



“COMPARITIVE STUDY TO ASSESS THE KNOWLEDGE REGARDING PEDIATRIC VENTILATOR CARE AMONG B.SC NURSING STUDENTS, IN COLLEGE OF NURSING, SVIMS AT TIRUPATI.”

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ABSTRACT

INTRODUCTION: The birth of a child is a joyous occasion filled with great anticipation. The first minute after birth, on the other hand, is filled with anxious moments and rapid physiological adjustments. The majority of newborns make the transition successfully as a matter of course. However, 10% of them may need to be modified. When they are critically ill, they require advanced medical care. Mechanical ventilation is a common therapy in sub acute and long-term care settings and is routinely required for the critically ill in intensive care units. The primary goals of mechanical ventilation assistance are to restore normal arterial blood gas levels and acid-base balance by ensuring proper ventilation and oxygenation. **AIM:** To assess the knowledge regarding paediatric ventilator care among B.sc 3rd and 4th years Nursing students. **Materials And Methods:** The research approach used for the study is non- experimental Comparative research design. The sample of the study is taken by non probability purposive sampling technique with 100 (50-50) B.sc 3rd and 4th years Nursing students, svims, tirupati. The data collection done in the period of 20- 08-2022. A self structured questionnaire was used to collect the data consist of 30 multiple choice questions. The data analyzed statistically. Mainly chi-square was used for data analysis. **Results:** The major findings of the study was out of 50 selected B.sc 3rd and 4th years Nursing students, svims, Tirupati, Out of 50 Bsc nursing 3rd year 26(52%) had moderate knowledge on pediatric ventilator care, out of 50 Bsc nursing 4th year students 27(54%) had moderate knowledge on pediatric ventilator care. There is no statistical significant association with the knowledge regarding pediatric ventilator care. The

comparison of knowledge scores regarding pediatric ventilator care among bsc nursing 3rd year and 4th year students among 3rd year bsc nursing students mean were 19.7 , standard deviation were 2.967 and standard error were 0.419. among the bsc nursing 4th year students mean were 21.28, standard deviation were 3.387, and standard error were 0.479 among all the bsc nursing 3rd and 4th year students the t value were 2.482.

CONCLUSION:The study shows the knowledge regarding pediatric ventilator care among bsc nursing students were having moderate knowledge. Based on the providing information booklet was given to all the students to improve the level of knowledge.

KEY WORDS: ventilator, pediatric ventilator care, knowledge

INTRODUCTION:

Mechanical ventilation is an invasive life-saving procedure that has a wide range of effects on the cardiopulmonary system. The goal is to optimize both gas exchange and clinical status while maintaining the lowest fractional concentration of inspired oxygen (FiO₂) and ventilator pressures/tidal volume possible. The ventilator strategy used to achieve this goal is determined in part by the infant's disease process. Furthermore, recent technological advances have increased the number of options for newborn ventilatory therapy.

According to data published by the Centers for Disease Control and Prevention (CDC)-sponsored National nosocomial infection surveillance system (NNIS), VAP is the second most common cause of nosocomial infection (20% of nosocomial infections) in paediatric intensive care units (PICU), with rates ranging from 1.4 to 7 episodes per 1,000 ventilator days.

Mechanical ventilation devices and methods are now essential components of neonatal intensive care. However, while their use is usually successful in supporting ventilation and preserving life, it is frequently associated with acute complications and chronic lung damage, particularly in the very small infant. Improvements in the management of respiratory failure in small infants have been closely linked to advancements in neonatal intensive care. This applies to the care of the preterm infant with immature lungs, as well as the treatment of the preterm or full-term infant with specific diseases associated with respiratory failure.⁷

Mechanical ventilators are intended to assist or replace the work of the respiratory muscles and thorax in maintaining the lungs' gas exchange function. There are numerous types of ventilators.

OBJECTIVES:

- ✓ To assess the knowledge regarding pediatric ventilator care among B.sc Nursing students
- ✓ To compare the knowledge scores regarding pediatric ventilator care among B.sc 3rd and 4th year Nursing students
- ✓ To find out the association between level of knowledge with selected Socio-demographic variables among bsc nursing 3rd year students
- ✓ To find out the association between level of knowledge with selected Socio-demographic variables among bsc nursing 4th year students
- ✓ To provide an information booklet on pediatric ventilator care

MATERIALS AND METHODS:**RESEARCH APPROACH**

Research approach that is used in study was non – experimental approach

RESEARCH DESIGN

The research design selected for this study was comparative research design.

VARIABLES OF THE STUDY**DEPENDENT VARIABLE**

Dependent variables of the study is level of knowledge

INDEPENDENT VARIABLE

Demographic variables like age, gender, Place of residence, religion, type of family, educational status, occupation, sibling history, family income, any of the family members admitted in Pediatric Intensive Care Unit, Previous knowledge, Source of information.

SETTING OF THE STUDY

The study was conducted at College of Nursing, SVIMS at Tirupati. The setting was chosen on the basis of investigator feasibility in terms of availability of required sample and co-operation extended by the principal, staff and students. The investigation was familiar with the setting and language of students studying in the college. Formal permission was obtained from the principal, SVIMS College of Nursing, Tirupati.

POPULATION

The population chosen for this study includes students who were studying 3rd & 4th year B.sc Nursing in college of Nursing, SVIMS, Tirupati.

SAMPLE

Sample chosen for this study was students who are studying 3rd& 4th year B.sc Nursing, in college of Nursing, SVIMS, Tirupati falling under inclusion criteria.

SAMPLE SIZE

Sample size consisted of 100 of B.sc (N) students (3rd year 50 members and 4th year 50 members) who were falling under inclusion criteria.

SAMPLING TECHNIQUE

Non probability Purposive sampling technique was adopted depending upon the availability of the selected samples. Total 120 samples who are studying B.sc (N) 3rd& 4th year in College of Nursing, SVIMS, Tirupati selected according to their role number in attendance register.

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA :

- B.sc Nursing students who are studying in college of Nursing at SVIMS, Tirupati
- B.sc Nursing 3rd and 4th year students who are willing to participate in the study

EXCLUSIVE CRITERIA:

- B.sc Nursing 3rd and 4th year students who are psychologically ill

DESCRIPTION OF THE TOOL :

The present study planned mainly to assess the knowledge on paediatric ventilator care among B.sc Nursing students in college of nursing, SVIMS at Tirupati.

Hence the following tools were used in the study. It consists of 2 sections.

- **SECTION – A** – Contain questions to collect socio-demographic data
- **SECTION –B** - Level of knowledge on paediatric ventilator care

The study tool consists of the following parts.

SECTION - A :- Questionnaire related to socio-demographic variables such as, age, gender, Place of residence, religion, type of family, educational status, occupation, sibling history , family income,any of the family members admitted in Paediatric Intensive Care Unit,Previous knowledge, Source of information.

SECTION - B:- Assess the knowledge on paediatric ventilator care. It consists of introduction, indications for mechanical ventilation, ventilator emergencies, supportive care during ventilation, fluid therapy, monitoring

during mechanical ventilation, nursing management, prevention of infections, complications of long-term ventilation, plan of care for ventilated patients, common causes of failure to wean, post-extubation care.

SCORING INTERPRETATION

Scoring key for section – A was prepared by coding socio-demographic data.

In section- B - consists of 30 questions related to level of knowledge on care of paediatric ventilator, each one carry one mark. Right answer considered as one mark. Wrong one considered as zero mark. The maximum score was 30. The total score reflects the knowledge on paediatric ventilator care. The score was organized as follows

Table :1

| Total score obtained | Percentage | Interpretation |
|----------------------|------------|----------------------|
| 1 – 10 | 0 – 50 % | Inadequate knowledge |
| 11 - 20 | 51% - 75 % | Moderate knowledge |
| 21 – 30 | > 76 % | Adequate knowledge |

PILOT STUDY

Prior formal permission was obtained from Principal of College of Nursing SVIMS Tirupati for conducting the study. The data were collected on 20- 08-2022 with sample size of 20 (B.sc (N) 3rd year -10, 4th year -10).Ten sample were selected by following non probability purposive sampling technique. Who fall under inclusion criteria were selected for the pilot study. Rapport was established with self-introduction and written consent from the participants in the study was obtained.The reliability method using for B.sc 3rd year students **Cronbach's alpha r = 0.78**, and B.sc 4th year students **Cronbach's alpha r =0.80**.

DATA COLLECTION PROCEDURE:

- Data was collected at svims, Tirupati. A 100(50-50) B.sc (N) 3rd& 4th year in College of Nursing, were selected by Non Probability Purposive Sampling Technique.
- 100 samples (3rd year 50 samples and 4th year 50 samples) were selected by non-probability purposive sampling technique. Data were collected on 03- 09- 2022 from B.sc (N) 3rd& 4th year students who were available and willing for participation.
- The investigators made them to sit comfortably and introduction herself to each participant and explained the purpose of the study and took a written consent and given structured questionnaire. The data collection took 30 -35 minutes for each participant.

DATA ANALYSIS

Descriptive statistics

- Frequency and Percentage and distribution were used for analysing the demographic variables.
- Percentage mean and standard deviation were used.

Inferential statistics

- Pair t-test was used for analysing the difference between the 3rd & 4th year students
- Chi-Square test was used for analysing the association demographic characteristics of 3rd & 4th year students with that of the tool score.
- The analysed data will be presented in the form of tables, diagrams and graph wherever necessary.

ETHICAL CONSIDERATION: A Formal written permission was obtained from the principal, college of nursing,svims, Tirupati, to conduct the study and written consent was taken from the B.sc (N) 3rd and 4th year students

RESULTS

Table:1 Frequency and percentage distribution of demographic variables among B.sc (N) 3rd and 4th year students
(N= Bsc (N) 3RD YR =50, Bsc (N) 4th YR=50)

| S.NO | DEMOGRAPHIC VARIABLES | RESPONDENTS | | | |
|-----------|-----------------------|------------------------------|--------|------------------------------|--------|
| | | BSC (N) 3 RD YEAR | | BSC (N) 4 TH YEAR | |
| | | F | % | F | % |
| 1. | AGE | | | | |
| | 19 - 20 Years | 32 | 64.0% | 0 | 0% |
| | 21 - 22 Years | 18 | 36.0% | 44 | 88.0% |
| | Above 23 Years | 0 | 0% | 6 | 12.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 2. | GENDER | | | | |
| | Male | 4 | 8.0% | 7 | 14.0% |
| | Female | 46 | 92.0% | 43 | 86.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 3. | RELIGION | | | | |
| | Hindu | 44 | 88.0% | 45 | 90.0% |
| | Christian | 3 | 6.0% | 2 | 4.0% |
| | Muslim | 3 | 6.0% | 3 | 6.0% |
| | Other | 0 | 0% | 0 | 0% |

| | | | | | |
|------------|--------------------------|-----------|---------------|-----------|---------------|
| | Total | 50 | 100.0 | 50 | 100.0 |
| 4. | PLACE | | | | |
| | Rural | 24 | 48.0% | 27 | 54.0% |
| | Urban | 19 | 38.0% | 17 | 34.0% |
| | Semi-urban | 7 | 14.0% | 6 | 12.0% |
| | Slums | 0 | 0% | 0 | 0% |
| | Total | 50 | 100.0 | 50 | 100.0% |
| 5. | TYPE OF FAMILY | | | | |
| | Nuclear Family | 33 | 66.0% | 42 | 84.0% |
| | Joint Family | 13 | 26.0% | 7 | 14.0% |
| | Single Parent Family | 4 | 8.0% | 1 | 2.0% |
| | Extended Family | 0 | 0% | 0 | 0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 6. | EDUCATION MOTHER | | | | |
| | Illiterate | 9 | 18.0% | 14 | 28.0% |
| | Primary Education | 20 | 40.0% | 14 | 28.0% |
| | Secondary Education | 17 | 34.0% | 16 | 32.0% |
| | Higher Education | 4 | 8.0% | 6 | 12.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 7. | EDUCATION FATHER | | | | |
| | Illiterate | 4 | 8.0% | 5 | 10.0% |
| | Primary Education | 13 | 26.0% | 12 | 24.0% |
| | Secondary Education | 22 | 44.0% | 18 | 36.0% |
| | Higher Education | 11 | 22.0% | 15 | 30.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 8. | OCCUPATION MOTHER | | | | |
| | Home Maker | 40 | 80.0% | 39 | 78.0% |
| | Daily Earner | 3 | 6.0% | 6 | 12.0% |
| | Business | 2 | 4.0% | 1 | 2.0% |
| | Employee | 5 | 10.0% | 4 | 8.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 9. | OCCUPATION FATHER | | | | |
| | Daily earners | 13 | 26.0% | 10 | 20.0% |
| | Agriculture | 19 | 38.0% | 19 | 38.0% |
| | Business | 12 | 24.0% | 7 | 14.0% |
| | Employee | 6 | 12.0% | 14 | 28.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 10. | SIBLINGS | | | | |
| | None | 2 | 4.0% | 2 | 4.0% |
| | One | 27 | 54.0% | 25 | 50.0% |
| | Two | 12 | 24.0% | 14 | 28.0% |

| | | | | | |
|-----|------------------------------|-----------|---------------|-----------|---------------|
| | Three or More | 9 | 18.0% | 9 | 18.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 11. | INCOME | | | | |
| | < Rs. 15000 | 11 | 22.0% | 12 | 24.0% |
| | Rs.15001 - Rs.30000 | 21 | 42.0% | 16 | 32.0% |
| | Rs.30001 - Rs.45000 | 6 | 12.0% | 8 | 16.0% |
| | > Rs. 45001 | 12 | 24.0% | 14 | 28.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 12 | ICU | | | | |
| | Yes | 4 | 8.0% | 2 | 4.0% |
| | No | 46 | 92.0% | 48 | 96.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 13 | PREVIOUS KNOWLEDGE 1 | | | | |
| | Yes | 24 | 48.0% | 22 | 44.0% |
| | No | 26 | 52.0% | 28 | 56.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |
| 14 | SOURCE OF INFORMATION | | | | |
| | Class room teaching /books | 49 | 98.0% | 46 | 92.0% |
| | Media | 0 | 0% | 2 | 4.0% |
| | Seniors | 1 | 2.0% | 1 | 2.0% |
| | Conferences/ Workshops | 0 | 0% | 1 | 2.0% |
| | Total | 50 | 100.0% | 50 | 100.0% |

TABLE : 2 (A) Distribution of Sample Respondents to assess the knowledge regarding paediatric ventilator care among 3rdYear B.sc nursing students

(N= Bsc (N) 3RD YR =50, Bsc (N) 4th YR=50)

| KNOWLEDGE REGARDING PAEDIATRIC VENTILATOR CARE 3 RD YEAR NURSING STUDENTS | FREQUENCY | PERCENTAGE | MEAN | SD |
|--|-----------|------------|------|-------|
| INADEQUATE | 16 | 32.0 | 2.03 | 0.688 |
| MODERATE | 26 | 52.0 | | |
| ADEQUATE | 8 | 16.0 | | |

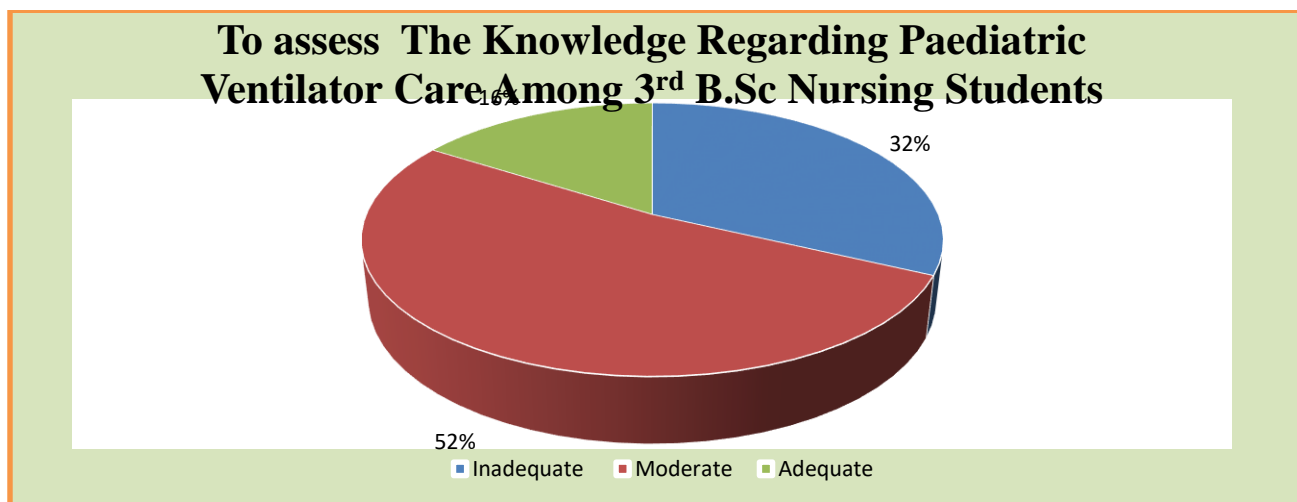


TABLE : 2 (B) Distribution of Sample Respondents to assess the knowledge regarding paediatric ventilator care among 4th.sc nursing students

| KNOWLEDGE REGARDING PAEDIATRIC VENTILATOR CARE 4 TH NURSING STUDENTS | FREQUENCY | PERCENTAGE | MEAN | SD |
|---|-----------|------------|------|-------|
| INADEQUATE | 6 | 12.0 | 2.10 | 0.738 |
| MODERATE | 27 | 54.0 | | |
| ADEQUATE | 17 | 34.0 | | |

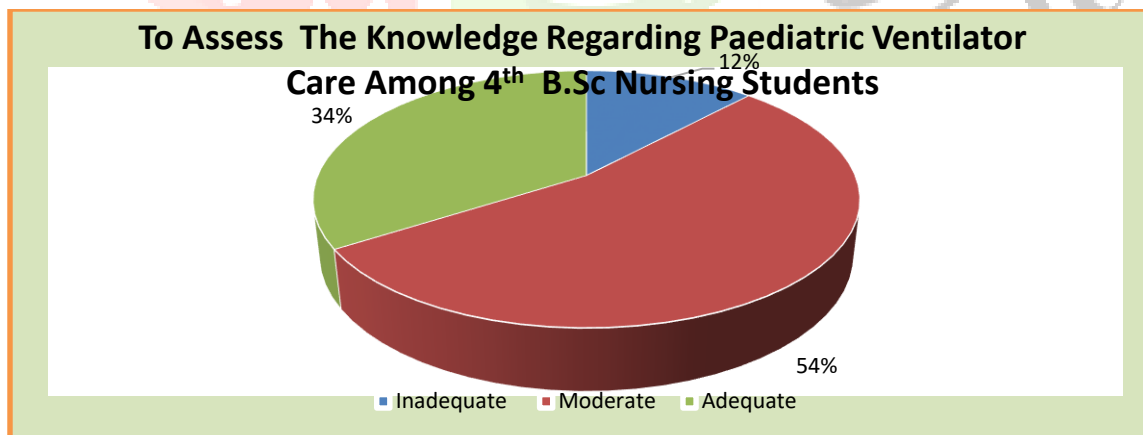


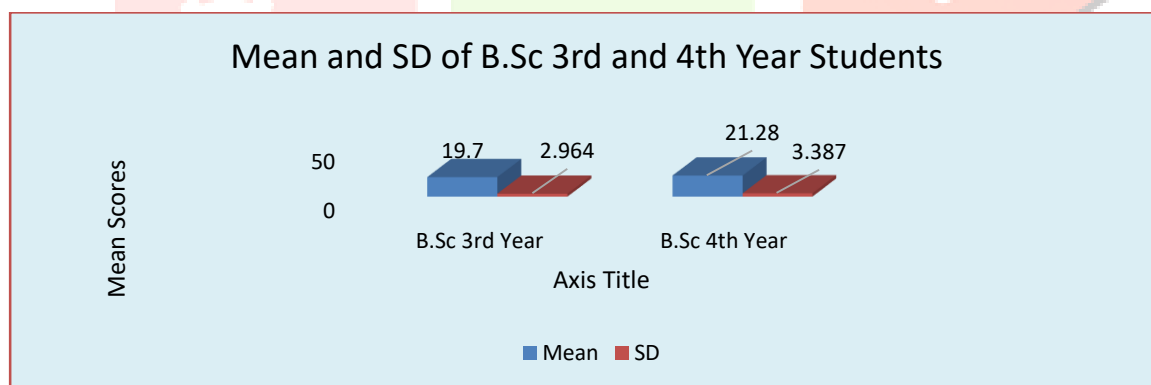
TABLE:3 ASSOCIATION OF KNOWLEDGE SCORES REGARDING PAEDIATRIC VENTILATOR CARE WITH SOCIO-DEMOGRAPHIC VARIABLES OF 3RD YEAR B.SC NURSING STUDENTS

TABLE:4 ASSOCIATION OF KNOWLEDGE SCORES REGARDING PAEDIATRIC VENTILATOR CARE WITH SOCIO-DEMOGRAPHIC VARIABLES OF 4TH YEAR B.SC NURSING STUDENTS

TABLE:5 COMPARISON OF THE KNOWLEDGE SCORES REGARDING PAEDIATRIC VENTILATOR CARE AMONG THE 3RD YEAR AND 4TH YEAR B.SC. NURSING STUDENTS

| | RESPONDENTS | N | MEAN | S.D | S.E | T-VALUE (P-VALUE) |
|--------|--------------------------|----|-------|-------|-------|----------------------|
| Scores | <i>B.Sc (N) 3rd Year</i> | 50 | 19.70 | 2.964 | 0.419 | 2.482* (0.015) |
| | <i>B.Sc (N) 4th Year</i> | 50 | 21.28 | 3.387 | 0.479 | |

*significant at 0.05 level;



DISCUSSION

Mechanical ventilation is a common therapy in subacute and long-term care settings and is routinely required for the critically ill children's. The goal of mechanical ventilation is to restore physiologic gas exchange, reduce work of breathing, and protect the airway in patients who are unable to do so.

The aim of the study is to assess the knowledge regarding paediatric ventilator care among B.sc Nursing 3rd year and 4th year students shows that the score of knowledge regarding paediatric ventilator care among 3rd year B.sc nursing students 26 (52 %) had moderate knowledge, 16 (32%) had inadequate knowledge, 8 (16%) had adequate knowledge and compute mean was 2.03 and compute standard deviation was 0.688. Score of knowledge regarding paediatric ventilator care among 4th year B.sc nursing students 27 (54 %)

had moderate knowledge, 17 (34%) had adequate knowledge, 6 (12 %) had inadequate knowledge, and compute mean was 2.10 and compute standard deviation was 0.738.

The study to compare the knowledge regarding paediatric ventilator care among B.sc Nursing students 3rd and 4th year students showed that mean were 19.7, standard deviation were 2.967 and standard error were 0.419. among the BSc nursing 4th year students mean were 21.28, standard deviation were 3.387, and standard error were 0.479 among all the BSc nursing 3rd and 4th year students the t value were 2.482.

To find out the association between level of knowledge with selected Socio-demographic variables among BSc nursing 3rd year students were statistically significant are place, type of family education of mother, occupation of father, income was significant at $p < 0.01$, age, previous knowledge significant at $p < 0.05$.

Mr. Adarsh Kumar and Mr. Raghavendran M (2021) Conducted Descriptive study on the assess the level of knowledge on prevention of ventilator associated pneumonia among nursing students in selected nursing colleges, Kanpur, with 50 GNM nursing students were selected by convenience sampling technique and structured questionnaire was used. The study revealed that result shows that 20 (40%) having Good knowledge level, 26 (52%) having Average knowledge level and 4 (8%) having Poor knowledge level of students regarding prevention of ventilator associated pneumonia. The maximum mean knowledge score was 12.06, and the Standard Deviation was 5.15. With respect to association between the level of knowledge with the selected demographic variables shows no significance. The study concludes that, the knowledge level of students regarding prevention on ventilator associated pneumonia is average *To find out the association between level of knowledge with selected Socio-demographic variables among BSc nursing 4th year students* were statistically significant are gender, education of father, Income significant at $p < 0.01$, type of family, education of mother, occupation of mother, occupation of father, previous knowledge significant at $p < 0.05$, To *provide information booklet* regarding paediatric ventilator care among BSc nursing 3rd year and 4th year students.

CONCLUSION:

The study shows the knowledge regarding pediatric ventilator care among bsc nursing students were having moderate knowledge. Based on the providing information booklet was given to all the students to improve the level of knowledge.

NURSING IMPLICATIONS:

The findings of the study have implications in various areas of nursing profession, i.e nursing service, nursing education, nursing administration and nursing research.

Nursing Services:

The present health care delivery system gives emphasis on comprehensive health care, which includes preventive, curative and rehabilitative care.

- Nurses should update the knowledge regarding through Paediatric Ventilator care workshops, conferences, etc.
- Continuous Nursing Education programmes can be conducted from time to time so that the nurses keep themselves updated with the latest standard guidelines.
- Complications of paediatric ventilator could be reduced through the use of good nursing care from the nurses in NICU/PICU.

Nursing Education:

- Nursing curriculum needs to be updated to identify the aspects of nursing care that are lacking to provide supportive education on ventilator care bundle for the prevention of ventilator associated pneumonia.
- In-service education programme can upgrade the knowledge of nurses about Paediatric Ventilator care.
- Nursing students who are posted in neonatal /paediatric intensive care units should be able to know the paediatric ventilator care, and how to prevent the complications on ventilated child
- The nurses should update with new protocols and policies for paediatric ventilator care in neonatal /paediatric ICU's.
- Nurse educators can also develop video tape study material, slides planned with the LED projector etc regarding paediatric ventilator care

Nursing Administration:

- Nursing students can do ward teaching and clinical presentations where ever it is necessary.
- Students develop proper knowledge regarding paediatric ventilator care and prevention of ventilator associated pneumonia.
- Nurse administrator should keep a separate budget for in-service education/ CNE Programmes, so that it can be conducted regularly.
- The nurse administrators can train the nurses in the implementation of the Modified Neonatal/ Paediatric paediatric care & paediatric VAP Preventive Care Bundle for the Newborns/ Children.

Nursing Research:

- Nursing research is an essential aspect of nursing education as it uplifts the profession, develops new nursing norms and enhances the body of nursing knowledge.
- Nursing research should be based on practicing newer methods of teaching programmes which includes computer based learning module etc.

- Similar studies may be conducted on larger samples and different settings. Researchers must focus on developing appropriate protocols for reducing the incidence of the Ventilator Associated Pneumonia in newborn/ children.

RECOMMENDATIONS:

- The study can be conducted with larger sample in another setting which provides care for critically ill paediatric patients.
- A quasi-experimental study can be conducted with the help of structured teaching programme regarding paediatric ventilator care and prevention of ventilator associated pneumonia in PICU/NICU among 3rd& 4th year B. Sc Nursing students.
- A comparative study could be conducted among nursing students and staff nurses regarding paediatric ventilator care and prevention of ventilator associated pneumonia in PICU/NICU'S
- Same study could be conducted on implementation of paediatric ventilator care among the nurses working in neonatal and paediatric intensive care units, and further research on factors affecting implementation of paediatric ventilator care is recommended.

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