Health Habit, Perceived Health Status and Physical Health Status of Young Korean and Korean-Chinese Women: A Comparative Study

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Purpose: The purpose of this study was to compare health habit, physical health status, and perceived health status between young Korean and Korean-Chinese women. **Methods:** This study was conducted as a cross-sectional comparative survey. For this study, 114 Korean women were recruited in Seoul, South Korea and 64 Korean-Chinese women in Jilin Province, China through convenience sampling. **Results:** A positive correlation was found between health habit and perceived health status. Perceived health status, WHR, body density, flexibility, and muscle endurance were significantly lower in Korean women than in Korean-Chinese ones. Knee flexion and ankle dorsal flexion was significantly higher in Korean women than in Korean-Chinese ones. **Conclusion:** Further investigation is required to compare the two different groups that share the same ethnicity and similar culture but were born into different countries. A study such as this may provide answers regarding the influence of migrated transition on health.

Key Words: Chinese, Habit, Health status, Korea, Women

INTRODUCTION

A health behavior, which is a health determinant, has the greatest direct influence on health improvement[1]. As health habit is a health behavior that has been formed through one's experiences, the environment surrounding the individual should be considered and understood from different points of view.

A health habit and perceived health status reflect an individual's knowledge, attitudes, values, and beliefs. These are influenced by social expectations and ideas about health, therefore health habit and perceived health status must be explored within a socio-cultural context[2]. Each social culture dictates what meaning of health for its people and how it is to be administered and promoted. Social culture is the totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought[3].

The social cognitive model emphasizes that paying attention to one's health habit, environment, and the motivational role of social relationships is important[4]. This model also makes a considerable point that the environment, the person, and the person's actions contribute jointly to an individual's health outcomes.

Young women adapt to their surroundings and are in charge of their own health and lifestyle. It is well known in health sociology and anthropology that health is a cultural system, just like other social systems such as politics, language, religion, or kinship[2]. In most countries, however, male health is given more attention than that of female health. Particularly, women in their early adult age, who are deemed to have no particular health problems, are not given much attention. In particular, Korean women tend to be submissive to the environment with regard to their health due to the influence of Confucianism. In addition, women in their early adult age tend to consider themselves healthy and thus are

likely to neglect their health[5]. During young adulthood, a healthy lifestyle can make a different health status in the future[6]. Therefore, more attention needs to be paid to the health of these young women.

At the turn of the last century, Korea became a colony of Japan. During this period, many Koreans migrated to China. These Korean immigrants became the first generation of individuals with mixed Korean Chinese ancestry. The first generation of Korean Chinese maintained their maternal culture and their descendants have maintained their ancestors' culture, and language[7]. In the past, there had been no social or cultural exchange between South Korea and China due to differences in their social systems despite their geographical proximity[8]. Since the establishment of diplomatic relations between the two countries in August 1992, however, there have been extensive social and cultural exchanges between the two countries[9]. Recently, many of Korean Chinese have immigrated to Republic of Korea from China[10]. Approximately, 30% of immigrants in Korea are Korean Chinese[7]. The majority of Korean Chinese immigrants have been young women. Besides, their health is negatively influenced by the new environment, which induces high level of stress and poor accessibility to health care system. Thus their health habit and health status needs to be investigated. In the comprehensive strategy for national health promotion, which aims to secure health equity among multicultural imigrants are considered the most important among the entire populations; thus the importance of health improvement for them is getting greater[10]. The government emphasizes health habit as a factor for increasing health status. This merits investigation. Health habits, particularly subjective awareness about the health and body conditions of immigrant women at early adult age are worth being investigated to better manage their health. Physical strength and the capability to conserve and maintain one's health and life, are closely related with health habit. To identify overall health status, muscle endurance, flexibility and the distribution of body composition need to be investigated and compared[12]. The truth is that health habit, perceived health status, and physical health status are still relatively unexplored among young Korean Chinese women[10]. Women's health is influenced by their experience of social and cultural changes concomitant with migration. With this in mind, this study focused on comparing health habit, perceived health status, and physical health status of young Korean and Korean Chinese women. This study aims to provide basic data for understanding of the changing population and the establishment of a health management system as well as related strategies.

The specific aims of this study were as follows:
- (a) to compare differences in health habit, perceived health status, physical health status between young Korean and Korean Chinese women.
- (b) to identify among body mass index, waist-hip ratio, body density, and percent body fat.

This study was designed to expand the understanding of the relationship between health habits, perceived health status, and physical health status among the two young women groups.

METHODS

1. Design and Sample

This study was a cross-sectional comparative design and secondary analysis study. Data of 114 Korean women in Seoul, Republic of Korea and 64 young Korean Chinese women in Jilin Province, China were selected from original data and were analyzed.

2. Data Collection

This secondary analysis study was approved by the Institutional Review Board (IRB) of the University of Texas at Austin, USA. IRB approval number is 2008-06-0074. The original study was announced using flyers, posters, and presentations at four universities from September 11th to September 29th of 2007. Three of the universities were in Republic of Korea. And one university which was established by Christian organization was in the People's Republic of China. There was only one university which is used Korean language for studying of students in China. Most of students were young Korean Chinese. The parents of all participants were Korean-Chinese who indicated in the survey questionnaires that they had noparticular health problems.

All participants could read and write in Korean and all were college students. Subject inclusion criteria, data collection procedures, benefits and risks involved, and the research goals were included in the study announcement. Those women, who agreed to participate in the study signed an agreement form. Participants were given the freedom to choose the date and time of participation.

The original data was collected in Republic of Korea and China from October 7th to December 3rd 2007. We contacted 453 Korean women in Republic of Korea and

158 Korean Chinese women in the People's Republic of China for recruitment. Four hundred eleven young Korean women and 75 young Korean Chinese women agreed to participate in the original study. Of the volunteers who agreed to participate in the study, those who rejected measurement of their physical health status or who did not participate in the measurements were excluded. We gave them the record of their individual examinations. The participants were given gift notebooks and pencils for participating in the study. Two research assistants were hired for his study and were trained on the usage of the measurement tools by a specialist.

One hundred thirty-five of 411 young Korean women and 73 of the 75 young Korean Chinese women agreed to let us evaluated their physical health status in the original study. Their data were used for this secondary analysis study. Finally, data of 114 young Korean women and 64 young Korean Chinese were selected for this study.

3. Measures

The following is a summary of the instruments used to collect the data, presented according to the major concepts of the study.

1) Health habit

The health habit assessment tool was developed by Lee and Kim[13]. This questionnaire is based on the Pender's Health Promotion model and on previous studies [14]. It consists of items of importance with respect to health, health management, self-efficacy, self-realization, interpersonal relationships, environment management, and health protection. The questionnaire consists of 50 items with responses made using a 3-point Likert scale. Higher score means better health habits. The reliability of Lee and Kim's study was Cronbach's α = .90[13]. The reliability in this study was Cronbach's α = .87.

2) Perceived health status

The visual analogue scale was used for measurement of perceived health status. It was developed by Lee and Kim[13]. This scale has self-rating scores from 0 to 100 across a10cm line. A score of 100 indicates the highest perceived health status.

3) Physical health status

Physical health status consisted of two parts: body composition and physical strength. Body weight, height, waist and hip circumference and skin fold thickness

were measured as factors for body composition. Power of grasp, knee extension, knee flexion, dorsal ankle flexion, plantar ankle flexion and flexibility were elements for physical strength.

(1) Body composition

Body weight and height were measured using an Automatic Height / Weight Measurement System (Dongsan Com., South Korea). Waist and hip circumference were measured using a measuring tape (Dongsan Com., South Korea). Body mass index (BMI) was calculated as weight in kilograms by height in square meters. Waist-hip ratio (WHR), an indication of fat distribution patterning and general body shape, was obtained by dividing the waist circumference (at the narrowest part of the torso between the bottom of the ribs and umbilicus) by the hip circumference (at the greatest extension of the buttocks). An electronic body fat calculator (Caldwell & Justiss Com., USA) was used to measure skin fold thickness. This was measured at the triceps, iliac crest and front thigh, and the median score was selected. Body density and percent body fat were calculated using the following the formula of Jackson et al.,[15]:

Body density=$1.09949-0.0009929X+0.0000023X^2-0.0001392Y$
X=Triceps brachial skin fold+iliac crest skin fold+front thigh skin fold
Y=age
Percent body fat=$\{(4.95/\text{body density})-4.5\}\times100$

(2) Physical strength

The grasping power of right and left hands were measured using a grip strength dynamometer (TAKEI, Japan). Muscle power of the lower extremities was measured using a Nicolas muscle tester (Lafayette Com., USA). Power of knee extension, knee flexion, dorsal ankle flexion, and plantar ankle flexion were measured in the seated position. A standing trunk flexion meter (TAKEI, Japan) was used for measuring flexibility. For muscle power and flexibility, measurement was performed twice each, and of the measurements, the ones that represent the best physical function were chosen.

4. Data Analysis

All statistical analyses were conducted using Statistical Package for Social Sciences (SPSS) 15.0 for Windows.

Statistical analyses included descriptive statistics, x^2 tests, t-tests, and Pearson's correlations. To identify socio-demographic characteristics, the percent, mean, stan-

dard deviation, x^2 test, and t-test were used. x^2 tests and t-tests were used to identify differences in health habit, perceived health status, physical health status (i.e. body composition [BMI, WHR, body density, and percent body fat] and physical strength [flexibility, muscle powers, and muscle endurance]) between young Korean and Korean Chinese women. Pearson's correlations were used to determine relationships between health habit and perceived health status, and among BMI, WHR, body density, and percent body fat.

RESULTS

1. Socio-demographic Characteristic

The Korean and Korean Chinese women's mean age was 20.8±1.57 years and 20.3±1.32 years, respectively with a range of age from 18 to 25 years. There was a slight significant difference in the age of the two groups (t=2.04, p=.042). The Korean and Korean Chinese women's mean height and body weight was 162.0±4.90 cm and 53.6±6.27 kg, and 158.3±4.54 cm and 51.6±6.32 kg, respectively. The mean waist/hip circumference for Korean and Korean Chinese women was 70.0±6.51 cm /92.6±5.26 cm and 75.4±7.31 cm/92.0±4.33 cm, respectively. Height and body weight of the Korean women were significantly higher than those of the Korean Chinese women (t=5.01, p<.001; t=2.03, p=.044). Waist circumference of the Korean women was significantly lower than that of the Korean Chinese women (t=5.39, p<.001); however, there was no significant difference in the average hip circumference between the two groups. Religious make-up of the Korean women was as follows: a) Buddhist, 12 (10.5%), b) Protestant, 39

(34.2%), c) Catholic, 22 (19.3%), and d) unaffiliated, 41 (36.0%). In contrast, the Korean-Chinese group was comprised of zero Buddhists (0.0%), 37 Protestants (57.8 %), one Catholic (1.6%), and 26 unaffiliated (40.6%). There was a significant difference with respect to religion among the two groups (t=22.30, p<.001). Socio-demographic characteristics of the participants are listed in Table 1.

2. Comparisons of Health Habit, Perceived Health Status and Physical Health Status

1) Health habit and perceived health status

Table 2 indicates that there was no significant difference in the health habit score between the two groups of women. However, the Korean women's score with respect to perceived health status was significantly lower than that of the Korean Chinese women (t=0.82, p= .044). There was a positive correlation between health habit and perceived health status (r=.33, p<.001).

2) Physical health status

(1) Body composition

Comparisons of body composition are presented in Table 2. There was no significant difference in the BMI between the two groups. The WHR of young Korean women was significantly lower than that of the Korean Chinese women (t=7.32, p<.001). The percent body fat of young Korean women was significantly higher than that of the Korean Chinese women (t=2.93, p=.004), while the body density of the Korean women was significantly lower than that of the Korean Chinese women (t=2.91, p=.004).

Table 1. Socio-demographic Characteristics of the Subjects

Variables	Categories	Korean (114) n (%) or M±SD	Korean Chinese (64) n (%) or M±SD	t	p
Age (year)		20.8±1.57	20.3±1.32	2.04	.042
Height (cm)		162.0±4.90	158.3±4.54	5.01	<.001
Body weight (kg)		53.6±6.27	51.6±6.32	2.03	.044
Waist circumference (cm)		70.0±6.51	75.4±7.31	5.39	<.001
Hip circumference (cm)		92.6±5.26	92.0±4.33	0.74	.461
Religion	Protestant Catholic Buddhism Unaffiliated	39 (34.2) 22 (19.3) 12 (10.5) 41 (36.0)	37 (57.8) 1 (1.6) 0 (0.0) 26 (40.6)	22.30	<.001

(2) Physical srength

Comparisons of physical strength are presented in Table 2. The Korean women's scores for knee flexion and ankle dorsal flexion were significantly higher than those for the Korean Chinese women (t=2.90, p=.004; t=2.73, p=.007). However, the Korean women's scores for ventral flexibility and on the sit-up test were significantly lower than those for the Korean Chinese women (t=4.54, p<.001; t=4.32, p<.001). There were no significant differences in powers of right or left hand grasp, knee extension, or ankle plantar flexion between the two groups.

3. Correlations among BMI, WHR, Percent Body Fat, and Body Density

Table 3 indicates that BMI was positively correlated

with WHR and percent body fat (r=.47, p<.001; r=.56, p<.001). Body density was negatively correlated with BMI and WHR (r=-.56, p<.001; r=-.20, p=.013).

DISCUSSION

Health habit, perceived health status, and physical health status of young Korean women were compared with those of young Korean Chinese women.

The finding of no significant difference in the health habit scores reflects the similarities in their health lifestyles. The health habit measurement tools used in the study included such subcategories as health management, self-efficacy, self-realization, interpersonal relationships, environment management, and health protection. The results of the study show that awareness about health management and health management be-

Table 2. Comparisons of Health Habits, Perceived Health Status, Body Composition, and Physical Health Status

Variables	Korean (114) M±SD	Korean Chinese (64) M±SD	t	p
Health habits (score)	63.2±14.81	63.9±14.11	0.30	.762
Perceived health status (score)	68.9±14.95	71.0±16.69	0.82	.044
Body mass index (kg/m²) [†]	20.4±2.22	20.6±2.57	0.56	.575
Waist hip ratio	0.75±0.06[‡]	0.81±0.56[‡]	7.32	<.001
Body density	1.034±0.01[‡]	1.040±0.01[‡]	2.91	.004
Percent body fat (%)	28.7±5.62	26.2±4.90	2.93	.004
Ventral flexibility (cm)	11.7±6.54	16.4±7.01	4.54	<.001
Power of muscle (kg)				
Right hand's grasp	25.7±3.64	25.8±3.79	0.21	.833
Left hand's grasp	23.6±3.83	24.6±3.78	1.73	.085
Knee flexion	34.6±14.38	28.5±11.01	2.90	.004
Knee extension	28.0±11.74	30.7±10.48	1.49	.140
Ankle dorsal flexion	27.6±11.01	23.0±9.99	2.73	.007
Ankle plantar flexion	26.6±11.52	26.0±7.84	0.36	.723
Muscle endurance				
Sit-up test (times/min)	24.1±9.83	30.5±8.60	4.32	<.001

[†] Body weight (kg)²/height (m)²; [‡] Marking down to two or three decimal places was used to show significant differences among the groups.

Table 3. Correlations between BMI, WHR, Percent Body Fat, and Body Density   (N=178)

Variables	BMI r (p)	WHR r (p)	Body density r (p)	Body fat r (p)
BMI	1			
WHR	.47 (<.001)	1		
Body density	-.56 (<.001)	-.20 (.013)	1	
Body fat	.56 (<.001)	.14 (.014)	-1.00 (<.001)	1

havior are similar between young Korean women and Korean-Chinese women. Young women are a critical period for establishing beliefs and opinions regarding one's health and behaviors for a healthy life. It has been noted that one's health behavior is likely to be influenced by culture and beliefs inherited from one's home country[2,7]. Also, family health history is an important factor explaining health habits. At the turn of the last century, Korea was a colony of Japan and many Koreans involuntarily moved to mainland of China. Most of Korean immigrants wanted to come back to Korea. However, they gathered to live in North-East part of China, Jilin province. It is near from Korea. First generation of Korean Chinese used Korean and kept their maternal culture. The descendants of the participants were married mostly to Korean-Chinese and lived in a community that they themselves formed in the self-governed district. Also, they have maintained their ancestors' language, foods, customs, and traditional holidays as Korean culture[7]. Young Korean and young Korean Chinese women can be characterized as a same descendant of same ancestors. Health attitude and heath habit often transfer from parents to children. Therefore, young Korean and Korean Chinese women can share similar health habit.

The finding that Korean women have a lower perceived health status, despite no significant difference in health habit, indicates that young Korean and young Korean Chinese women use different criteria to judge themselves regarding their personal health. This finding supports previous studies[16,17]. In these studies, Korean women tended to have high levels of concern over their health; however, they evaluated their health status as somewhat low. 28.7% of young Korean women perceived them as overweight, although their real body mass index was in the normal range[18]. 77.3% of Korean women had a high level of health concern[17]. Finally, psychological factors were positively related to the desirable direction of health, meaning perceived health concept. Self-presentation was defined as the process by which people monitor and control how they are perceived by their environments[19]. The differences in perception of health status between Korean and Korean Chinese women may indicate that the two groups have a difference in the desirable direction of their health in their attitude about their own health. Further studies are required to identify the correlation between perceived health status and health habit factors including health management, self-efficacy, self-realization, interpersonal relationships, environment management, and health

protection in the two groups.

The finding of a positive correlation between perceived health status and health habit agrees with previous studies[20,21]. An individual's health habit was considered to be closely related with subjective health status including one's awareness about his or her health because one's health habit is based on the attitude, value and belief about health[1]. Poor perceived health is associated with persistent physical inactivity[20]. Self-assessed health status was related to and could be used as an indicator of health behavior[21]. Therefore, nursing intervention skills for health promotion of the two groups should be developed based on health habit related to perceived health status.

BMI and WHR are markers for body composition and somatotype, respectively, and are predictors for various diseases[12]. WHO has recommended the adoption of standards for a healthy BMI of $18.5 \sim <25 \text{ kg/m}^2$ for international use. The BMI of the two groups in this study were in the normal range suggested by the WHO. Considering that BMI is apredictor that can be directly influenced by lifestyle, it is believed that the two groups had similar life styles. However, further studies are required to measure body composition more accurately and to identify the life style that influences body compositions [22]. WHO has recommended the adoption of standards for a healthy WHR of 0.85. The WHR of the two groups in this study were in the norma lrange suggested by the WHO. There is no significant difference in the BMI among two groups. However WHR is difference between the two groups. It is related to a difference in waist circumference. Waist circumference of the Korean women was significantly lower than that of the Korean Chinese women. However, there was no significant difference in the average hip circumference between the two groups. There is a clear difference in body shape between Korean and Korean Chinese women. Young Korean women havea more westernized body shape than young Korean Chinese women. BMI and WHR or waist circumference can be used as indexes for overall obesity and central abdominal obesity to predict high risk behavior[6,23]. The average WHR of both groups was similar to that reported by Choung and Park[24]; however, it was lower than that reported in the 2001 Korea National Health and Nutrition Examination Survey[17]. The BMI and the WHR the two groups in this study were in the normal range suggested by the WHO. All of these results support the conclusion that both groups of women in our study were in the normal range of health habits and health status.

Percent body fat is a strong associating factor of various obesity indices in the Korean population[25]. Health can be altered according to percent body fat, skin fold thickness, waist circumference, hip circumference, and WHR measurements related to in fat distribution and body shape in women[26]. In the study, the percent body fat and the body density of the two groups were in the normal range suggested by WHO. However Korean women had a higher percent body fat and lower body density than the Korean Chinese women. Body density is determined by hydrostatic weighing and is used to estimate relative body fat. In this study, positive correlations among BMI, WHR, and percent body fat, and negative correlations among body density, BMI, WHR, and percent body fat are in agreement with moderate relationships between the BMI and the WHR in Korean women[17]. It can explain why young Korean women have a higher potential risk for obesity or other unhealthy states as compared to young Korean Chinese women. At this point, more studies finding the reasons of this difference in two groups are needed for community nursing management.

The Korean Chinese women's ventral flexibility and scores on the sit-up test were higher than those of the Korean women. Flexibility refers to the maximum ability to move a joint through a range of movement. It is limited by bone structure, muscle volume, and elasticity of muscles, tendons, and ligaments[27]. Usually, the 60-second timed sit-up test is recommended as a measure of muscle endurance, especially with regard to abdominal strength. Muscle endurance is related to muscle fatigue-resistance and muscular activity. Differences in muscle endurance have been attributed to differences in muscle mass. These results support the conclusion that young Korean Chinese women have more muscle in their trunks and have more muscle fatigue-resistance than young Korean women. In the present study, the percentages of body fat in the upper arm, lower abdomen and thigh were significantly lower in Chinese-Korean women than in Korean women. However, this was not true with their BMI. This indicates that Chinese-Korean women have leaner body mass than Korean women (i.e., the former have more muscles). This also supports the result that Chinese-Korean women have better ventral flexibility and muscle endurance than Korean women.

The Korean women's knee flexion and ankle dorsal flexion were higher than those of the Korean Chinese women. The hamstring muscles of young Korean women were more powerful than those of Korean Chinese women[27]. Also, anterior tibia muscle of young Korean women was more powerful than that of Korean Chinese women. This result suggest that reduced α-motor neuron excitability of the gastrocnemius and increased flexibility of the ankle dorsal flexion would be followed by activation of the type III mechanoreceptor which around the ankle joint and the Golgi tendon organ in the gastrocnemius[28]. Tests of active knee extension and active knee flexion can be used as indicators for quadriceps muscle tightness. The study reported in this paper agrees with these findings. Ankle dorsal flexion is high correlated with ankle power and gait[29]. Also, muscle power and gait patterns are associated with the pattern of physical activity. Additionally, knee extension, knee flexion, ankle plantar flexion and ankle dorsal flexion were associated with muscle power and gait pattern[30]. Thus, differences in muscle power, especially with regard to knee extension and ankle dorsal flexion, as seen in our study may be due to differences in physical activity and gait pattern between the Korean and Korean Chinese women. Taken together, there were differences in flexibility, muscle endurance and muscle power between Korean-Chinese women and Korean women. As such, further studies in nursing are required to compare life environment and activity styles, in addition to the lifestyles, between the two groups.

CONCLUSION

The findings of this study indicate that there is no difference in health habit between young Korean and Korean Chinese women; however, perceived health status was different between the two groups. There were also differences in the WHR, waist circumference, percent body fat, and physical strength between young Korean and Korean Chinese women.

Based on our findings, we conclude this paper with the following implications for future research and practice. First of all, the reason for the difference in physical health status and in perceived health status between these two groups needs to be explored though future study. More in-depth cultural and environmental studies that compare the contextual factors influencing perceived health status and physical health status between the two groups could provide some answers. Second, researchers and health care providers need to be aware that possible variations in their intervention strategies may be required even for individuals within the similar ethnic group given that they may have been residing in a different area. Finally, we suggest more studies com-

paring two different groups sharing ethnicity and culture but who have been born into different countries, and religious, thus potentially providing answers regarding the influence of immigrated transition on health.

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