

# A Pre-Experimental Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Aerosol Devices among Staff Nurses Working in Selected Hospitals of District Hoshiarpur, Punjab

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## ABSTRACT

**Background of the study:** Respiratory diseases are some of the most common medical problems all over the world as they impair one's ability to breathe. Current effective treatments available for obstructive airway diseases are in the form of aerosol devices. Treatment failure frequently occur due to the incorrect use of these devices by the patients and nurses play a significant role in patient education and are the primary health caregivers. Thus, the ability of a patient to use aerosol devices is closely linked with the nurse's knowledge.

**Aim of the study:** The aim of this study was to assess the effectiveness of structured teaching programme on knowledge regarding aerosol devices among staff nurses.

**Material and methods:** A quantitative research approach that includes utilizing a pre-experimental one-group pre-test-post-test design was used. Non-probability consecutive sampling technique was employed to select 60 staff nurses. Knowledge-based questionnaire was utilised to collect data. Analysis was done using both descriptive and inferential statistics.

**Findings:** In the total pre-test knowledge score, 50% of the staff nurses had poor knowledge, whereas 45% had average knowledge and 5% had good knowledge about aerosol devices. Following the introduction of a structured teaching programme, 51.7% of staff nurses had average knowledge, 48.3% had good knowledge and no one i.e. 0% had poor knowledge of aerosol devices. The difference in mean knowledge scores between pre-test and post-test was statistically significant at  $p < 0.05$  level of significance.

**Conclusion:** The staff nurses' understanding of aerosol devices was improved as a result of a "structured teaching programme". Thus, structured teaching programme was an effective tool in improving knowledge of staff nurses regarding aerosol devices.

## BACKGROUND

Mortality and morbidity from respiratory disorders are on the rise across the globe. These have a huge impact on the health of people all around the globe. When it comes to the most frequent respiratory ailments, Asthma and Chronic Obstructive Pulmonary Disease (COPD) are the most common.<sup>1</sup>

There has been an increase in the incidence of asthma in many developing nations. Asthma is estimated to impact almost 300 million people globally.<sup>2</sup> Also, it

was seen that half of those with this condition had suffered from an asthma attack every year, resulting in hospitalizations and emergency department visits.<sup>3</sup> Alongwith this, it was found that the third greatest cause of mortality in the world is Chronic Obstructive Pulmonary Disease (COPD).<sup>4</sup>

Aerosol devices are thus often used to provide inhaled pharmacological treatments.<sup>5</sup> Symptomatic relief is made possible in large part by aerosol devices. As a

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**KEYWORDS:** Knowledge, Aerosol Devices, Staff nurses

result, the drug may be breathed or pushed directly into the lungs by use of an aerosol device.<sup>6</sup> Aerosol device misuse is a common cause of treatment failure in patients. Errors in the use of a medication delivery system have a negative influence on the treatment of asthma and COPD, resulting in less effective treatment.<sup>7</sup>

Thus, one-on-one instruction by nurses, the primary health caregivers is the greatest strategy to enhance patient inhaler technique. They are required to teach and train patients when inhaler devices are provided to them, since the success of inhaled treatment is highly dependent on proper inhaler use.<sup>8</sup>

Patients' inappropriate use of inhalers is strongly tied to the nurses' expertise of aerosol devices. The failure of an aerosolized therapy is often attributable to inadequately conveyed instructions resulting from substandard patient counselling by medical professionals.<sup>9</sup>

## OBJECTIVES

- To assess the pre-test level of knowledge regarding aerosol devices among staff nurses.
- To assess the post-test level of knowledge regarding aerosol devices among staff nurses.
- To compare the pre-test and post-test level of knowledge regarding aerosol devices among staff nurses.
- To find out the relationship of level of knowledge regarding aerosol devices among staff nurses with selected demographic variables.

## MATERIAL AND METHODS

A quantitative research approach that includes utilizing a pre-experimental one-group pre-test-post-test design was used. Non-probability consecutive sampling technique was employed to select 60 staff nurses. Knowledge-based questionnaire was utilised to collect data. Analysis was done using both descriptive and inferential statistics. This study was conducted at Civil Hospital, Dasuya; Civil Hospital, Mukerian and S.P.N. (ch.) Hospital, Mukerian of district Hoshiarpur, Punjab. All these hospitals provide patients with thorough treatment and were equipped with emergency services, diagnostic services, pharmacy, among other amenities. Aerosol devices, such as nebulizers and pressurized metered-dose inhalers, are often prescribed and used in different wards of these hospitals.

## TOOL

A self-structured knowledge-based questionnaire was used to collect data. Tool was divided into 2 parts:

**Part I: Demographic Variables**, which included 7 items about socio-demographic data of the staff nurses.

**Part II: Self-structured Knowledge Questionnaire**, which included questions on aerosol devices, their purposes, indications, medicines used with them and steps of using aerosol devices. The questionnaire consisted of 30 items, with each item having one correct answer among the four choices and each correct answer carried 1 mark and wrong answer carried 0 mark.

The **Criterion measure** used in the present research study was that if the staff nurses scored  $\leq 15$  mark on knowledge items in self-structured knowledge questionnaire then, it was considered to have poor knowledge; if scored between 16-22 then, they were said to have average knowledge and if scored  $\geq 23$  then, they were meant to have good knowledge. The necessary ethical clearance was also obtained from the research and ethical committee; from the respective authorities of the research settings as well as written consent was also obtained from the study participants before the data collection.

## RESULTS

### A. Socio-demographic Profile of Staff Nurses:

**Table-1 N=60**

Demographic Variables	f	%
<b>Age (In years)</b>		
20-24	17	28.3
25-29	23	38.4
30-34	8	13.3
$\geq 35$	12	20
<b>Gender</b>		
Male	0	0
Female	60	100
<b>Professional Educational Status</b>		
A.N.M	3	5
G.N.M	38	63.4
B.Sc. Nursing	9	15
P.B. B.Sc. Nursing	8	13.3
M.Sc. Nursing	2	3.3
<b>Type of Job</b>		
Government Job	23	38.3
Private Job	37	61.7
<b>Work experience (In years)</b>		
0-5	40	66.7
6-10	8	13.3
11-15	4	6.7
>15	8	13.3
<b>Area of work (As per wards)</b>		
Emergency	12	20
Medical	14	23.3
Surgical	2	3.3
Other	32	53.4
<b>In-service education programme/ workshop/ conference attended</b>		
No	49	81.7
Yes	11	18.3

**Table 1** depicts that about 38.4% staff nurses were between the ages of 25 and 29; 28.3% were between the ages of 20 and 24; 20% were from the ages of 35 and above; and 13.3% were between the ages of 30 and 34. They were all female staff nurses, 100% of the time. 63.4% of the staff nurses had finished their G.N.M., 15% had earned a bachelor's degree in nursing, 13.3% had earned a P.B. B.Sc. Nursing degree, 5% had earned an A.N.M diploma in nursing, and just 3.3% had earned a master's degree in nursing. 61.7% of staff nurses worked for private hospital, while 38.3% worked for the government, according to their job descriptions. 66.7% of staff nurses had less than five years of work experience, 13.3% of staff nurses had both 6-10 and >15 years of work experience, and 6.7% had 11-15 years of work experience. More than half of those surveyed, work in one or more specific fields. Over half (53.4%) of staff nurses were placed in other wards, 23.3% in medical ward, 20% of staff nurses were placed in emergency ward, and just 3.3% in surgical ward. 81.7% of staff nurses had not attended an in-service education programme, whereas just 18.3% had attended an in-service education session on aerosol devices.

## FINDINGS

**Objective-1:** To assess the pre-test level of knowledge regarding aerosol devices among staff nurses.

**Objective-2:** To assess the post-test level of knowledge regarding aerosol devices among staff nurses.

**Table-2 Pre-test and post-test level of knowledge regarding aerosol devices among staff nurses.**

**N=60**

Level of Knowledge	Score	Pre-Test		Post-Test	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor knowledge	≤15	30	50	0	0
Average knowledge	16-22	27	45	31	51.7
Good knowledge	≥23	3	5	29	48.3

*Maximum knowledge score: 30*

*Minimum knowledge score: 0*

**Table 2** depicts that during pre-test, half of them, 50% of the staff nurses had poor knowledge, 45% of them had average knowledge and 5% had good knowledge. Most staff nurses, 51.7% had average knowledge and 48.3% had good knowledge of aerosol devices in the post-test results.

**Objective-3:** To compare the pre-test and post-test level of knowledge regarding aerosol devices among staff nurses.

**H<sub>1</sub>:** There was statistically significant difference between the pre-test and post-test level of knowledge of staff nurses regarding aerosol devices after giving structured teaching programme at  $p < 0.05$  level of significance.

**Table-3 Comparison of the mean pre-test and post-test level of knowledge regarding aerosol devices among staff nurses**

**N=60**

Level of Knowledge	Mean	SD	Mean Difference	't' value	df	'p' value
Pre-test	15.42	4.366	6.98	16.89	59	0.001*
Post-test	22.40	2.226				

*\* Significant at  $p < 0.05$  level of significance*

**Table 3** depicts that the pre-test mean score and SD was  $15.42 \pm 4.366$  and in post-test, mean score and SD was  $22.40 \pm 2.226$  respectively with the mean difference of 6.98. The difference between the mean pre-test and post-test knowledge score was compared and tested using paired 't' test ( $t=16.89$ ,  $p=0.001$ ) which was statistically highly significant at  $p < 0.05$  level.

There was a statistically significant difference in staff nurses' knowledge of aerosol devices between pre- and post-tests at a  $p < 0.05$  level of significance, hence the H<sub>1</sub> hypothesis was accepted.

**Objective-4:** To find out the relationship of level of knowledge regarding aerosol devices among staff nurses with selected demographic variables.

**Table-4 Relationship of pre-test and post-test level of knowledge regarding aerosol devices among staff nurses with selected demographic variables.**

N=60

Demographic Variables	Pre-test knowledge score					Post-test knowledge score				
	n	Mean	SD	df	Test	n	Mean	SD	df	Test
<b>Age (In years)</b>										
20-24	17	16.24	5.093			17	22.59	2.476		
25-29	23	14.65	4.365	3	0.455 <sup>NS</sup>	23	22.22	2.173	3	0.093 <sup>NS</sup>
30-34	8	15.38	2.504			8	22.50	1.690		
≥ 35	12	15.75	4.475			12	22.42	2.503		
<b>Gender</b>										
Male	0	--	--			0	--	--		
Female	60	15.42	4.366			60	22.40	2.226		
<b>Professional Educational status</b>										
A.N.M	3	13.67	5.508			3	22.00	3.000		
G.N.M	38	15.39	4.252	4	0.260 <sup>NS</sup>	38	22.50	2.089	4	0.612 <sup>NS</sup>
B.Sc. Nursing	9	15.00	5.766			9	21.78	3.193		
P.B. B.Sc. Nursing	8	16.50	3.780			8	23.12	1.553		
M.Sc. Nursing	2	16.00	2.828			2	21.00	1.414		
<b>Type of Job</b>										
Government Job	23	16.39	4.020	58	1.374 <sup>NS</sup>	23	22.91	2.372	58	1.419 <sup>NS</sup>
Private Job	37	14.81	4.514			37	22.08	2.100		
<b>Work experience (In years)</b>										
0-5	40	15.48	4.591			40	22.38	2.168		
6-10	8	14.88	3.720	3	0.740 <sup>NS</sup>	8	22.00	2.268	3	0.809 <sup>NS</sup>
11-15	4	13.00	0.816			4	21.50	2.380		
>15	8	16.88	4.794			8	23.38	2.504		
<b>Area of work (As per wards)</b>										
Emergency	12	18.58	3.825			12	23.25	2.340		
Medical	14	15.57	4.014	3	4.447*	14	22.86	2.413	3	1.350 <sup>NS</sup>
Surgical	2	19.0	1.414			2	22.00	2.828		
Other	32	13.94	4.158			32	21.91	2.038		
<b>In-service education programme/ workshop/ conference attended</b>										
No	49	15.02	4.215	58	1.499 <sup>NS</sup>	49	21.94	2.115	58	3.742*
Yes	11	17.18	4.792			11	24.45	1.440		

NS- Non Significant at  $p < 0.05$  level of significance\*Significant at  $p < 0.05$  level of significance

**Table 4** depicts that the “area of work” had a statistically significant influence on staff nurses' understanding of aerosol devices during the pre-test. However, attending In-service education programme, workshop, or conference on aerosol devices had a statistically significant influence on staff nurses' understanding of aerosol devices in the post-test.

## DISCUSSION

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are the most common respiratory ailments. These have a huge impact on the health of people all around the globe. There has been an increase in the incidence of asthma in many developing nations and half of those with the condition suffer from an asthma attack every year, resulting in hospitalizations and emergency department visits.

The symptomatic relief has been made possible by the use of aerosol devices. However, the misuse of these devices may lead to an increased incidence of

hospitalizations. Nurses are the primary health caregivers and thus, plays an important role in educating their patients. So, the patients' inappropriate use of inhalers is strongly tied to the nurses' expertise of aerosol devices.

In the present study, during pre-test, 50% of the staff nurses had poor knowledge, 45% of them had average knowledge and 5% had good knowledge. However, in the post-test results, most of the staff nurses i.e., 51.7% had average knowledge and 48.3% had good knowledge of aerosol devices.



Along with this, in the current study, the pre-test mean score and SD was  $15.42 \pm 4.366$  and in post-test, mean score and SD was  $22.40 \pm 2.226$  respectively with the mean difference of 6.98. The difference between the mean pre-test and post-test knowledge score was compared and tested using paired 't' test ( $t=16.89$ ,  $p=0.001$ ) which was statistically highly significant at  $p<0.05$  level.

The findings of the present study indicate that, only in the pre-test, area of work had shown a statistically significant influence on staff nurses' understanding of aerosol devices but, it is clearly recommended that from the entire variables only one variable that is In-service education programme, workshop, or conference attended on aerosol devices is found to be statistically significant in the post-test which shows that a structured teaching programme was a successful method for enhancing the knowledge of staff nurses on aerosol devices.

## CONCLUSION

A well-designed "structured teaching programme" is proved to be an excellent means of increasing staff nurses' familiarity with aerosol devices as it has shown an increase in the post-test knowledge scores after the nurses receive an education programme.

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