The consumption of more vegetables and less meat is associated with higher levels of acculturation among Mongolians in South Korea

Zuunnast Tserendejid[a], Jinah Hwang[a], Jounghee Lee[b], Haeryun Park[a,]*

[a] *Department of Food and Nutrition, Myongji University, Gyeonggi-do 449-728, South Korea*
[b] *Graduate School of Education, Kyonggi University, Gyeonggi-do 443-760, South Korea*

ARTICLE INFO

ABSTRACT

Although Mongolian immigrants are a rapidly growing population in South Korea, the 2 countries have distinct diets because of climatic and geographical differences. The Mongolian diet is mostly animal-based with few vegetables and fruits, whereas the Korean diet is largely plant based. The purpose of this study was to examine the association between acculturation and dietary intakes among Mongolians living in South Korea. We hypothesized that higher levels of acculturation would be associated with higher vegetable, fruit, and plant-based food intakes among Mongolian immigrants. A total of 500 Mongolian immigrants participated in this study conducted between December 2010 and May 2011. To measure the acculturation level, we developed an acculturation scale based on the Suinn-Lew Asian self-identity acculturation scale. Dietary intakes were assessed using the 24-hour dietary recall method. Associations between acculturation and dietary intakes were investigated using a general linear model adjusted for demographic characteristics. The participants were grouped into either a low-acculturation group or a high-acculturation group. The high-acculturation group reported significantly higher consumption of vegetables and rice and significantly lower consumption of meat, potatoes, and flour products compared with their low-acculturation counterparts. However, a higher level of acculturation was also significantly related to a higher intake of sodium. These findings could be used to tailor nutrition programs to different acculturation levels.

1. Introduction

Mongolia, also known as Outer Mongolia, is one of the few countries where nomadic life has been preserved. Mongolia was once one of the world's most sparsely populated countries, but today, the population exceeds 2.7 million [1]. Until 1990, when Mongolia was still a socialist country, international migration was restricted by the Mongolian government. After the fall of communism, reforms created new opportunities for travel to other countries [2]. The number of Mongolian immigrants in South Korea (SK) has increased from 7057 in 2001 to 29 920 in 2010. Rapid economic growth in SK has also increased the number of jobs available since the 1980s. According to one survey report, "Consequences of Mongolian citizens working abroad," Mongolian immigrant workers have mostly handled difficult, dangerous, and dirty work, the 3D jobs, in small- and

medium-sized enterprises since 1994 [4]. A survey conducted by the National Human Rights Commission of Mongolia revealed that Mongolians have faced many problems including cultural difference, language barriers, health problems, and adaptation problems while working in SK [5]. However, marriages between Korean men and Mongolian women have increased rapidly, from 77 cases in 2000 to 2421 cases in 2010 [3].

People who immigrate undergo a process of acculturation to adapt to the host culture [6,7]. During the acculturation process, the new or dominant food culture influences dietary changes among immigrants [8]. Both retaining and changing old dietary habits while adapting to new diets may have positive or negative consequences on the overall quality of their diet [7–9]. Several studies of Asian Americans have shown that higher levels of acculturation are associated with an increased risk of chronic diseases after the adoption of a Western diet [6,10]. Moreover, these risks are related to the immigrant's age, length of residence, education, income, maintenance of traditional dietary patterns, and experience in food purchasing and preparation [11–13]. Franzen and Smith [14] examined the influence of acculturation and environmental changes on dietary habits among Hmong adults in the United States. They found that environmental changes (in the obesogenic food environment of the United States) and higher levels of acculturation have negatively impacted the weight and health of Hmong adults. Therefore, acculturation is increasingly viewed as a critical factor to consider in developing nutrition interventions and health education programs for immigrants and ethnic minority populations.

There are notable differences between Mongolian and Korean food consumption and dietary patterns. The Mongolian diet, influenced by an extreme continental climate and a nomadic lifestyle, includes large amounts of animal-based foods including meat and dairy products with few vegetables, fruits, and fishes. An animal-based diet results in increased intakes of total fat and saturated fatty acids (SFAs) [15–17]. In contrast, the Korean diet is largely plant based, which includes rice, whole grains, beans, and a wide variety of vegetables and fruits. Fish and shellfish also have been a major part of the Korean diet because of the oceans bordering the peninsula [18].

To the best of our knowledge, no studies have examined the association between acculturation and dietary intakes among Mongolians who live in SK or other foreign countries. Thus, it is very important to examine the influence of acculturation on the dietary intakes of Mongolian immigrants, which are a new understudied migrant population in SK. We hypothesized that higher levels of acculturation are positively associated with vegetable intake, whereas higher levels of acculturation are negatively associated with meat intake among Mongolians in SK. This study provides valuable information about differences in dietary intakes for immigrants with high and low levels of acculturation.

2. Methods

2.1. Participants

We designed a cross-sectional study of 500 participants who visited the Mongolian embassy in SK from December 2010 to May 2011. The participants were born in Mongolia, had lived in SK for at least 1 year, and were at least 18 years old. The visitors who met the inclusion criteria were invited to complete a self-administered questionnaire, and a 24-hour dietary recall was conducted by a trained interviewer. The study was approved by the institutional review board of Myongji University. In addition, we obtained each subject's verbal consent for study participation.

2.2. Acculturation scale

The Suinn-Lew Asian self-identity acculturation scale (SL-ASIA) is the most widely used instrument for assessing acculturation variations among Asian Americans [6,19]. Because no acculturation scale exists for Mongolians, we used a modified acculturation scale based on the SL-ASIA scale. The original SL-ASIA scale consists of a 21-item questionnaire, and each question is rated on a 5-point Likert scale ranging from very Asian (1) to very American (5). A higher score corresponds to a higher level of acculturation [19,20]. For the present study, the modified acculturation scale consisted of 10 items including spoken language proficiency, reading and/or writing competencies, language barriers, language used at home, preferred spoken language, friendship choices, language used with friends, music and food preferences, and type of restaurants preferred. The reliability of the acculturation scale was assessed using a coefficient of internal consistency (Cronbach α). An acculturation score was calculated by adding the answers for each of the 10 items and dividing the total by 10. The answers for each question were selected from a Likert scale, ranging from 1.00 (low acculturation [LA]) to 5.00 (high acculturation [HA]). The mean (SD) acculturation score of the participants was 2.7 (0.6; range 1.2-4.6), which reflects a moderately bicultural acculturation experience on the SL-ASIA scale. An acculturation threshold of 3.0 was used to classify participants, with scores lower than 3 being considered LA and scores equal to or greater than 3 being considered HA.

2.3. Dietary intakes

The dietary intakes of the participants were assessed using a 24-hour dietary recall that was administered by a trained interviewer who had majored in nutrition. Food portion sizes were estimated using photographs of food and meal portions and measuring cups and spoons. The participants' intakes of food groups and nutrients were calculated using CAN pro (Computer-Aided Nutritional analysis program), version 3.0 software (Korean Nutrition Society, Seoul, Korea) and statistically analyzed. A micronutrient adequacy score and a prevention score based on World Health Organization (WHO) recommendations for prevention of diet-related chronic diseases were the 2 dietary quality measures used.

2.3.1. Micronutrient adequacy score
The micronutrient adequacy score was computed based on meeting 75% of the Korean recommended nutrient intake (RNI) [21] for 11 micronutrients established in the Korean dietary reference intakes (KDRI). The selected nutrients were phosphorus, calcium, potassium, zinc, iron, vitamin A,