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Letter to the Editor

An Analysis of Korean University Students' Smartphone Use Situation and Lateral Spinal and Pelvic Tilt Indicators for Posture Evaluation

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Dear Editor-in-Chief

As smartphone use simultaneously realizing computer and portable phone functions spread in full swing around 2010, it has created opportunities in shifting the paradigm of life. The ratio of adults having smartphones in Korea was 94%, the highest in the world, along with Korea's Internet use and smartphone diffusion rates (1). Korean university students were significantly more sensitive to the varied and updated smartphones models, having easier access to them. Their use frequency of smartphones as a means to perform research, communicate, or conduct group activities is also much higher. Due to their utilization of Social Networking Service such as Kakao Talk App, Facebook, and Twitter, which are smartphone messenger services, their smartphone use duration per day is increasing further.

However, the excessive use of smartphones can cause musculoskeletal pain, as well as diseases related to spinal transformation, such as carpal tunnel syndrome, turtle neck syndrome, upper limb pain, popcorn brain, and vertebra lordosis (2, 3). Therefore, side effects, including musculoskeletal diseases due to Korean university students' excessive dependence on smartphones, have gradually emerged as a serious social problem.

The results of this study can serve as research data providing proactive information that establishes sound smartphone use culture and prevents musculoskeletal diseases among global university students through the examination of Korean university students' smartphone use situation and lateral spinal and pelvic tilt indicators and analysis of their correlations.

This study targeted 240 enrolled students at Namseoul University located in Cheonan City, Chungcheong Province, South Korea in 2019, who understood the purpose of this study and gave consent to research participation with the WMA Declaration of Helsinki.

As items to evaluate smartphone use type, the questionnaire survey questions included smartphone use period, use duration a day, and status of subjective addiction to smartphone (1. Yes, 2. No). For lateral spinal and pelvic tilt indicator measurement, the lateral deviation VP-DM (amplitude), trunk imbalance VP-DM (°), and pelvic tilt DR-DL (°) were measured by means of a 3D spinal scanning apparatus (Formetric 4D, DIERS, Germany). For the measured data, mean

and standard deviation (SD) were calculated; while a correlation analysis between smartphone use type and lateral spinal and pelvic tilt indicators for posture evaluation was carried out through SPSS 23.0 (IBM Corp., Armonk, NY, USA).

Upon examining each item's measurement values in this study, smartphone use period was 85.99 ± 26.07 month, use duration a day was 5.26 ± 10.42, status of subjective addiction to smartphone was 1.66 ± .58, lateral deviation was VP-DM 4.54 ± 2.59 cm, trunk imbalance was VP-DM 9.00 ± 6.99 (°), and pelvic tilt was 3.68 ± 6.99 (°). In the correlation analysis of smartphone use type and lateral spinal and pelvic tilt indicators for posture evaluation, significant correlations were not revealed in all items.

Through this study, it was confirmed that Korean university students' smartphone use did not have an effect on the correlation with change of lateral spinal and pelvic tilt indicators, which can offer new vision and information in the public health field for proper smartphone use and the prevention and treatment of lateral spinal and pelvic tilt disease.

Conflict of interest

The authors declare that there is no conflict of interest.

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