CHAPTER V:
SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

“Do not seek to follow in the footsteps of the men of old; seek what they sought.”
Matsuo Basho

This chapter, is as overview of research process, summary of the main findings, conclusion implication, suggestion and recommendation for further research are included.

The study was conducted with the purpose to assess the effectiveness of standard operating protocols on knowledge and practices of nurses regarding care of patient on ventilator in an intensive care unit at selected government hospitals in the state of Maharashtra.

The study had following objectives:-

1. To develop and validate the standard operating protocols regarding care of patient on ventilator.

2. To assess the knowledge of the nurses before and after implementation of the protocols and teaching

3. To assess the practices of the nurses before and after implementation of the protocols and teaching

4. To find the association of sociodemographic variables with the knowledge and practices of the nurses before and after implementation of the protocols and teaching

5. To find out the correlation between the knowledge and practices of the nurses regarding care of patient on ventilator.
The researcher used one group pre and post-test design. Two twenty nurses were in the study on the basis of their willingness from the selected government hospital I.C.U.

5.1) MAJOR FINDINGS OF THE STUDY:

A) Region wise distribution of nurses

Out of 220 nurses studied 42 (19%) each were from Konkan and Nagpur region, 50 (23%) were from Pune region, 53 (24%) were from Aurangabad region, 21(10%) from Amravati region and only 12 (6%) were from Nashik region.

B) Analysis of sociodemographic data of the nurses:

Majority of nurses 73(33 %) were from two age groups 26-30years and 36 years and above, while minimum 24 (11%) were from age group 21-25 years. The percentage of females working in this area was high 193(88 %) as compared to males 27(12%). The nurses with Diploma in general nursing were more in number 190(86%), while highly qualified nurses MSc Nursing was only 3(1%) all over Maharashtra. Additional qualification in CVTS course was done only by one nurse and ICU training was done by two nurses among 220 nurses. Majority 74(34 %) nurses had experience of three years and above where as 65(29%) of the nurses had one to three years' experience. 46(21%) nurses were with six months to one year experience and35(16%) of them had ICU experience of three to six months.

C) Analysis of knowledge:-

i. Overall Distribution of nurses according knowledge scores of each subsections of structured knowledge questionnaire

The knowledge score of nurses in six regions regarding care of patient on ventilator ranged from average to excellent. Pretest knowledge score was maximum in Konkan region in all the areas it was maximum also during post-test -1 and post-test-2.Except knowledge score of nurses regarding weaning was maximum (55 %) in Pune region during post-test -2. Knowledge score regarding enteral feeding was maximum during pretest, post-test-1 and post-test -2 in Nashik region. The overall score was minimum among the nurses of Amravati and Aurangabad region as compared to other four regions. From the study it is found that the nurses needed reinforcement. Teaching only once will not retain knowledge and they need regular inservice education.
ii. Distribution of overall nurses as per the grades obtained by them in knowledge questionnaire on care of patient on ventilator.

In Pretest it was found that majority 160 (75%) of nurses had good knowledge while there were only eight nurses (four %) having excellent knowledge.

Post-test -1 after five days showed that the knowledge score was improved, number of nurses having excellent knowledge increased from four % to 85 % while nine nurses had average knowledge. Similarly Post test -2 after one month showed that the number of nurses having excellent knowledge was still higher 74 (34%) as compared to pretest score. This showed that the knowledge score of each nurse has been increased after implementation of protocol and teaching though the score reduced after one month but still higher than the pretest.

iii. Region wise distribution of nurses according obtained knowledge score during pre and post test-2

Out of the 42 Nurses from Konkan region during pretest four (10%) of them had average knowledge, 34 (80%) of them had good knowledge and four (10%) of them had excellent knowledge during post-test -1 their knowledge was improved to excellent level (27) (64%) and remained good 15 (29%) number of nurses. Out of 50 nurses from Pune, pretest knowledge score varied from average to good. Nine (18%) nurses were average, 39 (78%) were good and two (4%) nurses had excellent knowledge however their post-test-2 knowledge score was changed to average 13 (26%), good 22 (44%) and excellent 15 (30%) nurses respectively. Out of 53 nurses majority 32 (60%) nurses from Aurangabad had good knowledge during pretest which was increased to 41 (77%) of nurses during post-test-1. Four (8%) and eight (15%) nurses each had average and excellent level of knowledge. Out of 42 nurses from Nagpur, nine (21%) nurses had average knowledge, 32 (77%) nurse had good knowledge and one (2%) nurse had excellent knowledge during pretest. During Post-test-2 their knowledge was increased to excellent 18 (43%) nurses, 17 (40%) nurses remained as good and Average were seven (17%) nurses respectively.

iv. Overall comparison of sub sections of knowledge questionnaire score with pretest, post test-1 and post test-2 of the nurses in the study.
The mean Knowledge score regarding all the areas of knowledge was higher in post-test -1 than in post test -2. The difference between the mean knowledge score of communication with patients and relatives during post test -1 was significant p= 0.0. In Post test -2 not significant p= 0.45.

However in all the other subsections post test -1 and post test-2 were significant. The area wise ‘value was as follows. Assisting in intubation and change in twill tape p = < 0.0001, Extubation of the patients, p = < 0.0001, monitoring the pt. on ventilator p = < 0.0001, assisting for weaning off from ventilator, p = < 0.0001, suctioning of endotracheal tube, p = < 0.0001, ABG collection and its interpretation, p = 0.004 oral hygiene of pt. on ventilator, back care and care of pressure points, enteral feed to a patient on ventilator p = 0.009.

The difference between the mean knowledge score of communication with patients and relatives during post-test -1 was significant p= 0.0. In Post-test -2 not significant p= 0.45. The differences between the mean knowledge score was significant during post-test -1 and post-test -2 in all the regions as value of ‘p’ ranged from <0.0001 to 0.004 except in Nashik region as p = 0.88, Pune region and Amravati region as p = 0.06 during post-test -2. Region wise comparison of sub sections of knowledge questionnaire score with pretest, post test-1and post-test -2 of the nurses in the study.

vi) Region wise comparison of sub sections of knowledge questionnaire score with pretest, post-test-1and post-test -2 of the nurses in the study.

a) There was significant change in the mean knowledge score in Nashik and Nagpur region during post test -1 as p = 0.047 and 0.005 respectively regarding communication with patient and relatives. However in all the other four regions there is no significant change during post test -1 and post test -2. Similarly there was no significant change in the mean knowledge score of nurses in Nagpur region during post test-2.

b) There was significant change in the mean knowledge score of nurses regarding assisting for intubation and change of twill tape pretest, post test-1, post test-2 in Konkan region as p = 0.001, significant during pretest, post test-1, post test-2 as p =
<0.0001 in Aurangabad region. Significant during pretest, post test-1, post test-2 as p = <0.0001 and 0.011 respectively in Nagpur region. Nashik and Amravati regions: significance was found only during post test-1 as p = 0.024 and 0.005 respectively.

c) Region wise comparisons of knowledge score of nurses regarding extubation of the patient. There is a significant change in the mean knowledge score during pretest, post test -1 and post test -2 in Konkan region as p = <0.0001, Aurangabad region as p = 0.038 and 0.001, Nagpur <0.0001 and 0.004 similarly there is significance in the mean knowledge score of Pune region during post test -1 as p = 0.042.

d) Region wise comparisons of knowledge of nurses regarding monitoring the patient on ventilator there was a significant change in the mean knowledge score during post test -1 and post test -2 in Konkan region as p = <0.0001, in Pune region as p = <0.0001 and 0.014, in Aurangabad region as p = <0.0001, in Nagpur as p = <0.0001 and 0.011. It was also significant in Amravati region during post test-1 as p = 0.008.

e) Region wise comparison of knowledge regarding assisting for weaning off from ventilator. there was a significant change in the mean knowledge score during post test -1 and post test -2 in Pune region as p = <0.0001. It was significant only during post test -1 in Konkan region as p = 0.008, in Nashik region as p = 0.046 in Amravati region as p= 0.026 and in Konkan region as p = 0.001.

f) Region wise comparison of knowledge score of nurses regarding suctioning of endotracheal tube. There was a significant change in the mean knowledge score during post test -1 and post test -2 in all the six regions. Konkan p = <0.0001, Nashik p= 0.005 and 0.002, in Pune <0.0001 and 0.004, in Aurangabad p= <0.0001, in Amravati p = 0.026 and 0.018 and in Nagpur p = <0.0001.

g) Region wise comparison of knowledge score of nurses regarding arterial blood gas collection and its interpretation. There was a significant change in the mean knowledge score during post test -1 and post test -2 in Konkan region as p = 0.024 and 0.028.Similarly there was significant change in mean knowledge score during post test -1 was in Nashik region as p = 0.027, Pune region p = 0.002.Amravati region p = 0.002 and Nagpur region p= <0.0001.
h) A region wise comparison of Knowledge of nurses regarding oral hygiene of the patient on ventilator shows that there was a significant change in the mean knowledge score during post test -1 and post test -2 in Konkan region as p = 0.001, in Aurangabad as p= 0.003 and 0.004. It was also significant during post test -1 in Pune region as p = < 0.0001, Amravati p = 0.003 and Nagpur p = 0.001.

i) Region wise comparisons of Knowledge regarding back massage and care of pressure points of the patient on ventilator shows that. there was a significant change in the mean knowledge score during post test -1 and post test -2 in Aurangabad region as p = <0.0001, It was also significant during post test -1 in Konkan region as p= 0.007, Nashik region as p = 0.037, Pune region as p = 0.009 and Nagpur region as p = 0.001.

j) Region wise comparison during pretest, post test-1 and post-test-2 knowledge score of nurse related to enteral feeding to a patient on ventilator shows that there was significant change in the mean knowledge score of nurses during post test -1 in Konkan region as p = 0.007, Nashik region as p = 0.024, Pune as p= 0.049, Aurangabad region as p = 0.02.

vi) Testing of hypothesis with knowledge scores.

H₁ The mean knowledge score of nurses Pre-test and Post-test-P1 of implementation of protocol and teaching was significant p = < 0.0001

H₂ The mean knowledge score of nurses before and after one month post-test-P2 of implementation of protocol and teaching was significant as p = < 0.0001). Research hypothesis accepted

vii) Association of knowledge score with selected demographic variables of the nurses.

Age, gender, education, years of experience has no association with knowledge score of the nurses as p= 0.31, 0.12, 0.12 and 0.92 respectively
D) Analysis of Observed practices:

i. Distribution of nurses according to their performance in each observed practices.

Observed practices of nurses regarding performance in handing over and taking over by the nurses during change of shift, communication skills of nurses with patient in ICU, communication skills of nurses with patients’ relatives in ICU, practices of nurses regarding mouth care of the patient on ventilator and practices regarding back massage and care of pressure points ranged from poor to average during pretest. It was 46% and below.

Performance of nurses regarding E.T suctioning showed that during pretest the nurses the practices ranged from poor to good 8(4%) to 113(51%). The performance of nurses was 51% only in one step of taking normal saline for suctioning rest all steps had performance below 50%.

Observed practices regarding enteral feeding to a patient on ventilator showed that the performance during pretest ranged from poor to good 17(8%) to 136(62%)

The performance of nurses during post test ranged from average to excellent. Most of the area the performance was >50 %. The change in performance attributed to the effectiveness of the protocol and teaching. The level of performance declined after one month but was more than the pretest performance this shows that there is a need for in-service education and self-motivation.

ii. Over all distribution of nurses according to their obtained scores observed practice scores according to each checklist.

It was found that overall observed practice score varied from poor to excellent. The practices score of nurses regarding Handing over and taking over in ICU, communication of nurses with patient, communication of nurses with relatives was average, it was minimum in Aurangabad and maximum in Pune region (26-28 %). Post test scores of three observations of practices after five days and after one month it was good (51-75%) In this area minimum score was obtained by nurses from Konkan and maximum from Pune. However the observed practice score was higher during post-test-P1,P2,P3 and P4

During pretest observed practices score of assisting in intubation, suctioning, change of twill tape, mouth care of a ventilated patient, back care were poor. During Post test the scores were increased to average level only.
Practice scores of enteral feeding during pretest was good among the nurses (57 -60%) The post test observation score ranged from Poor to excellent (21-90%) after five days and 65-75% after 30th day.

iii. Distribution Of Nurses According To Their Overall Individual Obtained Grades In Observed Practices:-

122(56 %) nurses had poor practice score, 95(43%) of them had average score, and 3(1%) of them had good score during pretest .However during post-test- 4 183 (83%) of them had average practice score and 15 (7%) of them had good score.22 (10%) nurses remained with poor knowledge.

iv. Region wise distribution of nurses according to their obtained observed practice scores pretest and post test-4 of implementation of protocols and teaching:-

Out of 53 nurses from Aurangabad region during pretest maximum nurses 34 (64%) had poor observed practice score. In post-test-4 after one month 49 (92%) of them had average practice score, while one (2%) had good practice score and 3 (6%) nurses remained with poor score. Out of 12 nurses from Nashik six (50%) were poor and six (50%) were average during pretest after post-test - 4 10 (83%) had average score and two (17%) were good, similarly in Konkan region out of 42 nurses 26 (62%) had poor score and 16(38%) were average during pretest .In post-test-4 35(83%) nurses had average score and six (14%) had got good score. In Amravati region out of 21 nurses’ eight (38%) were with poor practice score and 13(62%) with average score during pretest, during post-test 20(95%) nurses had average score while only one (5%) nurse had poor score. In Nagpur region out of 42 nurses during pretest 22(52%) nurses had poor observed practice score, 18(42%) had average score and two (5%) were good. During post test 35 were having average score two (5%) remained with good score and five (12%) nurses had poor practice score

v. Comparison of observational practices scores according to the observational checklists during pretest post test -P1, P2, P3, and P4 in the nurses.

a. There was a significant change in the mean observed practice score regarding handing over and taking over in the ICU during post test P1, P2 and P4 as p = 0.04 during P1, and p = <0.0001 during P2 and P4 but there was no significant change in the mean observed practice score during P3 as p = 031.
b. Observational practices regarding Communication skills of nurses with the patient, communication skills of nurses with the patients relative, performance of nurses in carrying out Endotracheal tube suctioning, performance of nurses in changing of Endotracheal twill tape, practices of nurses in maintaining Oral hygiene of the patient on ventilator and Practices of nurses during enteral feeding for the patient on ventilator all these observed practices showed significant change in the mean score during post test P1, P2, P3 and P4 and the value of \( p = <0.0001 \) for all the tests

vi. Region wise comparison of observational practice score by observation during pretest post test - P1, P2, P3, and P4 in the nurses:–

The mean observed practice score during pretest was minimum in Konkan region 44.4. While maximum in Pune region 47.6. The mean observed practice score was higher during post test -1 in all regions. It reduced during post test P2, P3, P4 but there was no much difference between the scores. There was a significant change in the mean observed practice score of nurses in all the regions as ‘p’ value ranged from <0.0001 to 0.009.

vii. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score

a. There was a significant change in the mean observational practice score during post test P2 and P4 in all of the regions. Konkan region \( p = <0.0001 \) during post test P2and P4, Nashik region \( p = 0.007 & 0.002 \), Pune region \( p = <0.0001 \) during both post test P1 & P4, In Aurangabad, Amravati and Nagpur region \( p = <0.0001 \) during both post test P1 & P4. It was also significant during post test P1 in Nagpur region \( p = 0.023 \).

b. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding communication skills of nurse with the patient. There was a significant change in the mean observational practice score during post test P1, P2, P3 and P4 in all of the six regions the value of ‘p’ was between <0.0001 to 0.005 except in Nashik region it was not significant during post test P3 as \( p = 0.07 \).
c. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding communication skills of nurse with the patient’s relatives. There was a significant change in the mean observational practice score during post test P1, P2, P3 and P4 in all of the six regions as the value of ‘p’ ranged between <0.0001 to 0.007. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding performance of nurses in carrying out endotracheal suctioning. There was a significant change in the mean observational practice score during post test P1, P2, P3 and P4 in four regions. Konkan, Aurangabad, and Nagpur ‘p’= <0.0001 during post test P1, P2, P3 and P4. In Amravati region during post test P1 and P2 value of p = <0.0001 during P3 p = 0.002 and during P4 value of p = 0.003. The significant change in mean observational practice score was also significant in Nashik and Pune region during post test P1, as p= <0.0001.

d. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding performance of nurses in carrying out endotracheal suctioning. There was a significant change in the mean observational practice score during post test P1, P2, P3 and P4 in four regions. Konkan, Aurangabad, and Nagpur ‘p’= <0.0001 during post test P1, P2, P3 and P4. In Amravati region during post test P1 and P2 value of p = <0.0001 during P3 p = 0.002 and during P4 value of p = 0.003. The significant change in mean observational practice score was also significant in Nashik and Pune region during post test P1, as p= <0.0001.

e. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding performance of nurses in changing of endotracheal twill tape. There was a significant change in the mean observational practice score during post test P1, P2, P3 and P4 in all of the six regions as the value of ‘p’ ranged between <0.0001 to 0.003.

f. Region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding practices of nurses in maintaining oral hygiene of the patient on ventilator. There was a significant change in the mean observational practice score in Konkan region during post test P1, P2-p= <0.0001 and P4-p=0.009. In Nashik region there was a significant change in the mean
observational practice score during post test P1 as p = 0.004. It was not significant during P2 as p = 0.095, P3 as p = 0.18 and P3 as p = 0.15. In Pune region there was a significant change in the mean observational practice score during post test P1 as p = <0.0001, P2- p = 0.017, P4-p = 0.004. In Aurangabad, Amravati and Nagpur region there was a significant change in the mean observational practice score during post test P1, P2 and P3 as ‘p’ value ranged from <0.0001 to 0.042.

g. region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding practices of nurses in giving back massage and taking care of pressure points for the patient on ventilator. There was a significant change in the mean observational practice score in Konkan region during post test P1, P2, in Nashik, Pune, Aurangabad Amravati and Nagpur region during P1 value of ‘p’ ranged from <0.0001 to 0.011.

h. region wise comparison of pretest and post test- P1, P2, P3 and P4 observational practice score regarding enteral feeding for the patient on ventilator. There is a significant deference between the mean practice score of the nurses in all the six regions ‘p’ value ranged from <0.0001 to 0.005

viii. Testing of hypothesis with observed practice scores.

There is a significant difference between the mean observed practice scores of nurses Pre-test and after post-test P1,P2,P3,P4 of implementation of protocols and teaching. Hence research hypothesis accepted.

ix. Association of observed practices scores with selected sociodemographic variables of the nurses

Age- There is significant association of age with pre-test observational practices as p = 0.021. However it was not significant after post-test P1, P2, P3, and P4.

Gender: - There is significant association of gender with post-test-1 observational practices as p = 0.021. However there was no significant association during pre-test, and after post-test P2, P3, and P4.
Educational Qualification: - There is significant association of educational qualification with post-test- P1, P3 and P4 observational practices as \( p = <0.0001 \). However there was no significant association during pre-test, and after post-test-P2.

Years of experience:- There is significant association of years of experience with pre-test observational practices as \( p = 0.021 \). However it was not significant after post-test-P1, P2, P3, and P4.

E) Analysis of reported practices:

i. Distribution of nurses as per the performance in individual reported practices
   From the analysis of the reported practices it was found that the performance was poor to excellent. There were many steps with > 50% performance during pretest. The reported practices ranged higher than the observed practices. The performance in reported practices regarding assisting in ABG collection showed no much improvement only five steps were > 50% after post test -1. Nurses need to develop skills in collection of ABG.

ii. Distribution of nurses in relation to their obtained scores of reported practices according to inventory check lists
   It was found that the overall reported practices during pretest were average and after post test it was found good. Assisting in collection of arterial blood gas practice score was poor in three regions while average in three regions during pretest. After post test it improved to average in five regions while poor in one region.

iii. Individual reported practice scores:
   During pretest it was found that seven (3%) nurses had excellent reported practices, 30(14%) were good, 166(76%) were average and 17(8%) were poor however after five days post test-1 the reported practices improved, 21(10%) nurses had excellent practices, 140(64%) were good and none were poor. Improvement in their practices can be attributed to the effect of protocols and teaching.
iv. **Region wise reported practice score:**

In Konkan region during pretest out of 42 nurses 28(67%) nurses had average reported practice scores, 12(28%) were with good scores and only two(5%) nurses had poor scores. After post test there were five (12%) nurses with excellent scores 27(64%) with good scores and 10 (24%) were in average. In Nashik region all 12(100%) nurses had average reported practice scores during pretest, in post test nine (75%) nurses had good practice scores and three (25%) nurses had average scores. In Pune region out of 50 nurses during pretest seven nurses had(14%) had excellent practice score, 12 (24%) were good, 29 (58%) were average and two (4%)were poor, during post test the scores improved, it showed 15(30%) nurses with excellent practice scores, 27(54%) good scores and eight (16%) of them remained with average scores .In Aurangabad region out of 53 nurses in pretest score three (6%) nurses had poor practice scores, 45(85%) had average practice scores while five (9%) nurses had good scores during post test one (2%) nurses had excellent practice score,37(70%) had good score and 15(28) were in average scores. In Amravati region out of 21 nurses in pretest 15(71) nurses had average practice score and eight(38%) had poor scores while in post test six (29%) nurses had good practice score and 15(71%) had average score. In Nagpur region out of 42, 39(92%) had average reported practice scores, two(5%) nurses had poor practice score, while only one(3%) nurse had good reported practices during pretest. Post test showed 34 (81%) nurses with good reported practice scores and eight (19%) nurses had average practice scores. This showed that there was improvement in the reported practices of nurses after post-test.

v. **Overall comparison of reported practices scores of the nurses by inventory checklist during pretest and post –test-1**

There was significant change in the mean reported practices in all the inventory checklist during pretest and posttest-1 as p = <0.0001 The mean reported practice score during pretest and post test -1 was minimum 5.11 and 7.77 respectively in inventory checklist of Assisting in ABG(Arterial blood gas) collection However the mean reported practice score during pretest and post test -1 was maximum 19.42 and 22.05 respectively in inventory checklist of Assisting in endotracheal intubation.
vi. Region wise comparison of reported practices scores of the nurses by overall inventory checklist during pretest and post-test – 1

In the study- region wise significant change in the mean reported practices in all the inventory checklist during pretest and post test-1 as p = <0.0001

vii. Region wise comparison of reported practices scores of the nurses by each inventory checklist during pretest and post-test – 1

a. Reported practice score of nurses regarding assisting in endotracheal intubation had significant change in the mean of reported practice score of the nurses in all the six regions. In Konkan, Pune, Aurangabad and Nagpur region p = <0.0001 where as in Nashik p = 0.016 and Amravati region p = 0.001.

b. Reported practice score of nurses regarding monitoring the patient on ventilator had a significant change in the mean of reported practice score of the nurses in all the six regions. In Konkan, Pune, Aurangabad, Amravati and Nagpur region p = <0.0001 where as in Nashik region p = 0.003.

c. Reported practice score of nurses regarding assisting in weaning the patient from ventilator was a significant in Konkan, Pune, Aurangabad, Amravati and Nagpur region p = <0.0001 where as in Nashik region p = 0.008.

d. Reported practice score of nurses regarding assisting in extubation was significant in all the six regions. In Konkan, Pune, Aurangabad, Amravati and Nagpur region p = <0.0001 where as in Nashik region p = 0.003

e. Reported practice score of nurses regarding assisting in arterial blood gas collection was a significant in Nashik p =0.041, Pune p = <0.0001, Aurangabad p= <0.0001, Amravati p= 0.001 and Nagpur region p = 0.002. It was not significant in Konkan region as p = 0.13.

viii. Testing of hypothesis with reported practices score.

There was significant difference between the mean reported practice score of nurses regarding care of patient on ventilator pre-test and post-test-1 after implementation of protocols and teaching as ’p’= <0.0001 at 0.05 level of significance hence research hypothesis accepted.
ix. **Association of reported practices scores with selected demographic variables of the nurses:**

Age Gender education and years of experience did not have any association with reported practices score during post-test-1

F) **Association of overall practices score (observed and reported) with selected demographic variables of the nurses:**

Age Gender: and years of experience did not have any association with overall practices score during post-test-1. However there was association between education and post test - mean practice score as \( p = 0.015 \)

G) **Correlation between the knowledge and practices**

i. **Over all correlation between the knowledge and practices of the nurses regarding care of patient on ventilator.**

Pretest revealed that there was very low correlation between the knowledge and overall practices as ‘r’ is 0.11 and low correlation between Knowledge and observed practices as ‘r’ is 0.15. However there was no correlation between Knowledge and reported practices as ‘r’ is 0.06.

Post-test findings showed that there was very low negative correlation between the knowledge and over all practices as ‘r’ was -0.10:; Similarly there was very low negative correlation between Knowledge and observed practices as ‘r’ was 0.12. However there was very low negative correlation between Knowledge and reported practices as ‘r’ is -0.04 regarding care of patient on ventilator. Statistically the values were not significant hence there is no correlation over all.

ii. **Region wise correlation between the knowledge and practices of the nurses regarding care of patient on ventilator.**

Region wise correlation between knowledge and practice score of the nurses. It is found that there was a negative co-relation between the knowledge and practices of the nurses after post test in five regions. In Amravati the co relation was positive between Overall (Knowledge and practice score) \( r = 0.18 \) and Knowledge and Reported practices. \( r = 0.21 \) It was also positive in Nagpur between Knowledge and Reported practices \( r = 0.12 \) A huge gap is found
between the knowledge and practices of the nurses. Correlation was significant in Konkan region

5.2) DISCUSSION:-

Assessment of knowledge and practices of the nurses regarding communication with patient and relatives in the ICU.

There was no significant change in the overall knowledge score of nurses regarding communication of nurses with patient and relatives during post test -2 as \( p = 0.45 \) Similarly there was no significant change in the mean knowledge score of nurses according. However there was significance in the practices regarding communication by the nurses with patient and relatives as \( p = < 0.0001 \). These findings are supported by following studies

Happ M B, Garrett K, Thomas D D and et.al (2011) “Nurse-Patient Communication Interactions the Intensive Care Unit” A Descriptive observational study was conducted by them in a medical and a cardiothoracic surgical intensive care unit. more than one-third (37.7%) of communications about pain were unsuccessful. Patients rated 40% of the communication sessions with nurses as somewhat difficult to extremely difficult. Assistive communication strategies were uncommon, with little to no use of assistive communication materials (e.g. writing supplies, alphabet or word boards). Study results highlight specific areas for improvement in communication between nurses and nonspeaking patients in the intensive care unit, particularly in communication about pain and in the use of assistive communication strategies and communication materials.\(^{18}\)

Johansson G W (2000) conducted a study on “Communication between nurse and patient during ventilator treatment: patient reports and Registered Nurse Response”. The registered nurse incharge of each patient evaluated the extent of communication during the ventilator treatment in a nurse protocol. Thirteen out of the twenty-two patients reported that the registered nurse were able to understand their needs and wishes during the ventilator treatment.\(^{22}\)

A study on “Research Stresses between ICU Nurses, Patient Families” by Christina Orlovsky (2011) The study included the families of 126 patients in 22 intensive care units. Lack of Inservice education nonformal orientation program on coming in ICU lacking interest in self-study because of personal responsibilities, wide nurses patient ratio.
Inadequate supply of material, lack of knowledge leading to lack of interest. The formal orientation program for the nearly joined staff nurses is needed to teach them the complete procedures technical competencies which they will have to use and that would help them. The research recommended that nursing intervention guideline should be distributed to all the nursing personal in ICU to acquaint them with the requirement of therapeutic communication with family members. 24

**Assessment of knowledge and practices of the nurses regarding suctioning of endotracheal tube.**

González A N, Mingo M A, Sagardoy E M, and et all in (2004) performed a evaluated study on “Assessment of practice competence and scientific knowledge of ICU nurses in the tracheal suctioning”. This study was to evaluate practical competence of the nurses, as well as the scientific knowledge that they have on these procedures in a Intensive Care Unit and analyze if there are discrepancies between the practice competence and scientific knowledge. The total mean score obtained in the practice observation grid (P) was 12.09 for a maximum score of 19, while it was 14.24 in the knowledge questionnaire. It is concluded that the study nurses have scientific knowledge of the suctioning procedure that are better than their practice competence. When the total scores obtained were compared, both in practice and knowledge, with the years of experience in ICU, no statistically significant differences were found.33

Ansari A, Alavi N M, Hajbagheri A M, Afazel M (2011) In the cross sectional study on “The gap between knowledge and practice in standard Endo-tracheal suctioning of ICU nurses” the average score of knowledge and performance were 19.59 and 8.75 respectively. The type of ICU and nurses' working experience were not significantly related to their knowledge and performance. This study revealed that despite acceptable knowledge, nurses' performance in endotracheal suctioning is poor.29

The above studies are contradictory as in this study it is found that the knowledge score of nurses regarding suctioning Mean ±SD = 6.42 while the practice score Mean ±SD = 19.39. There is no significant relationship between working experience & levels of knowledge & practice. The findings in this study is supported by the study given below
Raghda Elbokhary, Await Osama, Mugahed A L (2015) conducted a study on Knowledge and Practice of ICU Nurses Regarding Endotracheal Suctioning for Mechanically Ventilated Patients. The study findings showed that the majority of nurses working in Khartoum teaching hospital (35.7%) have 2 month - 1 year working experience, (85.7%) had poor knowledge level, (76.7%) had fair practice level, and there was no significant relationship between working experience & levels of knowledge & practice. Nurses have better practical level than knowledge level and they were not affected by nurse’s length experience.28

Assessment of knowledge and practices of the nurses regarding mouth care of a patient on ventilator:-

In this study there was no significant change during post-test -2 in the mean knowledge and practice scores of the nurses regarding mouth care of a patient on ventilator in four regions out of six value of  p = >0.05 in all four regions. These findings are supported by the following study.

Adib-H M. conducted a study. on “Intensive care nurses' opinions and practice for oral care of mechanically ventilated patients.” in 2013 This study aimed to evaluate the nurses' opinions and practice about oral care in patients under mechanical ventilation. More than 21% of subjects did not perform oral care in their usual duties. . Only 20% of the patients' charts contained a report on oral care. It was noticed that Nurses did not consider oral care in intensive care patients as a high priority. It was noticed that Nurses did not consider oral care in intensive care patients as a high priority. This result highlights the need to continue education programs on oral care for improving the knowledge and attitude of intensive care nurses with respect to oral care.36

Assessment of knowledge and practices of the nurses regarding Back massage and care of pressure points of a patient on ventilator:-

There was a significant change in the in the mean knowledge score of nurse regarding back massage and care of pressure points of a patient on ventilator after implementation of protocols and teaching as p = < 0.0001 during post-test-1 and post-test-2. However there was no significant change in the in the observed practice as p = score of nurse as p = 0.06,
0.18 and 0.38 during post-test P2, P3, P4. The practices of nurse are poor and were below 50% during post-test. This finding is supported by the following study.

Margareth Yuri Miyazaki; Maria Helena Larcher Caliri; Claudia Benedita dos Santos (2010) conducted a study on Knowledge on Pressure Ulcer Prevention among Nursing Professionals. 64.8% were nursing auxiliaries/technicians and 35.2% baccalaureate nurses (BSN). The mean percentage of correct answers on the knowledge test was 79.4% (SD=8.3%) for nurses and 73.6% (SD=9.8%) for nursing auxiliaries/technicians. Both professional categories display knowledge deficits in some areas related to the theme.  

The findings in this study are contradicted by the study conducted by Dilie and Daniel Mengistu in 2015 on “Assessment of Nurses’ Knowledge, Attitude, and Perceived Barriers to Expressed Pressure Ulcer Prevention Practice” 61.2% of the respondents had adequate knowledge on pressure ulcer prevention practices, while 68.4% had favourable attitudes towards prevention practices. Moreover, 67.3% of participants had good pressure ulcer prevention practices. More than half of the nurses were found to have adequate knowledge about pressure ulcer prevention and their attitude towards it was overall favourable.  

Assessment of knowledge and practices of the nurses regarding arterial blood gas collection and its interpretations.

In this study there was a significant difference in the mean knowledge score of the nurse regarding arterial blood gas collection and its interpretations during pre-test, post-test -1 & post-test -2 as $p = < 0.0001$ respectively. Similarly there was a significant difference in the mean reported pratice score of the nurse regarding arterial blood gas collection and its interpretations during pre-test, post-test -1 as $p = <0.0001$. This shows that the implementation of protocols and teaching have attributed towards the increase in the knowledge and practices. The findings of this study are supported by following studies.

Schneiderman J, Corbridge S, and Zerwic J J. Who conducted a research on Demonstrating the effectiveness of an online, computer-based learning module for arterial blood gas analysis. The result showed that staff nurses' knowledge increased significantly after viewing the computer-based learning module ($t = 6.3; P < .001$). This improvement was irrespective
of experience or department. Computer-based, online learning has emerged as a means of providing continuing education to nurses. Such a teaching strategy helps to overcome barriers pertinent to traditional classroom settings.\textsuperscript{57}

Dodds S. Reported that by using an education and training package along with a competency-based assessment, nurses can now perform this extended role. Findings stated that competency-based education and training programme is useful for nurses to carry out ABG analysis procedure.\textsuperscript{58}

Ganguly Sonali (2007) conducted a study about effectiveness of a need based teaching protocol on nurses responsibility in ABG analysis for the nursing personnel working in the critical care units. Findings of the study revealed that the teaching programme was effective and increasing the knowledge on ABG analysis as the computed “t” test was significant at 0.05 level.\textsuperscript{59}

**Assessment of knowledge and practices of the nurses regarding arterial blood gas collection and its interpretations.**

In this study there was a significant difference in the mean knowledge score of the nurse regarding enteral feeding to a patient on ventilator during pre-test, post-test -1 & post-test -2 as $p = < 0.0001$ respectively. Similarly there was a significant difference in the mean reported practice score of the nurse regarding arterial blood gas collection and its interpretations during pre-test, post-test -1 as $p = <0.0001$. This shows that the implementation of protocols and teaching have attributed towards the increase in the knowledge and practices. The findings of this study are supported by following study.

Mahmoud A. Shahin, Warda Yousef Mohamed and Manal Sayed conducted a study on Nurses’ Knowledge and Practices regarding Enteral Nutrition at the Critical Care Department of Al- Manial University Hospital in Egypt: Impact of a Designed Instructional Program. The findings stated that the baselines mean scores for total & subtotal knowledge and practices regarding enteral nutrition were low before the instructional program application. However, a sharp increment in the mean knowledge and practice scores was observed immediately after the implementation of the instructional program with significant statistical difference in mean scores of the knowledge and practice.\textsuperscript{98}
5.2) CONCLUSION:
This study was done to assess the effect of standard operating protocols on Knowledge and practices of the nurses while caring a patient on ventilator.

The researcher was able to achieve all the objectives of the study. Pre experimental one group pretest post-test design time series 5th and 30th day observations was used. The analysis showed significant increase in the knowledge and practice score among all the six regions.

The researcher found that majority of nurse had average and good knowledge but were not practicing it. Practice needs more attention and supervision. As rightly said “practice makes man perfect”. Improvement in the nurse patient ratio and availability of sources may help in improving practice compared to knowledge. The areas like suctioning, change of twill tape, mouth care and back massage needs more supervision. Administrative control and rewards for good work shows better performance.

5.3) PERSONAL EXPERIENCE:
The researcher had an enriching experience throughout the study. The problem identified was very relevant in the current requirement criteria of Intensive Care Units in the government setup. The studies done in this area were not much, and so to select the appropriate study was a challenge in front of the researcher.

Electronic search for CINHAL, PUBMED, and MEDLINE etc. helped the researcher to view different studies and their abstracts. The workshop attended on research methodology gave an insight on overall view of how to go about in performing a research and helped in clarifying many of the doubts. The exam on research methodology also boosted the confidence. The two term papers done by the researcher were the following

i) Scoring system in intensive care unit.

ii) Review of literature which consisted of 50 studies related requirements of protocols and studies on different aspects in caring a patient on ventilator.

The term paper helped the researcher to exchange her knowledge in respective areas and helped her in development of tool, protocols, teaching module, conceptual framework,
Preparation of tool, protocols, teaching module and A.V aids had its own difficulties and challenges. Presentation of the proposal in front of the ethical committee and an open defense was also a very good experience for the researcher to get the study approved by the ethical committee. Seeking permission for data collection at different levels of administration was another challenge in front of the researcher. Data collection was a breath holding task as it was a journey through entire Maharashtra specially experiencing water scarcity in Marathwada, places visited in Aurangabad region and also the hot summer of Dhule and Nagpur. Staying at each place also gave additional information about the life style of the people in each region.

Though the nurses were easily available reaching till them was difficult. They were often involved in their task. It was not difficult to deliver the pretest and teaching but it was difficult to get a maximum number of nurses at a time for observation. Collecting them back for the post test was a bit tough job.

The staff nurses, sisters’ incharge, matrons, and HOD’s were thankful for the protocols and teaching module given to each Intensive care unit, they felt it very useful and also gave time to time feedback. The nurses were willing to implement what is taught and also participate in many such studies in future.

Analysis and interpretation of the data needed concentration and accuracy. Doing the statistical calculation helped in improving the knowledge about statistics. It was a challenging job as well as good learning opportunity. The study findings brought out valuable information to be shared with DMER. Completing the study within the stipulated time of three years was a great achievement. This study also helped in bringing awareness about higher education in nursing and also motivated many nurses for higher education. This study also gave an opportunity to conduct in-service education program for the nurses in all the places visit. I thank all those who have contributed to its smallest part in my study.

5.4) NURSING IMPLICATIONS:

The findings of this study are valid and relevant in the field of nursing. The implications of this study could be discussed under four broad areas, namely nursing services, nursing education, nursing administration and nursing research.
A) Nursing Services:
A Nurse has a very vital role in the intensive care unit and nursing care is the backbone of ventilated patient. Prevention of complications in the patient on ventilator and reducing the mortality rate in the ICU is one of the important tasks of a nurse. The nurse working in the ICU will develop confidence in their care while referring the protocols. The newly posted nurses will also have a guideline regarding their responsibilities in the ICU and will follow a set pattern which will ultimately cater good nursing care to the patient.

B) Nursing Education:
Effective delivery of nursing services is taught to the nurses during nursing education. At the time of clinical posting the students are scared to work in the ICU but with help of these protocols the students will get the guidelines of what is supposed to do in the ICU and how to give the nursing care to a patient who is ventilated, she will also learn how to communicate with the patient who is on ventilator and also with the relatives and health team members. Students will also know what observations are to be made, how the monitoring has to be done.

The nurse Educator can refer the protocols and teaching module while she teaches unit of Critical care nursing to the students.

C) Nursing Administration:
Protocols are one of the very important aspects in an ICU. An ICU which has protocols is said to be one of the good functioning ICU. It is also mandatory for NABH accreditation Protocols also help in developing orientation program for the nurses before appointing them in ICU. Reference to protocols will help in evaluating the care towards the patient as well as assessing the nurses for their efficiency. Administrative check and nursing audit will become easy with help of protocols. These protocols will also help in evaluating the standard of care in all the ICU’s in Maharashtra.

D) Nursing Research:-
The tools and techniques and the findings of the study has added to the body of nursing knowledge. Tools can be used as a reference material in future. Nurses should be
encouraged to conduct action research and incorporate the findings as evidence based practice nursing care.

More studies are needed regarding nursing care of patient on ventilator. Different aspects of nursing care need to be studied.

5.5) SUGGESTIONS/RECOMMENDATIONS:

A) For future study

Keeping in view the findings of the study following recommendations are made.

i) A comparative study can be done with private and government settings to find significant difference in knowledge and practice.

ii) Similar type of study can be done with single protocol.

iii) A study can be done to improve the practices of the nurses by participatory observations.

iv) Follow up study can be done to assess the attitude and practices of nurses during implementation of protocol.

v) Similar type of study can be done in different areas of the hospital.

vi) Similar type of Study can be done with a control group.

B) For future practice at government hospitals:

On the basis of findings and the experience gathered while conducting the study the researcher would like to make the following recommendations.

i) Orientation program for the nurses before posting them in ICU- The findings of effectiveness of protocols and teaching on the knowledge and practices of nurses will help in including these protocols as the guidelines.

ii) To develop positive correlation between knowledge and practices the researcher suggests for regular workshops and in-service education programs which needs to be mandatory.
iii) Critical Care Nursing course needs to be started in the Government sector as the findings in the demographic data showed that there were only three nurses with this additional qualification working in the ICU.

iv) The developed protocols can be included in the curriculum.

v) Trained nurses in Critical Care Nursing and ward management and administration needs to be posted as supervisors or sisters incharge in the ICU as reinforcement and supervised participatory observations are needed for better results.

vi) Improvement in nurse patient ratio 1:1 or 2:5 in the Intensive care units will give good results in patient care.