	46.67	30	50.00	2	3.33

Table-3 FREQUENCYANDPERCENTAGEDISTRIBUTIONOFPOST-TESTLEVEL OF KNOWLEDGE N= 60

Aspect of post operative hypothermia	*Max Score*	*In-adequate*		*Moderate*		*Adequate*	
		F	%	F	%	F	%
Knowledge about post operative hypothermia	17	4	6.66	37	61.67	19	31.67
Knowledge about post operative hypothermia	17	4	6.67	24	40.00	32	53.33

Table-4 COMPARISIONOFPRE-TESTANDPOST-TESTLEVELOFKNOWLEDGE N= 60

Sr. No.	*Level of knowledge*	*Pre-test*		*Post-test*	
		F	*%*	*F*	*%*
1	In-adequate	44	73.33	4	6.67
2	Moderate	14	21.68	31	51.67
3	Adequate	2	3.33	25	41.66
	Total	60	100	60	100

Table:8 MEAN, S.D., RANGE, MEANS CORE PERCENTAGE OF KNOWLEDGE SCORE BEFORE PROTOCOL N=60

S. No.	Aspect of Knowledge	Max possible score	Mean	SD	Range	Mean%
1.	Knowledge about post operative hypothermia	17	8.08	1.66	10	47.52
2	Knowledge about Prevention of postoperative hypothermia	17	8.43	1.95	11	49.58
	Overall	34	16.51	3.11	20	48.55

Table:9 MEAN, S.D., RANGE, MEAN SCORE PERCENTAGE OF KNOWLEDGESCORE AFTER PROTOCOL N=60

S. no.	Aspect of Knowledge	Max possible score	Mean	SD	Range	Mean%
1	Knowledge about post operative hypothermia	17	12.08	2.12	9	71.05
2	Knowledge about Prevention of post operative hypothermia	17	12.5	2.31	11	73.52
	Overall	34	24.58	3.95	19	72.29

Table-10 ASSESSMENT OF EFFECTIVENESS OF PROTOCOL BY COMPARISION OF PRE AND POST TEST KNOWLEDGE SCORE N=60

Aspect of knowledge	Max. Score	Pre-test				Post-test				T Value
		Mean	SD	Range	Mean %	Mean	SD	Range	Mean %	
Knowledge about post operative hypothermia	17	8.08	1.66	10	47.52	12.08	2.12	9	71.05	11.48
Knowledge about prevention of postoperative hypothermia	17	8.43	1.95	11	49.58	12.5	2.31	11	73.52	10.39
Overall	34	16.51	3.11	20	48.55	24.58	3.95	19	72.29	12.41

Table-11 SIGNIFICANCE DIFFEREN BETWEEN PRETEST AND POST TEST RISK FACTORS N=60

S. No.	Score	Mean	S.D	Std. Error	Mean Difference	DF	Calculated "t" value	Tabulate value
1.	Pre-Test	16.51	3.11	0.40	8.07	59	12.41	2.00
2.	Post-Test	24.58	3.95	0.51				

Table-16.1 ASSOCIATION BETWEEN PRE-TEST LEVELS OF KNOWLEDGE WITH AGE

S. No.	*Level of Knowledge*			*Total*	*D. F.*	*Chi Square*	*Result*
Age in Year	*Inadequate*	*Moderate*	*Adequate*				
21-25	4	14	3	**21**	6	17.113	Sig.
%	19.04	66.66	14.28	**100**			
26-30	0	10	8	**18**			
%	00	55.56	44.44	**100**			
31-35	0	5	8	**13**			
%	00	38.46	61.53	**100**			
36-40	0	2	6	**8**			
%	00	25.00	75.00	**100**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Sig. denotes significant at0.05 level (i.e. p>0.05).

Table-16.2 ASSOCIATION BETWEEN PRE-TEST KNOWLEDGE WITH FAMILY TYPE

S. No.	*Level of Knowledge*			*Total*	*D. F.*	*Chi Square*	*Result*
Family Type	*Inadequate*	*Moderate*	*Adequate*				
Joint	2	17	6	**25**	6	6.763	Not Sig.
%	8.00	68.00	24.00	**100**			
Extended	0	6	8	**14**			
%	00	42.85	57.14	**100**			
Nuclear	2	8	11	**21**			
%	9.52	38.09	52.38	**100**			
Blended	0	0	0	**0**			
%	00	00	00	**00**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Not Sig. denotes Not Significant at 0.05 level (i.e. p<0.05).

Table-16.3 ASSOCIATION BETWEEN PRE TEST LEVELS OF KNOWLEDGE WITH EDUCATION STATUS

S. No.	*Level of Knowledge*			*Total*	*df*	*Chi Square*	*Result*
Education	*Inadequate*	*Moderate*	*Adequate*				
Primary	4	5	8	**17**	6	19.76	Sig.
%	23.53	29.42	47.05	**100**			
Secondary	0	8	11	**19**			
%	00	42.10	57.89	**100**			
Graduation	0	8	5	**13**			
%	00	61.53	38.46	**100**			
Post-graduation	0	10	1	**11**			
%	00	90.90	9.09	**100**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Sig. denotes significant at 0.05 level(i.e.p<0.05).

Table-16.4 ASSOCIATION BETWEEN PRE TEST LEVELS OF KNOWLEDGE WITH FAMILY OCCUPATION

S. No.	Level of Knowledge			Total	D. F.	Chi square	Result
Father's occupation	Inadequate	Moderate	Adequate				
Agriculture	3	5	3	**11**	6	11.986	Not Sig.
%	27.27	45.46	27.27	**100**			
Business	0	8	11	**19**			
%	00	42.10	57.89	**100**			
Labour	0	7	5	**12**			
%	00	58.33	41.66	**100**			
Others	1	11	6	**18**			
%	5.56	61.11	33.33	**100**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Not Sig. denotes Not significant at 0.05 level (i.e. p>0.05).

Table-16.5 ASSOCIATION BETWEEN PRE TEST LEVELS OF KNOWLEDGE WITH FAMILY INCOME

S. No.	Level of Knowledge			Total	D. F.	Chi square	Result
Family Income	Inadequate	Moderate	Adequate				
<10000	3	10	3	**16**	6	14.978	Sig.
%	18.75	62.50	18.75	**100**			
10000-20000	1	14	9	**24**			
%	4.17	58.33	37.50	**100**			
20000-30000	0	7	8	**15**			
%	00	46.67	53.33	**100**			
>30000	0	0	5	**5**			
%	00	00	100	**100**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Sig. denotes significant at 0.05 level (i.e. p>0.05).

Table-16.6 ASSOCIATION BETWEEN PRE TEST LEVELS OF KNOWLEDGE WITH PRIOR EDUCATION ABOUT POST OPERATIVE HYPOTHERMIA

S. No.	Level of Knowledge			Total	D. F.	Chi Square	Result
Prior education	Inadequate	Moderate	Adequate				
YES	0	1	7	**8**	2	8.01	Sig.
%	00	12.50	87.50	**100**			
NO	4	30	18	**52**			
%	7.69	57.69	34.61	**100**			
Total	**4**	**31**	**25**	**60**			
%	**6.67**	**51.67**	**41.66**	**100**			

Note: Sig. denotes significant at 0.05 level (i.e. p>0.05).

SUMMARY

This chapter deals with detailed discussion of the findings of the study interpreted from statistical analysis. The findings are discussed in relation to objectives, reviewed literature, hypothesis and conceptual framework.

The present study was conducted to assess the effectiveness of planned teaching program on knowledge regarding post-operative hypothermia. In order to achieve the objectives of the study, pre-experimental design with evaluative approach was adopted. The data was collected from 60 antenatal mothers before and after administration of self-instructional module from selected hospitals at Lucknow. Collected data was analyzed by using descriptive and inferential statistics and presented in the form of tables and graphs.

Major Findings of the Study:

1. **Section I: Description of the Demographic Variables of Patient Undergoing Surgery**

The participated study subject's personal variables were by age-wise. Out of the study, the percentage distribution of study subjects by age group represents that, out of 60 subjects, 35% (21) of the subjects

belong to the age group of 21–25 years, 30% (18) in the age group of 26–30 years, 21.67% (13) of them are in the age group of 31–35 years, and 13.33% (8) in the age group of 35–40 years.

The study represents the percentage distribution of study subjects by family group. Out of 60 subjects, 41.67% (25) of the subjects belong to the family type of joint, 23.33% (14) in the family type of extended, and 35% (21) of the subjects belong to the nuclear family.

Distribution of study subjects with reference to Education Status showed that out of 60 subjects, the majority, 28.33% (17) of the subjects were secondary, while 31.67% (19) had primary education, 21.67% (13) were graduates, and 18.33% (11) belonged to post-graduation.

Percentage distribution of study subjects with reference to father's occupation showed that out of 60 subjects, 18.33% (11) of subjects belong to agriculture, 31.67% (19) of them belong to business, 20% (12) belong to labour, and 30% (18) belong to other groups of father's occupation.

The study represents the percentage distribution of study subjects by family income group. Out of 60 subjects, 26.67% (16) of the subjects belong to the family income group of below 10,000, 40% (24) in the group of 10,000–20,000, 25% (15) of them are in the family income group of 20,000–30,000, and 8.33% (5) in the group of more than 30,000.

Distribution of study subjects with reference to knowledge about patients undergoing surgery is that out of 60 subjects, 13.33% (8) had an idea about patients undergoing surgery and 86.67% (52) had no idea about patients undergoing surgery.

2. Section II: Frequency and Percentage Distribution of Pre-test and Post-test Level of Knowledge of Patients Undergoing Surgery

Overall finding of pre-test knowledge, out of 60 subjects, 73.33% (44) had inadequate knowledge, 21.68% (14) had moderate knowledge, and 3.33% (2) had adequate knowledge regarding patients undergoing surgery.

3. After protocol (post-test), out of 60 subjects, 6.67% (4) had inadequate knowledge, 51.67% (31) had moderate knowledge, and 41.66% (25) had adequate knowledge regarding patients undergoing surgery.

Post-test Level of Knowledge in Different Aspects of Patients Undergoing Surgery

4. Among patients undergoing surgery, it is clear from the data that 61.67% (37) had moderate and the remaining 31.67% (19) had adequate knowledge level regarding patients undergoing surgery. 40% (24) had moderate and 53.33% (32) had adequate knowledge level regarding patients undergoing surgery.

5. The result concluded that compared to the pre-test score, there was an increase in the post-test score level of knowledge among patients undergoing surgery, which proved that the administration of SIM was effective.

Section III: Effectiveness of PTP by Comparison of Mean and Standard Deviation in Pre-test and Post-test Knowledge

6. In aspect-wise knowledge on patients undergoing surgery among patients undergoing surgery, pre-test and post-test mean was SD, range, mean score percentage of knowledge score before PTP.

i.e., aspect-wise pre-test mean knowledge of patients undergoing surgery indicates that combined mean knowledge of 48.55% was found in the aspect of knowledge, mean knowledge of 47.52% on patients undergoing surgery, and 49.58% on prevention of post-operative hypothermia.

7. However, the overall pre-test mean knowledge score was 48.55%. The mean, SD, range, and mean score percentage of knowledge score after PTP, i.e., aspect-wise post-test mean knowledge of patients undergoing surgery, indicates that combined mean knowledge of 72.29% was found in the aspect of knowledge on patients undergoing surgery, mean knowledge of 71.05% on post-operative hypothermia, and 73.52% on prevention of post-operative hypothermia.

However, the overall post-test mean knowledge score was 72.29%, with SD as 3.95. This indicates that there was a significant difference in knowledge regarding post-operative hypothermia before and after delivering PTP.

Section VI: Association Between Pre-test Level of Knowledge on Patients Undergoing Surgery with Selected Demographic Variables

As per the finding of the present study, the association between pre-test score level of knowledge of patients undergoing surgery regarding post-operative hypothermia with their selected demographic variables such as age, family education, father's occupation, family income, previous knowledge, and family type shows no significant association at the level of $P < 0.005$, but all other demographic variables have association at $P < 0.005$ level.

The level of knowledge of patients undergoing surgery will be significantly associated with the selected demographic variables.

CONCLUSION

This presents study concluded that implications, limitations, and recommendations of the study. The focus of this study was to evaluate effectiveness of protocols on knowledge regarding post-operative hypothermia among patients undergoing surgery in selected hospital at Lucknow. The study involved pre-experimental research design and evaluative approach. The sample and sample size was 60 patients from selected hospital; they were selected by using purposive sampling technique and according to inclusive, exclusive criteria. The pre-test level of knowledge was collected by using observational checklist. Followed by SIM on post-operative hypothermia were implemented. Post-test level of knowledge collected after 7 days by using same questionnaire as in pre-test. The results were analyzed and interpreted by descriptive and inferential statistics with the view of tables and figures.

The knowledge regarding post-operative hypothermia among antenatal mothers was inadequate before the administration of SIM. After SIM, all knowledge was increased. So, SIM administered on post-operative hypothermia among patients was effective. There was significant association between pre-test score knowledge and selected demographic variables of age, type of family, mother's education, and previous knowledge of patient regarding post-operative hypothermia. So, it indicates that age, mother's education, father's occupation, and previous knowledge variables will influence the knowledge level, and other selected variables such as family income and type of family were not associated.

The study finding shows that there is significant improvement in knowledge and practice after SIM on post-operative hypothermia of patients. The patients expressed that the teaching programme was very informative, clear, and it would help them to modify their lifestyle which will be appropriate to maintain optimum health condition. Hence, the SIM was instructionally effective, appropriate, and feasible and has enhanced the level of knowledge regarding post-operative hypothermia.

NURSING IMPLICATION OF THE STUDY

The finding of the study has implications for nursing education, community health practice, nursing practice, nursing administration, and nursing research.

Nursing Education

The nursing curriculum should consist of increased depth, content, and activities which help to develop knowledge among patients undergoing surgery on post-operative hypothermia. As a nurse educator, there are abundant opportunities for nursing professionals to educate people regarding post-operative hypothermia among patients. The study emphasizes the significance of conducting short-term in-service education programmes for nurses and peripheral health workers related to health education for patients regarding post-operative hypothermia. Nursing personnel working should be given in-service education and helped to keep abreast with recent trends. The nurse educator needs to conduct health campaigns and use different informational modalities and teaching strategies about post-operative hypothermia. The nurse should educate about the utilization of local health services and the availability of voluntary health agencies, which helps to promote better health and prevent complications among patients undergoing surgery.

Nursing Practice

An implication of nursing practice derived from the study is that, in modern times, the health care delivery system has changed from a care-oriented approach to a health promotion and illness prevention-oriented approach. Nurses are the key persons of the health team who play a major role in effective health promotion and maintenance. This study implies a basis for developing standards of lifestyle and health care at home as well as in the care of the community. Providing health education is one of the functions of nursing personnel, and its accountability should be stressed. Nursing intervention programmes can be used as a teaching strategy in the community. Health education can be imparted through mass media, i.e., through radio, television, documentary films, pamphlets, leaflets, information booklets, and lesson plans. This will help the nursing profession to move towards the goal of providing holistic care.

Community Health Practice

Public awareness can be created by various community health programmes regarding post-operative hypothermia. Attention should be focused on the prevention of post-operative hypothermia, and measures should be taken to prevent further complications related to post-operative hypothermia.

Nursing Administration

The nurse administrator can take part in developing protocols and standing orders related to the design of health education programmes to update nursing personnel's knowledge and attitude regarding patients. The nurse administrator can mobilize the available resource personnel towards the health education of patients regarding post-operative hypothermia. They should take interest in providing information on selected aspects. They should be able to plan and organize programmes, taking into consideration cost-effectiveness, and carry out successful educational programmes. The nurse

administrator should plan and organize continuing education programmes for the nursing staff and organize camps regarding post-operative hypothermia among patients. The nurse administrator should explore their potential and encourage innovative ideas in the preparation of appropriate information and modalities. They should organize sufficient manpower, money, and materials for disseminating health information.

Nursing Research

The study helps nurse researchers to develop appropriate health education tools for educating patients regarding post-operative hypothermia. Nurses should come forward to take up unsolved aspects in the field of care to the public. The study will motivate beginning researchers to conduct studies with different variables on a large scale. Public and private agencies should also encourage research in this field through needed materials and funds.

Limitation of the Study

The study was limited to:

- Selected hospital at Lucknow.
- Patients undergoing surgery who were available during the period of data collection.
- Only patients who could understand Hindi and English.

The study findings cannot be generalized because the sample size was only 60.

Recommendations

On the basis of findings, the study recommendations are as follows:

- A similar study can be replicated on a larger sample in order to generalize the findings.
- An experimental study can be conducted with a control group for the effective comparison of the results.
- A study can be conducted to evaluate the efficiency of teaching strategies like lesson plans on post-operative hypothermia among patients undergoing surgery.
- A study can be conducted on other samples.

Suggestions

- Health professionals should conduct periodic awareness programmes in schools, colleges, as well as in the community.
- Nurses should update their knowledge constantly in order to help the public regarding post-operative hypothermia.
- All hospitals, private clinics, and community health centres should have resource materials and guidelines regarding post-operative hypothermia.

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