The moderating role of acculturation mode on the relationship between depressive symptoms and health-related quality of life among international students in Korea

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ABSTRACT

We examined the moderating role of acculturation mode on the relationship between depressive symptoms and health-related quality of life (HRQoL) in international students. This cross-sectional study enrolled a convenience sample of 147 international students at a university in Korea. Participants' overall HRQoL was moderate (mean = 57.2 of 80). The main and interaction effects of depressive symptoms and selected acculturation modes explained 39.9% of the variance in HRQoL. For all acculturation modes except the integration mode, as depressive symptom scores increased, HRQoL decreased. Specifically, at high depressive symptoms levels, participants with the marginalization, separation, and assimilation modes had worse HRQoL than did the integration mode, while HRQoL was similar for all acculturation modes at low depressive symptom levels. These findings suggest that future prospective intervention strategies should be considered for not only depressive symptoms levels, but also for different acculturation modes to enhance HRQoL in this population.

Introduction

Worldwide, international student mobility has increased remarkably, from about 2.2 million students in 2000 to 4.5 million in 2012 (Institute of International Education, 2014). Global higher education has particularly expanded in Asia (e.g., China, India, and South Korea) (British Council, 2012). For instance, the number of international students in Korean universities/colleges increased 7.6% in 2015 compared to 2014 (Ministry of Education of Korea, 2015); these students' countries of origin ranged widely, including China, Vietnam, the United States (USA), and Japan (Ministry of Education of Korea, 2015). International students face considerable stress during their adaptation to Korea. Particularly, they are faced with language barriers that can influence academic performance and impede interaction with classmates (Yan & FitzPatrick, 2016). Other transcultural difficulties include health issues, discrimination, poor peer relationships, and religious differences (Smith & Khawaja, 2011).

Acculturation is defined as the process of adopting the cultural traits or social patterns of another group (Berry, 1992). The overall

transcultural adaptation process can impact international students' health-related quality of life (HRQoL) (Bhandari, 2012; Yan & FitzPatrick, 2016). Berry (1992) proposes four acculturation strategies (modes) formed of two dimensions: "maintenance of ethnic cultural identity and characteristics" and "maintenance of relationships with other groups." These modes include integration (high affiliation with ethnic heritage and host culture); assimilation (high affiliation with host culture only); separation (high affiliation with ethnic heritage only); and marginalization (low affiliation with both ethnic heritage and host culture) (Berry, 2005; Kaholokula, Nacapoy, Grandinetti, & Chang, 2008). Most past studies indicate that international students use mainly the separation mode. For example, among East Asian international university students in Germany, the separation mode was most prevalent and the integration mode the least (Shim, Freund, Stopsack, Kämmerer, & Barnow, 2014). Conversely, marginalization is the most stressful strategy; separation and assimilation are somewhere in the middle.

Depending on one's particular acculturation modes, health status, such as HRQOL, may differ among immigrants (Berry, 2005; Lian &

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Tsang, 2010). Among immigrants in Northern Chile, those using the integration mode had higher HRQoL (Urzúa et al., 2017). In a German National migrant study, the separation mode was related to lower HRQoL (Brand et al., 2017). Acculturation to a new educational environment can be a negative predictor of HRQoL among Nepalese students studying in South Korea (Bhandari, 2012). Similarly, among immigrant women, acculturation was related to the pain, vitality, mental health, and social functioning aspects of HRQoL, even when they moved within Asian countries, which have relatively similar cultures (Yang & Wang, 2011). Due to acculturation's bilinear process in the context of the culture and value system, acculturation is related to the physical and psychological aspects of HRQoL as well as the social and environmental aspects (Brand et al., 2017).

The predominant mental health problem for immigrants is depressive symptoms (Maradiegue, Lyon, & Meyers, 2013). Likewise, about 45% of international students report depressive symptoms related to acculturation mode while studying in a host country (Kono, Eskandarieh, Obayashi, Arai, & Tamashiro, 2015). Depressive symptoms can negatively affect HRQoL by impairing academic and social functioning (Arslan, Ayranci, Unsal, & Arslantas, 2009). Berry (2005) claimed that integration produces the least acculturative stress, making it conducive to good mental health. A meta-analysis of 325 studies revealed that integration was the favored mode from the perspective of mental health (Yoon et al., 2013). For example, the integration mode was associated with lower risk of depressive symptoms compared to the separation and marginalization modes among Turkish migrants in Germany (Morawa & Erim, 2014). Similarly, the integration mode showed less depression than did the other three modes among Turkish migrants in the Netherlands (Ünlü Ince et al., 2014). For Korean immigrants to the USA, higher integration and lower marginalization scores were associated with lower depressive symptoms scores (Kim, 2009).

Studies in Western countries have emphasized the importance of HRQoL for international students during their adjustment to new environments (Chai, Krägeloh, Shepherd, & Billington, 2012; Yan & FitzPatrick, 2016). Most studies have focused on the association of acculturative stress and HRQoL (Bhandari, 2012; Chai et al., 2012). A recent study suggested that the interaction of acculturation modes with depressive symptoms might buffer or accelerate heath status or HRQoL. Among immigrant Hispanic childhood cancer survivors in the USA, the assimilation mode was associated with higher depressive symptoms and lower HRQoL (Tobin et al., 2018). However, little information is available on this interaction (i.e., moderating effect) of acculturation mode on the relationship between depressive symptoms and HRQoL in international students in Korea. This moderating effect may be useful for developing strategies for promoting HRQoL among international students; understanding the transcultural and psychosocial factors related to HRQoL is important for developing effective strategies and providing comprehensive nursing care to affected individuals.

The specific aims were (a) to describe the acculturation modes, depressive symptoms, and HRQoL of the sample and (b) to determine whether the relationship between depressive symptoms and HRQoL is moderated by acculturation mode (Fig. 1).

Materials and methods

Design and participants

A cross-sectional survey design was utilized. We recruited a convenience sample of 147 international students from a university in Suwon, South Korea. These students were members of the Office of International Affairs and were enrolled in undergraduate or graduate courses. We selected international students aged 19 years or older who could read/write in English equivalent to an Official Test of English as a Foreign Language (TOEFL) score of > 550/213 (paper-based test/computer-based test) or an International English Language Testing System (IELTS) score of above 5.5. The sample size was based on an a priori power analysis conducted using G*Power 3.1.9.4 (Faul, Erdfelder, Buchner, & Lang, 2009). A minimum sample size of 113 was required to obtain a medium effect size ($f^2 = 0.13$) with seven independent variables and one dependent variable for regression analysis, at a two-sided significance threshold of 0.05 and a power ($1 - \beta$) of 80; a medium effect size was selected based on previous research (Son & Lee, 2011).

Data collection and ethical considerations

Data collection was conducted from March 2013 through August 2014. Before the study, we obtained approval from the Institutional Review Board of our institution. Participants were informed about the research study purpose, risks and benefits, alternatives to participation, confidentiality, compensation, voluntary participation, and who to contact with questions. All participants voluntarily signed an informed consent form. All survey questionnaires were self-reported, and the survey took approximately 20 min to complete.

Measures

Health-related quality of life

HRQoL was measured using the World Health Organization Quality of Life Instrument-Short Version (WHOQOL-BREF; Skevington, Lotfy, & O'Connell, 2004). The WHOQOL-BREF contains 26 items scored on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). This scale contains two items assessing overall HRQoL and four domains: physical (7 items), psychological (6 items), social relationships (3 items), and environmental (8 items). Raw domain scores were transformed to a score ranging from 4 to 20, according to the WHOQOL-BREF instructions. The total scale score (i.e., sum of the four domains) ranges from 16 to 80. Higher scores denote higher HRQoL. The Cronbach's alpha for the total scale and domains ranged from 0.72 to 0.82 (Henning, Krägeloh, Moir, Doherty, & Hawken, 2012), and was 0.93 for the total scale in the present study.
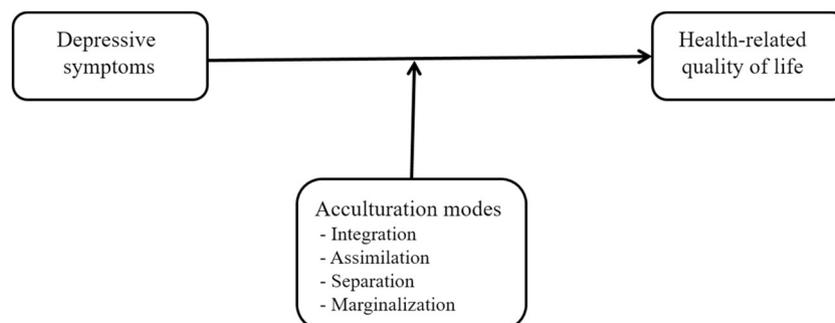

Fig. 1. The hypothesized model: the moderating role of acculturation modes on the relationship of depressive symptoms and health-related quality of life.

Acculturation mode

We assessed acculturation mode using the acculturation attitudes questionnaire developed by Ward and Kennedy (1994). This questionnaire evaluates the two dimensions of acculturation attitude—co-national (own country) and host-national (Korean) identification—using 21 cognitive and behavioral items scored on a 7-point Likert scale from 1 (*not at all similar*) to 7 (*extremely similar*). Scores indicate the similarity between participants' life experiences in their own country and Korean culture; the total score ranges from 21 to 147, with higher scores indicating greater similarity.

Using participants' acculturation attitudes, we classified them into four modes: integration, assimilation, separation, and marginalization. Individuals displaying the integration mode exhibit scores over the median on both the co-national and host-national dimensions (i.e., they have adapted to the host-national culture while maintaining their co-national identity). The assimilation mode exhibits scores lower and higher than the median on co-national and host-national dimensions, respectively (i.e., a stronger host-national identity at the expense of their co-national identity). The separation mode is the opposite of the assimilation mode—these students maintain their co-national culture without adjusting to their host-national culture. Finally, the marginalization mode has scores lower than the median on both dimensions; they have no concern for either identity (Ward & Kennedy, 1994). A study of international students in South Korea found Cronbach's alphas of 0.94 and 0.92 for the co-national and host-national dimensions, respectively (Son & Lee, 2011); the alphas were 0.95 and 0.92 in this study.

Depressive symptoms

Depressive symptoms were measured using the Self-Rating Depression Scale (Zung, 1965), which has been used for students (Mowrer & Parker, 2004). This scale comprises 20 items scored on a 4-point Likert scale ranging from 1 (*a little of the time*) to 4 (*most of the time*). The total score ranges from 20 to 80, with higher scores representing more severe depressive symptoms. Scores of < 50, 50–59, 60–69, and ≥70 indicate normal, mild depression, moderate depression, and severe depression, respectively. The Cronbach's alpha was 0.81 for students in the Mowrer and Parker (2004) study and 0.93 in this study.

Data analysis

IBM SPSS Statistics for Windows version 20.0 (IBM Corp., Armonk, NY, USA) was used for data analyses. Descriptive statistics (means, standard deviations (*SD*), and percentages) were used to describe participants' general characteristics. Analysis of variance was used to test for differences in depressive symptoms and HRQoL by acculturation mode. Acculturation mode was transformed into 3 dummy variables (assimilation, separation, and marginalization) with a reference category (integration). To avoid multicollinearity in the interaction term of depressive symptoms and acculturation mode, the independent variable (i.e., depressive symptoms) was centered before creating the term (Aiken & West, 1991). Multiple regression analyses using the PROCESS macro for SPSS (Release 2.13.2; Hayes, 2013) were used to examine the moderating effect of acculturation mode on the association between depressive symptoms and HRQoL. Interaction analysis (simple slope tests) was implemented with Interaction version 1.7.2211 (Soper, 2012). All analyses were two-tailed and the significance level was set at 0.05.

Results

Participant characteristics, depressive symptoms, acculturation mode, and health-related quality of life

Table 1 shows participants' characteristics. Their mean age was

Table 1
General characteristics (*N* = 147).

Variables	Categories	*n*	(%)
Age (years)	≤25	77	(52.4)
	26–30	46	(31.3)
	≥31	24	(16.3)
Gender	Male	91	(61.9)
	Female	56	(38.1)
Nationality	East Asia	39	(26.5)
	East-South Asia	17	(11.6)
	Central Asia	38	(25.8)
	Non-Asia	53	(36.1)
Registered program	Undergraduate	63	(42.8)
	Master	62	(42.2)
	Doctor	12	(8.2)
	Other	10	(6.8)

Notes: Mean (*SD*) age was 25.15 (4.80) years old.

25.15 years. Fifty-six (38.1%) participants were female, and most (*n* = 94, 63.9%) were from the Asian continent with similar percentages of undergraduate and master's students. Participants' mean depressive symptoms score was 37.94 (range, 20–80), with 137 (93.2%) demonstrating normal depressive symptoms. The mean total HRQoL score was 57.2 (range 16–80). For the HRQoL domains, the means were 12.95 for physical, 14.17 for psychological, 15.14 for social relationships, and 14.94 for environmental HRQoL (each domain range, 4–20). Participants' acculturation attitude score for the co-national and host-national dimensions were 107.99 and 85.47, respectively (range, 21–147). Most participants were in the marginalization group (*n* = 42, 28.6%), followed by integration (*n* = 38, 25.8%), separation (*n* = 35, 23.8%), and assimilation (*n* = 32, 21.8%) (Table 2 and Fig. 2).

Moderation analysis

Table 3 shows a visual representation of the conditional effect of depressive symptoms (X: independent variable) on overall HRQoL (Y: dependent variable) by acculturation mode (M: moderation). The final multiple regression model explained 39.9% of the overall variance in HRQoL (R^2 = 0.399, *F* (7,139) = 12.760, *p* < .001). The effects of depressive symptoms (β = −0.263, *p* = .013; 95% CI −0.416, −0.051) and selected acculturation modes were significantly and negatively associated with HRQoL. Compared to the integration mode (reference category), the most significant and negative predictor of HRQoL among the three acculturation modes was the marginalization mode (β = −0.289, *p* < .001; 95% CI −6.840, −1.988) followed by the separation (β = −0.171, *p* = .024; 95% CI −5.177, −0.369) and assimilation (β = −0.149, *p* = .057; 95% CI −5.046, 0.078) modes.

There were significant interaction effects between depressive symptoms and the assimilation (β = −0.189, *p* = .037; 95% CI −0761, −0.023) and separation (β = −0.166, *p* < .018; 95% CI −0.570, −0.055) modes. Specially, the coefficient as an interaction slope

Table 2
Health-related quality of life, acculturation attitudes, and depressive symptoms (*N* = 147).

Variables	Mean (*SD*)	Skewness	Kurtosis	Range
HRQoL				
Physical HRQoL	12.95 (1.86)	−0.115	0.777	4–20
Psychological HRQoL	14.17 (1.91)	−0.425	0.266	4–20
Social relationships HRQoL	15.14 (2.80)	−0.601	0.838	4–20
Environmental HRQoL	14.94 (2.00)	0.215	−0.146	4–20
Acculturation attitudes				
To own country	107.99 (22.15)	−0.685	0.232	21–147
To Korean culture	85.47 (20.85)	0.013	−0.449	21–147
Depressive symptoms	37.94 (7.80)	−0.114	−0.742	20–80

Abbreviations: HRQoL, health-related quality of life.

Acculturation attitudes
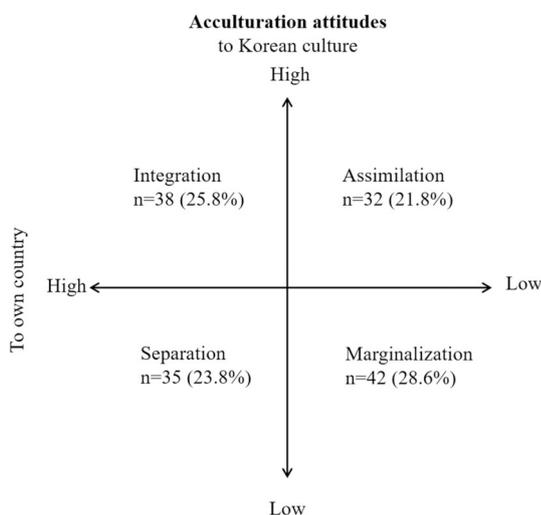to Korean culture
High

Fig. 2. Modes of acculturation.

between the assimilation mode and depressive symptoms significantly increased by 21.2%. There was a trend for an interaction between depressive symptoms and the marginalization mode ($\beta = -0.165$, $p = .089$; 95% CI $-0.552, 0.040$). R-square increase due to interaction accounted for a marginally significant proportion of the variance in HRQoL ($\Delta R^2 = 0.032$, F (3,139) = 2.603, $p = .054$).

Fig. 3 and Supplement Fig. 1 show visual representations of the conditional effect of depressive symptoms in four groups defined by the moderator variable (acculturation modes) on overall HRQoL and each domain of HRQoL, respectively. We observed the simple slope test results at low or high level of depressive symptoms by acculturation modes on overall HRQoL; the simple slopes of integration, assimilation, separation, and marginalization modes were -0.233 ($p = .013$), -0.626, -0.546, and -0.489 (*all ps* $< .001$), respectively (*see* Fig. 3). At low depressive symptom levels, HRQoL was similar across all acculturation modes (at higher than the average). At high depressive symptom levels, participants with the marginalization, assimilation, and separation modes had worse HRQoL (Mean = 51.39, 52.18, and 52.55, respectively) than did the integration mode (Mean = 57.95; reference value of dummy variable), respectively (*see* Fig. 3). Specifically, an accelerating effect was observed—as acculturation modes and depressive symptoms scores increased, HRQoL decreased. This pattern was found for all acculturation modes except integration, which was significant overall and for physical and environmental HRQoL with a trend for psychological and social relationships HRQoL (*see* Supplement Fig. 1).

Discussion

This may be the first study to examine the moderating role of

acculturation mode on the relationship between depressive symptoms and HRQoL among international students in Korea. We found that acculturation mode did in fact moderate this relationship. Use of the four modes was roughly even among participants. This result is consistent with previous research on sojourner university students (Lian & Tsang, 2010; Ma & Wang, 2015). Chinese Mainland undergraduate students in Hong Kong more often used integration (Lian & Tsang, 2010), whereas doctoral students had an equal distribution of acculturation modes (Ma & Wang, 2015). Furthermore, the separation mode was more prevalent among immigrants (Brand et al., 2017; Urzúa et al., 2017).

It should be noted that under Berry's (1992) classification, international students are not permanent immigrants but temporary visitors willing to learn the host country's academic and ethnic culture (Lian & Tsang, 2010); thus, integration is perhaps best for this population. Still, Asian university students in Germany more often used separation (Shim et al., 2014) compared to immigrants (Morawa & Erim, 2014; Ünlü Ince et al., 2014). Therefore, it is likely that the unfamiliar and strange environment that comes with visiting a country with a vastly different ethnicity and language has considerable impact on acculturation mode. A national policy for the international population (e.g., students, immigrants) should be prepared and tailored for the characteristics of each population.

In our study, participants with the integration mode had higher HRQoL than did those with the other modes. This finding coincides with a study of Turkish migrants in Germany (Brand et al., 2017). Specifically, the integration mode was positively related to physical and mental HRQoL, whereas separation was negatively associated with overall HRQoL and marginalization with mental HRQoL (Brand et al., 2017). Integration has previously been identified as the most beneficial mode for HRQoL, while marginalization was the most harmful (Urzúa et al., 2017). Among immigrants with disease such as cancer or schizophrenia, acculturation was a significant predictor of HRQoL (Kim, Ashing-Giwa, Kagawa Singer, & Tejero, 2006), with the integration mode being a predictor of higher HRQoL (Tobin et al., 2018; Weisman de Mamani et al., 2017). Together, the literature suggests that integration serves as a buffer against acculturative stress and its resultant physical and mental health problems (Kashima & Loh, 2006) and may enhance HRQoL (Yang & Wang, 2011). Therefore, international students should be assisted to better balance integration of their co-national and host-national identities.

Participants' overall HRQoL was moderate in this study. This result accords with previous research on international students (Bhandari, 2012; Henning et al., 2012). However, international students often have lower HRQoL than do middle-aged Korean adults (Kim & Kang, 2015). This result is consistent with a study of Nepalese students in Korea, where HRQoL scores (using a different HRQoL instrument) were lower than were the general USA population normed scores (Bhandari, 2012). Therefore, international students in Korea may be a critical population for interventions optimizing HRQoL.

Depressive symptoms, which were also moderate, were a strong

Table 3

Results from a regression analysis examining the moderation of the effect of depressive symptoms to overall health-related quality of life by acculturation modes.

Final model		Unstandardized coefficients	SE	Standardized coefficients (β)	t	p	LLCI	ULCI
Intercept	i_1	59.901	0.818		73.272	< .001	58.285	65.517
Depressive symptoms (X → Y)	a_1	−0.233	0.092	−0.263	−2.526	.013	−0.416	−0.051
Assimilation mode (D_1 → Y)	b_1	−2.484	1.296	−0.149	−1.917	.057	−5.046	0.078
Separation mode (D_2 → Y)	b_2	−2.773	1.216	−0.171	−2.281	.024	−5.177	−0.369
Marginalization mode (D_3 → Y)	b_3	−4.414	1.226	−0.289	−3.597	< .001	−6.840	−1.988
Interaction1 (X*D_1 → Y)	c_1	−0.392	0.187	−0.189	−2.101	.037	−0.761	−0.023
Interaction2 (X*D_2 → Y)	c_2	−0.313	0.130	−0.166	−2.398	.018	−0.570	−0.055
Interaction3 (X*D_3 → Y)	c_3	−0.256	0.150	−0.165	−1.711	.089	−0.0552	0.040
		$R^2 = 0.399$, MSE = 30.146, F (7,139) = 12.760, $p < .001$						

Abbreviations: D, dummy variable; MSE, Mean Squared Error; SE, Standard Error; LLCI, Lower Limit of Confidence Interval; ULCI, Upper Limit of Confidence Interval.
Notes. Reference value of dummy variable, integration mode; X = independent variable, Y = dependent variable.
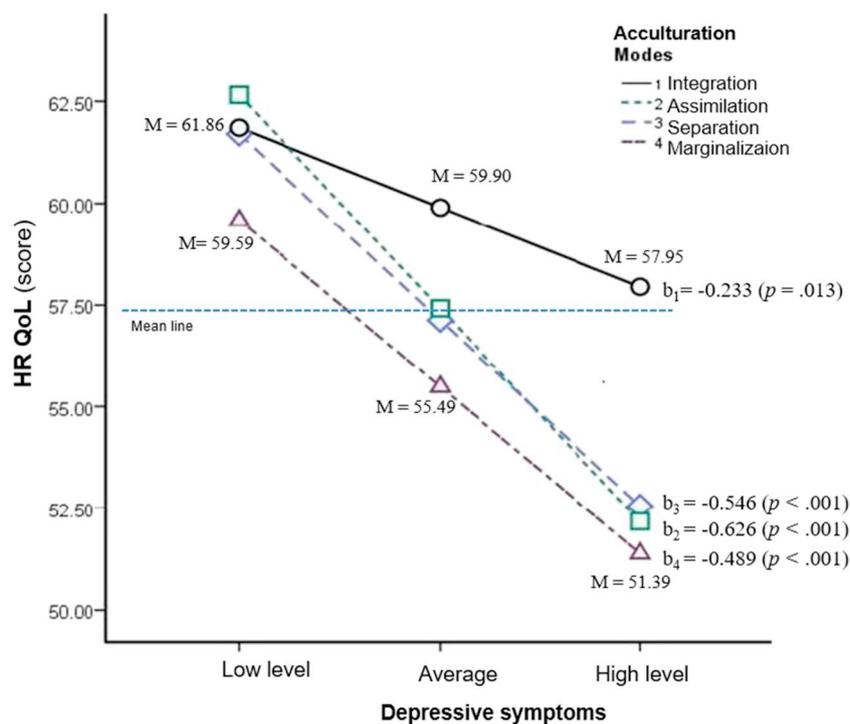R-square increase due to interaction: R^2 change = 0.032, F (3,139) = 2.603, $p = .054$.

Fig. 3. A visual representation of conditional effect of depressive symptoms in four groups defined by the moderator variable (acculturation modes) on overall health-related quality of life.
Abbreviations: M, mean; HRQoL, health-related quality of life.
Notes: 1 = integration; 2 = assimilation; 3 = separation; 4 = marginalization.

predictor of HRQoL in this study. This finding accords with the findings of Kim and Kang (2015). For international students, risk factors of depressive symptoms include health status, relationships with advisors (Han, Han, Luo, Jacobs, & Jean-Baptiste, 2013), sleep quality, housing conditions (Kono et al., 2015), lifestyle behaviors, and future occupations (Arslan et al., 2009). Therefore, it is important that international student facilities provide not only academic services, but also health-related counseling covering the physical, psychological, social relationship, and environmental domains.

Acculturation mode was a moderator of the association between depressive symptoms and HRQoL, although the interaction effect was borderline significant and a rather small effect. Particularly, participants with the marginalization, assimilation, and separation modes with high depressive symptoms had significantly worse HRQoL than did those with the integration mode. The interaction plot also indicated an accelerating effect—as acculturation mode and depressive symptoms scores increased, HRQoL decreased. Integration is rarely associated with lower HRQoL, and is instead known to be related to lower depressive symptoms. According to Berry (2005), integration involves maintaining one's co-national culture during daily interaction with the larger host-national social network (Berry, 2005). Past studies indicate that a bi-cultural heritage may serve as a protective factor for health, which may explain why the integration mode seems to benefit HRQoL (Urzúa et al., 2017).

However, among Latino cancer survivors in America, more acculturated Latino adults were more likely to have depression and a poorer HRQoL (Ritt-Olson et al., 2018). Potentially, international students experiencing depressive symptoms in the stressful academic environment in Korea, but who continue to identify with the co-national culture, may utilize relevant helpful resources (e.g., their own spiritual institutes, the university's cultural center, and the student cultural council). Similarly, maintaining a co-national culture and values might provide greater meaning and richness to these students' lives, while simultaneously actively interacting with institutional or resources

systems associated with the host culture.

Contribution to the literature

Our results indicate that nurses working in college communities should consider international students' acculturation attitudes for ensuring health promotion. Particularly, international students with depressive symptoms may be able to enhance HRQoL if they adopt the integration strategy. To this end, it may be necessary to develop interactive strategies for specific acculturation modes, along with screening and management of depressive symptoms, to improve international students' HRQoL. These findings suggest directions for future research, such as longitudinal studies of these relationships and intervention studies designed to improve integration mode and depressive symptoms for effects on HRQOL.

Limitations of this study

This study has some limitations. First, the data were collected using convenience sampling of members of a single university's Office of International Affairs of Korea. The sample was drawn from one site, which may be a setting bias. To increase the generalizability of our findings, studies should conduct random sampling of participants from multiple sites (i.e., universities) across South Korea. Second, since this study utilized a cross-sectional design, we cannot assume causal relationships between HRQoL and acculturation. The results should be confirmed in a large population-based prospective longitudinal study design to examine directionality of the relationships. Third, another possible source of bias is the self-reported measurements that we used; data collected by self-report could affect the results.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apnu.2019.08.003.

Acknowledgments

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