








Figure S1. Protocol for core stability exercise

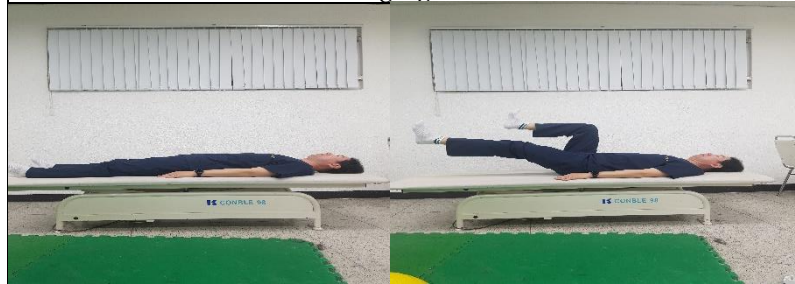
Phase 1(10 sessions ) :Independent isometric contraction of the transversus abdominis (trA) and multifidus			
	hooklying	supine	quadruped
	Isolated isometric contraction of TrA: Drawing the belly button toward the spine without moving the back		
			
	Sitting: Lift the opposite arm while feeling the multifidus muscle contracting		Standing: Stepping your feet alternately while feeling the multifidus muscle contracting
	Isolated isometric contraction of Multifidus muscle		
Phase 2 (10 sessions) :Co-contraction and functional tasks of the deep trunk muscles			
	Co-contraction of lumbar stabilizing muscle: sitting		
			
	Co-contraction of lumbar stabilizing muscle: maintaining the co- contraction of the lumbar stabilizing muscles while sitting on an unstable surface		
			
	Segmental movement of the thoracic or hip joints: Segmental movement of the thoracic or hip joints while maintaining the co-contraction of the lumbar stabilization muscles		



Alternately lifting the arms or legs in multiple positions  
(supine, quadruped, sitting, standing)



Bridging exercise



Cycling in a supine position

Phase 3 (10 sessions):  
Functional task with load—the  
exercises in phase 2 were  
performed with an external load  
applied to the wrist and ankle.



Alternately lifting the arms or legs in multiple positions  
(supine, quadruped, sitting, standing)



Bridging exercise



Cycling in a supine position

Phase 4 (10 sessions)  
Functional task with an  
unstable surface;



Bridging exercise with a balance ball placed under the leg



Alternately raising the arms and legs in a four-legged posture with the chest rested on the balance ball



Alternately raising the arms and legs while sitting on the balance ball



Side bending the trunk while sitting on the balance ball.



Alternately raising the arms and legs while standing on a balance pad

Note. Before and after exercise, 5 minutes of warm-up and cool-down were provided. Subjects were instructed to maintain a neutral lumbar spine position while performing all functional movements.

\*This protocol was modified by adopting the exercise method used in the studies of shamsi et al. [8].