TP  Factors associated with physical and mental fitness in the East Japan
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More than 3 years have passed since the devastating disaster of the Great East Japan Earthquake and Tsunami. Restoration and recovery from the disaster are still on the way. The numbers of evacuees have decreased but the number still exceeds 250,000. Maintaining or restoring appropriate level of physical activity is important for the health of evacuees. Inactivity may lead to frailty for the elderly people, obesity and metabolic disorders for the middle-aged people, and reduced physical fitness and performance for children and youth. Mental distress may affect them irrespective of age. The negative influence of the disaster on both physical and mental health not only affected the evacuees, but also those living in the disaster distressed regions where the damage was milder. We recently found from a cohort study “Sendai Orosisho Study” started from 2008, that several pre-disaster life style associated factors was considered as risk factors for the development of post traumatic stress disorder (PTSD) related symptoms among middle-aged people. Interestingly, it was demonstrated that lower the leg extension power higher was the prevalence of PTSD symptoms. Frequent drinking and depressive symptoms for men, hypertension for women were also considered as risk factors after adjustment for potential confounders such as physical activity levels and direct damages from the earthquake. Awareness for positive health effect of physical fitness and performance among the community level appeared to be important to establish a disaster resilient community.

MS-I  Muscle-tendon unit : knowledge and recent findings
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Movements of animals, including humans, are achieved through joint motions generated by skeletal muscles that exert forces onto bones via tendinous tissues. Anatomical features of muscle fibers and tendinous tissues vary among muscles and it is pertinent to consider a skeletal muscle as a unit with tendinous tissues (muscle-tendon unit, MTU). There is accumulated knowledge of the anatomy and functional implications of MTUs in that muscle fibers and tendinous tissues interact with each other to optimize joint power development, which is typically observed in MTUs located distally in the lower limb (Kawakami, 2012). Previous and many ongoing studies have regarded an MTU as a combination of actuators (muscle fibers) and springs (tendinous tissues) that are connected in series. Some recent studies however have presented evidence to strengthen the notion that tendinous tissues are not a simple linear spring serially connected to muscle fibers. Reasons for this might include 1) activation-dependence of tendinous tissues elasticity (Sugisaki et al. 2011), 2) deformation of aponeuroses upon contraction in longitudinal and transverse directions (Iwanuma et al. 2011a), and 3) structures other than tendinous tissues acting as a spring (e.g., the foot complex, Iwanuma et al. 2011b). Some data were presented in this session to highlight the need to re-consider the form and function of MTU in vivo.

Key words: Series elasticity, Muscle-tendon interaction