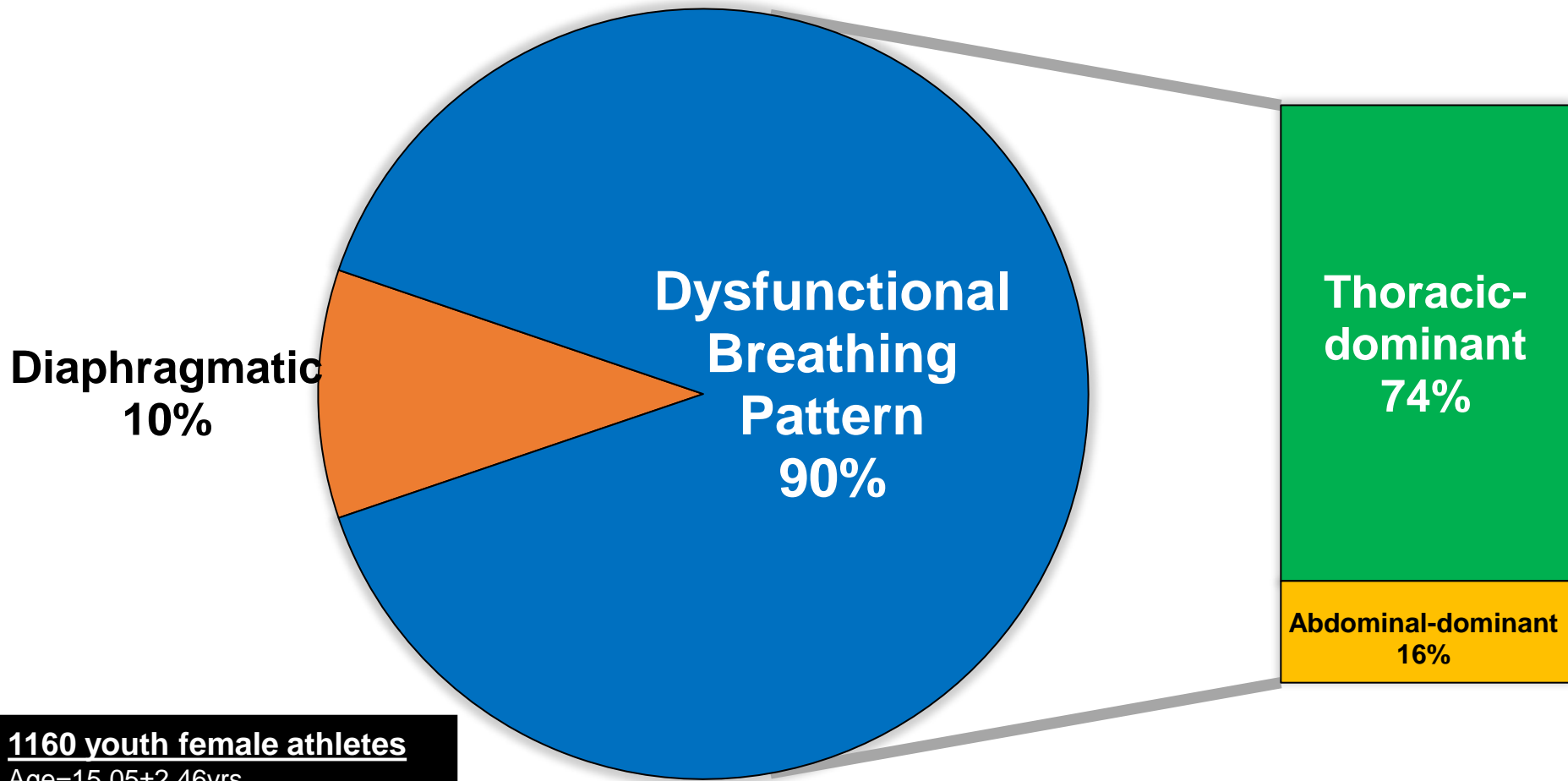


# Breathing Patterns in Youth Female Athletes



**1160 youth female athletes**

Age=15.05±2.46yrs  
Height=159.06±7.61cm  
Mass=51.86±8.49kg

## Prevalence of Dysfunctional Breathing Patterns in Youth Female Athletes

Shimozawa Y\*, Isaka T\*, Kurihara T\*, Kusagawa Y\*, Hori M\*, Numasawa S†, Suga T\*, Sugiyama T\*, Shiroma R‡, Tanaka T\*, Terada M \*: \*Ritsumeikan University, Shiga, Japan; †Medical Committee of Osaka Basketball Association, Osaka, Japan; ‡REACH Inc., Kyoto, Japan.

Because of a possible **increase** risk of  
**musculoskeletal injuries &  
poor performance**  
in **dysfunctional** breathers,

**Screening of breathing patterns**  
may be an important step towards  
the development of  
**effective prevention strategies**  
for musculoskeletal injuries.

**Functional Breathing Pattern**

**Dysfunctional Breathing Pattern**

**Diaphragmatic**

**Thoracic-Dominant**

**Abdominal-Dominant**

**Presence of Abdominal Expansion**



**Lateral Rib Cage Expansion**



**Superior Rib Cage Migration  
or  
Shoulder Elevation**



Breathing patterns were categorized based on scores of the Hi-lo and modified lateral rib expansion test

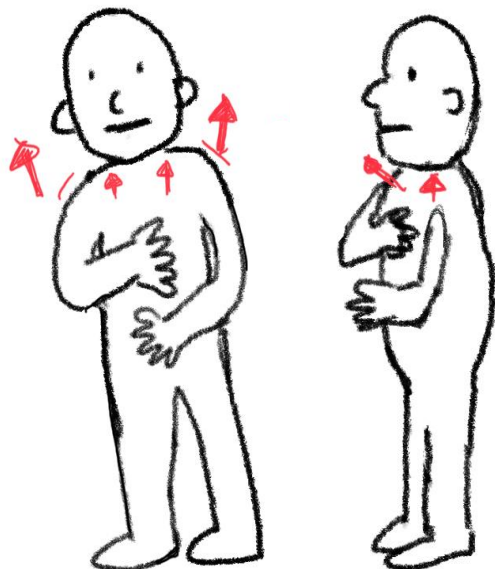
# Dysfunctional Breathing Pattern

# Functional Breathing Pattern

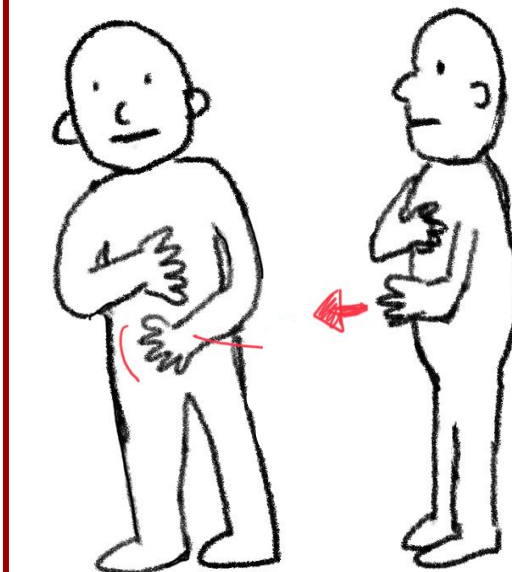
## Thoracic-dominant

## Abdominal-dominant

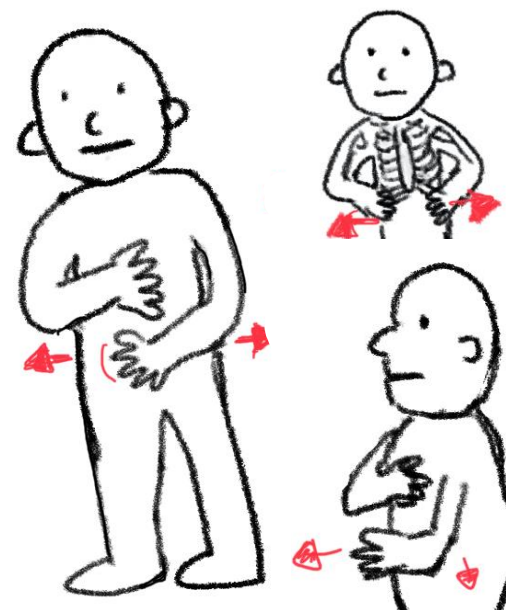
## Diaphragmatic



**Superior Rib Expansion  
and/or  
Shoulder Elevation  
without  
Abdominal and  
Lateral Rib Expansion**



**Abdominal Expansion  
with  
Shoulder Elevation, Superior  
Rib Expansion and without  
Lateral Rib Expansion**



**Lateral Rib Expansion and  
Abdominal Expansion  
without  
Shoulder Elevation or  
Superior Rib Expansion**

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- Japan Sports Agency Female Athletes Development & Support Projects (G18016-001)