



# A STUDY TO EVALUATE THE EFFECTIVENESS OF SKILL TRAINING PROGRAMME REGARDING INCENTIVE SPIROMETRY AMONG B.SC NURSING STUDENTS OF SELECTED NURSING INSTITUTE OF KASHMIR

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**Abstract-**Incentive spirometry is a method of deep breathing that provides visual feedback to encourage the patient to inhale slowly and deeply to maximise lung inflation and prevent or reduce atelectasis. In addition to preventing post operative pulmonary complications, the Incentive spirometer can also help patients who have chronic lung diseases. Pulmonary complications are the most frequent cause of postoperative morbidity and mortality. Every surgical patient is at a risk of developing postoperative pulmonary complications if not managed properly. Incentive spirometry (IS) is a technique that is both effective and appropriate for prophylactic bronchial hygiene. The nurses as well as nursing students are in close contact with the patients in the clinical areas. So it is important for the nursing students to know the proper technique of incentive spirometry which they can teach to patients to reduce the incidence of postoperative pulmonary complications. The study aimed at assessing the level of knowledge and skill regarding Incentive spirometry among B.Sc nursing students before the administration of Skill Training Programme (Pre – test), evaluating the effectiveness of skill training programme by comparing pre and post test score, to determine the relationship between knowledge and skill gain and to associate the pre test knowledge and skill score with selected demographic variables (age, gender, academic qualification, residence, parental income, basic concept of incentive spirometry, source of information).

The study was conducted on Forty 3<sup>rd</sup> year B.Sc nursing students of Bibi halima college of nursing and medical technology who were selected by total enumerative sampling technique. A structured questionnaire and checklist was used to collect the data. After the pre test, Skill training programme was conducted. Post test was done after five days. The collected data was analysed using both descriptive and inferential statistics.

The findings of the study revealed that the Skill training programme administered by the researcher was effective in enhancing the knowledge and skill of nursing students regarding incentive spirometry as the mean post test knowledge and skill score of subjects was significantly higher than mean pretest knowledge and skill score. The mean pre test knowledge score was 17.23 which increased to 37.45 in the posttest showing an average increase of 20.23. while as the mean pre test skill score was 8.10 which increased to 19.20 showing an average increase of 11.10 ( $p < 0.001$ ). Further, a statistically significant association was found between the pre test knowledge and skill score of subjects with some selected demographic variables i.e, residence and basic concept of incentive spirometry ( $p < 0.05$ ) while as no association was found with other demographic variables i.e, age, gender, academic qualification, parental income and source of information ( $p > 0.05$ ).

**Key words:** COPD, Incentive spirometry, Pulmonary complications, Skill training programme.

## 1. INTRODUCTION

Incentive spirometry also known as Sustained Maximal Inspiration (SMI) is a method of deep breathing that provides visual feedback to encourage the patient to inhale slowly and deeply to maximise lung inflation and prevent or reduce atelectasis. An Incentive spirometer is a medical device that helps patients to improve the functioning of their lungs. In the 1970s, the incentive spirometer was developed and a new therapy called Incentive spirometry came into trend. An article in the May, 14 1973 edition of the "Journal of the American Medical Association" titled "Respiratory Maneuvers to Prevent Postoperative Pulmonary Complications" explains that the device was developed as a means of encouraging deep breathing after abdominal or thoracic surgery. Incentive spirometry (IS) is a technique that is both effective and appropriate for prophylactic bronchial hygiene.[1]

Pulmonary complications are the most frequent cause of postoperative morbidity and mortality . Abdominal surgery, especially upper abdominal surgical procedures are known to adversely affect pulmonary function.

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Data suggest that 30 to 50% of patients undergoing abdominal surgeries develop hypoxaemia postoperatively, and 8 to 10% require endotracheal intubation postoperatively.[2]

In addition to preventing the post operative pulmonary complications, the incentive spirometry can also help the patients who have chronic lung disease. Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality across the globe. It is a well-known independent risk factor for the development of postoperative complications after thoracic or non-thoracic surgery.[3,4] According to World Health Organisation (WHO) estimates, 65 million people have moderate to severe COPD. More than 3 million people died of COPD in 2005 corresponding to 5% of all deaths globally and it is estimated to be the third leading cause of death by 2030.[5] Crude estimates suggest there are 30 million COPD patients in india.[6] In a collaborative study with Burden of Lung Disease (BOLD) investigators using Bold protocol, the prevalence of stage 1 or higher COPD in participants > 40 years of age based in rural Kashmir was found to be 19.3%. [7] Evidence supports the use of pulmonary rehabilitation in the treatment of patients with COPD both in acute exacerbation and at later stages.[8]

During clinical posting, the researcher has found that most of the patients do not know the proper technique of using an incentive spirometer. On the basis of above statistics, literature review and from own clinical experience, the researcher strongly felt that there is a need to enhance the level of knowledge and skill regarding incentive spirometry among B.Sc nursing students through Skill training programme so that they can teach the proper technique of incentive spirometry to patients during their clinical posting which in turn helps to reduce the incidence of pulmonary complications.

## 2. STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness Of Skill Training Programme regarding Incentive spirometry among B.Sc nursing students of selected nursing institute of kashmir.

### 2.1 Objectives of the Study

- To assess the level of knowledge and skill regarding Incentive spirometry among B.Sc nursing students before the administration of Skill Training Programme .
- To assess the level of knowledge and skill regarding Incentive spirometry among B.Sc nursing students after the administration of Skill Training Programme.
- To evaluate the effectiveness of skill training programme regarding Incentive spirometry among B.Sc nursing students by comparing pre and post test score.
- To determine the relationship between knowledge and skill gain regarding Incentive spirometry among B.Sc nursing students after the administration of Skill Training Programme.
- To associate the pre test knowledge and skill score of B.Sc nursing students with selected demographic variables ( age, gender, academic qualification, residence, parental income, basic concept of incentive spirometry, source of information).

### 2.2 Hypothesis

**H1** : There is significant increase in knowledge and skill gain among B.Sc nursing students regarding incentive spirometry at 0.05% level of significance.

**H2** : There is significant relationship between knowledge and skill gain regarding incentive spirometry.

**H3** : There is significant association between pre test knowledge and skill with selected demographic variables.

## 3. MATERIALS AND METHODS

### 3.1 Research Approach

Evaluative research approach was used.

### 3.2 Research Design

Pre experimental one group pretest – posttest design has been used.

### 3.3 Research Setting

Bibi Halima College of Nursing and Medical Technology.

### 3.4 Population

The population of the present study comprises of B.Sc nursing students of Bibi Halima College of Nursing and Medical Technology and the target population comprises of 3<sup>rd</sup> year B.Sc nursing students of Bibi Halima College of Nursing and Medical Technology.

### 3.5 Sample

The sample comprises of 40 3<sup>rd</sup> year B.Sc nursing students of Bibi halima college of nursing.

### 3.6 Sampling Technique

Total Enumerative sampling technique was used to select the sample.

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### 3.7 Data Collection Tool

The final draft of the tool was prepared by considering the suggestions from the experts. It comprised of three sections.

#### 3.7.1 Section A: Demographic Proforma

It consisted of 7 items such as age, gender, academic qualification, residence, parental income, basic concept of incentive spirometry and source of previous knowledge.

#### 3.7.2 Section B: Structured Knowledge Questionnaire

A structured knowledge questionnaire was used to assess the knowledge regarding incentive spirometry. It consisted of 48 items covering overview of anatomy and physiology of respiratory system 13 items (27.08%), concept of incentive spirometry 17 items (35.42%), procedure of incentive spirometry 10 items (20.83%), post procedural precautions 3 items (6.25%) and nurse role 5 items (10.42%).

#### 3.7.3 Section C: Observation Checklist

An observation checklist was used to assess the skill regarding incentive spirometry. It consisted of 30 items covering pre procedural steps 5 items (16.67%), procedural steps 19 items (63.33%) and post procedural steps 6 items (20%).

### 3.8 Content Validity of the Tool

The tool was submitted to 12 experts along with the criteria checklist and content validity certificate for establishing the validity of the tool. Ten experts were post graduates from the department of nursing and 2 experts were from the department of general medicine.

### 3.9 Reliability of the Tool

The reliability of the structured knowledge questionnaire and checklist was established by using test – retest method. The reliability coefficient was ( $r = 0.98$ ) and the developed tool was found to be highly reliable.

### 3.10 Data Collection Procedure

A formal written permission was obtained from the principal of Bibi Halima College of Nursing and Medical Technology. The researcher approached the target population and the purpose of the study was explained and confidentiality was assured. Informed consent was obtained from the subjects before collecting the data. Data was collected using structured questionnaire and observation checklist. In order to collect the data, subjects were divided into two groups (20 subjects in each group) and the data was collected in 2 sessions: Morning session (20 subject) and Afternoon session (20 subjects).

To conduct the pretest of subjects (morning session) regarding knowledge of incentive spirometry, structured questionnaire was given to all the 20 subjects and to check the skill of subjects regarding incentive spirometry, one by one demonstration was taken from subjects. The same procedure was followed in afternoon session.

On the next day of pre test, intervention was given to subjects. Firstly, the researcher gave planned teaching regarding incentive spirometry by means of power point presentation and then manual demonstration of incentive spirometry in the laboratory to each group separately. After completion of demonstration handouts were distributed among the subjects.

Five days after intervention, Post test was conducted using same structured questionnaire and return demonstration from each subject to evaluate the effectiveness of Skill training programme in terms of gain in knowledge and skill regarding incentive spirometry.

### 3.11 Analysis of Data

Both descriptive and inferential statistics analysed on the basis of objectives and hypothesis of the study. The findings were interpreted and presented with the help of tables and graphs. The level of significance was set at the conventional level of 0.05% to test the hypothesis.

## 4. RESULTS

The data and findings were organised under following sections:

### 4.1 Section 1

Description of demographic variables of subjects:

Out of 40 subjects,

- majority 31 (77.5 %) of subjects were in the age group of 20 – 23 years, 9 (22.5%) were in the age group of less than 20 years, whereas none of the subjects was in the age group of above 23 years.
- majority 29 (75.2 %) of subjects were females and least 11 (27.5%) were males.
- majority 22 (55.0%) of subjects were having 12<sup>th</sup> as their academic qualification, 15 (37.5%) of subjects were above 12<sup>th</sup> standard and remaining 3 (7.58%) of subjects were graduates.
- majority 32 (80%) of subjects were from rural area while 8 (20%) belong to urban area.

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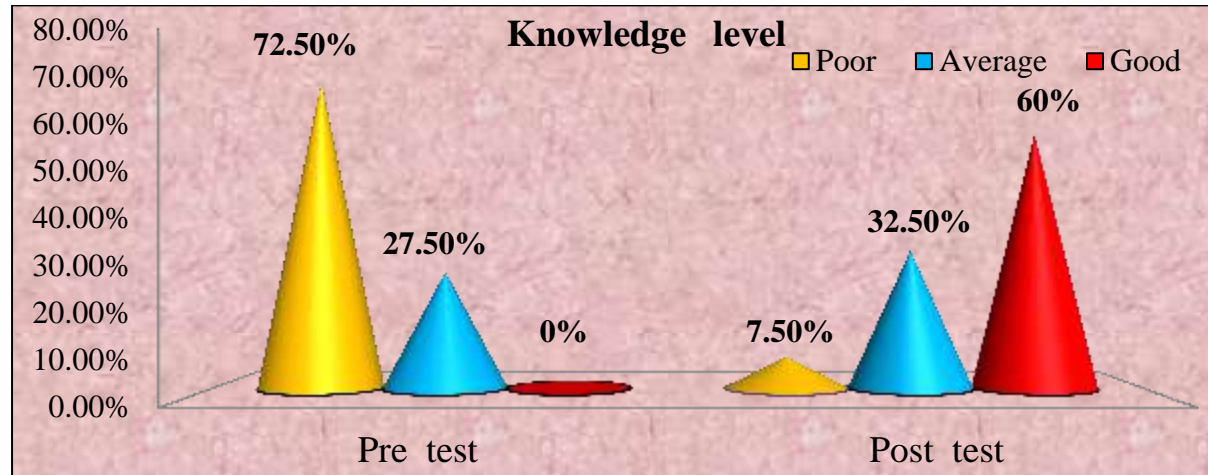
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- majority 18 (45%) of subjects were having parental income above 20,000 while 15 ( 37.5%) of subjects were having 10,000 – 20,000 and least 7 (17.5%) were having less than 10,000.
- majority 28( 70%) were not having basic concept of incentive spirometry while only 12 (30%) of subjects have basic concept of incentive spirometry.
- among 12 (30%) of subjects who have basic concept of incentive spirometry, majority 6 (50%) subjects have heard from mass media and 3 (25%) each of subjects have heard from teachers and books.

#### 4.2 Section II

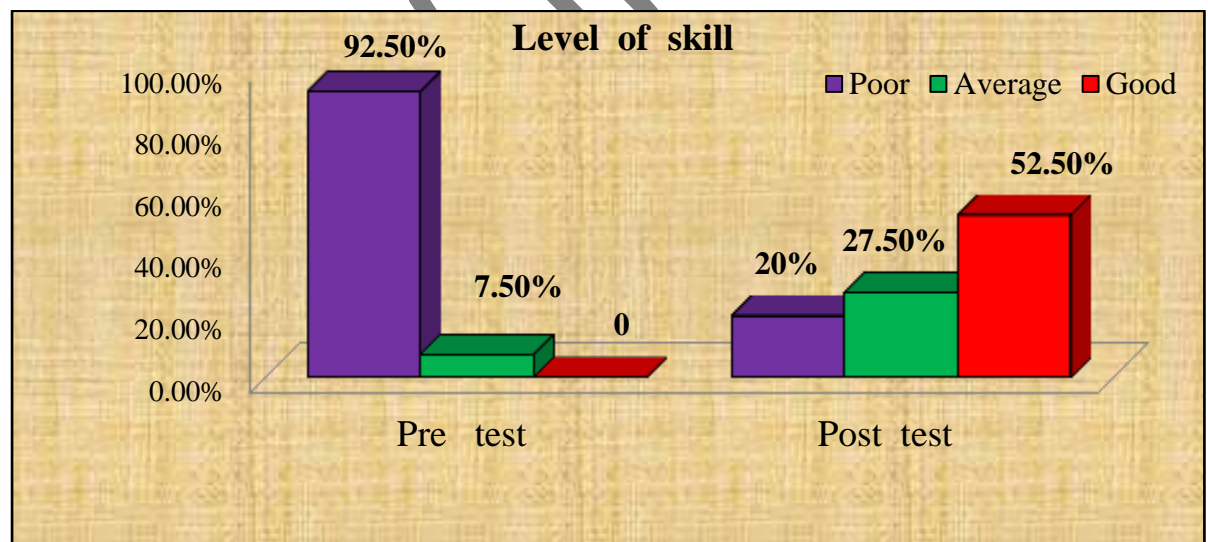
Analysis of level of knowledge and skill score of subjects regarding incentive spirometry:

In pretest majority 29 (72.5%) of subjects had poor knowledge level , 11 (27.5% ) had average knowledge level and none of the subjects had good level of knowledge, while as in post-test 24 (60%) had good knowledge level, 13 (32.5%) had average knowledge level and only 3 (7.5%) had poor knowledge level as shown in Fig. 4.1



**Fig. 4.1 Comparison Between Pretest and Posttest Knowledge Level**

In pretest 37(92.5%) of subjects had poor skill level , 3 (7.5% ) had average skill level and none of the subjects had good skill level , while as in posttest 21 (52.5%) had good skill level, 11 (27.5%) had average skill level and only 8 (20%) had poor level of skill as shown in Fig. 4.2.



**Fig. 4.2 Comparison Between Pretest and Posttest Skill Level**

#### 4.3 Section III

Analysis of effectiveness of Skill training programme (STP ) on knowledge and Skill gain of subjects regarding Incentive spirometry.

The mean post test knowledge and skill score of subjects was significantly higher than mean pretest score. The mean pretest knowledge score was 17.23 which increased to 37.45 in the posttest showing an average increase of 20.23, while as the mean pretest skill score was 8.10 which increased to 19.20 showing an average increase of 11.10. at  $p < 0.001$  level as shown in Fig. 4.3.

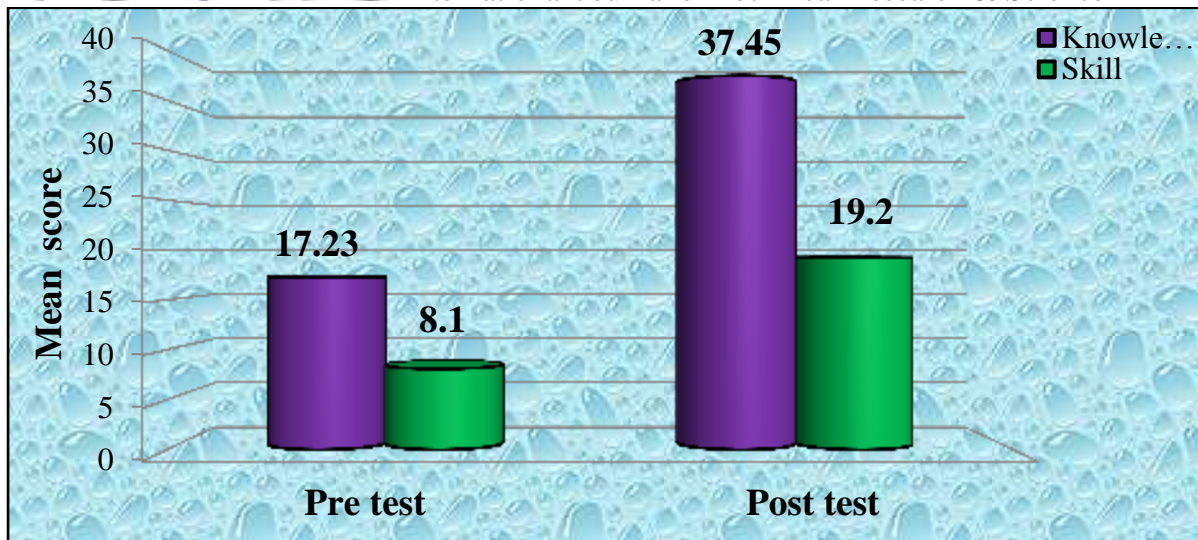


Fig. 4.3 Overall Pre-test and Post-test Mean Scores of Knowledge and Skill

#### 4.4 Section IV

Analysis of relationship between knowledge and skill gain regarding incentive spirometry.

The correlation coefficient between knowledge and skill ( $r = 0.469$ ) which indicates the positive correlation between the two with significant p value 0.002 as shown in fig. 4.4.

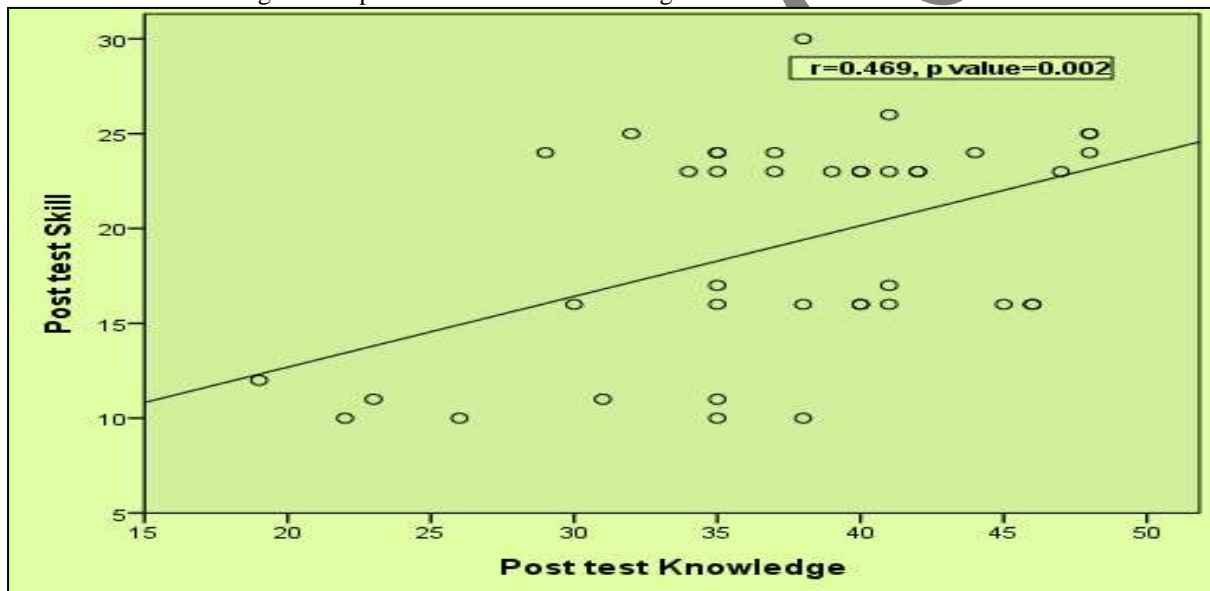


Fig. 4.4 Relationship Between Knowledge and Skill Gain

#### 4.5 Section V

Analysis of association between pre test knowledge and skill score with selected demographic variables.

Statistically significant association was found between the pre test knowledge and skill score with selected demographic variables such as residence ( $p < 0.05$ ) and basic concept of incentive spirometry ( $p < 0.05$ ). However no association was found between pretest knowledge and skill score with other demographic variables like age, gender, academic qualification, parental income and source of information ( $p > 0.05$ ).

### 5. DISCUSSION

In the present study, the mean post test knowledge score 37.45 was found to be significantly higher than mean pretest knowledge score 17.23 ( $p < 0.001$ ) whereas the mean post test skill score 19.20 was also found to be significantly higher than mean pre test skill score 8.10 ( $p < 0.001$ ). Therefore it was concluded that there was significant gain in knowledge and skill through skill training programme.

As no direct research study has been conducted on the effectiveness of skill training programme regarding incentive spirometry among nursing students. However, a study has been conducted by Jacob BT in 2012 to evaluate the effectiveness of structured teaching programme on knowledge and skill regarding Cardio pulmonary resuscitation among selected college students of Bangalore. The findings of the study also revealed that there was significant gain in knowledge and skill through structured teaching programme as the mean post test



knowledge score 23.85 was found to be significantly higher than mean pretest knowledge score 9.56 ( $p < 0.001$ ) while as the mean post test skill score 15.68 was also found to be significantly higher than mean pre test skill score 1.4 ( $p < 0.001$ ).

## CONCLUSION

The study intended to evaluate the effectiveness of skill training programme regarding incentive spirometry among B.Sc nursing students of selected nursing institute of Kashmir.

The following conclusion were drawn on the basis of the findings of the study.

Majority of the subjects were having poor level of knowledge and skill before attending the skill training programme.

The mean post test knowledge and skill score of subjects was significantly higher than mean pretest score. The mean pretest knowledge score was 17.23 which increased to 37.45 in the posttest showing an average increase of 20.23. while as the mean pretest skill score was 8.10 which increased to 19.20 showing an average increase of 11.10. It indicates that skill training programme was effective in increasing the knowledge and skill score of subjects regarding incentive spirometry.

The correlation coefficient between knowledge and skill was ( $r = 0.469$ ) which indicates the positive correlation between the two with significant  $p$  value 0.002.

There was no significant association between pre test knowledge and skill score with selected demographic variables like age, gender, academic qualification, parentel income and source of previous information. However there was significant association between pre test knowledge and skill score with other demographic variables i.e, residence and basic concept of incentive spirometry.

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## LIMITATIONS OF THE STUDY

- The study was limited to students of Bibi Halima college of nursing and medical technology.
- The study was limited to 40 nursing students only which limits generalisation.
- There was no control group.
- There was no study on skill training programme regarding incentive spirometry.

## RECOMMENDATIONS

Keeping in view the findings of the present study, the following suggestions were made:

- The study can be replicated in different setting with a larger sample
- A true experimental study can be done to assess the effectiveness of skill training programme regarding incentive spirometry among nurses and nursing students.
- A similar study can be done on the patients to observe the effectiveness of skill training programme.
- A similar study can be undertaken using other teaching strategy like self instructional module.

## ETHICAL STANDARDS

Prior permission was obtained from the concerned authorities of MMINSR SKIMS Soura Srinagar, Ethical Committee Skims Soura Srinagar for ethical clearance and permission. Permission was also taken from the principal of Bibi Halima College of Nursing and Medical Technology to conduct the study. Informed consent was taken from subjects. Privacy, Confidentiality and anonymity was guarded.

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**Conflict of interest:** The author had no relationship/condition/circumstances that present a potential conflict of interest.

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