

## PREVALENCE OF SCOLIOSIS IN AL-MEDINA AL-MUNAWARA

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## ABSTRACT

**Background:** Prevalence of scoliosis in literatures has a wide range among different countries, increased in north countries and decreased closed to the equator. Screening for scoliosis has been practiced worldwide for many years and has provided valuable knowledge about prevalence, etiology and the natural history of idiopathic scoliosis. In the Middle East, no one country developed that screening. The aim of the present study was to describe the point prevalence of Adolescent Idiopathic Scoliosis (AIS) in KSA. **Methodology:** All participating medical students fulfilled an educational course to improve their knowledge about AIS and learn the screening procedure including the Adam Forward Bending Test and measurement of gibbus using a scoliometer. A Total of 376 females at Alrashed mall, Almadinah ALmonawarah were subjected to study. Female were asked to participate in answering question by interview. Wight, height, Blood presser, random blood glucose, neck circumference, hip circumference and waist circumference were measured. **Results:** The prevalence of idiopathic scoliosis defined as a positive Adam Forward Bending Test, gibbus  $> 7^\circ$ . The overall prevalence rate of scoliosis ( $> 7$  degrees or more) was 19%. It was 20.9% (49 of 186 participants) among the age group 6-26 years, 16% in 27-47 years and 17.9% among the age group 48-68 years. East Medina showed the greatest prevalence 24.3%. There was a positive but very weak correlation between scoliosis and age. **Conclusion:** The prevalence of scoliosis in Almadinah ALmonawarah was 19%. As delayed referrals of patients with high-risk curves can lead to increased morbidity we recommend a screening program to schoolchildren. According to these results, epidemiological regional variability, possibly with genetic basis, can be considered.

**KEYWORD:** prevalence, etiology and the natural history of idiopathic scoliosis.

## INTRODUCTION

Screening can have many purposes—surveillance for disease, protection of public health from contagious disease, or contribution to the health of individuals. This later is called “prescriptive screening.” Prescriptive screening can be “mass screening” of an entire population or “selective screening” of a predetermined high-risk group. “Case finding,” while distinct from screening, is often an element of screening. It is the application of tests in a group to bring those with the disorder to treatment. Screening for scoliosis in school programs is prescriptive screening with a strong element of case finding on a selected group at higher risk for the disease.

Over 30 years a scoliosis screening was practiced in U.S. However there is a controversy about its value.<sup>[1]</sup> It has been a worthwhile in many reports.<sup>[2]</sup> Early diagnosis of a disease will be a beneficial but 3 points have to be considered: ethical, scientific, and financial especially in our community.<sup>[3]</sup> With early identification and intervention, scoliosis may be prevented from progressing so that it does not interfere with mobility, activity or

comfort.

Scoliosis has a large percentage that remains asymptomatic,<sup>[4]</sup> therefore the feasibility of screening is worthwhile. Today's treatment modalities include observation, bracing, bracing and exercise and/or surgical spinal fusion. Early detection may eliminate the need for surgery. Treatment begun in the later stages can also produce favorable results, although it may take longer and be less successful. Therefore, is screening programs for school age children coupled with subsequent follow-up procedures worthwhile?

## Aim and Objective

The objective of this study was to determine the frequency of undiagnosed orthopedic problems in a population discovered through simple examinations carried out in a mass population. Therefore, the aim of the present study was to describe the point prevalence of Adolescent Idiopathic Scoliosis (AIS) in KSA.

## METHODOLOGY

The study is a cross section observational descriptive study to describe the prevalence of scoliosis in Saudi community. All participating medical students fulfilled an educational course to improve their knowledge about AIS and learn the screening procedure including the Adam Forward Bending Test and measurement of gibbus using a scoliometer. Physical examination will be conducted by observing the patient standing for assessment of asymmetries of the shoulder, ribs, scapula, waist and hips. Height and body weight will be measured for calculating the body mass index (BMI kg/m<sup>2</sup>).

A Total of 376 females at Alrashed mall, Almadinah ALmonawarah were subjected to study. Female were asked to participate in answering question by interview. Wight, height, Blood presser, random blood glucose, neck circumference, hip circumference and waist circumference were measured.

Descriptive statistics of mean, median, standard deviation, range, and frequencies were calculated using Statistical Package for Social Science (SPSS).

## RESULTS

The prevalence of idiopathic scoliosis defined as a positive Adam Forward Bending Test, gibbus > 7°. The overall prevalence rate of scoliosis (> 7 degrees or more) was 19%. It was 20.9% (49 of 186 participants) among the age group 6-26 years, 16% in 27-47 years and 17.9% among the age group 48-68 years (Table 1). East Medina showed the greatest prevalence 24.3% (Table 1) that was statistically significant. There was a positive but very weak correlation between scoliosis and age. Comparison of some anthropometric measurement between normal and scoliosis females was not statistically significant (Table 2). Both scoliotic and normal girls showed mild obesity (BMI 20 – 30). The comparison of body weight between scoliotic and nonscoliotic fails to show any statistical difference. The most interesting issue that all volunteers that was included in this study had scoliosis to some degree (Graph 1).

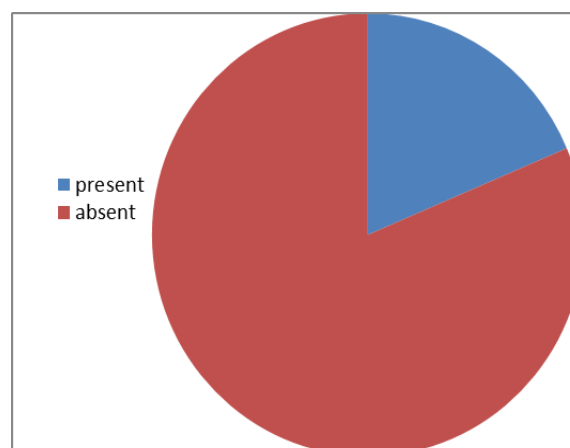
It was evident that scoliotic girls had menarche at an age close to the discovering of the curve (Graph 2).

**Table: 1**Prevalence of scoliosis according to personal characteristics.

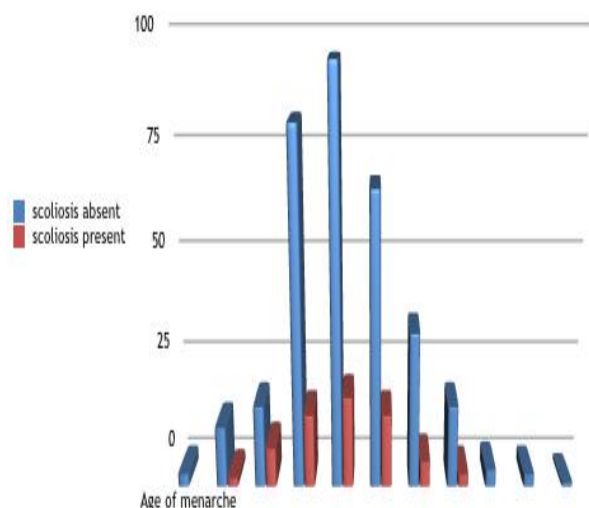
personal characteristics	Scoliosis				P-value
	Absent		Present		
	N	%	N	%	
<b>Age group</b>					0.43
- (6-26)	186	79.1	49	20.9	
- (27-47)	158	84	30	16	
- (48-68)	32	82.1	7	17.9	
<b>Nationality</b>					0.85
- Saudi	360	81.6	81	18.4	
- Non Saudi	16	80	4	20	
<b>Living district</b>					0.03
- North of Madinah	25	86.2	4	13.8	
- East of Madinah	131	75.7	42	24.3	
- South of Madinah	70	86.4	11	13.6	
- West of Madinah	74	89.2	9	10.8	

**Table: 2** Comparison of some anthropometric measurement between normal and scoliosis females.

Parameter	Scoliosis				P-value
	Absent		Present		
	Mean	±SD	Mean	±SD	
<b>BMI</b>	26.4068	6.15592	25.4475	5.78115	.25
<b>Neck circumference</b>	37.8513	23.6676	35.7806	7.12803	.46
<b>Waist circumference</b>	82.4507	15.9496	82.1912	17.7050	.90
<b>Hip circumference</b>	101.102	16.6691	100.068	17.4794	.65



**Graph 1:** (Pie chart) Prevalence of scoliosis among study sample.



**Graph 2: (Double bar graph) comparison of distribution of age at menarche between scoliosis and normal females.**

## DISCUSSION

According to the American academy of orthopedics surgeon, scoliosis was defined as a lateral curvature of the spine usually takes the shape of "S" or "C". Commonly, it is idiopathic (of unknown origin) and it tends to happen in adolescence from the age of 10 till the child is fully grown.<sup>[5-8]</sup>

This study aimed to screen females in general regardless the age. Early screening and detecting of the cases especially young cases can help us to have a rough idea about the prevalence of scoliosis in Medinah and help people with high gibbus (scoliometer reading  $\geq 7^\circ$ ) to seek further medical help as they have been educated during the interview what to do next.

In Saudi Arabia, we found 2 screening studies 2011 and 2014. Both of them were towards males only. Unfortunately there is lack of studies concerning females although they have higher incidence of scoliosis than males 1.5-2:1. The first one was screening for Acquired Spinal Deformities among Secondary School Students in Jizan City.<sup>[9]</sup> It screened 717 male students and they found a percentage of 5.3 % for scoliosis. The second one was conducted in alkharg city screened 1300 male primary school students (gibbus < 5 considered positive) and the percentage of scoliosis was 0.08 %.<sup>[10]</sup> Compared to our study, which showed 19 % scoliosis in the age group 6-26 years (gibbus < 7), which makes the female to male ratio higher than the one mentioned above. This prevalence is considered also high if compared to the other studies all over the world that did not exceed 6%.

Worldwide, there were two articles that conducted on school children both boy and girls. The first one study of Kamtsiuris was conducted in Germany by the Robert Koch Institute (RKI) (17,641 sample) were interviewed and examined for chronic diseases, children from 0 to 17 years participated. They found the prevalence of AIS

is 5.2%.<sup>[11]</sup> The other study in Korean had Cross-sectional epidemiologic scoliosis screening for prevalence of scoliosis among school children (1,134,890 schoolchildren) overall scoliosis prevalence rate was 3.26%; girls had a higher prevalence (4.65%) than boys (1.97%).<sup>[12,13]</sup>

The American Academy of Orthopedic Surgeons recommends screening for girls at ages of 11 and 13. The Pediatrics age groups recommended scoliosis screening for them by Adam's forward bending test as routine visits at 10, 12, 14 and 16 years of age.<sup>[14,15]</sup>

Comparing to our study we found that the prevalence of AIS among 186 volunteer was 19% (49 out of 186). Volunteer from 6 to 26 old age was 20.9%, 27 to 47 old age 16%, and 48 to 68 old age was 17.9%.

Further studies have to be done concerning scoliosis screening among children at schools and a health measurements have to be done towards them scoliotic one in a routine basis.

## CONCLUSION

The prevalence of scoliosis in Almadinah ALmonawarah was 19%. As delayed referrals of patients with high-risk curves can lead to increased morbidity we recommend a screening program to schoolchildren. According to these results, epidemiological regional variability, possibly with genetic basis, can be considered.

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