

# RELATION BETWEEN THE CHARACTERISTICS OF A. I. S. AND VITAL CAPACITY IN JOUNG AND ADULTS

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The target is to reveal if

there is any relation between scoliosis characteristics,

such as Scoliosis Cobb angle, Surface Rotation,  
Hypokyphosis and Vital Capacity

in young teenagers as well as in adults with  
Adolescent Idiopathic Scoliosis.

# MATERIALS AND METHODS

130 Patients

115 young teenagers with A.I.S.

107 ♀ and 8 ♂

15 adults with not operated A.I.S.

12 ♀ and 3 ♂

## Age

### Teenagers

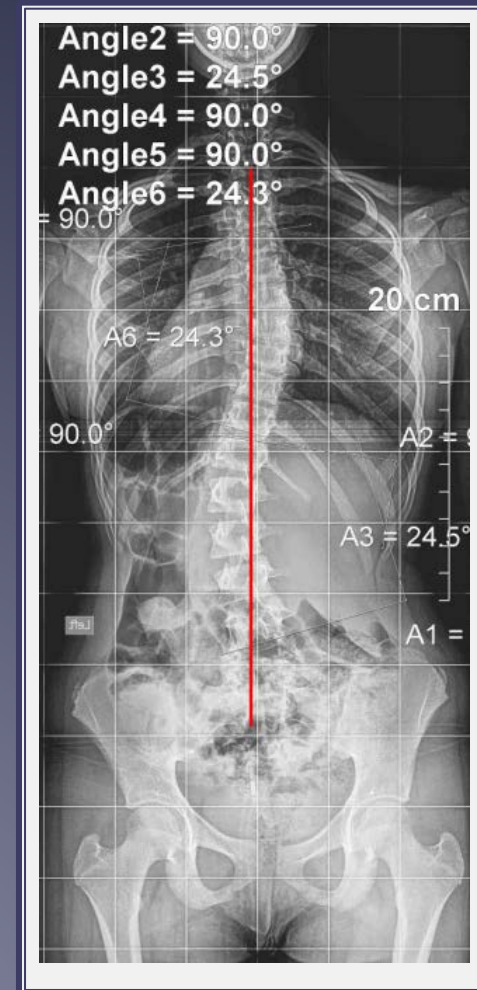
7 y - 18 y (average **14,2** y)

### Adults

19 y - 60 y (average **30** y)

## Measurements

For the Cobb angle we have used Digital X-rays in which we have measured with absolute accuracy the angle.



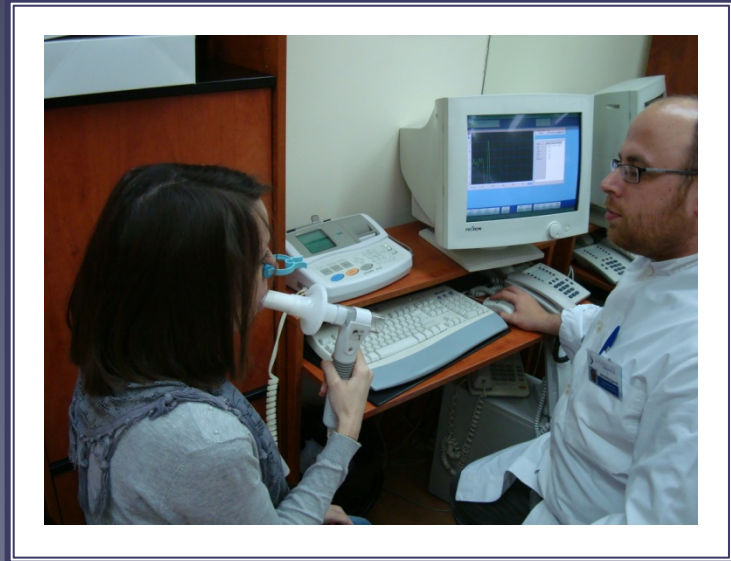
## Measurements

For measure the surface rotation we have used the DIERS Formetric 4D in combination with SpineScan scoliometer



## Measurements

For spirometry we have used the Chest Graph HI 101 Spirometer. All patients wear no brace for 2 hours before the test and they didn't take any drugs and especially bronchodilators

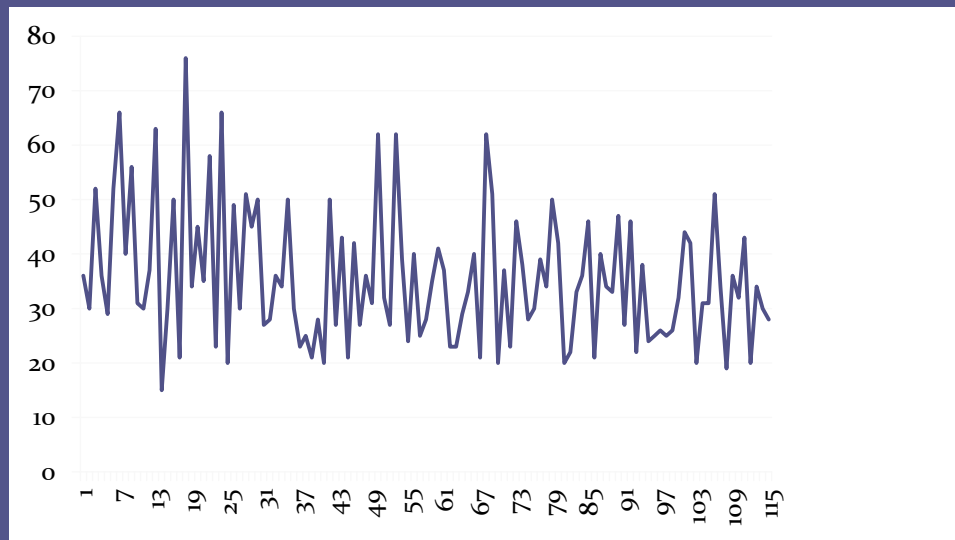




# RESULTS

## Scoliosis Cobb angle

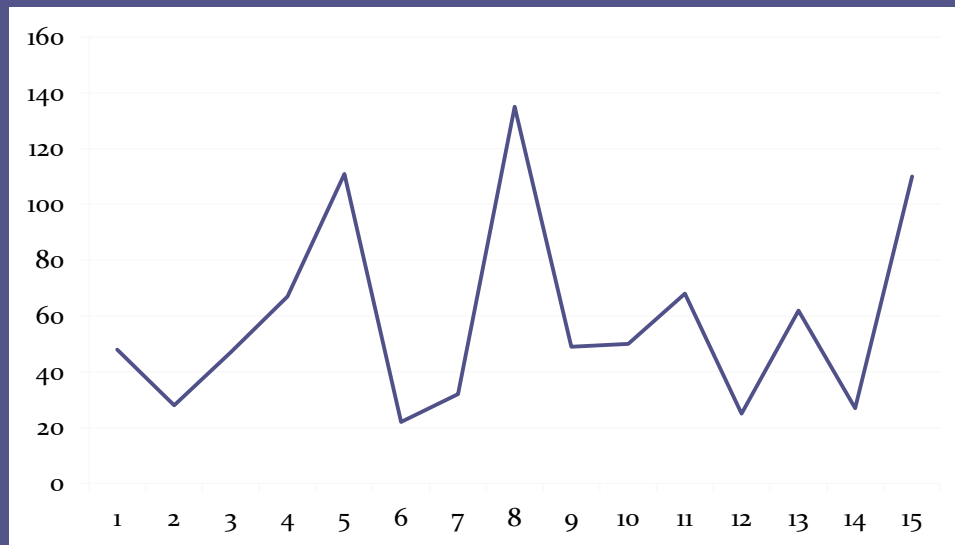
Teenagers  $19^{\circ}$  -  $76^{\circ}$  average  $35,6^{\circ}$



## Scoliosis Cobb angle

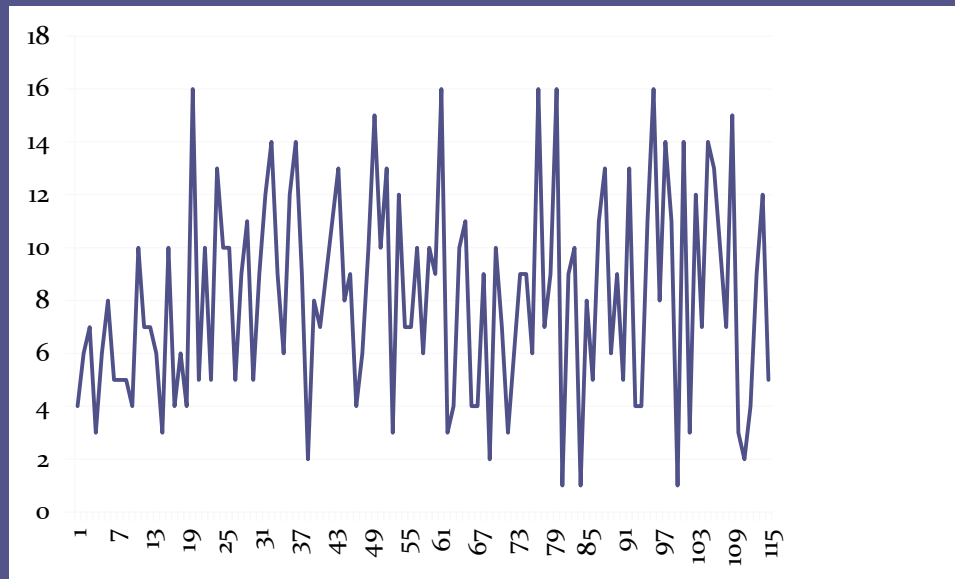
Adults

22° - 135° average 58.7°



## Surface Rotation

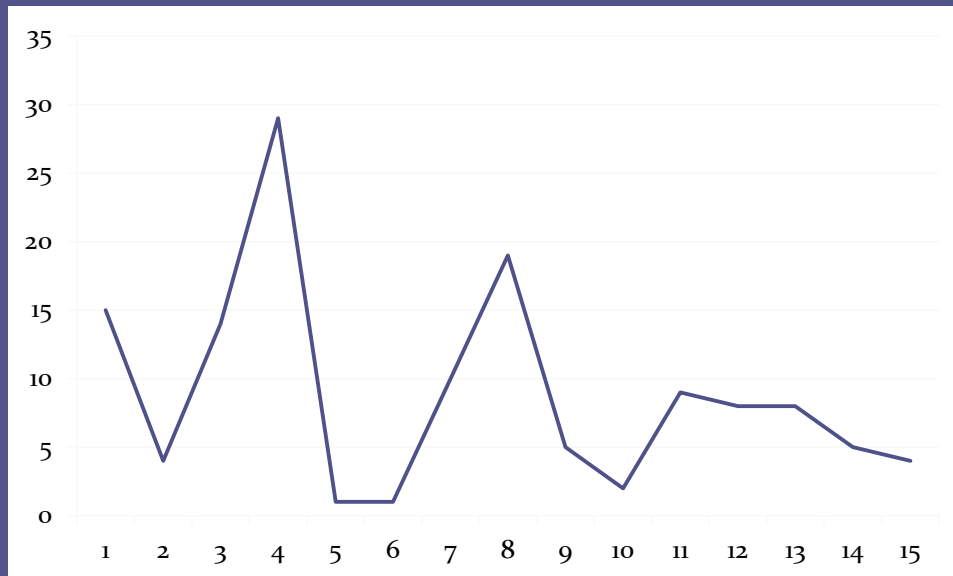
Teenagers  $1^{\circ}$  -  $16^{\circ}$  average  $8.1^{\circ}$



## Surface Rotation

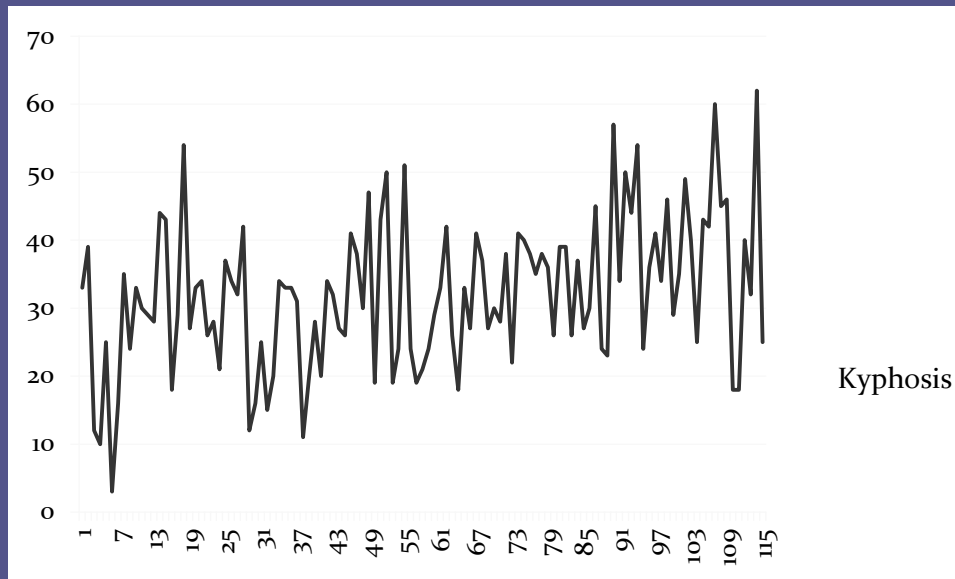
Adults

1° - 29° average 8.9°



# Kyphosis Cobb angle

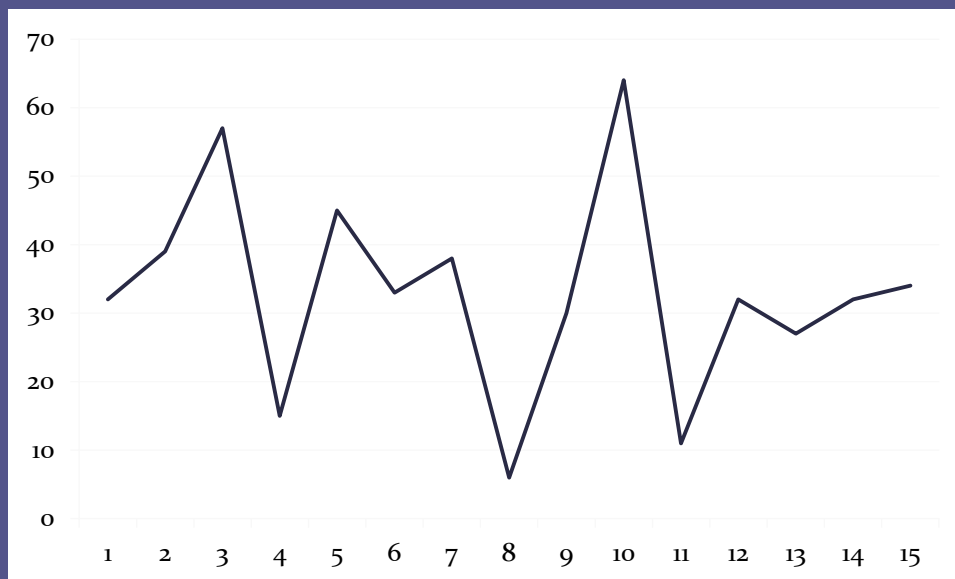
Teenagers  $3^{\circ}$  -  $62^{\circ}$  average  $32.8^{\circ}$



# Kyphosis Cobb angle

Adults

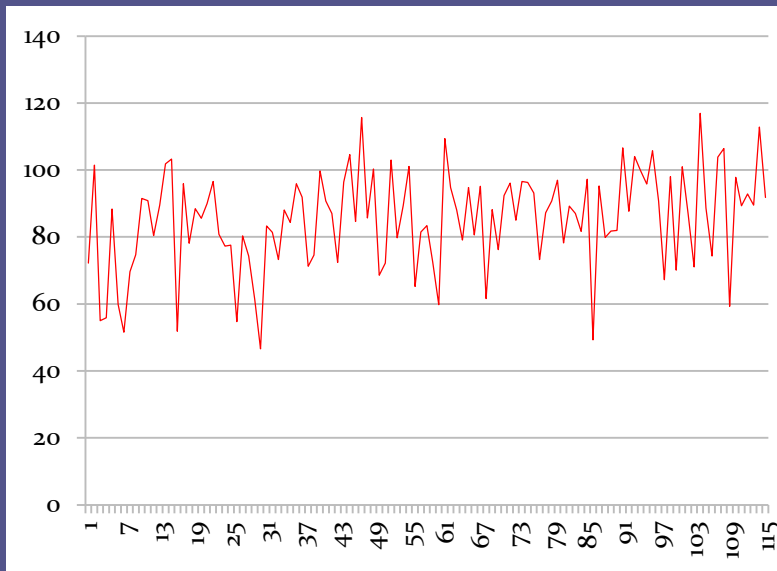
6° - 64° average 33°



## Vital Capacity

Teenagers

46.6 % - 116.9 % average **85.1 %**

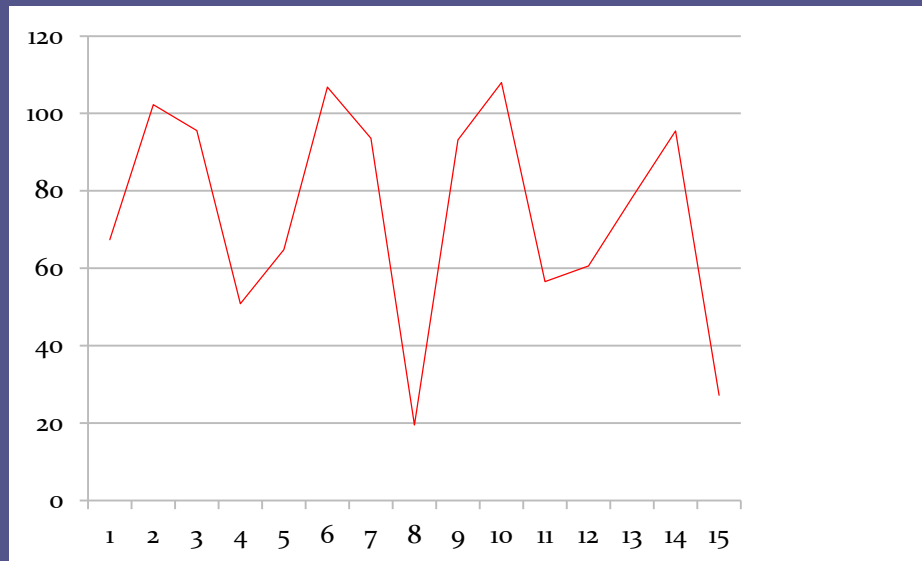




# Vital Capacity

Adults

19.5 % - 106.8 % average **74.68 %**



## Forced Vital Capacity (FVC)

Teenagers	44.2 % - 115.7 %	average	78.9 %
Adults	19 % - 105.4 %	average	71.3 %

## Forced expiratory volume in 1<sup>st</sup> second (FVC<sub>1</sub>)

Teenagers	44.5 % - 121.7 %	average	81.1 %
Adults	19.8 % - 108.3 %	average	74.6 %

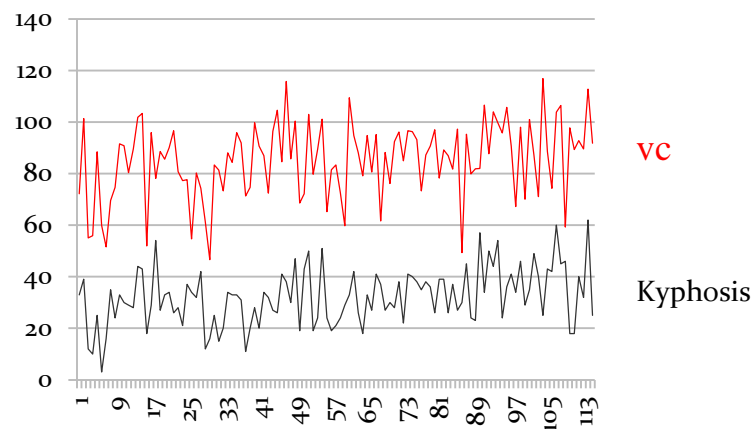
# DISCUSSION

There was no significant correlation between Cobb angle, surface rotation and Vital Capacity in Teenagers as well as in Adults

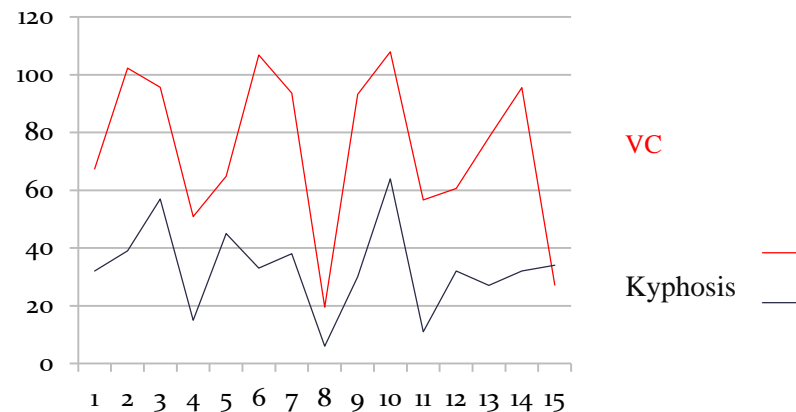
except for angles that exceeded **50°** Cobb angle  
with surface rotation  $>14^\circ$   
which seemed that influence the Vital Capacity  
but only in young non athletic patients and ever  
with kyphotic angle less than  $24^\circ$

In adults with Cobb angles higher than  $100^{\circ}$  with surface rotation  $>22^{\circ}$ , the Vital Capacity was measured even at 19,5%

The only scoliosis characteristic that influenced the Vital Capacity was the Hypokyphosis, in which more smaller was the angle such less become the Vital Capacity



Teenagers



Adults

# CONCLUSION



There is no significant correlation between Cobb angle, Surface Rotation and Vital Capacity (as well as FVC, FVC1) but seems that is influenced by Hypokyphosis

Also seems that sports, singing and special respiratory exercises like the Schroth method, increase the Vital Capacity.

Thank you

