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Health-promoting lifestyles and cardio-metabolic risk factors among international students in South Korea

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Summary This study examined the health-promoting lifestyles and cardio-metabolic risks among international students in Korea. This descriptive, cross-sectional study design enrolled a convenience sample of 118 international students at a university in Korea. Collected data included items from the Health-promoting Lifestyle Profile (II) scale and cardiovascular risk factors. The participants had a moderately health-promoting lifestyle (2.5 of 4). Men engaged in more physical activity than did women ($p = .002$). The most prevalent risk factor was elevated blood lipid profiles (26.3%), followed by overweight/obesity (25.4%), elevated blood pressure (17.8%), and elevated fasting glucose levels (5.1%). More than half of the participants (54.2%) had one or more cardiac risk factors, and these participants also scored lower in health-promoting lifestyle factors than other students ($p = .034$). Regular health check-ups are needed to identify the cardio-metabolic risks of international students. A university-based programme aimed at promoting healthy lifestyles could help prevent cardio-metabolic risks among international students.

1. Introduction

The definition of an international student varies according to each country's education system. The Organization of Economic Cooperation and Development (OECD, 2013) defines international students as individuals who are typically in early adulthood and travel to countries other than their own to pursue tertiary studies. In 2009, more than 2.5 million students were studying outside of their home countries;

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this number is expected to reach approximately 7 million by the year 2020 (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2009). Similar to the OECD countries, the number of international students studying in South Korea has sharply increased over the past few decades because of internationalization and globalization as well as the country's economic growth. In 1994, there were only 1,879 international students in South Korea; this number increased to 11,646 in 2001, when the government promoted a policy to attract international students in earnest. In 2012, the total number of international students attending college, graduate school, or language programmes in South Korea was 86,878. Students from other countries within Asia accounted for approximately 70% of these students (Ministry of Statistics of Korea, 2012b).

International students generally experience more difficulties adapting to college life abroad than they would in their home countries (Carpenter & Garcia, 2012). Problems in this regard include homesickness, unfamiliar foods, language barriers, health and financial issues, future career plans, relationships with peers, everyday life, religion, discrimination, and differences in the education systems (Mallinckrodt & Leong, 1992). The stress associated with adaptation includes physical, psychological, and social aspects that are often accompanied by specific stress behaviours and physical symptoms (Berry, 2005). The university or tertiary study period coincides with the late stage of youth and/or the initial stage of adulthood. At this stage, students are no longer dependent on their parents and families and therefore assume responsibility for managing their own health. If they are unaware of the importance of health at this stage and continue to engage in risky behaviours such as incorrect eating habits, lack of exercise, smoking, and drinking, the foundations of their health during adulthood may be threatened (Dietz, 1998).

Cardio-metabolic risks may be influenced by both genetic factors and lifestyle choices (Gallistl, Sudi, Cvirn, & Borkenstein, 2001). Whilst genetic factors cannot be modified, lifestyle risk factors such as smoking, exercise, and dietary intake can be modified. Many previous studies have suggested health-promoting lifestyles as an important component of preventing and/or reducing the incidence and prevalence of cardio-metabolic diseases and associated complications (The Look AHEAD Research Group, 2010; Lakerveld et al., 2012). Increased cardio-metabolic risks can lead to various chronic diseases (i.e. diabetes, hypertension, heart attack, and stroke); these diseases require lifetime management, constitute socioeconomic problems, and have significant impacts on an individual's quality of life and productivity (Isomaa, Almgren, & Tuomi, 2001). A health-promoting lifestyle in early adulthood can be sustained throughout life; therefore, it is preferable to develop a healthy lifestyle rather than reversing undesirable health behaviours at a later stage.

Given the Korean university policy's short history of attracting foreign students, studies on this phenomenon have only recently been initiated in Korea. Most previous studies focused on the perceived health statuses and acculturative stress (Chang et al., 2010; Kim et al., 2010) or mental health (Do & Cho, 2009; Lee, Koeske, & Sale, 2004) among international students. Although some studies have investigated the relationship between health and lifestyle factors (i.e. drinking, smoking, and physical activity) among international students (Haug, Schaub, Salis Gross, John, & Meyer, 2013; Pan, Wong, Joubert, & Chan, 2007; Steptoe et al., 2002; Wicki, Kuntsche, & Gmel, 2010), most of these studies were conducted in Western countries and the study participants were mostly international students from China, Taiwan, or Vietnam (Chang et al., 2010; Do & Cho, 2009; Ying, 2005). Furthermore, there is a limited amount of research regarding health-promoting lifestyles and cardio-metabolic risks among international students in Asian countries such as Korea (Yan & Cardinal, 2013).

Although the number of international students is increasing, the Korean government and universities have mostly focused on administrative work and tended to neglect welfare, the psychosocial environment, and health care (Baik, 2011). There is insufficient information to determine the components required to establish a university health policy aimed at improving the health care of international students in Korea. Little is known about the extent to which these students engage in health-promoting lifestyles associated with cardio-metabolic risks. Therefore, this study aimed to examine health-promoting lifestyles and cardio-metabolic risk factors among international students in South Korea. The specific aims were: (a) to examine the prevalence of cardiovascular risk factors; (b) to examine the extent of health-promoting lifestyles and cardio-metabolic risk factors; and (c) to compare health-promoting lifestyles in the presence and absence of cardio-metabolic risks (at-risk group versus normal group).

2. Methods

2.1. Design, setting, and participants

This study incorporated a descriptive and cross-sectional design. The international students were members of the Office of International Affairs, were enrolled in undergraduate courses or Master's or PhD programmes offered at graduate schools, and comprised a wide range of individuals from different ethnic backgrounds and continents ranging from Asia to Africa.

Data collection conducted during the health check-up period for international students, which took place from January to February 2011. The inclusion criteria were international students who (a) were aged 19 years or older, (b) could read and write English, and (c) had undergone a general health check-up at a university hospital. The sample size was determined based on an a priori type of power analysis conducted using G*Power 3.1.2 (Cohen, 1988; Faul, Erdfelder, Buchner, & Lang, 2009). A minimum sample size of 110 was required at a medium effect size (f); a significance threshold of .05 via Student's t-test and a power ($1-\beta$) of 80% via two-sided tests were set.

2.2. Ethical considerations

Approval was obtained from the Office of International Affairs and the health centre at a university hospital. Each participant accepted the explanation of the study purpose from the researchers and voluntarily signed an informed