

## ORIGINAL RESEARCH

# Effect of Abdominal Breathing Exercises in increasing chest expansion in normal subjects

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### **ABSTRACT**

**Introduction:** Chest wall expansion is defined as a circumferential measurement of chest wall ability from rushing through in hellion only. Chest expansion measurement are used to assess a patients baseline statue treatment effectiveness and progression of disease with regards to chest wall moiety and respiratory muscle function. Chest expansion is used as a measurement tool in research or in clinical practice. At present, research expansion is the method for processing the involvement of chest wall particularly controverter and costotransverse joints for diagnostics and monitoring progression as a part of routine assessment. Chest compression is also affected by age, sex, body compotation, and other geography parameters. **Objectives of the study:** To find out the normal values for chest expansion at all the three levels of chest in healthy subjects of 20-40 years of age group.

- Manubrium sterni
- Xiphisternum
- 2 inches above the umbilicus

**Methodology:** The study of chest expansion is done on healthy normal individual with the mean age of 30 years (20-40 years). The study was conducted at Adesh Hospital and Research Centre, Sri Muktsar Sahib and In Malout for 21 days. A sample of 10 subjects and those fulfilling the inclusion and exclusion criterion were included in the study. Subjects were randomly assigned to 2 groups. **Results:** The comparison of subjects just expansion for age group 20-30 to 30-40 showed respective mean difference. The current study shows a positive correlation between males and BMI and females and BMI., for age group 20-40 increase in BMI which is within normal range showed positive correlation. **Discussion and conclusion:** There are significant effect of abdominal breathing exercise in increasing chest expansion at all three levels.

**Keywords:** Abdominal Breathing Exercises, Chest expansion, chest wall ability, BMI, Manubrium sterni, Xiphisternum, and umbilicus.

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### **INTRODUCTION**

The diaphragm, the essential muscle that helps breathing and which comprises 80% of it, can be strengthened by the practice of diaphragmatic breathing, a sort of breathing exercise. Additionally known as breathing from the abdomen or abdominal breathing, this breathing practice. Ventilation is efficient and the oxygen consumption of the muscles of ventilation is low during relaxed (tidal) breathing when the diaphragm is working properly in its role as the major muscle of inspiration. The mechanical work of breathing (oxygen consumption) and ventilation efficiency both deteriorate when a patient heavily relies on the auxiliary muscles of inspiration. Diaphragmatic breathing is also called as:

- Abdominal breathing.
- Belly breathing.

Diaphragmatic breathing enhances

- Mobilize secretions and impart control over breathing.
- To help coughing effectively and to get rid of secretions.
- To promote calmness.
- To impart postural awareness.
- Mobilizing the shoulder girdle and thorax.

### **MATERIALS AND METHODS**

**Research design:** A quantitativative research approach, in which quasi experimental design was used for the present study. Subjects were randomly assigned to 2 groups.

**Setting:** The present study was conducted at atAdesh Hospital and Research Centre, Sri Muktsar Sahib and in Malout from 2006-2007.

**Sample:**A sample consists of 10 subjects and those fulfilling the inclusion and exclusion criterion were included in the study.

**Selection criteria:** Person falling into age group of 20-40 years.

**Exclusion Criteria**

- Any history of respiratory disease.
- Smoking
- History of musculoskeletal condition impairing the ability to perform the test.
- Any previous thoracic or abdominal surgery.

**Techniques and measurement procedure**

- The study is done at levels of chest with one layer of clothing during testing.
- The tape as place at all the three levels in such a way as to ensure that it remains horizontal at all 3 levels.
- Subjects were instructed to “fill your lungs right up with air and hold while therapist measure them breath out completely and then therapist will measure you again” encouragement such as right in was not given, since providing encouragement

might influence chest expansion measurement from trial to trial. V

- The chest expansion measurements at maximal inspiration and maximal expiration were recorded on each trial and two such trials were carried out for accurate measurement.
- The position of physiotherapist should be perfect which is very necessary.
- At the three level of chest:
  - Manubrium sterni
  - Xiphisternum
  - 2 inches above the umbilicus

The measurement was taken in standing position at full inspiration and at full expiration.

Measurement instrument in the study is a simple, flexible, measuring tape of 1.5m. This instrument was chosen for its simplicity. Ease of use, inexpensiveness, and wide use in clinical trials of this nature, being routinely used in clinics to assess subjects.

Results: To find out the correlation between body mass index with male to female, statistical analysis was done by using students unpaired ‘t’ test, Karl pearsons Coefficient of Correlation and X2 test. P<0.05 is considered to be significant. Statistical package SPSS Vers 11.5 is used for analysis.

**RESULTS**

**BMI CORRELATION**

Age	sex	At inspiration			At expiration			‘p’Value
		Axilla	Xiphisternum	2” above umbilicus	Axilla	Xiphisternum	2” above umbilicus	
20-30 years	M	.463	.520	4.65	.478	.530	.468	0.001 VHS
	F	.592	.492	.525	.614	.523	.553	
30-40Years	M	.737	.773	.761	.422	.762	.758	
	F	.727	.609	.718	.688	.646	.737	

**ARMS BY THE SIDES**

**Before Abdominal breathing exercises**

Age group	Sex	Axilla	Xiphisternum	2” above umbilicus
20-30 years	M	3.3	2.0	2.2
	F	1.9	1.8	2.0
30-40Years	M	2.9	2.8	2.8
	F	2.2	2.4	2.2

**After Abdominal breathing exercises**

Age group	Sex	Axilla	Xiphisternum	2” above umbilicus
20-30 years	M	3.8	4.0	3.1
	F	3.5	3.4	3.0
30-40Years	M	3.9	3.9	4.2
	F	4.0	3.8	3.8

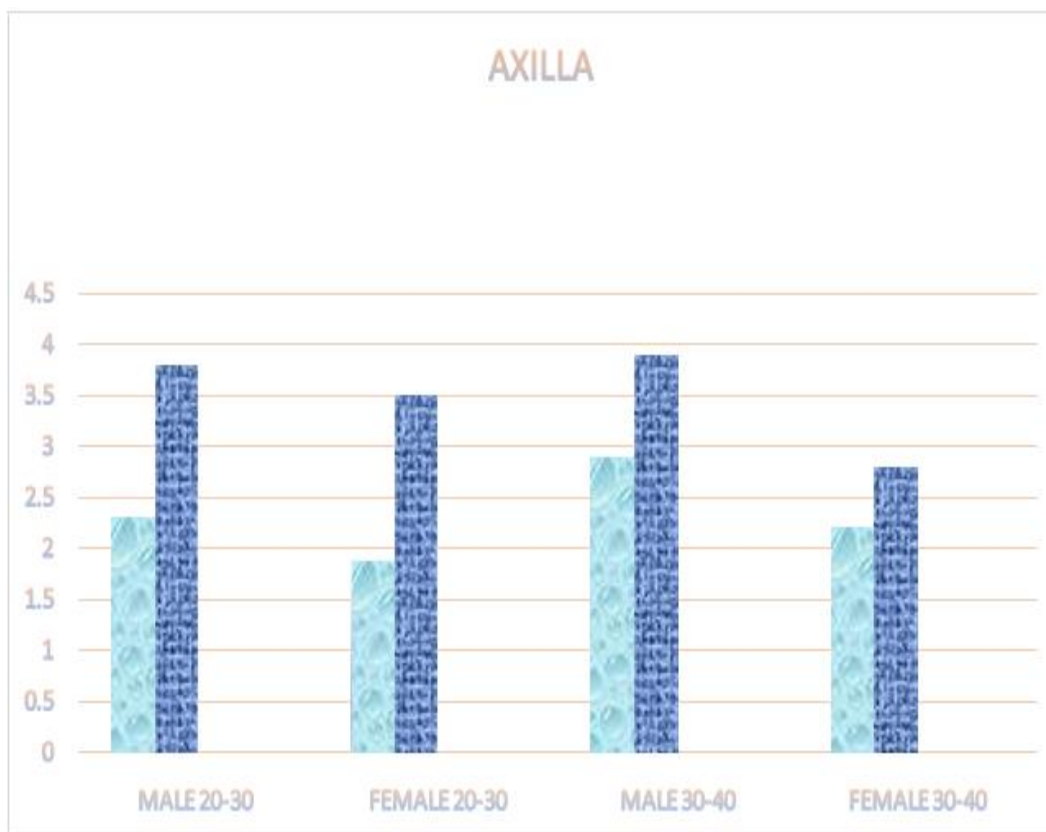


Figure 1 shows pretest and posttest measurement of Axilla

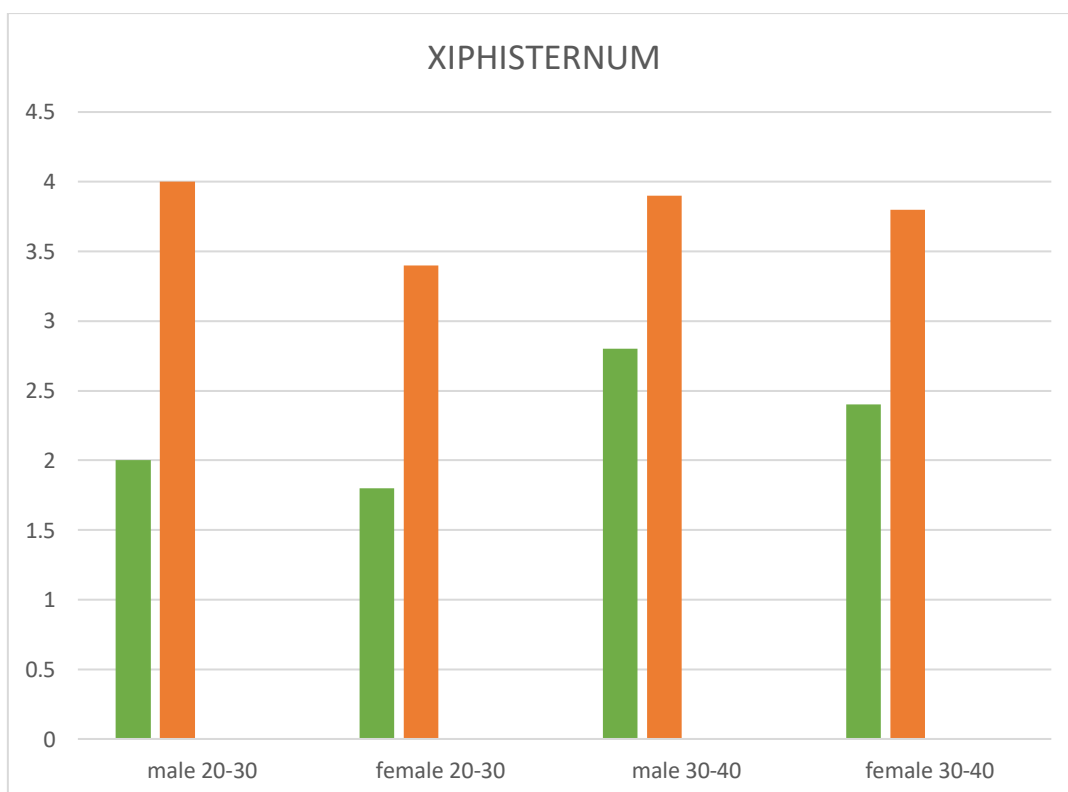


Figure 2 shows pretest and posttest measurement of Xiphisternum

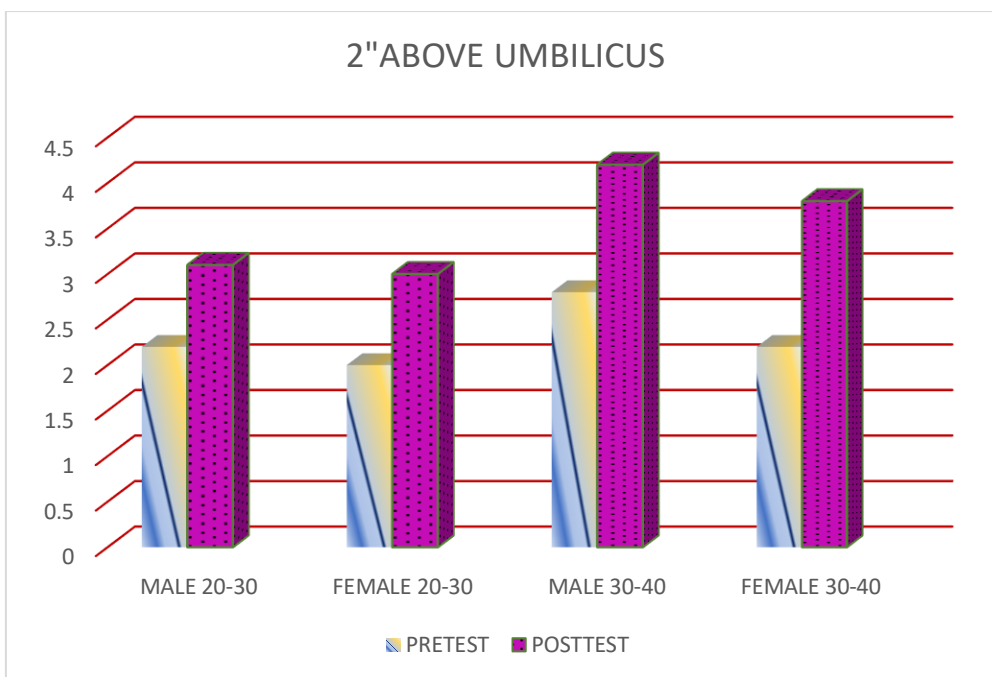


Figure 3 shows pretest and posttest measurement of 2” above umbilicus

**Level of significance**

Levels	Mean value from pre test	Mean value from post test	‘t’value	‘p’value
Manubriumsterni	2.32	3.8	2.0	P< 0.05
Xiphisternum	2.5	3.2	2.14	P< 0.05
2 inches above the umbilicus	2.3	3.7	2.0	P< 0.05

**LIMITATION OF THE STUDY**

- Patients with respiratory diseases
- Goniometric errors
- Independent variables

**DISCUSSION AND CONCLUSION**

The comparison of subjects just expansion for age group 20-30 to 30-40 showed respective mean difference. The current study shows a positive correlation between males and females BMI and the age group 20-40 increase in BMI which is within normal range showed positive correlation. There are significant effect of abdominal breathing exercise in increasing chest expansion at all three levels.

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