

Structural relations in the effect of convenience food satisfaction and quality of life according to dietary style - Comparative study of singles in metropolitan area of Korea, Japan and China -

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BACKGROUND/OBJECTIVES: Due to recent changes in social structure, single-person households are on the rise worldwide and therefore the interest in the quality of life of singles is increasing, but the research on the relationships related to their diet-related quality of life is scarce. This research analyzes the structural relations in the effect of convenience food satisfaction and quality of life according to dietary style of Korean, Japanese and Chinese singles.

SUBJECTS/METHODS: The targets of this study were Korean, Japanese, and Chinese singles, identified as adults between the ages of 25 and 54, having economic capabilities or working and living alone, either legally or in actuality having no partner. A statistical analysis was conducted using SPSS12.0 for Windows and SEM using AMOS 5.0 statistics package. The reliability of these findings was supported by a Cronbach's alpha coefficient of 0.6 and higher for all the factors. In an attempt to study the level of satisfaction with convenience food in accordance to dietary style and the quality of life of singles, a structural equation model was constructed and analyzed.

RESULTS: Of the three countries, regarding the effect of dietary style on singles' quality of life, the convenience-oriented style was found to have a negative effect on Korean singles' overall quality of life, but a positive effect on Japanese singles' overall quality of life, and a negative effect on Chinese singles' positive psychological aspect of quality of life. In addition, although Chinese singles have a high level of interest in health, they have an overall high level of satisfaction regarding fast food and its nutritional value.

CONCLUSIONS: The number of singles in Korea, Japan, and China has been consistently increasing in recent years, and there is a need for continuous interest in their healthy dietary lifestyles in terms of convenience, economy, and taste.

Nutrition Research and Practice 2014;8(3):312-318; doi:10.4162/nrp.2014.8.3.312; pISSN 1976-1457 eISSN 2005-6168

Keywords: Singles, SEM, dietary lifestyle, convenience food satisfaction, quality of life

INTRODUCTION

Due to recent changes in social structure and way of thinking, single-person households are on the rise worldwide. The survey on single-person households in England and France showed that the increase in urban single-person households was striking and its major reasons were divorce and late marriage [1], and according to Mulder [2], it was reported that living arrangements of living alone or living together without marriage is on the rise in Netherland as well due to parents' demand for independence. According to Korea Statistics [3], single-person households are increasing from 6.3% in 1980 to 15.5% in 2000, to 19.9% in 2005, and the number of single-person households was 23.9% in 2010, exceeding, for the first time, the proportion of the traditional four-person households which was 22.5% [4]. Also in Japan, it shows steady increase from 19.8% in 1980,

to 27.6% in 2000, and to 29.5% in 2005 [5] and in China, according to the 5th Census Report for People's Republic of China [6], the number of single-person households in Beijing in 2000 was 494,553 out of 28,273,35 single-person households in China, which was noticeably large compared to 598,327 four-person households. As such, the number of singles is on the rise in Korea, Japan, and China, three countries in Northeast Asia, and the importance of singles in the society is growing accordingly.

In the case of traditional or dual-income families, family members gather and have meals together, able to consume various and plentiful foods, and often have homemade meals together on the weekends or holidays; however, in the case of singles, many skip meals, consume instant foods, or a consume limited variety and insufficient amounts of food because they usually eat alone [7]. The reality is that singles encounter

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Received: August 10, 2013, Revised: March 13, 2014, Accepted: March 26, 2014

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considerable difficulties in their dietary lifestyles.

Although a variety of factors including health, psychological state, and spirituality, social, mental and economic conditions may contribute to life satisfaction, the pleasure of eating can account for a large part of the quality of life as Lee [8] reported that the emotional stability related to meals and the pleasure of eating have a significant effect on the quality of life of the elderly staying home. Consequently, the interest in the quality of life of singles is increasing, but the research on the relationships related to their diet-related quality of life is scarce.

Therefore, the present study attempted to provide basic data to improve the quality of life of singles by analyzing dietary styles of Korean singles, along with the singles in Japan where the development of convenience food advanced earlier than Korea, and singles in china where rapid economic growth occur recently, and comparing the relationships between the current state of convenience food use and the factors that affect satisfaction and the quality of life.

SUBJECTS AND METHODS

Study participants

In the present study, singles are defined based on the previous study [9] as 'the households currently without a legal or a putative spouse among the adults between 25 and 54 at the Korean age who live alone in a single separate household with economic capacity or working for a job. Survey questionnaires were directly distributed to the singles living in Seoul, Tokyo, Tianjin metropolitan area, and the survey period was between April and August, 2012. Out of 250, 200, 200 surveys in total that had been distributed, 208, 155, 153 surveys excluding incomplete surveys were used for statistical analysis.

Survey protocols, instruments, and the process for obtaining informed consent for this study were approved by the institutional review committees of Sookmyung Women's University (SM-IRB-13-0924-008). All participants gave their written informed consent.

Measurement instrument

The questionnaire for singles' dietary style was constructed with reference to relevant previous studies[9-13] and consisted of 18 items on eating habits and the questionnaire for singles' convenience food satisfaction was constructed with reference to relevant previous studies[14-16] and consisted of 38 items on HMR, processed food, delivery food, fast food satisfaction. The questionnaire for singles' quality of life was constructed with reference to relevant previous studies[8,17,18] and consisted of 17 items on health, economy, human relationship, psychological satisfaction, measuring them with a 5-point Likert scale.

Research model and hypotheses

Structural equation model was used to examine the effect of Singles dietary style on convenience food satisfaction and quality of life. The research model and research hypothesis are shown in Fig. 1.

Hypothesis 1. Convenience food satisfaction will be significantly different depending on the dietary styles of Korean, Japanese, and Chinese singles.

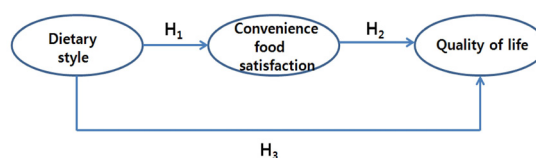


Fig. 1. The research model

Hypothesis 2. Quality of life will be significantly different depending on convenience food satisfaction of Korean, Japanese, and Chinese singles.

Hypothesis 3. Quality of life will be significantly different depending on the dietary style of Korean, Japanese, and Chinese singles.

Statistical analysis

All of the collected data were analyzed with SPSS 12.0 for Windows and AMOS (Analysis of Moment Structure) 5.0 Statistical programs. In order to test unidimensionality of multiple items that consist of each factor, exploratory factor analysis and reliability test were performed. After evaluating the validity of measured items by performing the confirmatory factor analysis for each factor, a structural equation model (SEM) was constructed and analyzed. All tests proved the model satisfied the recommended level of the goodness of fit index and thus, the overall research model was proved to be appropriate. Structural equation model was used to determine path coefficients of the research model, and path coefficients were used to compare research models for Korean, Japanese, and Chinese singles.

RESULTS

Explorative factor analysis and confirmatory factor analysis of Korean, Japanese, and Chinese singles

The reliability of these findings was supported by a Cronbach's alpha coefficient of 0.6 and higher for all the factors. After obtaining the factors from processing an exploratory factor analysis, a confirmatory factor analysis for the produced model was carried out using AMOS and the end results supported the its validity.

The results of a factor analysis of Korean singles are as follows. Dietary style was categorized into four factors. The level of satisfaction with convenience food satisfaction was categorized into five factors and quality of life was categorized into five factors. The results of a factor analysis of Japanese singles are similar to Korean singles in terms of dietary style and satisfaction with convenience foods. However, quality of life was categorized into four factors. The results of a factor analysis of Chinese singles are as follows. Dietary style was also categorized into the same four factors. However, convenience food satisfaction was categorized into seven factors. But quality of life was categorized into the same four factors as for Japanese singles.

Comparison in dietary style and convenience food satisfaction between Korean, Japanese, and Chinese Singles

The results of comparison between Korean, Japanese, and Chinese singles in the effect of dietary style on convenience

Table 1. Path coefficient analysis of structural equation model comparison of dietary style and convenience food satisfaction

	Standard path coefficient		
	Korean Singles	Japanese Singles	Chinese Singles
Convenience oriented → HMR satisfaction	0.369* ¹⁾	2.074*	-0.332
Convenience oriented → Processed food satisfaction	1.046***	2.655*	-0.350
Convenience oriented → Delivery food satisfaction	0.472**	1.836*	-0.537
Convenience oriented → Fastfood satisfaction	0.545***	1.891*	-0.690
Health oriented → HMR satisfaction	0.335*	0.893*	-1.102
Health oriented → Processed food satisfaction	0.548**	1.165*	-2.029*
Health oriented → Delivery food satisfaction	-0.012	0.776*	-2.702*
Health oriented → Fastfood satisfaction	0.196	0.824*	-3.883*
Economy oriented → HMR satisfaction	0.076	-0.301	0.343
Economy oriented → Processed food satisfaction	0.093	-0.327	0.837
Economy oriented → Delivery food satisfaction	-0.105	-0.264	1.367*
Economy oriented → Fastfood satisfaction	-0.366*	-0.280	2.114**
Gourmet oriented → HMR satisfaction	-0.181	-0.021	0.147
Gourmet oriented → Processed food satisfaction	-1.180***	-0.304	-0.105
Gourmet oriented → Delivery food satisfaction	-0.317	0.315	-0.123
Gourmet oriented → Fastfood satisfaction	0.613***	-0.217	0.045

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Table 2. Path coefficient analysis of structural equation model comparison of convenience food satisfaction and quality of life

	Standard path coefficient		
	Korean Singles	Japanese Singles	Chinese Singles
HMR satisfaction → Human relationship satisfaction	0.041	-0.123	-0.038
HMR satisfaction → Health satisfaction	0.064	-0.078	0.108
HMR satisfaction → Psychological satisfaction	-	-0.182	-0.029
HMR satisfaction → Positive psychological satisfaction	0.177*	-	-
HMR satisfaction → Negative psychological satisfaction	0.165	-	-
HMR satisfaction → Economy satisfaction	0.104	-0.307*	0.050
Processed food satisfaction → Human relationship satisfaction	0.511**	-0.157	-0.008
Processed food satisfaction → Health satisfaction	0.220	-0.412*	-0.112
Processed food satisfaction → Psychological satisfaction	-	-0.179	0.109
Processed food satisfaction → Positive psychological satisfaction	0.560*	-	-
Processed food satisfaction → Negative psychological satisfaction	0.379*	-	-
Processed food satisfaction → Economy satisfaction	0.298*	-0.140	0.283
Delivery food satisfaction → Human relationship satisfaction	-0.015	0.068	0.199
Delivery food satisfaction → Health satisfaction	0.105	-0.132	0.343
Delivery food satisfaction → Psychological satisfaction	-	-0.263	0.180
Delivery food satisfaction → Positive psychological satisfaction	0.027	-	-
Delivery food satisfaction → Negative psychological satisfaction	0.222	-	-
Delivery food satisfaction → Economy satisfaction	0.011	-0.212	0.546
Fastfood satisfaction → Human relationship satisfaction	0.107	-1.140***	-0.088
Fastfood satisfaction → Health satisfaction	0.190	-1.447***	0.213*
Fastfood satisfaction → Psychological satisfaction	-	-0.924*	-0.112
Fastfood satisfaction → Positive psychological satisfaction	0.394*	-	-
Fastfood satisfaction → Negative psychological satisfaction	0.155	-	-
Fastfood satisfaction → Economy satisfaction	0.280*	-0.974**	0.312

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

food satisfaction using path coefficients are shown in Table 1, and the factors affecting them significantly are charted and shown in Fig. 2.

The convenience-oriented style had a positive effect on convenience food satisfaction among Korean and Japanese

singles, but not among Chinese singles.

The health-oriented style among Japanese singles had a significantly positive effect on the overall convenience food satisfaction, indicating that health-oriented Japanese singles have a high level of satisfaction for convenience food. Among

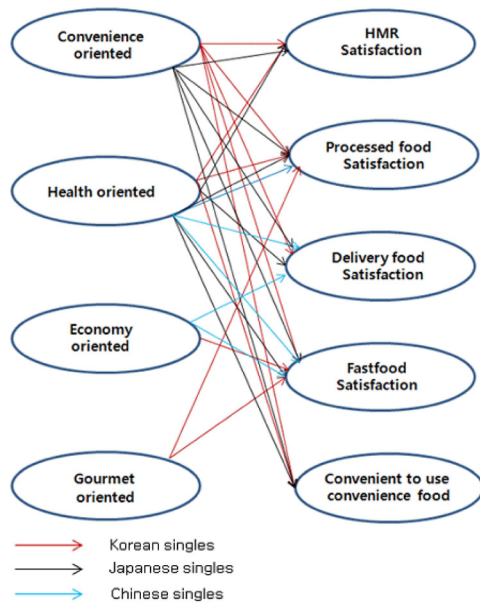


Fig. 2. Comparison of Korean, Japanese and Chinese singles' structural equation model of dietary style and convenience food satisfaction

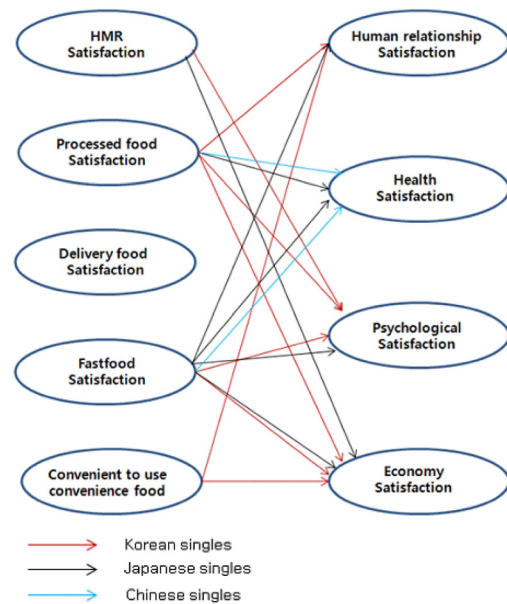


Fig. 3. Comparison of Korean, Japanese and Chinese singles' structural equation model of convenience food satisfaction and quality of life

Table 3. Path coefficient analysis of structural equation model comparison of dietary style and quality of life

	Standard path coefficient		
	Korean Singles	Japanese Singles	Chinese Singles
Convenience oriented → Human relationship satisfaction	-1.245***	4.381*	0.131
Convenience oriented → Health satisfaction	-0.788**	6.835*	0.530
Convenience oriented → Psychological satisfaction	-	6.552*	-0.513*
Convenience oriented → Positive psychological satisfaction	-1.616***	-	-
Convenience oriented → Negative psychological satisfaction	-1.539***	-	-
Convenience oriented → Economy satisfaction	-0.540*	4.622*	1.351
Health oriented → Human relationship satisfaction	-0.895***	2.236*	-0.128
Health oriented → Health satisfaction	-0.587***	3.222*	2.250
Health oriented → Psychological satisfaction	-	3.204*	-1.164
Health oriented → Positive psychological satisfaction	-1.192***	-	-
Health oriented → Negative psychological satisfaction	-0.982***	-	-
Health oriented → Economy satisfaction	-0.196	2.364*	6.201
Economy oriented → Human relationship satisfaction	0.403	-0.913*	-0.017
Economy oriented → Health satisfaction	0.522*	0.999	-1.137
Economy oriented → Psychological satisfaction	-	-1.249*	0.557
Economy oriented → Positive psychological satisfaction	0.501	-	-
Economy oriented → Negative psychological satisfaction	0.128	-	-
Economy oriented → Economy satisfaction	-0.440*	-1.016*	-2.914
Gourmet oriented → Human relationship satisfaction	1.630***	-0.176	0.032
Gourmet oriented → Health satisfaction	1.217***	0.216	0.099
Gourmet oriented → Psychological satisfaction	-	0.663	-0.151
Gourmet oriented → Positive psychological satisfaction	2.028***	-	-
Gourmet oriented → Negative psychological satisfaction	1.613***	-	-
Gourmet oriented → Economy satisfaction	0.970***	0.046	-0.006

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Korean singles, the health-oriented style was found to have a high level of satisfaction for HMR and processed food. However, health-oriented Chinese singles were found to have a low level

of satisfaction for convenience food.

The economy-oriented style had a significantly negative effect only on fast food satisfaction among Korean singles, and a

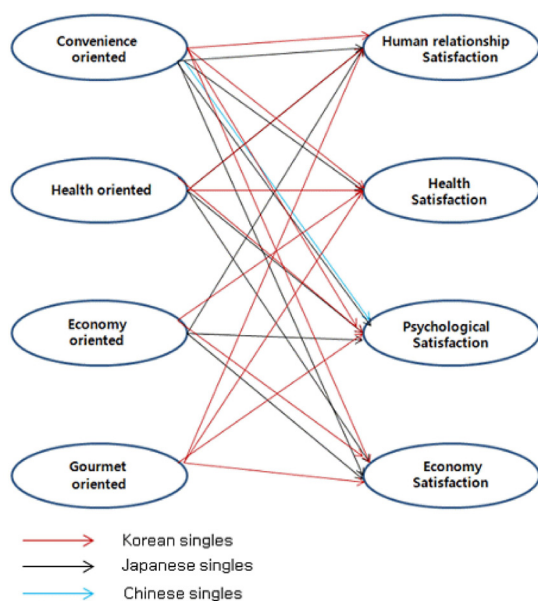


Fig. 4. Comparison of Korean, Japanese and Chinese singles' structural equation model of dietary style and quality of life

positive effect on delivered food satisfaction and overall fast food satisfaction among Chinese singles, but had no significant effect on convenience food satisfaction among Japanese singles.

The gourmet-oriented style had a significantly negative effect on processed food satisfaction and fast food satisfaction among Korean singles. In contrast, among Chinese and Japanese singles, gourmet-orientation was found to have no significant effect on convenience food satisfaction.

Comparison in convenience food satisfaction and quality of life between Korean, Japanese, and Chinese Singles

The results of comparison in path coefficients for the effects of convenience food satisfaction on quality of life among Korean, Japanese, and Chinese singles are shown in Table 2, and the factors that have a significant effect are charted and shown in Fig. 3.

In terms of HMR satisfaction, the higher HMR satisfaction among Japanese singles was associated with economy satisfaction in quality of life.

Among Korean singles, processed food satisfaction had a significantly positive effect on the overall quality of life. However, it was found the higher processed food satisfaction was associated with lower health satisfaction in quality of life among Japanese singles, and Chinese singles' quality of life was not significantly affected by processed food satisfaction. Delivered food satisfaction did not affect quality of life significantly among Korean, Japanese, and Chinese singles.

Fast food satisfaction had a significantly positive effect on economy satisfaction in quality of life among Korean singles, and a significantly negative effect on overall quality of life among Japanese singles.

Comparison in dietary style and quality of life between Korean, Japanese, and Chinese Singles

The results of comparison in path coefficients for the effects of dietary style on quality of life of Korean, Japanese, and Chinese singles are shown in Table 3, and the significant effects are charted and shown in Fig. 4.

The convenience-oriented style was found to have a significantly negative effect on overall quality of life among Korean singles, and a significantly positive effect on overall quality of life among Japanese singles.

The health-oriented style was found to have a significantly positive effect on all parts of quality of life except economy satisfaction among Korean singles, and have a negative effect on overall quality of life among Japanese singles, while having no significant effect on Chinese singles' quality of life.

The gourmet-oriented style was found to have a significantly positive effect on overall satisfaction in quality of life among Korean singles, but among Japanese and Chinese singles, gourmet-oriented style was found to have no significant effect on quality of life.

The economy-oriented style was found to have a significantly positive effect on health satisfaction and a significantly negative effect on economy satisfaction in quality of life among Korean singles, a negative effect on all parts of quality of life except health satisfaction among Japanese singles, and no significant effect on Chinese singles' quality of life.

DISCUSSION

The results of the comparative study on the convenience food satisfaction and quality of life depending on the dietary style of Korean, Japanese, and Chinese singles are as follows: As a result of testing Hypothesis 1, the convenience-oriented style had a positive effect on convenience food satisfaction among Korean and Japanese singles, but not among Chinese singles. In a number of earlier studies [15,19,20], the instant food-oriented and convenience-oriented lifestyles were generally associated with higher satisfaction with convenience food, such as instant food, processed food, and Home Meal Replacements (HMR). This is also in line with Chung [14] finding that convenience eating is related to meals and snacks that give the consumer more time to do other activities. Hence, convenience food satisfaction is inferred to be high among those with the convenience-oriented diet style. The health-oriented style among Japanese singles had a significantly positive effect on the overall convenience food satisfaction and among Korean singles, the health-oriented style was found to have a high level of satisfaction for HMR and processed food. Eco-friendly convenience food products with safety and sanitation are thought to be increasing along with the recent rise in the interest in health, and the singles' satisfaction are increasing accordingly. Japan's HMR industry is particularly well-developed, and cooking areas are openly visible within the establishments, leading customers to feel as if the food was freshly made and is safe [15]. Therefore, Japanese singles who are concerned with their health also displayed a high degree of satisfaction with convenience foods. However, Chinese singles showed the overall negative effect, indicating that singles with the health-

oriented diet style in China are low in satisfaction for convenience food. In accordance with Chinese consumers' interest in healthy functional food increases [21], it speculated that their idea of convenience food showed negative. Chinese singles' economy-oriented style generally had higher fast food satisfaction than two other countries, and the economy-oriented Chinese singles who take price into consideration in maintaining their dietary style were particularly high in fast food satisfaction. The gourmet-oriented style among Korean singles were found to be low in satisfaction for processed food and fast food, and therefore, the development for taste improvement of convenience food is deemed essential.

As a result of testing Hypothesis 2, in terms of HMR satisfaction, out of three countries, Japanese singles had the lowest satisfaction for the price, indicating that the price of HMR somewhat influenced economy satisfaction in quality of life. Among Korean singles, processed food satisfaction had a significantly positive effect on the overall quality of life, which is thought to be the positive effect of singles' processed food satisfaction on quality of life. It is inferred that singles often want simple and easily prepared meals particularly due to their characteristics as singles, and processed food improves their quality of life due to being able to save time, efforts, and money invested in preparing a meal by using processed food.

Among Chinese singles in particular, the higher fast food satisfaction was associated with health satisfaction, indicating that they are currently focusing on the positive effect rather than negative effect of fast food. As seen in the case of Yonho-Doujian(永和豆漿), a Taiwan-based restaurant chain which developed Chinese breakfast foods as fast food and operates around the concept of "healthy food which can be eaten by the whole family for their entire lives" [22], cases in which so-called fast foods are being developed with the health of the consumer in mind are gradually increasing and this trend can have a notable influence on the health aspect of quality of life.

As a result of testing Hypothesis 3, the convenience-oriented style was found to have a significantly negative effect on overall quality of life among Korean singles. It is thought that Korean singles often do not feel the pleasure of eating which a large part of life, as they often take the simple meals, and are low in satisfaction for communication with others during a meal as they often eat alone and accordingly the psychological, economic and health satisfaction appeared to be low as well. Among Chinese singles, the convenience-oriented style was found to have a significantly negative effect on psychological satisfaction. Among the many factors which influence quality of life, the effect of loss of appetite on quality of life has been documented [23], and it may be argued that the relative importance of dietary lifestyle in quality of life is considerable. Therefore, convenience-oriented singles who are unable to prepare meals with other family members or do not have sufficient time to eat and thus often consume light meals, precooked foods, or processed foods often suffer from psychological disorders such as anxiety or depression.

However a significantly positive effect on overall quality of life among Japanese singles. In contrast to Korean singles, among Japanese singles, the more efficient use of time and

simpler convenience-oriented style are thought to be associated with overall life satisfaction. The health-oriented style was found to have a significantly positive effect on overall quality of life among Japanese singles. Kim [24] set items such as regular check-ups or exercise, alcohol consumption, skipping breakfast, dietary fiber consumption, and a high-fat diet as health promotion behavioral levels and researched the correlation between these behavioral levels and quality of life. She found that the higher the health promotion behavior levels, the higher the quality of life, results which are similar to those of this study. In addition, according to the research of Kim [25], the more one's lifestyle actively responds to one's environment in order to elevate one's health, the stronger the correlation between all kinds of quality of life factors such as health accountability, exercise, interpersonal relationship management, and stress management. It was also found that the quality of life of middle-aged women increased the more immersed they were in a health promotion lifestyle. The results of this study are also related to such results.

The economy-oriented style was found to have a negative effect on economy satisfaction in quality of life among Japanese singles and Chinese singles. The costs of cooking at home or purchasing organic food products for singles is more burdensome than purchasing processed foods or precooked foods, and it appears that economic-oriented singles may have a low degree of economic satisfaction in their quality of life because they pursue inexpensive dietary lifestyles.

The number of singles in Korea, Japan, and China has been consistently increasing in recent years, and there is a need for continuous interest in their healthy dietary lifestyles in terms of convenience, economy, and taste. Furthermore, various social assistance programs and further research must be conducted in order to raise the quality of life of these singles.

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