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Practice on pulmonary hygiene and associated factors among health professionals working in two government hospitals at Amhara, Ethiopia

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Abstract
Introduction: Pulmonary hygiene is formerly referred to as pulmonary toilet which is a set of methods used to clear mucus and secretions from the airways and it is depends on consistent clearance of airway secretions.
Objective: To determine the level of practice on pulmonary hygiene and associated factors among Health Professionals.
Methodology: Institution based cross sectional study design was employed among one hundred twelve health professionals using systematic random sampling technique. The collected data were analyzed using descriptive and inferential statistics. Practice was computed using 10 questions related to pulmonary hygiene. The mean practice score of the total sample was 8.56 (± 1.6 SD). Subjects who scored above the mean value were categorized as having good level of practice.
Results: A total of 112 participants were included in this study out of total participants, 69 (61.6%) were females and their mean age was 26.10 (±3.47SD) years. Fifty eight (51.8%) of respondents were more than 25 years old. The majority of the respondents were Orthodox 53 (47.3%) followed by Muslims 47 (42%). Fifty- five (49.1%) of the participants were single. In this study the majority of participants 91(81.3%) had work experience less than five years. Majority of the respondents (52%) had no recent training on pulmonary hygiene. Around sixty- three percent of participants were nurses. Off 78 % study participants had good practice about pulmonary hygiene.
Conclusion & Recommendation: The present study concluded that further study can be conducted with large similar groups with advanced evidence based interventional strategy by involving other health professionals as well.

Keywords: pulmonary hygiene, practice, health professionals, associated factors

1. Introduction

Pulmonary hygiene is formerly referred to as pulmonary toilet which is a set of methods used to clear mucus and secretions from the airways. It is also called as respiratory health, pulmonary rehabilitation and pulmonary health [1].

Pulmonary hygiene depends on consistent clearance of airway secretions. Normal airway clearance is accomplished by 2 important mechanisms: the mucociliary clearance system and the ability to cough. Impaired mucociliary clearance is linked to poor lung function in a broad range of diseases and disabilities. Because at-risk individuals are prone to recurrent episodes of respiratory inflammation, infection, and, eventually, irreversible lung damage, improvement of mucociliary clearance is a vital treatment goal - one that can be accomplished with an individualized bronchial hygiene plan that includes effective airway clearance therapy [2].

The word pulmonary refers to the lungs. The word toilet is related to the French toilette, refers to body care and hygiene; this root is used in words such as toiletry that also relate to cleansing. Pulmonary hygiene prevents the collapse of the alveoli of the lungs and rids the respiratory system of secretions, which could cause respiratory infections. It can also decrease pulmonary shunting, increase the functional reserve capacity of the lungs, and prevent respiratory infection after chest trauma [3].

Methods used for pulmonary hygiene include chest physiotherapy, postural drainage, coughing and breathing exercise, suctioning and tapping, incentive spirometer, bronchoscopy, blow bottles, tracheostomy care and so on. Pulmonary hygiene used to prevent and reduce the life threatening pulmonary complications such as obstruction, hypoventilation, hypoxemia and infections in order to restore muscular and pulmonary function as fast as possible. Globally more than 1.5 million deaths annually from respiratory infections are attributable to the environment, including at least 42% of lower respiratory infections and 24% of upper respiratory infections in developing countries [4]. Both globally and regionally there is a paucity of studies in Africa, South East Asia and the Eastern Mediterranean region. There is a need for governments, policy makers and international organizations to consider strengthening collaborations to address COPD globally [5].

WHO reported that, tuberculosis is accounted for 2.4% of deaths (230,000 deaths) in sub Saharan Africa countries and the environmental burden by the disease category the Respiratory infections stands/ranks 2nd in Ethiopia [6]. Centers for Disease Control and Prevention (CDC) Global Health-Ethiopia 2014, says Lower respiratory infections accounts for 10% of death and it is the leading cause of death in the country [7].

According to The National Center for Biotechnology Information (NCBI) chronic obstructive pulmonary (COPD) account for 2.7% to 4.3% morbidity in Amhara Region, Ethiopia [8].

However, pulmonary rehabilitation can make a tremendous difference in both the severity of symptoms and exacerbations for those coping with the disease [9]. Thus, the pulmonary hygiene and its associated elements are very essential in preventing and promoting respiratory health, since health professionals are the life savers of the patients based this result interventional strategies could be applied to increase the efficacy on pulmonary hygiene among health professionals.

Objectives

1. To determine the level of practice on pulmonary hygiene among Health Professionals working in Dessie Referral Hospital and Kemissie General Hospital Amhara region, Ethiopia
2. To assess socio-demographic factors on the level of practice towards pulmonary hygiene among Health Professionals working in Dessie Referral Hospital and Kemissie General Hospital Amhara region, Ethiopia

2. Methodology

Research Design

Institution based cross sectional study design was employed.

Setting and Sampling

The study was conducted in Dessie Referral Hospital and Kemissie General Hospital North East, Ethiopia, 2017. Systematic sampling technique was used to select total of 112, 32 General Practioners and 75 Nurses.

Description of the Tool

The tool is divided into mainly two parts,

Part-A: Demographic pro-forma of the Health professionals.

Part-B: Structured practice questionnaire

Content Validity

Validity of the tool was ascertained in consultation with prepared by emergency and critical care and adult health specialty professionals. The experts were requested to judge the items for accuracy, relevance, appropriateness and degree of agreement. The suggestions of the experts were incorporated into the tool and the tool was modified accordingly.

Pilot Study

Pilot study was conducted in Woldia General Hospital with 10% of the sample size before the main study to identify potential problems in the proposed study such as data collection tools and to check the performance of the data collectors and questionnaires used in the pre-test did not included in the analysis as part of the main study. English version of questionnaire was used to assess the attitude and socio demographic factors on pulmonary hygiene among health professionals.

Data Collection Procedure

Prior permission was obtained from the concerned authority. Informed consent obtained from the subjects. Once all necessary data obtained, data was checked for completeness edited, cleaned, coded and entered in to and analyzed by SPSS version 20 for windows. Bivariate and multivariable regressions used to identify the independent predictor on pulmonary hygiene.

Statistical Analysis

The collected data were analyzed by using descriptive (frequency, distribution, percentage, mean and standard deviation) and inferential statistics (Logistic regression). This was done by entering each independent variable separately into bivariate analysis. Then, variables that showed statistical significant association with p-value of less than 0.25 on bivariate analysis were entered into multivariate logistic regression. Then, variables which showed statistical significant association with p-value less than 0.05 on multivariable regression were considered as predictors of the attitude and socio demographic factors affecting on pulmonary hygiene.

3. Results

Socio-demographic characteristics

A total of 112 participants were included in this study. Out of 112 of total participants, 69 (61.6%) were females and their mean age was 26.10 (±3.47SD) years. Fifty eight (51.8%) of respondents were more than 25 years old. The majority of the respondents were Orthodox 53 (47.3%) followed by Muslims 47 (42%). Fifty- five (49.1%) of the participants were single. In this study the majority of participants 91(81.3%) had work experience less than five years. Majority of the respondents (52%) had no recent training on pulmonary hygiene. Around sixty- three percent of participants were nurses (Table 1).

Table 1: Socio-demographic characteristics of the study participants (n =112) in Dessie Referral & Kemissie Hospitals, Ethiopia, 2017GC.

Participants characteristics		Frequency	Percent (%)
Sex	M	69	61.6
	F	43	38.4
Age category (in years)	< 25	54	48.2
	25^{+}	58	51.8
Ethnicity	Amhara	17	15.2
	Oromo	79	70.5

	Gurage/Tigray/	16	14.3
Religion	Orthodox	53	42.0
	Muslims	47	47.3
	Protestant/Catholic	12	10.7
Marital status	Single	55	49.1
	Married	57	50.9
Profession	Doctors	37	33
	Nurses	75	67
Work experience (yrs)	< 5 years	91	81.3
	5^+ years	21	18.8
Recent training in Pulmonary hygiene	Yes	18	16.1
	No	94	83.9

Level of practice on pulmonary hygiene

Practice was computed using 10 questions related to pulmonary hygiene. The mean practice score of the total sample was 8.56 ($\pm$ 1.6 SD). About 78 % study participants had good practice about pulmonary hygiene.

Socio-demographic factors related to level of practice

Among variables entered in the bi-variate analysis, Sex variable showed significant association with the level of practice on pulmonary hygiene.

Variables with P-value $\leq$ 0.25 were entered in the multivariate logistic analysis. In the multiple logistic analysis, Male participants were 6 times (AOR = 6, CI=2.3, 17.9) more likely to have poor level of practice on pulmonary hygiene as compared to female subjects. Married subjects were 0.3 times (AOR = 0.3, CI=1.2, 6.5) more likely to have good level of practice as compared to single individuals. (Table 2)

Table 2: Bivariate and multivariate logistic regression predicting the level of practice of participants towards pulmonary hygiene among study participants of Dessie Referral& Kemissie Hospitals, Ethiopia, 2017 (n =112).

Factors		Level of practice				COR (95% CI)	P-value	AOR (95% CI)	P-value
		Good		Poor					
		n	(%)	N	(%)				
Sex	Males	31	62	19	38	0.2(0.1,0.5)	0.001*	6(2.3,17.9)	0.001*
	Females (Ref)	56	90.3	6	97				
Age category	<25	42	77.8	12	22.2	1(0.4,2.5)	0.9		
	25+ (Ref)	45	77.6	13	23.4				
Marital status	Single (R)	47	85.5	8	14.5				
	Married	40	70.2	17	29.8	2.5(0.9,6.4)	0.06	0.3(0.1,0.9)	0.04*
Profession	Doctors	27	73	10	27	0.7(0.3,1.7)	0.4		
	Nurses(Ref)	60	80	15	20				
Work experience(yrs)	< 5 years	67	74.4	23	25.6	1(0.4,2.4)	0.9		
	5^+ years(Ref)	20	90.9	2	9.1				
Recent training on Pulmonary hygiene	Yes (Ref)	17	94.4	1	5.6				
	No	70	74.5	24	25.5	0.2(0.1,1.4)	0.95		

*($p < 0.05$)

4. Discussion

This study is the first study to report on practice and associated factors related to pulmonary hygiene among health workers. The findings of this study revealed that majority 87 (78 %) study participants had good practice about pulmonary hygiene. Male participants were 6 times (AOR = 6, CI=2.3, 17.9) more likely to have poor level of practice on pulmonary hygiene as compared to female subjects and (6) Married subjects were 0.3 times (AOR = 0.3, CI=1.2, 6.5) more likely to have good level of practice as compared to single individuals. This result resembles the explanatory study on practices followed to prevent ventilator associated pneumonia among 86 staff members in six hospital. The study revealed 72-83 % of responding practicing semi recumbent position was used to prevent ventilator associated pneumonia and 21% responding using subglottic secretion drainage was used to prevent ventilator associated pneumonia. This study indicated semi recumbent position was commonly used to prevent ventilator associated pneumonia and subglotic drainage, was used for less often [9].

5. Conclusion

The level of practice about the Pulmonary Hygiene is very important. So there a need to incorporate pulmonary hygiene in the on job training strategy with advanced teaching in regional health office and other stake holders.

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