LETTER TO THE EDITOR

Activation of the trunk muscles during Salat (Muslim Prayer)

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Madam, Salat is a mandatory prayer to be practiced by all Muslims 5 times a day.[1] The total number of Muslims was 1.8 billion in 2015, comprising 24.1% of world population, andis expected to rise to 3 billion, becoming the largest religious group by 2060.[2] This makes Salat as one of the most commonly practiced exercises, with a significant global health impact in terms of biomechanics, ergonomics and rehabilitation.[3] According to a review study summarizing the literature till 2017, published in the March 2019 issue of JPMA,[1] muscles including Biceps and Triceps Brachii, Pectoralis Major, Scapular Musculature, Rectus and Biceps Femoris, Tibialis Anterior and Gastrocnemius are found to be activated during the act of Salat and respective Electromyography (EMG) values have also been reported.[1] However, literature was absent regarding the activation of trunk muscles, but according to recent studies conducted in 2018, upper (Trapezius) and lower (Erector Spinae) back muscles are also found to be activated during Salat, with greater activity of trapezius as compared to Erector Spinae (ES) except in sitting.[3,4] Moreover, trapezius is found to be more stable than ES, implying a superior risk of fatigue for ES during longer prayers such as taraweeh.[4] Interestingly, a co-contraction phenomenon is observed between trapezius & ES during standing and bowing, in order to maintain a balanced posture, even though the two muscles are not antagonists.[3,4] Perhaps this is the reason Salat is found to have positive effects as an exercise in terms of balance.[1] On the other hand during sitting and prostration trapezius and ES act independently, with EMG activity of trapezius decreasing and that of ES increasing from bowing to sitting, with an intersection point between the amplitude of EMG activation of both muscles at sitting position.[3,4] Moving on from sitting to prostration, ES lengthens resulting in decreased activation, being lowest during prostration, whereas increased activation is noted in trapezius, moving from sitting to prostration, being highest in standing.[3,4] Due to this alternate manner of contraction and relaxation of muscles, the overall activity is very comforting,[3,4] making it an idyllic exercise break.[1,5] However, in both the studies trapezius was considered in its entirety instead of EMG activation of the upper, middle and lower fibers. Moreover, in both studies ES was considered which is a global mobilizer, instead of lumbar multifidi which are considered to be the local stabilizers of lumbar spine. Furthermore, muscles on the ventral aspect were not analyzed in both studies, such as abdominal muscles which are the true antagonist to ES, the analysis of which may show insightful findings and co-contraction patterns. Lastly, it is important that activation of lumbar musculature is also observed in individuals with low back pain (LBP) during Salat, and compared with healthy controls, as literature suggests that there may be a correlation of bowing and prostration with LBP[3]. Moreover, lumbar spine is found to be the second most common site of musculoskeletal symptoms with greatest amount of associated functional limitation, and a prevalence of 62.5% for discomfort[6] and 55% for pain[7] in the Pakistani population.

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