Prevalence and Risk Factors of Dyspnea among General Population of Arar City, Kingdom Saudi Arabia

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ABSTRACT

Background: Dyspnea is defined as the subjective experience of breathing discomfort. It is increasing by age and it is a common problem affecting up to half of patients admitted to acute, tertiary care hospitals and also affecting one quarter of ambulatory patients. **Study objective:** to determine the prevalence and risk factors of dyspnea among general population of Arar city, Northern Border Province, Saudi Arabia. **Methods:** This was a cross-sectional, community-based study. It was conducted on the general population of Arar city during the period from 1st October, 2015 to 30th June 2016.Data were collected using a predesigned online self-administered questionnaire covering all the needed items. **Results:** Dyspnea was reported in 35.2% of the study population. Causes of dyspnea reported in our study were mainly of unknown causes (38.6%), bronchial asthma (23.9%), allergy (22.7%), psychological causes (12.5%), cardiac causes (1.1%), and COPD (1.1%).It was more common among females as 44.8% of females reported dyspnea while it was reported in only 31.7% of males. Our study has also shown that dyspnea was most prevalent among the < 20 age group by ratio as 52.6% of them reported dyspnea. However, 36.1% of subjects aged between 20 and 40 have reported dyspnea. Precipitating causes of dyspnea were found to be mostly due to dust (30.7%), smoking (22.7%), climate changes (14.7%), nervousness (13.6%), specific food/ingested material (11.4%), and excess physical activities (6.8%). It was also founded in our study that 56.5% of participants with family history of dyspnea suffered from dyspnea. While 72.9% of those who did not have a family history of dyspnea did not suffer any dyspnea. **Conclusion:** Dyspnea was reported in 35.2% of Arar population. Our study showed that dyspnea was more common among females than males. large scale study with detailed investigations about causes and precipitating factors are required.
Keywords: Dyspnea, hard breathing, Prevalence, chronic disease.

INTRODUCTION

Chronic respiratory diseases represent a group of diseases characterized by abnormal condition of the respiratory system such as inflammation of the airways, airflow obstruction, chest pain, dyspnea, hemoptysis, and sputum production[1]. It became a predominant cause of morbidity and mortality, especially in the resource-poor countries such as South and Southeast Asia and Africa[2].

Dyspnea is a normal symptom of heavy exertion but becomes pathological if it occurs in unexpected situations[3] or light exertion. In 85% of cases it was due to asthma, pneumonia, cardiac ischemia, interstitial lung disease, congestive heart failure, chronic obstructive pulmonary disease, or psychogenic causes[4] such as panic disorder and anxiety. Dyspnea is known as a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity" or as the experience of breathlessness which may be either acute or chronic[3]. There are many causes of dyspnea, it may occur in normal condition such as, exercise is usually a trigger for short-term dyspnea or when you at a higher elevation and you're not used to

having less oxygen available, you may also experience temporary dyspnea. At extremely high elevations, such as mountaintops, the air can be a real health hazard[4]. Also dyspnea may occur due to medical condition and it appear in a sudden breathlessness, as in heart failure, low blood pressure, pneumonia, pulmonary embolism, carbon monoxide poisoning, stress or anxiety or may also experience sudden dyspnea if a piece of food or some other object blocks your airway[5].

An injury that harms a lung or causes a rapid loss of blood will also make breathing more difficult, and all this cases are considered as acute dyspnea but when shortness of breath isn't a sudden emergency, but is instead a problem that lingers for at least four weeks, it's considered chronic cases as in chronic obstructive pulmonary disease (COPD), interstitial lung disease (scarring of lung tissue), poor physical conditioning, obesity, heart disease[6].

The symptoms of chronic dyspnea appear in sensation of just not getting quite enough air into lungs all the time. In serious cases, you may feel as though you're suffocating. Bouts of dyspnea may also

bring on chest tightness. Dyspnea prevalence has varied greatly across studies and countries [7]. Some might be due to differences in the distribution of known correlates of dyspnea such as age, sex, and smoking status [8]. Or may differ due to variation in how dyspnea was measured, the nature of the samples studied and the burden of chronic diseases that cause dyspnea. Some population-based studies have reported a dyspnea prevalence of more than 20% [9]. A high-prevalence of cardiopulmonary diseases, life-style changes, obesity and subclinical medical conditions might have explained this dyspnea

Objectives

The aim of this study was to determine the prevalence and risk factors of dyspnea among general population of Arar city, Northern Border Province, Saudi Arabia.

METHODOLOGY

Study design and setting: This present study is a cross-sectional, community-based study. It was conducted on the general population of Arar city (Northern Border Province, Saudi Arabia) of both sexes, during the period from 1st October, 2015 to 30th June 2016 to evaluate the prevalence of dyspnea among the population of Arar city.

Sampling technique: systematic random technique was followed as we choose the participants randomly from the general population. We include every 20th.

Data collection:

Data were collected using a pre-designed online questionnaire which was distributed among the population. It was self-administered by participants after a brief introduction or explanation of the idea of the research. The questionnaire included the relevant questions to collect the needed data. Collected data included:
1- Socio-demographic characteristics, smoking, obesity, performing muscular exercise, family history of dyspnea.
2- Dyspnea, causes,physician diagnosis and precipitating factors of dyspnea among the studied population.

Statistical analysis

Collected data were coded and analyzed using statistical package for the social sciences (SPSS, version 15). Descriptive statistics for the prevalence and quantitative variables was used. Relationship between dyspnea and socio-demographic characteristics, smoking, obesity, performing muscular exercise, family history of repeated dyspnea of the studied population was determined using the chi-square test. P-value of less than 0.05 was considered statistically significant.

Ethical considerations:

The participants were informed that participating is completely voluntary. All the participants were assured that their data will be dealt with confidentiality. No names were written in the forms and the data was kept safely.

RESULTS

Table (1) shows socio-demographic characteristics, smoking, obesity, performing muscular exercise, family history of repeated dyspnea of the studied population. We found that most of the studied population were males (73.2%), 67.6% aged from 20 to 40 years and 50.4% were singles. About education, 80.0% of population reach university level or more, and 57.6% were working, 66.0% not smokers . Regarding obesity, 74.0% were non obese and 76.4% do muscular exercise . Family has not a history of dyspnea was present in28.6% of the studied sample .

Table (2) discuses repeated dyspnea, causes, physician diagnosis, precipitating causes of dyspnea among the studied sample. We found that, dyspnea was reported in 35.2% of the studied population sample . Causes of dyspnea were mainly of unknown causes (38.6%), bronchial asthma (23.9%), allergy (22.7%), psychological causes (12.5%), cardiac causes (1.1%), and COPD (1.1%) was more common among females as 44.8% of females reported dyspnea while it was reported in only 31.7% of males. Precipitating causes of dyspnea were found to be mostly due to dust (30.7%), smoking (22.7%), climate changes (14.7%), nervousness (13.6%), specific food/ingested material (11.4%), and excess physical activities (6.8%).

Our study showed that dyspnea was more common among females as 44.8% of females reported dyspnea while it was reported in only 31.7% of males. Our study has also shown that dyspnea was most prevalent among the < 20 age group by ratio as 52.6% of them reported dyspnea. However, 36.1% of subjects aged between 20 and 40 have reported dyspnea. It is also observed in our study that 56.5% of participants with family history of dyspnea suffered from dyspnea. While 72.9% of those who did not have a family history of dyspnea did not suffer any dyspnea.
 (Table 3)

Table (1): Socio-demographic characteristics, smoking, obesity, performing muscular exercise, family history of dyspneaamong the studied population

Dyspnea (n=250)	Frequency	Percent
• No	162	64.8
• Yes	88	35.2
Physician diagnosis (n=250)		
• No	197	78.8
• Yes	53	21.2
Causes of dyspnea (n=88)		
• Psychological causes	11	12.5
• Bronchial asthma	21	23.9
• Allergy	20	22.7
• COPD	1	1.1
• Cardiac causes	1	1.1
• Unknown causes	34	38.6
Precipitating factors of dyspnea (n=88)		
• Dust	27	30.7
• Some foods	10	11.4
• Smoking	20	22.7
• Excess physical activities	6	6.8
• Climatic changes	13	14.7
• Nervousness	12	13.6

Table(3): Relationship between dyspnea and socio-demographic characteristics, smoking, obesity, performing muscular exercise, family history of dyspnea of the studied population

	Dyspnea		Total	P value
	Yes (N=88)	**No (N=162)**	**(N=250)**	
Gender				
• Female	30	37	67	0.039
	44.8%	55.2%	100.0%	
• Male	58	125	183	
	31.7%	68.3%	100.0%	
Age group				
• <20	10	9	19	0.173
	52.6%	47.4%	100.0%	
• 20-40	61	108	169	
	36.1%	63.9%	100.0%	
• 41-60	15	35	50	
	30.0%	70.0%	100.0%	
• >60	2	10	12	
	16.7%	83.3%	100.0%	
Working status				
• Not working	40	66	106	0.278
	37.7%	62.3%	100.0%	
• Working	48	96	144	
	33.3%	66.7%	100.0%	
Smoking				
• Ex-smokers	3	9	12	0.723
	25.0%	75.0%	100.0%	
• Non smokers	58	107	165	
	35.2%	64.8%	100.0%	
• Smokers	27	46	73	

	Dyspnea		Total	P value
	Yes (N=88)	No (N=162)	(N=250)	
	37.0%	63.0%	100.0%	
Obesity				
No	63	122	185	0.311
	34.1%	65.9%	100.0%	
Yes	25	40	65	
	38.5%	61.5%	100.0%	
Muscular exercises				
No	64	127	191	0.197
	33.5%	66.5%	100.0%	
Yes	24	35	59	
	40.7%	59.3%	100.0%	
Family history of dyspnea				
No	49	132	181	0.001
	27.1%	72.9%	100.0%	
Yes	39	30	69	
	56.5%	43.5%	100.0%	

DISCUSSION

Dyspnea is defined as the subjective experience of breathing discomfort [10]. It is increasing by age and it is a common problem affecting up to half of patients admitted to acute, tertiary care hospitals [11] and also affecting one quarter of ambulatory patients [12]. Mostly, patients' explaining the experience of severe dyspnea are illuminating, and they report association with a sense of impending death [13]. Dyspnea is experienced when there is difficulty in the oxygen transport, with metabolic dysfunction such as in lactic acidosis, high pulmonary vascular pressures as in congestive heart failure, and increased work of breathing as in increased airway resistance and hyperinflation from asthma and chronic obstructive pulmonary disease (COPD) [14]. Although COPD is a treatable condition, it remains the third leading cause of death worldwide [15]. Reduced oxygen transport can be due to heart failure, emphysema, pulmonary embolism, and anemia. Medical professionals refer to the case with the term dyspnea, while most patients rather describe it with terms such as breathlessness, chest tightness, shortness of breath, and air hunger or as increased effort of breathing which indicates that dyspnea is complex and varies between patients [16]. In the study of **Sajadi** *et al.*[17], it was found that "My breath doesn't go out all the way" with 83.1%, "My chest feels tight " with 45.8%, and "I feel that my airway is obstructed" with 40.7%, were the most frequent dyspnea descriptors in asthma patients.

This cross-sectional community-based study was conducted on the general population of Arar city (Northern Border Province, Saudi Arabia) of both sexes, during the period from 1st October, 2015 to 30th June 2016 to evaluate the prevalence of dyspnea among a representative sample of Arar city. The results and outcomes of this study present unique information on trends in dyspneic patients, their socio-demographic characteristics, and relationships between them and other factors affecting them. In the present study, the total number of participants was 250 among which 183 (73.2%) were males and 67 (26.8%) were females. The participants were grouped in 4 groups according to age classification, most of which were in the 20-40 years old group, counting 169 (67.6%). However, 50 (20%) of the patients were 41-60 years old, 12 (4.8%) were over 60 years old, and 19 (7.6%) were less than 20 years old.

Dyspnea was reported in 35.2% of the study population. Dyspnea was found to be less prevalent in the study of **Grønseth** *et al.*[18], as 27% of the total population had reported dyspnea. Some population-based studies have reported a dyspnea prevalence of more than 20% [19, 20].

The causes of dyspnea reported in our study were mainly of unknown causes (38.6%), bronchial asthma (23.9%), allergy (22.7%), psychological causes (12.5%), cardiac causes (1.1%), and COPD (1.1%). In **Grønseth** *et al.*[18] study, it was observed that dyspnea exhibited geographical variation beyond that which might be explained by known risk factors such as age, sex, education, smoking habits, comorbidities as obesity and life style.

Our study showed that dyspnea was more common among females as 44.8% of females reported dyspnea while it was reported in only 31.7% of males. Our

study has also shown that dyspnea was most prevalent among the < 20 age group by ratio as 52.6% of them reported dyspnea. However, 36.1% of subjects aged between 20 and 40 have reported dyspnea. Precipitating causes of dyspnea were found to be mostly due to dust (30.7%), smoking (22.7%), climate changes (14.7%), nervousness (13.6%), specific food/ingested material (11.4%), and excess physical activities (6.8%). It is also founded in our study that 56.5% of participants with family history of dyspnea suffered from dyspnea. While 72.9% of those who did not have a family history of dyspnea did not suffer any dyspnea.

In **Grønseth** *et al.*[9] study, it was observed that occurrence of unexplained dyspnea could be related to known risk factors related to age, sex, education, smoking habits, comorbidities as obesity and life style.

Another population-based studies have reported a high-prevalence of dyspnea, cardiopulmonary diseases, life-style, obesity and subclinical medical conditions might have explained this dyspnea [19, 20].

CONCLUSION

Dyspnea was reported in 35.2% of Arar population. Our study showed that dyspnea was more common among females than males. large scale study with detailed investigations about causes and precipitating factors are required.

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