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Knowledge and Practice on Rotacap Inhalation among Chronic Obstructive Pulmonary Disease Patients in a Teaching Hospital of Pokhara

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Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a prevalent lung disease that causes restricted airflow and breathing difficulties. While COPD is incurable, proper management can help alleviate symptoms and improve patients' quality of life. Proper inhalation techniques, such as rotacap inhalation, play a crucial role in effective disease management. **Objective:** The study aimed to assess the knowledge and practice of rotacap inhalation among COPD patients at a teaching hospital in Pokhara. **Methods:** A descriptive cross-sectional research design was employed at Gandaki Medical College Teaching Hospital

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and Research Center, Pokhara. The study included 111 COPD patients who were present and willing to participate. Data were collected through a structured interview schedule and observation of practice using guidelines developed by CiplaMed. Data were entered and analyzed using SPSS version 16. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used, while inferential statistics (chi-square test) were applied at a 5% level of significance. **Findings:** The study revealed that only 18.9% of respondents had a good level of knowledge, while 28.8% demonstrated correct rotacap inhalation practice. Knowledge levels were significantly associated with age ($p=0.003$) and demonstration ($p=0.005$). Similarly, practice was significantly associated with age ($p=0.002$), religion ($p=0.033$), education ($p=0.002$), and demonstration ($p<0.001$). Furthermore, knowledge was significantly correlated with practice ($p<0.001$). **Conclusion:** The study concludes that although COPD patients had satisfactory knowledge, their practice of rotacap inhalation remained poor. This highlights the need for targeted educational interventions, including clear instructions and practical demonstrations, to enhance both knowledge and correct inhalation practices among COPD patients. **Novelty:** This study provides valuable insights into the gaps between knowledge and practice of rotacap inhalation among COPD patients in a teaching hospital setting. By identifying significant factors influencing knowledge and practice, the study underscores the necessity of structured educational programs to improve disease management.

Keywords: Chronic Obstructive Pulmonary Disease, Knowledge, Practice, Rotacap Inhalation

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a common lung disease causing restricted airflow and breathing problems. COPD is third leading cause of death worldwide, causing 3.23 million deaths in 2019. Nearly 90% of COPD deaths in those under 70 years of age occur in low- and middle-income countries (WHO, 2023).

The prevalence of COPD in Nepal shows 12% and also second leading cause of death in Nepal (NHRC, 2019). COPD are non-curable but symptoms can be improved by proper approaches. Pharmacological management of COPD includes bronchodilators, anticholinergics, methylxanthines, corticosteroids etc. The most effective and highly recommended treatment for COPD is inhalation therapy. Inhalation promotes the supply of drugs directly to the affected site and has fewer side effect (NHS 2023). The most common inhalation device is dry powder inhaler, meter dose inhaler and nebulizers. Inappropriate inhalation technique leads to the inadequate delivery of the drug to the respiratory tract, causing poor control COPD symptoms. Rotacap are powered form capsules which are placed in a rotahaler. A rotahaler is a plastic inhalation device which releases medication from the rotacaps. When inhaled correctly, the medication has a better chance to reach the small airways. Rotahaler helps to open airways in lungs. It relaxes the muscles of these airways and makes easier for breathing (National Jewish health, 2024).

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The study conducted at Turkey shows that the correct utilization of Dry Powder Inhalation (DPI) rate was 58.9%. The factors like gender, living in a rural location, length of illness, diagnosis and follow-up with a chest disease expert, and educational level impact in correct inhalation technique. After training, the percentage of accurate usage for DPI increase to 92.6%. The factors affecting continued incorrect usage after standard training were old age (Aydemir, 2015).

Another study was conducted at a tertiary hospital of India in outpatient department revealed that 16.7% of them were prescribed the dry powder inhalation approach. Approximately 79.2% of the patients could accurately show the inhaler technique after receiving training, compared to 52.1% before training (Nitya et al., 2022).

Another study at Dhulikhel Hospital shows that correct inhalation technique was found in 37%, 61% failed to breathe out deeply before inhaling, 59% failed to hold breath for at least 10 second and 25% were unable to breathe in deeply. Age, occupation, source of inhalation instruction and re-demonstration of technique were found to be significantly associated with the correct inhalation technique (Sapkota & Amatya, 2017).

In order to treat COPD effectively and meet the objectives for lowering the burden of non-communicable diseases, there is a serious concern about the current state of knowledge, practice and rising COPD prevalence in Nepal. According to the previous research study among COPD patients the correct practice of rotacap inhalation technique was quite low. It shows that knowledge and practice regarding rotacap inhalation is inadequate in Nepal (Adhikari Baral et al., 2018; Poudel et al., 2016). Study also shows that the patient's inhalation technique may be affected by the factors like, health care provider's failure to provide enough instruction, demonstration, and re-demonstration. Thus, researcher is interested to assess knowledge and practice on rotacap inhalation technique among COPD patients and to examine their association.

Methods and Materials

A descriptive cross-sectional study design was used for this study. This study was conducted in Gandaki Medical College Teaching Hospital and Research Centre located in Nayabazar, Pokhara. It is 550 bedded hospital established in 2007A.D. This hospital has both inpatient and outpatient departments, advance and emergency services. The population of the study was all the patients diagnosed with COPD who regularly uses rotacap inhaler for at least up to one month and seek medical help under OPD and admission basis at Gandaki Medical College and Teaching Hospital of Pokhara Metropolitan City. Non-probability purposive sampling technique was used to select the sample. The patients who are diagnosed with COPD and regularly uses rotacap inhaler more than one month and who had sought medical help through OPD or admission to the medical ward and available during the study period were included in the study. Sample size was 111.

Structured interview schedule and observation checklist of CiplaMed was used for data collection. The development of tool was done based on objectives of the study, extensive

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literature review and consulting with subject expert. The questionnaires were made in English language first then translated into Nepali language and back translation was done by language expert. The instrument was divided into three sections, Part I: Questions related to socio-demographic information and information on rotacap_inhalation. Part II: Questions related to Knowledge on rotacap inhalation. Part III: Questions related to Practice on rotacap inhalation technique by using observation checklist which was developed by CiplaMed (CiplaMed, 2016). Knowledge level was categorized as more than 70%: good level of knowledge, 50-70% : satisfactory, Less than 50%: poor knowledge (Desalu et al., 2013). Likewise, Practice was categorized as: If the respondents perform essential steps like holding mouthpiece firmly, seal the mouthpiece with teeth, deep inhalation, holding breath for as long as they can then they were labelled as correct technique and if all or at least any one of the essential steps are not performed, the performance was labelled as incorrect technique (Sapkota & Amatya, 2017).
Validity of the tool was maintained by developing tool after extensive literature review, seeking opinion from subject experts adopting the standard checklist by CiplaMed. Pre-testing of the instrument was done 10% (11 respondents) of total sample at Pokhara Academy of Health Science.

Data Collection Procedure

Data was collected only after getting approval from medical director of Gandaki Medical College Teaching Hospital and Research Centre of Pokhara. The objectives and importance of the study was clearly stated and explain to executive director, HOD of Medical Department, in-charge of Medical and OPD ward and each respondent.
Patients who seek health service from OPD and at ward COPD patients who had been using rotacap inhalation were identified. In OPD, data was collected by interviewing patients in separate chair and in ward data was collected at patient's bedside. They were clearly explained about their voluntary participation in the study and their right to withdraw from the study at any time if they like. Verbal and written consent was taken from the patients. Data was collected by face-to-face interview technique by using self-structured interview schedule and assessment of rotacap inhalation technique was done by using standard checklist developed by CiplaMed. After assessment of inhalation technique researcher had given instruction and demonstration on rotacap inhalation who had performed incorrect technique. Confidentiality was maintained by not disclosing the information given by the patients and the given information was used only for the study purpose.

Data Analysis

The collected data was reviewed and organized for accuracy and completeness. The collected data was reviewed, organized, edited, coded and was entered in SPSS (Statistical Package for Social Sciences) version 16. Descriptive statistics frequency, percentage, mean and standard deviation and inferential statistics chi-square test was used at 5% level of significance.

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Results

Out of 111 respondents, (31.5%) of the respondents belonged to the age group 70-79 years with Mean ± SD, 67.47 ± 10.43. More than half of the COPD patients using rotacap inhaler were females (55%) and from urban areas (52.3%). More than half of them were Brahmin/Chhetri (59.5%). Most of the respondents were Hindu (86.5%). Majority of the respondents are illiterate (63.1%). Among the literates, maximum number (63.4%) rotacap inhalation users had attained basic education. More than one third of the respondents are engaged in agriculture (38.7%) (Table 1).

Table 1

Socio-Demographic Characteristics of Patients

n = 111

Characteristics	Number	Percent
Age group in years		
>60	27	24.4
60 to 69	32	28.8
70 to 79	35	31.5
80 above	17	15.3
Mean ± SD: 67.47 ± 10.43		
Gender		
Female	61	55.0
Male	50	45.0
Residence		
Urban	58	52.3
Rural	53	47.7
Ethnicity		
Brahmin/Chhetri	66	59.5
Dalit	31	27.9
Janajati	13	11.7
Muslim	1	0.9
Religion		
Hinduism	96	86.5
Buddhism	11	9.9
Christianity	3	2.7
Islam	1	0.9
Education		
Illiterate	70	63.1
Basic level	26	23.4
Secondary level	14	12.6
Higher level	1	0.9

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Occupation			
Agriculture	43		38.7
Unemployment	25		22.5
Home maker	17		15.3
Others	8		7.2
Labor	7	6	6.4
Service holder	5		5.4
Business			4.5

Nearly half (47.8%) of respondents had diagnosed with COPD between 1 to 5 years. Similarly, (52.3%) of respondents had use rotacap inhaler between 1 to 5 years. Almost all of the respondents (92.8%) had got information about rotacap inhaler (Table 2).

Table *2*

Rotacap Inhalation related Information of Patients

n = 111

Variables	**Number**		**Percent**
Duration of COPD (years)			
< 1	15		13.5
1 to 5	53		47.8
6 to 10	30		27.0
>11	13		11.7
Duration of Rotacap Inhaler use (years)			
< 1	16		14.4
1 to 5	58		52.3
6 to 10	25		22.5
>11	12		10.8
Information about Rotacap Inhaler			
Yes	103		92.8
No		8	7.2
If yes from whom (n=103)			
Nurse	61		59.2
Doctor	12		11.7
Pharmacist	30		29.1
Demonstration of Inhalation Technique by health workers			
Yes			
No	35		31.5
	76		68.5
If yes from whom (n=35)			
Nurse	21		60.0
Doctor	3		8.6
Pharmacist	11		31.4

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Re-demonstration of inhalation technique by respondents		
Performed		
Not performed	4	3.6
	107	96.4

Almost all (98.2%) of the respondents had correct knowledge about storage of rotacaps in cool and dry place and (93.7%) were aware of breathing deeply and forcefully while inhaling drug. Nearly, half of the respondents (45.0%) had correct knowledge of holding breathe after inhalation. However, only (16.2%) of them had correct knowledge of rotacap inhaler that should be cleaned in every 2 weeks or if needed (Table 3).

Table 3

Knowledge on Rotacap Inhalation among Patients

n = 111

Variables	Number	Percent
Rotacaps should be stored in		
Cool and dry place [c]	109	98.2
Moist place	2	1.8
Nature of breathe during inhalation		
Inhale deeply and forcefully during inhalation [c]	104	93.7
Exhale completely before inhalation	3	2.7
Inhale slowly and gently during inhalation	3	2.7
Inhale through nose and exhale through the mouth	1	0.9
Position of head during inhalation		
Straight	71	64.0
Slightly tilt head backward [c]	27	24.3
Highly bend up	6	5.4
Bending the head downward	7	6.3
Holding breathe after inhalation		
10 seconds [c]	50	45.0
20 seconds	24	21.6
30 seconds	9	8.2
Not necessary to hold breathe	28	25.2
Rinsing mouth after inhalation		
Yes (Gargle and rinse with water) [c]	86	77.5
No	25	22.5
Cleaning of rotacap inhaler		
No	20	18.0
Wash with tap water [c]	63	56.8
Wash with hot water	20	18.0
Wipe with wet cloth	3	2.7
Wipe with dry cloth	5	4.5
Rotacap inhaler should be cleaned		
Daily	11	9.9

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Once a week	63	56.8
Not needed	19	17.1
Once every two weeks or if needed [c]	18	16.2
Rotacap inhaler can be used for		
3 months	6	5.4
6 months [c]	23	20.7
9 months	2	1.8
12 months	80	72.1

[c] *: denotes correct answer.*

Regarding the total 10 steps, the step most correctly performed by respondents was unscrew the cover and hold the rotahaler vertically (95.5%) and holding the mouthpiece firmly with one hand and rotate its base (91.9%) followed by press the rotacap firmly such that top of rotacap is in level with the top hole (91%). However, the least correctly performed step was breathing out gently and avoid breathing inside the inhaler (18.9), tilt head slightly backward (30.6%), followed by remove the rotahaler from mouth and hold breath for at least 10 seconds and as long as you feel comfortable (41.4%). Regarding the essential steps, almost all of the COPD patients correctly performed step were holding the mouthpiece firmly with one hand and rotate its base / A click sound will indicate proper closing (91.9%), followed by breath in through the mouth as deeply as you can (85.6%) (Table 4).

Table 4

Practice on Rotacap Inhalation among Patients

n= 111

Steps	Number	Percent
Unscrew the cover and hold the Rotahaler vertically.	106	95.5
Insert Rotacap into the Rotacap hole with its transparent end facing downwards.	83	74.8
Press the Rotacap firmly such that top end of Rotacap is in level with the top of the hole.	101	91.0
# Holding the mouthpiece firmly with one hand, rotate its base / A click sound will indicate proper closing.	102	91.9
Breathe out gently and avoid breathing inside the inhaler.	21	18.9
# Grip mouthpiece between the teeth and seal with the lips around it.	96	86.5
Tilt head slightly backward	34	30.6
# Breathe in through the mouth as deeply as you can.	95	85.6
# Remove the Rotahaler from mouth and hold the breath for at least 10 seconds and as long as you feel comfortable.	46	41.4
Exhale out and repeat above steps if in case some powder remains.	75	67.6

#: denotes essential steps

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More than half of them (55.0%) had possessed satisfactory level of knowledge and 26.1% had possessed poor level of knowledge on rotacap Inhalation with mean ± standard deviation ,4.32±1.322. Regarding practice (28.8%) of the patients performed all the essential steps correctly. However, (71.2%) of them could not perform one or more of the essential steps correctly (Table 5).

Table 5

Level of Knowledge and Practice on Rotacap Inhalation among Patients

n = 111

Variables	Number	Percent
Level of knowledge		
Good knowledge (more than 70%)	21	18.9
Satisfactory knowledge (50% to 70%)	61	55.0
Poor knowledge (less than 50%)	29	26.1
Mean ± SD:4.32±1.322		
Practice		
Correct	32	28.8
Incorrect	79	71.2

There was significant association between level of knowledge on rotacap inhalation with age and demonstration on rotacap inhalation. However, no significant association could be seen between knowledge of rotacap inhalation with sex, residence, ethnicity, religion, education and occupation (Table 6).

Table 6

Association Between Level of Knowledge on Rotacap Inhalation with Selected Variables

n = 111

Variables	Knowledge level			χ^2	*p* value
	Good No. (%)	Satisfactory No. (%)	Poor No. (%)		
Age (in years)					
≤ 67	16 (29.6)	30 (55.6)	8 (14.8)	11.533	0.003*
>67	5 (8.8)	31 (54.4)	21 (36.8)		
Sex					
Male	11 (22.0)	30 (60.0)	9 (18.0)	3.178	0.204
Female	10 (16.4)	31 (50.8)	20 (32.8)		
Residence					
Urban	12 (20.7)	30 (51.7)	16 (27.6)	0.531	0.767
Rural	9 (17.0)	31 (58.5)	13 (24.5)		
Ethnicity					
Brahmin/ Chhetri	14 (21.2)	35 (53.0)	17(25.8)	0.571	0.752
Others	7 (15.6)	26 (57.7)	12 (26.7)		

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Religion					
Hindu	19 (19.8)	50 (52.1)	27 (28.1)	2.585[b]	0.275
Others	2 (13.3)	11 (73.4)	2 (13.3)		
Education					
Literate	11 (26.8)	21 (51.2)	9 (22.0)	2.749	0.253
Illiterate	10 (14.3)	40 (57.1)	20 (28.6)		
Occupation					
Employed	7 (38.9)	9 (50.0)	2 (11.1)	6.063	0.48
Unemployed	14 (15.1)	52 (55.9)	27 (29.0)		
Duration of rotacap inhaler use (years)					
≤ 5	16 (21.6)	39 (52.7)	19 (25.7)	1.079	0.583
>5	5 (13.5)	22 (59.5)	10 (27.0)		
Obtained verbal information					
Yes	20 (19.4)	58 (56.3)	25 (24.3)	2.257	0.323
No	1 (12.5)	3 (37.5)	4 (50.0)		
Demonstration on rotacap inhalation					
Obtained	11 (31.4)	21 (60.0)	3 (8.6)	10.495	0.005*
Not obtained	10 (13.2)	40 (52.6)	26 (34.2)		

*$\chi^{2:}$ chi square, *p value significant at < 0.05, [b]: Likelihood Ratio*

Practice of rotacap inhalation was significantly associated with age, religion, education and demonstration on rotacap inhalation. Patients below 67 years demonstrated use of rotacap inhaler correctly than those above 67 years. The results also show that COPD patients who were literate performed inhalation technique more correctly than the illiterates and those who received demonstration on rotacap inhalation performed the inhalation technique correctly than those who did not get demonstration. However, no significant association was seen between practice of rotacap inhalation with sex, residence, ethnicity, occupation and duration of use (Table 7).

Table 7

Association Between Practice on Rotacap Inhalation with Selected Variables

n = 111

	Practice			
Variables	**Correct**	**Incorrect**	**χ^2**	***p* value**
Age (in years)				
≤67	23 (42.6)	31 (57.4)	9.709	0.002*
>67	9 (15.8)	48 (84.2)		
Sex				
Male	14 (28.0)	36 (72.0)	0.30	0.861
Female	18 (29.5)	43 (70.5)		

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Residence				
Urban	19 (32.8)	39 (67.2)	0.914	0.339
Rural	13 (24.5)	40 (75.5%)		
Ethnicity				
Brahmin/ Chhetri	16 (24.2)	50 (75.8)	1.669	0.196
Others	16 (35.6)	29 (64.4)		
Religion				
Hindu	24 (25.0)	72 (75.0)	5.076[a]	0.033*
Others	8 (53.3)	7 (46.7)		
Education				
Literate	19 (46.3)	22 (53.7)	9.718	0.002*
Illiterate	13 (18.6)	57 (81.4)		
Occupation				
Employed	8 (44.4)	10 (55.6)	2.553	0.110
Unemployed	24 (25.8)	69 (74.2)		
Duration of use (years)				
≤ 5	24 (32.4)	50 (67.6)	1.405	0.236
>5	8 (21.6)	29 (78.4)		
Obtained verbal information				
Yes	31 (30.1)	72 (69.9)	1.120[a]	0.435
No	1 (12.5)	7 (87.5)		
Demonstration on rotacap inhalation				
Obtained	21 (60.0)	14 (40.0)	24.208	<0.001*
Not obtained	11 (14.5)	65 (85.5)		

*χ^2: chi square, *p value significant at < 0.05, [a] : Fisher's Exact Test*

There was significant association between knowledge and practice. This means that the respondents who had good level of knowledge had performed correct practice on rotacap inhalation technique (Table 8).

Table 8

Association Between Level of Knowledge and Practice on Rotacap Inhalation among COPD Patients

n=111

Knowledge level	Practice level		χ^2	*p* value
	Correct No. (%)	Incorrect No. (%)		
Good	12 (57.1)	9 (42.9)	15.018	0.001*
Satisfactory	18 (29.5)	43 (70.5)		
Poor	2 (6.9)	27 (93.1)		

*χ^2 : chi square, *p value significant at < 0.05*

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Discussion

Knowledge on Rotacap Inhalation

This study shows that nearly, half of the respondents (45.0%) had correct knowledge of holding breathe after inhalation whereas, more than half of the respondents (56.8%) had good knowledge of cleaning rotacap inhaler and (93.7%) of respondents were aware that they should take deep and forceful breathe during inhalation which is in contrast with the research done in India by (Gadhia et al., 2023) in which 13% knew correct knowledge of holding breathe after inhalation, 45% had good knowledge of cleaning rotacap and 80% were aware that they should take deep and forceful breathe during inhalation.

Regarding level of knowledge only (18.9%) of the respondents possessed good level of knowledge on rotacap inhalation and the more than half of the respondents possessed satisfactory level of knowledge (55.0%) whereas (26.1%) of the respondent possessed poor level of knowledge. The respondents who possessed satisfactory level of knowledge was similar to the study conducted in Pokhara (Adhikari Baral, 2018) which shows (49.5%). This could have happened because of the poor instructions and demonstration on rotacap inhalation, lack of questioning attitude in study participants and their negligence.

Practice on Rotacap Inhalation

Regarding practice the most correctly performed step by respondents was unscrew the cover and hold the rotahaler vertically (95.5%) followed by press the rotacap firmly such that top of rotacap is in level with the top hole with transparent end down (91%) , breathe out gently and avoid breathing inside the inhaler (18.9), holding breath for at least 10 seconds and as long you feel comfortable (41.4%) which is consistent to the research done in India by (Gadhia et al., 2023) which shows 99%, 92%,25% and 36% performed correct practice respectively.

Regarding the essential steps, the correct inhalation technique was found in 28.8% of total respondents. Similar findings was supported by study conducted in Kathmandu Medical College by (Sapkota & Amatya, 2017) which shows (37%) of respondents had correct inhalation practice. However, the finding was contrasts with the study done by (Adhikari Baral, 2018) which shows (77.5%) of respondents had correct inhalation practice. Majority of the COPD patients correctly performed step were holding the mouthpiece firmly with one hand and rotate its base / A click sound will indicate proper closing (91.9%), grip mouthpiece between the teeth and seal with the lips around it (86.5%) followed by breath in through the mouth as deeply as you can (85.6%) and holding breath for at least 10 seconds and as long you feel comfortable (41.4%). Similar findings have been reported in other study which is conducted in Kathmandu Medical College by (Sapkota & Amatya, 2017) which shows 89%,91%,75% and 41% respectively. However, different finding was obtain in other study done in Kathmandu by (Pun et al., 2015) which shows holding the mouthpiece firmly with one hand and rotate its base (71%), grip mouthpiece between the teeth and seal with the lips around it (68%), inhale powder deeply and forcefully (58%), holding breath (31%).

In the current study, significant association was found between level of knowledge and age (p = 0.003). However, the result contrasts with (Nitya et al., 2022) which shows that there was no

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any association between level of knowledge and age. Similarly, present study shows that there was significant association between level of knowledge on rotacap inhalation and demonstration on rotacap inhalation (p=0.005) but the association between level of knowledge and demonstration on rotacap inhalation was not considered in other studies.

In present study, no significant association of level of knowledge with education and occupation was found. However, the study conducted by (Adhikari Baral, 2018) showed significant association of level of knowledge with education and occupation. The present study shows significant association between increasing age (p= 0.002) and incorrect practice of rotacap inhalation which is consistent with findings from the study done in Kathmandu Medical College by (Sapkota & Amatya, 2017). Regarding, correct practice, literate performed better than illiterate people (p=0.002). Similar finding supports the study done in turkey by (Aydemir, 2015) which shows that inhaler misuse was associated with low level of education. However, many of the study have not considered religion as socio-demographic variables but, current study reveals that there was significant association between religion and practice (p= 0.033). Therefore, no comparison of results could be conducted.

In this study there was no significant association of level of practice with sex, residence, ethnicity and occupation. However, the studies conducted in Kathmandu Medical College by (Sapkota & Amatya, 2017) showed significant association between practice and occupation(p= 0.02) and the study done by (Adhikari Baral, 2018) showed significant association between practice and residence (p=0.024).

In current study there was significant association between level of practice and demonstration on rotacap inhalation (p= 0.001) which was supported by the research done in India by (Gadhia et al., 2023) which shows (p<0.001). Similarly, there was significant association between level of knowledge and practice (<0.001) where poor level of knowledge had poor practice. Similar finding supports the study done in western regional hospital by (Adhikari Baral, 2018).

Conclusion and Recommendations

The study concludes more than half of the COPD patients had possessed satisfactory level of knowledge and majority of respondents had incorrect practice on rotacap inhalation. Knowledge level is significantly associated with age and demonstration on rotacap inhalation. Similarly, there is significant association between practice level and age, religion, education practice demonstration on rotacap inhalation. The study also shows significant association between level of knowledge and practice which signifies respondents who had goof level of knowledge had performed correct practice. To improve knowledge and practice on rotacap inhalation, there is a need for more focused education program for COPD patients which includes clear instruction and demonstration about rotacap inhalation.

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