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ORIGINAL ARTICLE

The influences of socio-individual determinants and health information seeking on health-promoting behaviors among migrant women: A cross-sectional study

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Abstract

Aim: This study aimed to examine the effects of socio-individual and health information-seeking variables on health-promoting behaviors among migrant women living in Korea.

Methods: A descriptive, cross-sectional design was used. A convenience sample comprising 190 Filipino marriage-migrant women from G City and J province, South Korea, were recruited between November and December 2015. Participants completed self-report surveys examining health-promoting behaviors, health information seeking, and socio-individual determinants.

Results: The most popular health information sources were healthcare professionals (39.0%), family or friends (31.6%), and the Internet (28.9%). Most respondents (90.5%) possessed smart devices; 55.8% used them to seek health information, while 9.5% used health-related applications. The health information that migrant women searched for online mainly concerned their health, diet/nutrition, and physical activity. Education ($\beta = .15$, $p = .008$), health status ($\beta = -.10$, $p = .038$), and smart device possession ($\beta = .20$, $p = .032$) were factors influencing health-promoting behaviors.

Conclusions: Considering the high use of smart devices among migrant women in Korea, these findings suggest the need for an accessible, reliable, and easily understandable Internet-based health information source to facilitate their health-promoting behaviors.

KEYWORDS

cross-sectional studies, health promotion, information seeking behavior, migrants

1 | INTRODUCTION

Overseas migration is a prominent phenomenon of the 21st century, and the change in the members of society due to migration in Korea is visible. There has been an increase in migrant workers and marriage-migrant women (those who have relocated to another country after marriage) because of the shortage of a low-wage workforce, a low birth rate, population aging, and gender imbalance in the marriage market (H. M. Kim, 2014). In the last 5 years, the foreign resident population in Korea has recorded a 9.3% rate of increase every year and, in 2016, there were about 2 million such residents (Ministry of Justice, 2016). Among the foreign residents, marriage-migrant women form the group that most influences population change in Korea, as they create new families after settling in the country. Marriage-migrant

women usually immigrate individually after marrying Korean men from rural areas. Thus, they are highly dependent on their husbands and in-laws and experience stressful life events, such as migration, marriage, pregnancy, and childbirth, all in a relatively short time. Marriage-migrant women often find themselves in situations in which the health behaviors they used to maintain are stopped or transformed due to physical and mental stress (Lee, Lee, & Kim, 2011).

Migrants are known to have lower accessibility to health information because of language and cultural differences, their weak socio-economic status, and unfamiliar information navigation paths and healthcare systems (Ahn, 2010; W. Kim & Kreps, 2014). According to a national survey in the USA, migrants with low linguistic ability showed significantly low online accessibility and utilization of information technology regarding health information (Patel, Barker, & Siminerio, 2014). Health information seeking exerts a positive influence on an individual's health knowledge, disease prevention activities, health behaviors, healthcare service use, and relationships with healthcare personnel (G. S. Kim, Kim, & Ryu, 2010). Those who acquire and utilize health information more tend to enjoy healthier lives, therefore making health information seeking a significant indicator of health equity (Im & Cho, 2013). Likewise, in the US national health objectives, Healthy People 2020, "health communication and health information description" was selected as a topic area and debated to consider the influence of seeking, understanding, and utilization of health information on the health and health equity of a population group (U.S. Department of Health and Human Services, 2017). From a long-term viewpoint, to improve the health of migrants – a vulnerable health group – there is an urgent need to provide them with the ability to seek, understand, and utilize the information necessary for health management.

Previous studies on health-promoting behaviors of marriage-migrant women in Korea were focused on determining the relationships among various factors such as social support, self-efficacy, perceived health status, level of Korean language proficiency, marital satisfaction, country of origin, income status, and number of children (Jeong & Lee, 2010; G. S. Kim & Moon, 2011; Seo & Park, 2013). Although marriage-migrant women have an insufficient level of access to and utilization of health information and quality of use (National Information Society Agency, 2014), there is a lack of understanding about the influence of health information seeking on health-promoting behaviors among marriage-migrant women living in Korea. Most of them have migrated from other Asian countries including China, Vietnam, and the Philippines (Ministry of Gender Equality and Family, 2015). Among them, Filipino women are known to actively participate in online networking by surfing Internet websites or blogs to seek better adjustment and economic opportunities in Korea (D. Y. Kim, 2010).

1.1 | Conceptual framework

The social determinants of health are "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life" and are mostly responsible for health inequities (World Health Organization, 2018). Fleischman, Willen, Davidovitch, and Mor (2015) insisted that migrant status itself constitutes a social determinant of health and it intersects with other key social determinants with adverse effects of healthcare access and health outcomes. Common barriers to care exacerbated by migrant status (Fleischman et al., 2015) included limited access to health information, confusion about insurance, and language barriers. As the complexity of health information and healthcare institutions increases, people need additional information, skills, and supportive relationships to meet their health needs. In addition, increase of online health information challenges people with limited health literacy such as migrants (U.S. Department of Health and Human Services, 2017).

This study was based on the structural influence model which explains the social determinants and intervention/control factors affecting heath communication, which (using health media and through information seeking) ultimately affect health outcomes (Viswanath, Ramanadhan, & Kontos, 2007). The social determinants include socioeconomic position (education, income, employment, occupation) and place (residential area), while the mediating/moderating factors include sociodemographic characteristics (age, gender, race, ethnicity) and social networks (social capital, resources). In the current study, we modified the model to be composed of social determinants reflecting migration status (education, household income, employment, health insurance status, residential area, length of residence, language proficiency, citizenship) and individual determinants (age, religion, parental status, chronic disease, health status) to the conceptual framework (Figure 1).

1.2 | Research questions

The aim of this study was to determine the factors influencing health-promoting behaviors among Filipino marriage-migrant women living in Korea. The following research questions were addressed.

- What are the levels of health-promoting behaviors, health information seeking and socio-individual determinants?

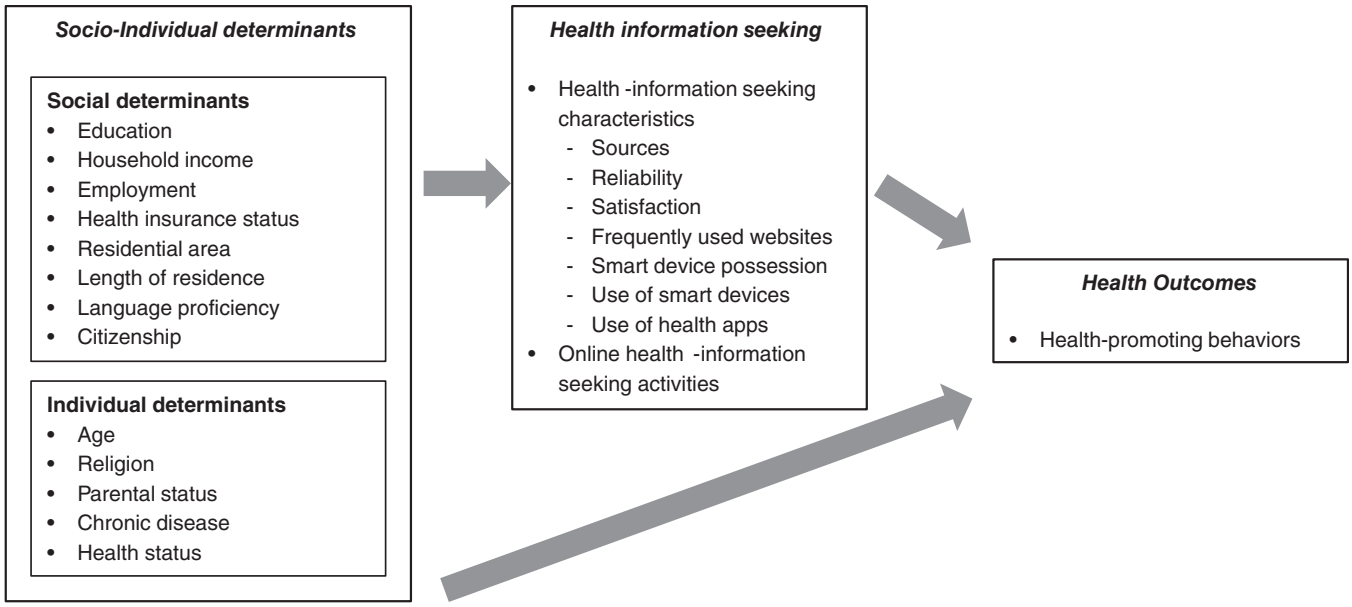

FIGURE 1 Conceptual framework of the study

- What are the differences in health-promoting behaviors regarding socio-individual determinants and health information seeking of migrant women?
- What are the factors that influence the health-promoting behaviors of migrant women?

2 | METHODS

2.1 | Design and sample

This study used a descriptive, cross-sectional design to examine health-promoting behavior levels and to determine influences of socio-individual determinants and health information seeking on health-promoting behaviors among migrant women. Using convenience sampling, we recruited Filipino marriage-migrant women living in G city and J province, South Korea. The inclusion criteria were that the participants were able to understand and complete the self-report questionnaire. List-wise deletion was used in cases of missing data. As a result, 50 with missing data were excluded. Thus, the responses from 190 women were analyzed. According to power calculations by G-power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009), a sample size of 191 participants would assure a p value of .05, power of 0.90, medium effect size of 0.15, and number of predictors of 20. Thus, a sample size of 190 can be considered appropriate.

2.2 | Measures

The questionnaire was provided in three languages: Korean, English, and Tagalog. Permission was received from the original developer (W. Kim & Kreps, 2014; Walker, Sechrist, & Pender, 1987) and adapter to use the English and Korean versions. A preliminary survey targeting eight Filipino marriage-migrant women was conducted using the English and Korean questionnaires. Following this survey, it was pointed out that there was a need for a Tagalog questionnaire as well. Thus, one Filipino nursing professor and one Filipino student currently enrolled in a Master's course, both of whom were fluent in English and Tagalog, translated the questionnaire. The self-report survey consisted of three parts: (a) health-promoting behavior; (b) health information seeking; and (c) socio-individual determinants.

2.3 | Health-promoting behavior

Health-promoting behavior was measured by the 52-item Korean version (J. Park & Oh, 2005) of the Health Promoting Lifestyle Profile II (HPLP-II) questionnaire, which was originally developed by Walker et al. (1987). The HPLP-II comprises six subcategories: physical activities (eight items), spiritual growth (nine items), health responsibility (nine items), nutrition (nine items), interpersonal relationships (nine items), and stress management (eight items). Responses are scored on a 4-point scale (ranging from 1 = "strongly disagree" to 4 = "strongly agree"). The scores can range 52–208, where a higher score indicates a higher level of practice of health-promoting behaviors. The Cronbach's alpha was .94 in a previous study (Walker et al., 1987), and .90 in the present study.

2.4 | Health information seeking

Health information seeking was measured by the Health Information National Trends Survey developed by the US

National Cancer Institute to determine health-related communication characteristics of cancer patients, which was later utilized in a study regarding online health information-seeking behaviors of Korean residents in America (W. Kim & Kreps, 2014). After the preliminary survey, awkward Korean translations were revised before the actual survey was conducted. The survey comprises two parts: health information-seeking characteristics (10 items) and online health information-seeking activities (10 items).

Health information-seeking characteristics include main health information sources (one item), reliability of information (one item), satisfaction with health information-seeking results (four items), smart device possession (one item), health information seeking using smart devices (one item), using health-related applications (one item), and frequently used websites (one item). Among them, "reliability of information" was evaluated on a 4-point scale ranging from 1 = "very unreliable" to 4 = "very reliable", with a higher score indicating a higher level of reliability. "Satisfaction with health information-seeking results" was similarly evaluated along a scale of 1 = "strongly disagree" to 4 = "strongly agree". Four negative items were reverse-coded, with a higher score indicating higher level of satisfaction.

Online health information-seeking activities were evaluated with the 10 questions. Respondents were asked whether they sought 10 types of health information over the preceding 12 months, including information regarding their own health, health of others, diet/nutrition, physical activity, social network service (SNS), individual health information management, health experts, participating in an online support group, purchasing vitamins or drugs, and email communications with healthcare professionals. Responses were scored on a dichotomous basis (1 = "yes" and 0 = "no"). The scores can range 0–10, with a higher score indicating active online health information-seeking behaviors.

2.5 | Socio-individual determinants

Socio-individual determinants were measured by 13 items: education, household income, employment, health insurance status, residential area, length of residence in Korea, Korean language proficiency, citizenship, age, religion, parental status, chronic disease, and health status. Among them, "health status" and "Korean language proficiency" were evaluated on a 5-point scale ranging from 1 = "very poor" to 5 = "very good".

2.6 | Data collection

Data collection was carried out between November and December 2015. The purpose of this study was explained, and participants' cooperation was requested for data collection in relevant institutes located in G city and J province (e.g. multicultural family support center, the Philippines embassy, health clinic, foreign worker health center, etc.). The researcher and trained Filipino research assistants explained the purpose, method, and confidentiality of the study at a place within the data collection institute. The subjects who agreed to participate in the study were provided with the questionnaire in the language requested (Korean, English, Tagalog). The questionnaire was answered by the subjects without any help. When subjects had questions or requested clarifications during the survey, the researcher or assistants aided the subject.

2.7 | Ethical consideration

This study was reviewed and approved by the research ethics committee of the author's institution (IRB No. 1040198-151104-HR-056-03). Information about the purpose of the study, anonymity, and credit for the voluntary participants was provided, and written informed consent was obtained from all participants.

2.8 | Analytic strategy

Data were analyzed using PASW Statistics 21 (SPSS, Chicago, IL, USA). Differences in health-promoting behaviors regarding socio-individual determinants and health information seeking were analyzed using an independent *t* test and analysis of variance. Pearson's correlation coefficient among variables was evaluated and, in order to identify the factors influencing health-promoting behaviors, hierarchical multiple regression analysis was conducted.

3 | RESULTS

3.1 | Socio-individual determinants of subjects

Those with high school education and below comprised 35.8%, college dropouts comprised 30.5%, and those who were college graduates or higher comprised 33.7%. As for the monthly household income, US$1,000 to US$1,999 was the most common range (41.1%), while 25.8% of the subjects said that they did not know the income. A majority of the subjects (75.1%) had an occupation. Most of the subjects (91.1%) were national health insurance subscribers and the most common residential areas were rural households (41.6%). The mean residence period in Korea was 11.40 years (±5.85), and the level of Korean language proficiency averaged 3.24 (±0.71) out of 5. Those who acquired Korean citizenship comprised 51.9%.

The average age of the subjects was 37.3 (±8.4) years, and those who were 40 years or older comprised the most common age group (41.8%). Catholicism was the most

common religion (65.8%). Most of the subjects (93.1%) had children. The average health status was 1.63 (±0.55) out of 5, and 9.7% of the subjects were suffering from chronic diseases (Table 1).

3.2 | Level of health-promoting and health information-seeking behaviors

All health-promoting behaviors averaged 2.45 (±0.37) out of 4. As for the subcategories, the most common behavior participants engaged in was that related to spiritual growth (2.69 ± 0.47), followed by interpersonal relationships (2.55 ± 0.52), nutrition (2.50 ± 0.44), health responsibility (2.37 ± 0.51), stress management (2.37 ± 0.44), and physical activity (2.19 ± 0.48).

The most popular sources for health information seeking were healthcare professionals (39.0%), followed by family or friends (31.6%) and the Internet (28.9%). The reliability of health information sources was 2.88 (±0.91) out of 4, and the satisfaction with health information-seeking results was

TABLE 1 Health-promoting behaviors by socio-individual determinants (N = 190)

Characteristics	Categories	n (%) / mean ± SD	HPB mean ± SD	*t*, F, *r* (*p*)
Social determinants				
Education level	High school[a]	68 (35.8)	2.37 ± 0.38	7.59 (.001)
	College dropout[b]	58 (30.5)	2.38 ± 0.33	a,b < c[§]
	≧College graduate[c]	64 (33.7)	2.59 ± 0.36	
Household income (US$ per month)[†]	<1,000	39 (20.5)	2.44 ± 0.30	0.01 (.998)
	1,000-1,999	78 (41.1)	2.46 ± 0.38	
	≧ 2,000	23 (12.1)	2.45 ± 0.37	
	Do not know	49 (25.8)	2.45 ± 0.41	
Employment[†]	Unemployed	47 (24.9)	2.44 ± 0.36	0.26 (.795)
	Employed	142 (75.1)	2.46 ± 0.41	
Health insurance	Yes	173 (91.1)	2.46 ± 0.38	−1.74 (.083)
	No	17 (8.9)	2.30 ± 0.29	
Residential area	Metropolitan city	50 (26.3)	2.47 ± 0.30	0.74 (.480)
	City	61 (32.1)	2.48 ± 0.38	
	Rural	79 (41.6)	2.41 ± 0.41	
Length of residence in Korea (years)		11.40 ± 5.85		−0.14 (.049)
Korean proficiency[†]		3.24 ± 0.71		0.01 (.913)
Korean citizenship[†]	Have	98 (51.9)	2.41 ± 0.40	−1.57 (.119)
	Have not	91 (48.1)	2.49 ± 0.33	
Individual determinants				
Age[†]	20–29	33 (17.5)	2.46 ± 0.38	0.05 (.952)
	30–39	77 (40.7)	2.45 ± 0.36	
	≧ 40	79 (41.8)	2.44 ± 0.38	
Religion	Roman Catholic	125 (65.8)	2.45 ± 0.37	0.90 (.407)
	Christian	29 (15.3)	2.51 ± 0.28	
	Others	36 (18.9)	2.39 ± 0.42	
Parental status[†]	Yes	175 (93.1)	2.45 ± 0.37	0.30 (.767)
	No	13 (6.9)	2.48 ± 0.39	
Chronic diseases[†]	Have	18 (9.7)	2.55 ± 0.40	−1.14 (.255)
	Have not	167 (90.3)	2.44 ± 0.37	
Health status[†]		1.63 ± 0.55		−0.18 (.016)

Abbreviations: HPB = Health-promoting behaviors

[†]Missing values were included.

[§]Scheffe test.

2.39 (±0.51) out of 4. Most respondents (90.5%) possessed smart devices (tablet PCs or smartphones) and 55.8% used them to seek health information, while 9.5% used health-related applications. The most popular website for information seeking was Google (42.1%) followed by YouTube (19.9%), Facebook (19.0%), NAVER (12.5%), and others (6.5%).

Online health information-seeking activities was 6.02 (±2.27) out of 10. The most common item searched for online was health information for oneself (84.7%), followed by diet/nutrition (77.4%), physical activity (75.8%), using SNS (71.6%), health information for others (70.0%), individual health information management (63.2%), and health experts (58.9%). Apart from these, participating in a support group with those who had similar health problems (37.9%), purchasing vitamins or drugs (34.7%), and using email to communicate with healthcare professionals (24.2%) were comparatively unpopular (Table 2).

3.3 | Health-promoting behaviors by socio-individual determinants and health information seeking

As for the differences in health-promoting behaviors regarding socio-individual determinants, subjects who were college graduates or had a higher level of education showed significantly more health-promoting behaviors than those who graduated from high school or dropped out of college

TABLE 2 Health-promoting behaviors by health information seeking (N = 190)

Characteristics	Categories	n (%) / mean ± SD	HPB mean ± SD	*t*, F, *r* (*p*)
Primary sources[a]	HP	73 (39.0)	2.49 ± 0.37	2.79 (.064)
	Family or friends	59 (31.6)	2.36 ± 0.31	
	Internet	55 (28.9)	2.50 ± 0.41	
Reliability of sources		2.88 ± 0.91		0.17 (.022)
Satisfaction		2.39 ± 0.51		−0.06 (.383)
Smart device possession	Yes	172 (90.5)	2.46 ± 0.38	−1.86 (.064)
	No	18 (9.5)	2.29 ± 0.25	
Use of smart devices	Yes	106 (55.8)	2.50 ± 0.40	−2.41 (.017)
	No	84 (44.2)	2.38 ± 0.32	
Use of health apps	Yes	18 (9.5)	2.65 ± 0.53	−2.49 (.014)
	No	172 (90.5)	2.43 ± 0.34	
Frequently used websites[b]	Google	91 (42.1)		
	YouTube	43 (19.9)		
	Facebook	41 (19.0)		
	NAVER	27 (12.5)		
	Others	14 (6.5)		
Online activities		6.02 ± 2.27		0.04 (.554)
Item search for online[b]	HI for oneself	161 (84.7)		
	Diet/nutrition	147 (77.4)		
	Physical activity	144 (75.8)		
	Using SNS	136 (71.6)		
	HI for others	133 (70.0)		
	HI management	120 (63.2)		
	Health experts	112 (58.9)		
	Participating OSG	72 (37.9)		
	Purchasing drugs	66 (34.7)		
	Communication with HP	46 (24.2)		

Abbreviations: HI, health information; HP, healthcare professionals; HPB, health-promoting behaviors; OSG, online support group.

[a]Missing values were included.

[b]Multiple responses.

(F = 7.59, p = .001). The health-promoting behaviors of Filipino marriage-migrant women had a negative correlation with length of residence in Korea (r = −.14, p = .049) and health status (r = −.18, p = .016). Other than that, there were no significant differences in health-promoting behaviors regarding socio-individual determinants (Table 1).

Pertaining to health-promoting behaviors by health information seeking, there was a positive correlation with the reliability of health information sources (r = .17, p = .022). There was a statistically significant difference between those using smart devices to seek health information and those who did not (t = −2.41, p = .017). A statistically significant difference between those using health-related applications and those who did not (t = −2.49, p = .014) was also found. Other than that, there was no significant difference among other variables (Table 2).

3.4 | Factors influencing health-promoting behaviors

In model I, when we input socio-individual determinants, education (β = .19, p = .001) and health status (β = −.10, p = .033) affected health-promoting behaviors, and the explanation power of the model was 9%. In model II, which additionally included health information-seeking variables, education (β = .15, p = .008), health status (β = −.10, p = .038), and smart device possession (β = .20, p = .032) had a significant influence on health-promoting behaviors. The explanation power of model II was 12%, which thereby showed a 3% increase in explanation power compared to model I (Table 3).

4 | DISCUSSION

This study used the structural influence model as its conceptual framework to explain the influencing factors of health-promoting behaviors. In was confirmed that education and health status among socio-individual determinants and smart device possession among health information seeking were significant influencing factors of health-promoting behaviors. It can be assumed that marriage-migrant women who do not own smart devices are more likely to be vulnerable in various aspects including socio-economic position and cultural adjustments. Such vulnerabilities could have a negative effect on health-promoting behaviors. Although this model was not sufficient to explain the health-promoting behaviors of migrant women, it provided a framework for recognizing that health information seeking could affect health-promoting behaviors.

Of all the study subjects, 33.7% were college graduates or had a higher level of education, which was a comparatively higher percentage than that recorded by the Korean national survey conducted in 2015, which revealed that 24% of marriage migrants were college graduates (Ministry of Gender Equality and Family, 2015). Filipino marriage-migrant women with a higher level of education tend to enjoy healthier lifestyles – a finding that was also reflected in studies targeting Arab migrants in the USA (Aqtash & Van Servellen, 2013) and migrant women from the Caribbean (Persaud, 2007).

Filipino marriage-migrant women with shorter residence periods in Korea showed more health-promoting behaviors. The relationship between length of residence at the migrant country and health-promoting behaviors showed mixed

TABLE 3 Factors influencing health-promoting behaviors (N = 190)

		Model I		Model II	
Variables	**Categories**	**β**	**t (*p*)**	**β**	**t (*p*)**
Socio-individual determinants	Education[a] (ref. = high school or college dropout)	.19	3.51 (.001)	.15	2.67 (.008)
	Length of residence	−.01	−1.49 (.138)	−.01	−1.42 (.158)
	Health status	−.10	−2.15 (.033)	−.10	−2.09 (.038)
Health information-seeking	Reliability of sources			.06	1.97 (.051)
	Smart device possession[a](ref. = no)			.20	2.17 (.032)
	Use of smart devices[a](ref. = no)			.02	0.27 (.786)
	Use of health apps[a](ref. = no)			.12	1.43 (.155)
R^2		.11		.16	
Adjusted R^2		.09		.12	
F (*p*)		7.53 (<.001)		2.62 (.037)	

Abbreviations: β, standardized beta; ref, reference group.
[a]Dummy variables.

results in previous studies. One study showed that among subjects with an average residence period of about 3 years, health-promoting behaviors were found to increase with an increase in the residence period (M. J. Kim, Kim, & Jung, 2008). However, other studies showed that when the residence period of the subjects averaged 4.2 years (J. K. Jung & Park, 2012) or 4.8 years (Yang, 2011), the level of drinking increased, and the practice rate of physical activity decreased as the residence period increased. In a national survey conducted in 2015, the subjective health status of marriage migrants was better than that of the general public (Ministry of Gender Equality and Family, 2015). However, in the same survey, in the age group comprising those over 60 years, the subjective health status of the general public was better than that of the migrants. This reveals that although the health status of migrants was better than that of native Koreans soon after migration, it showed a tendency to worsen with increasing lengths of residence (Lee et al., 2011). This study also confirmed that an increase in the residence period of marriage-migrant women reduces their practice of health behaviors, which indicates that such an increase ultimately has a negative influence on health.

The recent survey of migrants in Korea (Ministry of Gender Equality and Family, 2015) indicated that the higher the age, the lower the household income, and the lower the education level, the more difficult it was to use healthcare institutions. The major problems faced in using healthcare institutions were economic problems, language barriers, lack of information on healthcare systems, and complicated healthcare institution procedures. In a study of Australian Filipino migrants, competing priorities, communication difficulty, and lack of knowledge about health systems were found to be barriers to health-seeking behavior (Maneze, DiGiacomo, Salamonson, Descallar, & Davidson, 2015). Most subjects in this study were low-income migrant women who were responsible for work and childcare. Most marriage-migrant women in Korea are known to be pregnant less than a year after marriage and the average number of children was 1.3 (H. R. Kim, 2009). The number of working women increased from 49.0% in their 20s to 64.2% in their 30s and 75.9% in their 40s. This was about 10% higher than that of native Korean women (Ministry of Gender Equality and Family, 2015). Therefore, it is assumed that migrant women in low-income families are forced to work after their children passed the early childhood period, and their health-promoting behaviors become neglected because of their competing priorities of work and childcare. Furthermore, the complex healthcare system provided in Korean language would have hampered the health behaviors. In other words, migrant women faced barriers common in low-income women but were exacerbated by migrant status when they attempt to seek health behaviors (Fleischman et al., 2015). As the residence period of migrants increases along with the development of a multicultural society, there is a need to observe how their health-promoting behaviors change through prospective studies.

The subjects of this study showed more health-promoting behaviors during worsening subjective health conditions. However, in a study targeting 300 marriage-migrant women (G. S. Kim & Moon, 2011), health-promoting behaviors and subjective health status were found to have a positive relationship, while in a study targeting North Korean defectors (Choe, Yi, Choi, & Shin, 2012), the subjective health status did not seem to affect health-promoting behaviors. Thus, there was no consistent relationship between the self-reported health status and health-promoting behaviors of migrants.

To seek health information, the most common source of the study subjects were healthcare professionals (39.0%), followed by family or friends (31.6%), and the Internet (28.9%). As most Koreans use the Internet (75.1%) followed by mass media including TVs and newspapers (12.9%) and healthcare professionals (7.1%) to seek health information (Pyo, 2010), it indicates that migrant women use mass media including the Internet less than do native Korean people. The differences in health information sources can be interpreted as linguistic and cultural differences, such as the level of Korean language proficiency and accessibility to health information. This is similar to the context of Korean Americans seeking health information through Korean mass media or from Korean healthcare professionals (Oh, Zhou, Kreps, & Kim, 2014).

Meanwhile, it was confirmed that those using the Internet to obtain health information had different pursuing behaviors and attitudes toward diseases (S. Park & Lee, 2011). Moreover, the type of information was also different depending on the level of health behavior (G. S. Kim et al., 2010). In this study, there was no significant difference in health-promoting behaviors based on health information sources, but the respondents who obtained information from family or friends practiced the lowest level of health-promoting behaviors. This is assumed to be the situation afflicting those who seek information from family or friends to solve their immediate health problems rather than actively pursuing health promotion.

Filipino marriage-migrant women explored online health information for themselves (84.7%) or for family or friends (70.0%). These findings corresponded to that of a previous study in which migrants sought health information for themselves (W. Kim & Kreps, 2014). Additionally, more than half of the respondents used the Internet and SNS to search for information regarding diet/nutrition, physical activity, social networking, individual health information management, and health experts. This supports the conclusion of a

previous study showing that Filipino marriage-migrant women have a higher tendency of using the Internet and SNS (D. Y. Kim, 2010), and it is similar to Korean Americans sharing health information through online channels like SNS (W. Kim & Kreps, 2014).

Most Filipino marriage-migrant women (90.5%) possessed smartphones or tablet PCs enabling Internet access. About half of the respondents (55.8%) used the Internet to seek health information, and a few of them (9.5%) installed health-related applications (e.g. pace counter) to further monitor their health. These results were similar to that 61% of American adults searched online health information and 9.5% used health-related applications (Madden, Lenhart, Cortesi, & Gasser, 2010). We assumed that the similarity might be due to the subjects' long residence period (average 11.4 years) and the high smartphone distributions and easy Internet accessibility in Korea (National Information Society Agency, 2014). However, from other perspectives, even though the majority of Filipino marriage-migrant women possessed smart devices, they showed a lower rate of health-related application utilization. In other words, it indicates that there could be an unequal distribution of health information, and information alienation, based on the level of Internet application and utilization, regardless of the possession of smart devices (National Information Society Agency, 2014).

4.1 | Limitations and recommendations for future research

Our study provides the framework for further studies to assess the health-promoting behaviors of migrants through social determinants reflecting migration status and health information seeking. However, the regression model had a low explanatory power of 12%, and other significant influencing factors remain to be determined. This study is also limited as it targeted only Filipino marriage-migrant women from G city and J province.

This study showed that migrant women who have low educational attainment, good health, and no smart devices have the least practice of health-promoting behavior. They are predicted to experience adverse health outcomes as the length of residence period in Korea increases, and future studies should focus on developing effective health-promoting strategies for these vulnerable migrant women. In addition, considering the high accessibility to the Internet and most migrant women possessing smart devices in Korea, further research is needed to determine the effects of using health-related applications on health-promoting behaviors of migrant women. The findings also suggest that health education for migrants should be provided with information on reliable health information sources and methods for searching and utilizing health information easily by using smart devices.

5 | CONCLUSIONS

This study was the first to analyze the relationship between socio-individual determinants, health information seeking and health-promoting behaviors among marriage-migrant women living in Korea. Although Filipino marriage-migrant women showed a high level of smartphone possession and Internet activity, health information-seeking behaviors only partially influenced health-promoting behaviors. Nevertheless, the findings of this study highlight the applicability and necessity of smart device-based health promotion programs. In addition, this study suggests the need for an accessible, reliable, and easily understandable Internet-based health information source for migrants to seek, understand, and use the information necessary to facilitate health-promoting behaviors.

CONFLICT OF INTERESTS

The authors declare they have no relevant financial interest or competing interest.

AUTHOR CONTRIBUTIONS

JA wrote the manuscript, contributed to the design of the study, coordinated the data, and revised the manuscript. DC wrote the manuscript, contributed to the design of the study, and revised the manuscript. All authors read and approved the final version of the manuscript.

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