



# جامعة الناصر AL-NASSER UNIVERSITY

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جميع حقوق النشر محفوظة لمكتب البحوث والنشر بجامعة الناصر

## Prevalence of Asthma and Allergic diseases among high School students in urban & rural communities, Yemen

By

Saleh Bahaj<sup>1</sup>, Ahmed moharem<sup>1</sup> and Ahmed kaid<sup>2</sup>

Microbiology<sup>1</sup> and physiology<sup>2</sup> Departments faculty of medicine and health science, Tamar university

### Introduction:

Asthma is a major public health problem worldwide, a significant increases in the prevalence of asthma have been noticed globally over the past few decades in certain geographical regions. However, there is a limited data on asthma prevalence among school children in Yemen.

The present study was undertaken to determine the prevalence of asthma in Yemen and also to examine the different factors influencing its occurrence.

### Methodology :

#### Study area:

The republic of Yemen is located in the south west of sub Arabian island, south of Saudi Arabia and west of Oman Sultanate. Three cities within the Republic of Yemen (Sana'a Ala-manah, Sana'a government and Shabwah government) were chosen to conduct the present study, because the principle researchers and there co-workers where present in or near by each city, the other reason also because the region provided some interesting variations for comparisons, Sana' Al- amanh represent the urban area while Sana'a Government represent rural area and Shabwah represent a dry, coastal and desert climate.

### **Study population:**

The population of interest was school pupils of Sana'a Alamanh, Sana'a government and Shabwah government within the Republic of Yemen aged 13-14 years (in compliance with the ISAAC study requirements). For each candidate schools, classes with the age 13-14 years old were selected.

### **Sample size:**

Depending on the data collected from the educational offices regarding to the number of schools and pupils aged 13-14 years old in each candidate city, the number of schools surveyed for 13-14 year age group was 536 for Alamanh, 1171 for Sana'a government and 486 for Shabwah government. The study sample size was calculated using standard sample size calculation. The schools were randomly selected by creating a random list using epiCalac 2010 program to ensure that the sample of schools was representation of the wider community.

After the sample definition, ISAAC (translated Arabic version) written questionnaire was filled by pupils themselves during class hours under supervision of the trained research team and their teachers.

The questionnaire was applied to 1028 School pupils aged from 13-14 as follows:

Sana'a Al- amanh; (N=311); Sana'a government (N=327); Shabwah (N=390). All selected pupils agreed to participate and fill in the questionnaire. The study was carried out between February and May 2010.

### **Ethics Statement**

There is no health ethics committee for school-based research in the study regions. Permission to undertake the present study was however obtained from the education authorities in each region. A letter with explanation of the purpose of the study was submitted to the educational offices and approval for the study was given by the educational offices and school's managers.

### **Results**

**The results of the present study are presented in the tables (1- .....)** our results showed that the prevalence of asthma , hay fever & eczema was 14.4%, 12% and 12.1% respectively. Asthma was found to be higher among males pupils ( 18.6% ) than females (12.9 %), same as hay fever ( male 16.8%, female 10.3%) while eczema was almost the same ( male 14.6%, female 13.4%) , also Asthma was higher in Shabwa than in Sana'a area, hay fever was higher in Sana'a urban than other areas , while eczema was higher in Sana'a than in Shabwa.

**Table No.1 Shows the prevalence of the various allergic diseases.**

Disease	Frequency	Percentage
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ASTHMA	148	14.4 %
HAY FEVER	123	12.0 %
ECZEMA	125	12.1 %
NO DISEASE	632	61.5 %
<b>TOTAL</b>	<b>1028</b>	<b>100 %</b>

Figure No.1 pie chart showing the prevalence of the various allergic diseases.

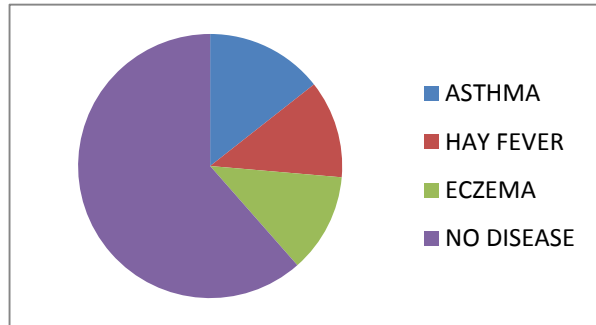


Table No.2 shows the gender vs. asthma cross tabulation .

gender		do you have asthma before?		Total
		yes	no	
male	Count	91	399	490
	% within gender	18.6%	81.4%	100.0%
female	Count	57	385	442
	% within gender	12.9%	87.1%	100.0%
<b>Total</b>	Count	148	784	932
	% within gender	15.9%	84.1%	100.0%

CHI SQUARE = 5.6

DF= 1

SIG= 0.011

Table No.3 shows the gender vs. hay fever cross tabulation .

gender		have had hay fever before?		Total
		yes	no	
male	Count	78	386	464
	% within gender	16.8%	83.2%	100.0%
female	Count	45	393	438
	% within gender	10.3%	89.7%	100.0%
Total	Count	123	779	902
	% within gender	13.6%	86.4%	100.0%

CHI SQUARE = 8.17

DF= 1

SIG= 0.003

Table No.4 shows the gender vs. eczema cross tabulation .

gender		have you had eczema before?		Total
		yes	no	
male	Count	67	392	459
	% within gender	14.6%	85.4%	100.0%
female	Count	58	374	432
	% within gender	13.4%	86.6%	100.0%
Total	Count	125	766	891
	% within gender	14.0%	86.0%	100.0%

CHI SQUARE = 0.253

DF= 1

SIG= 0.342

Table No.5 shows the area vs. asthma cross tabulation .

area		do you have asthma before?		Total
		yes	no	
Sana'a urban	Count	42	250	292
	% within area	14.4%	85.6%	100.0%
Sana'a rural	Count	29	239	268
	% within area	10.8%	89.2%	100.0%
Shabwa urban	Count	19	79	98
	% within area	19.4%	80.6%	100.0%
Shabwa rural	Count	58	216	274
	% within area	21.2%	78.8%	100.0%
<b>Total</b>	Count	148	784	932
	% within area	15.9%	84.1%	100.0%

CHI SQUARE = 12.263

DF= 3

SIG= 0.007

Table No.6 shows the area vs. hay fever cross tabulation .

area		have had hay fever before?		Total
		yes	no	
Sana'a urban	Count	47	239	286
	% within area	16.4%	83.6%	100.0%
Sana'a rural	Count	28	212	240
	% within area	11.7%	88.3%	100.0%
Shabwa urban	Count	12	86	98
	% within area	12.2%	87.8%	100.0%
Shabwa rural	Count	36	242	278
	% within area	12.9%	87.1%	100.0%
<b>Total</b>	Count	123	779	902

**Table No.6 shows the area vs. hay fever cross tabulation .**

area		have had hay fever before?		Total
		yes	no	
Sana'a urban	Count	47	239	286
	% within area	16.4%	83.6%	100.0%
Sana'a rural	Count	28	212	240
	% within area	11.7%	88.3%	100.0%
Shabwa urban	Count	12	86	98
	% within area	12.2%	87.8%	100.0%
Shabwa rural	Count	36	242	278
	% within area	12.9%	87.1%	100.0%
<b>Total</b>	Count	123	779	902
	% within area	13.6%	86.4%	100.0%

CHI SQUARE = 2.963

DF= 3

SIG= 0.397

**Table No.7 shows the area vs. eczema cross tabulation .**

area		have you had eczema before?		Total
		yes	no	
sana'a urban	Count	43	237	280
	% within area	15.4%	84.6%	100.0%
sana'a rural	Count	41	199	240
	% within area	17.1%	82.9%	100.0%
shabwa urban	Count	10	87	97
	% within area	10.3%	89.7%	100.0%
shabwa rural	Count	31	243	274
	% within area	11.3%	88.7%	100.0%
<b>Total</b>	Count	125	766	891
	% within area	14.0%	86.0%	100.0%

**CHI SQUARE = 5.053****DF= 3****SIG= 0.168**

- Our results showed that the prevalence of asthma , hay fever & eczema was 14.4%, 12%, 12.1% respectively. (Table no.1)
- Asthma is higher among males ( 18.6% ) than females (12.9 %), same as hay fever ( male 16.8%, female 10.3%) while eczema was almost the same ( male 14.6%, female 13.4%) . (table No. 2,3,4)
- Asthma was higher in Shabwa than in Sana'a area, hay fever was higher in Sana'a urban than other areas , while eczema was higher in Sana'a than in Shabwa (table No. 5,6,7)

### **Discussion:**

Our results showed that the prevalence of asthma , hay fever & eczema was 14.4%, 12% and 12.1% respectively.

The results of the present study showed that the prevalence of asthma in the Republic of Yemen is within the reported prevalence ranges from many other parts of the world.

Our result is in a agreement with a studies from other countries which have reported the prevalence of asthma among 13-14 year from the Mediterranean, North Africa and middle East was 14.6% in Malta, 10.4% in Morocco, 8.7% in Algeria, 11.7% in Pakistan, 13.2% in Iran and 7.6% in Kuwait.<sup>1</sup>

A study from Syria conducted by (Mohammad, Y. et al., 2010) revealed that there is no relation between prevalence of asthma among 13-14 year age group and environmental factors such as climate and exposure to air pollution.<sup>2</sup>

Neil Pearce reported that The mean symptom prevalence of current wheeze in the last 12 months changed slightly from 13.2% to 13.7% in the 13–14 year age group (mean increase of 0.06% per year) and they concluded that international differences in asthma symptom prevalence have reduced, particularly in the 13–14 year age group, with decreases in prevalence in English speaking countries and Western Europe and increases in prevalence in regions where prevalence was previously low.<sup>3</sup>

In a study from India Ganesh Kumar S., et al., ( 2012) reported the overall prevalence of bronchial asthma was found to be 8.7% and the prevalence of asthma was comparatively more in 12-13 year age group (11.4%) compared to 14-15 year age group (7.1%). Boys scored a higher prevalence of asthma (10.1%) compared to girls (7.1%), this finding is agreed with the results of our study which revealed that the prevalence Asthma found to be a higher among males pupils ( 18.6% ) than females (12.9 %), same as hay fever ( male 16.8%, female 10.3%) while eczema was almost the same ( male 14.6%, female 13.4%).<sup>4</sup>

Hijazi et al. reported the prevalence of asthma in 1,020 urban and 424 rural children from Saudi Arabia was 13.9% and 8%, respectively <sup>5</sup>

The results are shown varieties in respect to the areas, asthma was higher in Shabwa than in Sana'a area, hay fever was higher in Sana'a urban than other areas , while eczema was higher in Sana'a than in Shabwa.

Epidemiological studies in Saudi Arabia revealed an increasing prevalence of asthma in the past three decades that may be attributed to rapid lifestyle changes related to the modernization of Saudi society, changes in dietary habits, and exposure to environmental factors, such as indoor allergens, dust, sand storms and tobacco.<sup>6</sup>

A study from Qatar showed that the prevalence of asthma, eczema and allergic rhinitis among 12-14 age group found to be 18.4%, 28.0% and 29.3% respectively ,they also reported that male scored high prevalence rate of asthma(22.9% ) than female (12.9% ).<sup>7</sup>



They concluded the combination of genetic, environmental, and socioeconomic factors might explain the noted high prevalence rates of asthma and related disorders in their study.<sup>7,8</sup>

Another study from south India which designed to investigate the prevalence of bronchial asthma in rural Indian children reported that the prevalence of bronchial asthma among age group of 6 – 15 year was 10.3%, while the prevalence of asthma among age group of 13-15 years was 5.6%, the low rate of asthma among this group may be refer to the low sample size (162 child). They also reported Boys had a higher prevalence of asthma (12.1%) compared to girls (8.4%).<sup>9</sup>

Our result showed the prevalence of asthma is high among urban pupils than rural pupils this is agreement with a previous studies from the neighboring countries and other worldwide. A.R. Al Frayh et al., in one study reported increase prevalence of asthma in Saudi Arabia from 8% in 1986 to 23% in 1995. They attributed this change to increase exposure to the environmental factors such as tobacco smoke and the continues changes in contemporary life.<sup>10</sup>

A recent study from Iran reported that the prevalence of asthma, allergic rhinitis and eczema among 12-14 year age group in north of Iran was found to be 21.7%, 19.9% and 8.2% respectively, They also revealed that the prevalence of asthma, rhinitis, and eczema symptoms in boys are higher than in girls.<sup>11</sup>

The International study of asthma and allergies in Childhood (ISAAC) phase three conducted in the large number of centers (233) and countries (98) showed the prevalence for current asthma, rhino conjunctivitis and eczema in the 13-14 year age group was 14.1%, 14.6% and 7.3%, respectively.<sup>12</sup>

The present study may be considered a baseline for further, broader studies across Yemen in the future.<sup>13</sup>

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