Mobile device use and Musculoskeletal disorders

Grace Szeto

Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong SAR, China

1. Rising use of mobile devices in modern society

Touchscreen technology is making a tremendous impact on young people’s lives and it may affect their health. Nowadays we can use touchscreen devices to do everything that we do by computers, and we can use these at any time, for example, on the way home or to school, in the bus or on the train, in class or at work. Use of mobile “apps” has been described as “sky-rocketing”, and it is common for people to use the smartphone for internet-surfing, reading newspapers or books, listening to music and playing electronic games. In other words, the constantly increasing variety of functions offered by new smartphone products will continue to enhance the fascination and domination of touchscreen IT devices. This phenomenon appears to be worldwide, but the extent of mobile device use may vary in different countries. Research on the relationship between handheld mobile devices and musculoskeletal disorders (MSD) is scarce in the literature, as these products have only been available in the past 5-6 years. A recent paper by Sharan et al (2014) reported specific cases of individuals suffering from pain in the thumb and forearm with various symptoms due to extensive text messaging on handheld mobile devices. Additional case studies have been published detailing upper extremity symptoms due to these devices.

2. Mobile devices and musculoskeletal disorders

Prolonged use of computers is known to be associated with musculoskeletal disorders in the neck and upper limb, and is recognized as an occupational hazard. Many research studies have already demonstrated increased activity in the neck and shoulder muscles contributing to neck and shoulder pain in prolonged computer users (Szeto et al, 2009). Other studies have reported relationship of wrist posture and intensive keyboard work contributing to forearm and wrist/hand symptoms.

3. Research on prevalence and biomechanical factors related to mobile devices

While there has been extensive research published on the issue of computer work contributing to neck and upper limb disorders, research on the association between using mobile phones and musculoskeletal disorders is only emerging in the past few years. Gold et al (2012) observed the postures and typing styles of over 800 university students in using mobile phones and confirmed that majority of students (over 90%) adopted a flexed neck posture, with protracted shoulders and non-neutral wrist posture on the texting side. Her recent research has focused on biochemical and imaging biomarkers in texting (Gold et al, 2014). Gustafsson et al (2010, 2011) compared the muscle activities in the neck, shoulder and forearm region as well as neck and thumb kinematics in using keypad phones, and reported that symptomatic group showing more adverse postures and higher muscle activation when texting on the mobile phone. Szeto et al (2014) compared the postural muscle activity in viewing the touchscreen devices positioned horizontally or at an angle. Dennerlein and his research group has conducted a series of studies examining the effects of different tilt angles of tablet computers on neck, shoulder and wrist joint postures and muscle activation (Young et al, 2012), as well as thumb movements in mobile phone use (Trudeau et al, 2012). The issue of key size on the virtual keyboard of touchscreen devices is also an important topic for research by Johnson and associates (Kim et al., 2014). Introducing motor variability has been identified as one possible solution for reducing musculoskeletal disorders, and this has important potential for application to the use of mobile devices (Samani and Madeleine, 2014).

Given the current public fascination with new developments in smartphone technology, it is anticipated that there will be increasing reports of musculoskeletal complaints related to intensive use of these devices. The use of mobile devices is linked with the modern hi-tech yet increasingly sedentary lifestyle around the world,
and this issue has also attracted much attention in the media. Straker et al (2013) have reported on how occupation with screen-based media will impact on physical activity and health among young people.

The symposium will bring together international experts to share their research experience about the use of mobile devices and risk factors contributing to MSD. It is hoped that more research interest will be generated on this topic and collaborative projects can be developed. There is tremendous potential to conduct large scale research studies related to the use of smartphone devices and MSD, either to provide recommendations and guidelines for health concerns, and also for future product design.

References:


