

**A Prospective Interventional
Study On Evaluation Of Metered
Dose Inhalation Technique
Amongst Healthcare
Professionals In Nepal**

**Panduru V Kishore¹, Subish Palaian¹,
Kadir Alam¹, P. Ravi Shankar¹, Bhawana
Bajracharya¹, Jef Van Den Ende²
1 Manipal Teaching Hospital, Nepal,
2 Tropical Institute, Antwerp**



Introduction

- **Worldwide and Nepal**

Asthma and Chronic Obstructive Pulmonary Disease (COPD) - Common cause of morbidity and mortality

- **Treatment failure**

Still a common problem

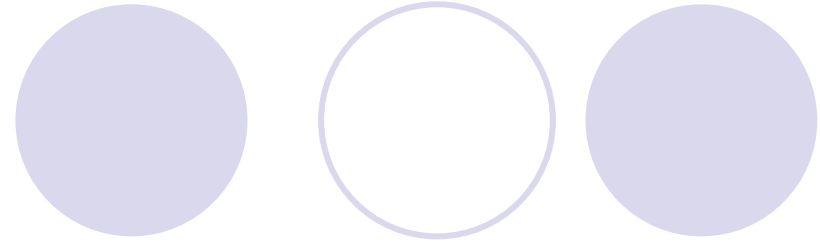
Incorrect use demonstrated to occur in approximately 75% of the patients using MDIs



Introduction: Problems & Solutions

- Poor knowledge among the healthcare professionals can lead to an incomplete and improper information to the patients
-
- Knowledge And Training programs to healthcare professionals
 - Teaching the patients correct use of MDIs

Back ground



Our Objectives

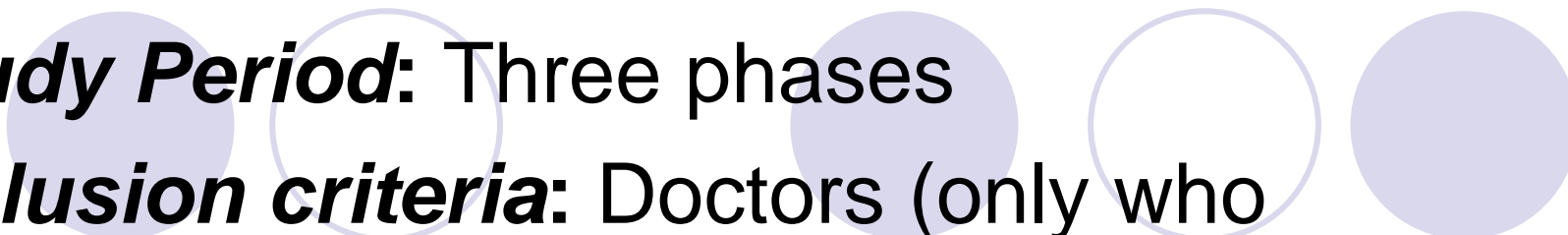


- To study the proficiency of proper use of MDI demonstrated by the doctors, nurses, pharmacists and medical interns
- To evaluate the impact of an educational intervention on the improvement in MDI use

Study site

- Manipal Teaching Hospital, Pokhara, Nepal, a 700 bedded tertiary care teaching hospital



- 
- ***Study Period:*** Three phases
 - ***Inclusion criteria:*** Doctors (only who prescribe MDIs), Nurses, Pharmacists
 - ***Study tool:*** ‘MDI use evaluation score chart’ (NAEPP Criteria)
 - ***Operational modality:*** The healthcare professionals demonstrated the use of the placebo inhaler and the steps were graded as per the NAEPP criteria
 - ***Statistical methods:*** Microsoft excel & SPSS version 9.5



Results

Demographic distribution of the healthcare professionals

Demographic characteristics	Parameters	Pre intervention (n= 143)	Post intervention (n=101)
Sex	Male	53.85 (77)	41.58 (42)
	Female	46.15 (66)	58.42 (59)

Demographic characteristics	Parameters	Pre intervention (n= 143)	Post intervention (n=101)
Age (In years)	10-20	10.49 (15)	7.92 (8)
	21-30	81.82 (117)	82.18 (83)
	31-40	6.99 (10)	9.90 (10)
	41-50	0.70 (1)	0 (0)

Demographic distribution of the healthcare professionals

Demographic characteristics	Parameters	Pre intervention (n= 143)	Post intervention (n=101)
Category	Medical Doctor	18.18 (26)	10.89 (11)
	Intern	25.17 (36)	30.69 (31)
	Pharmacist	10.49 (15)	9.90 (10)
	Staff nurse	46.15 (66)	48.51 (49)

Demographic characteristics	Parameters	Pre intervention (n= 143)	Post intervention (n=101)
Length of service in the hospital (Months)	≤10	35.66 (51)	42.57 (43)
	11-20	27.97 (40)	17.82 (18)
	21-30	11.89 (17)	11.88 (12)
	31-40	10.49 (15)	11.88 (12)
	41-50	4.20 (6)	4.95 (5)
	51-60	0.70 (1)	0.99 (1)
	>60	6.99 (10)	7.92 (8)
	Data not available	2.10 (3)	1.98 (2)

Overall knowledge regarding correct use of MDIs

Steps	Pre intervention (n=143)	Post intervention (n=101)
Shake vigorously	70.63	100
Remove cap	95.10	99.01
Hold upright	90.21	95.05
Breathe out gently, Not fully	32.87	71.29
Start breathing in slowly deeply	9.79	77.23
Actuate during inspiration	43.36	70.30
Continue slow inhalation	20.98	69.31
No aerosol loss is visible	24.48	22.77
Hold breath for 10 seconds	29.37	75.25
Next dose after 1 minute	27.97	89.11



Impact of Intervention

- Pre-Intervention

Overall mean \pm SD Score was 4.44 ± 2.07

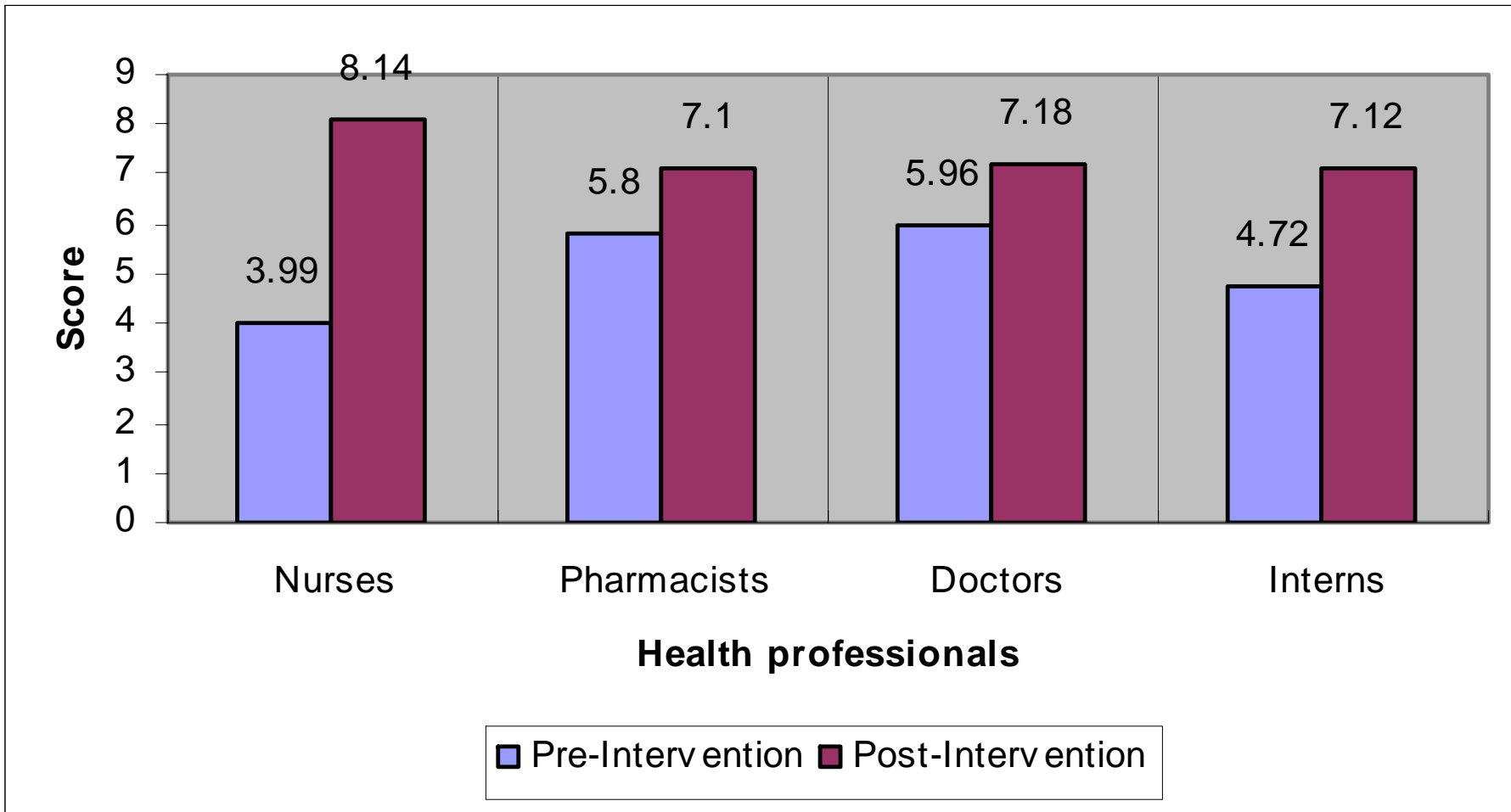
None of the professionals demonstrated the correct technique

- Post-Intervention

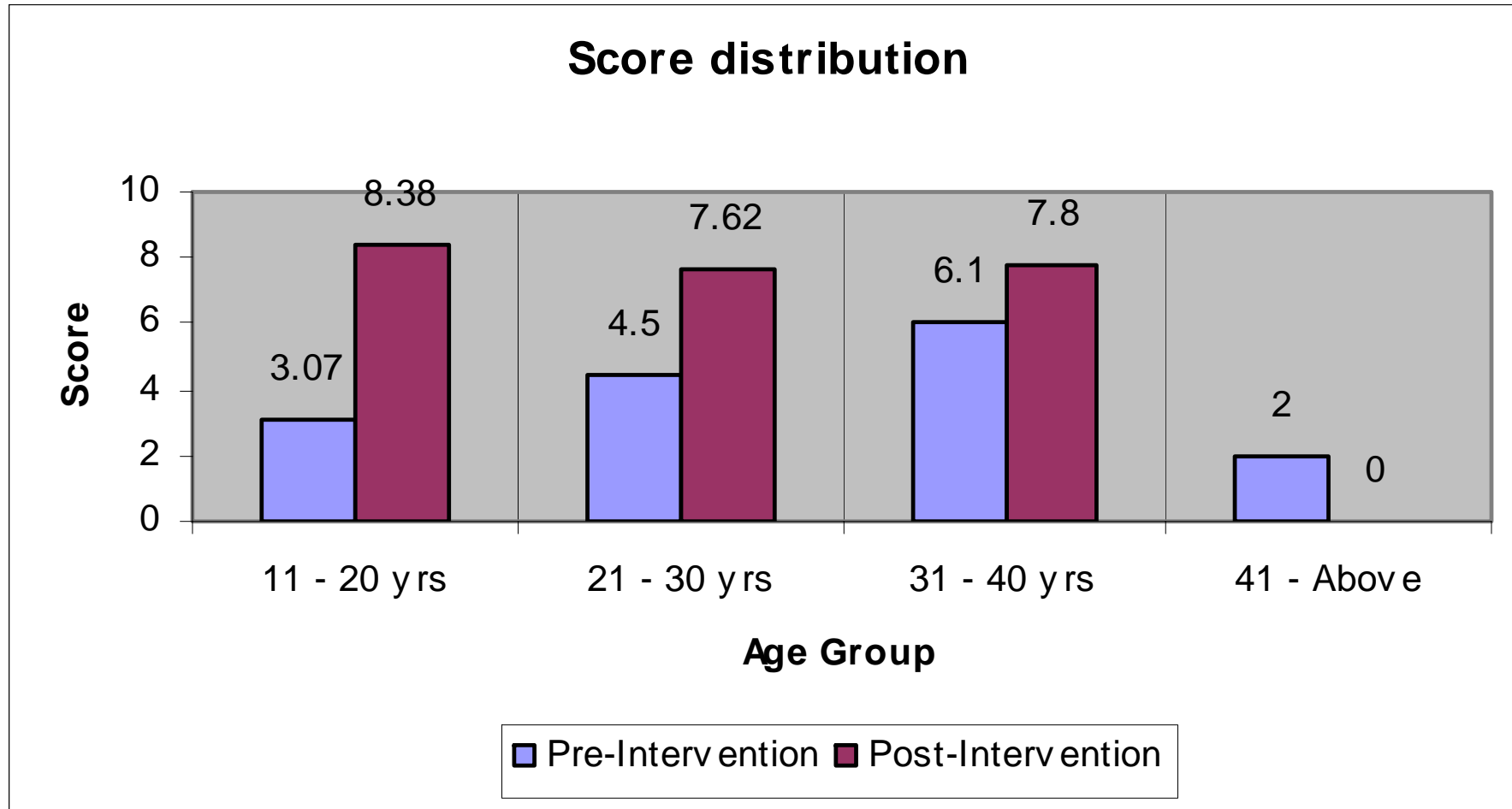
Overall mean \pm SD Score was 7.68 ± 1.74

8 Nurses; 4 Interns; 1 Doctor demonstrated the correct technique

Score Distribution based on their profession – Pre and Post Intervention



Score distribution based on the age of the professionals – Pre & Post Intervention



Correct use of MDIs step-wise by the professionals (Pre and Post Intervention) - Percentage

Steps	Professionals	Pre – Intervention	Post - Intervention
Step I Shake vigorously	Nurses	66.67	100
	Pharmacists	93.33	100
	Doctors	76.92	100
	Interns	97.3	100
Step II Remove cap	Nurses	95.45	100
	Pharmacists	86.67	90
	Doctors	92.31	100
	Interns	97.3	100
Step III Hold upright	Nurses	81.82	97.96
	Pharmacists	93.33	90
	Doctors	96.15	90.91
	Interns	97.3	93.55
Step IV Breathe out gently, not fully	Nurses	18.18	79.59
	Pharmacists	46.67	70
	Doctors	50	54.55
	Interns	40.54	64.52
Step V Start breathing in slowly and deeply	Nurses	0	87.76
	Pharmacists	33.33	50
	Doctors	26.92	72.73
	Interns	5.41	70.97

Correct use of MDIs step-wise by the professionals (Pre and Post Intervention) - Percentage

Steps	Professionals	Pre – Intervention	Post - Intervention
Step VI Actuate during inspiration	Nurses	21.21	85.71
	Pharmacists	66.67	50
	Doctors	69.23	54.55
	Interns	54.05	58.06
Step VII Continue slow inhalation	Nurses	4.55	73.47
	Pharmacists	33.33	70
	Doctors	50	72.73
	Interns	24.32	61.29
Step VIII No aerosol loss is visible	Nurses	12.12	22.45
	Pharmacists	20	10
	Doctors	46.15	18.18
	Interns	32.43	29.03
Step IX Hold breath for 10 seconds	Nurses	15.15	81.63
	Pharmacists	53.33	90
	Doctors	50	63.64
	Interns	29.73	64.52
Step X Next dose after 1 minute	Nurses	24.24	85.71
	Pharmacists	53.33	90
	Doctors	38.6	90.91
	Interns	16.22	93.55

Distribution of the average score based on the length of service in the hospital (Maximum score 10)

Length (Months)	Pre intervention	Post intervention
≤10 (n=51)	4	7.47
11-20 (n=40)	4.78	8
21-30 (n=17)	4.06	7.58
31-40 (n=15)	5.13	8.42
41-50 (n=6)	5.83	7
51-60 (n=1)	5	9
>60 (n=10)	4.73	7.38
Data not available (n=3)	3.33	8.5



Limitations in our study

- Drop outs following the intervention
- Evaluation of interventional impact only once
- Sustainability of intervention not assessed
- Final goal – Betterment among patients' was not evaluated



Discussion

- Identified a poor knowledge of MDI technique among health care professionals

Studies from Iran and Oman demonstrated correct technique in 6.93% and 15% respectively

- The most difficult step observed was step 5, **‘Start breathing in slowly and deeply’**

Study from Turkey reported the most improperly performed step to be **‘hold breath for 10 seconds’**



Discussion

- Significant post intervention improvement among Nurses

Study from Turkey also demonstrated a significant improvement in MDI use after a training program

- Present study revealed the need for periodical educational intervention among all health care professionals



Impact

- Created awareness of importance of adequate knowledge of ‘Inhaler technique’
- Could provide some knowledge inputs to health care professionals
- Could improve the practice outcomes of health care professionals
- Perception of treatment outcomes of patients are appreciable

Conclusions



- Poor understanding of MDI technique among health care professionals
- Identified a scope for improvement
- Beneficial to have a periodic educational Programme
- Alternatively, information leaflets with pictorial aid in local languages may be provided to patients

Thank you

