

Acculturative Stress, Work-related Psychosocial Factors and Depression in Korean-Chinese Migrant Workers in Korea

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Abstract: Acculturative Stress, Work-related Psychosocial Factors and Depression in Korean-Chinese Migrant Workers in Korea: Hyeonkyeong LEE, et al. Yonsei University College of Nursing, Korea—Objectives: The purposes of this study were to identify the relationships among acculturative stress, work-related psychosocial factors and depression in Korean-Chinese migrant workers living in Korea and to determine whether work-related psychosocial factors mediate the relationship between acculturative stress and depression. **Methods:** A descriptive correlational cross-sectional design was used. A convenience sample of 200 Korean-Chinese full-time migrant workers was recruited, and 170 completed questionnaires were included in the analysis. Acculturative stress was assessed by Sandh and Asrabadi's Acculturative Stress Scale. Work-related psychosocial factors were assessed by job demand, insufficient job control and interpersonal conflict measures from the Korean Occupational Stress Scale. Depression was assessed by the Center for Epidemiologic Studies Depression Scale. Self-administered or face-to-face surveys were conducted by trained data collectors. Multiple regression and path analysis were used. **Results:** Roughly 30% of the sample met the criteria for depression. Female workers had significantly higher depression scores than male workers. Acculturative stress and work-related psychosocial factors significantly predicted 26.3% of the variance in depression. A path model revealed the mediating effect of job demand on the relationship between acculturative stress and depression. **Conclusions:** Our results indicate that work-related psychosocial factors are salient factors that lead to depression among Korean-Chinese migrant workers living in Korea. The results suggest that occupational health-care professionals should promote the prevention

and management of depression in this population and highlight the importance of acculturation context in the development of interventions designed to reduce work-related stress.

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Key words: Acculturative stress, Depression, Job stress, Migrant workers

During the last decade, one of the greatest social changes in South Korea has been the development of a multicultural society with increasing numbers of migrant workers. Migrant workers, mostly from Asian countries, comprised 2.3% of the total Korean workforce in 2009¹. Korean-Chinese (commonly called *Chosun-Jok*), Chinese citizens of Korean origin living in China, are currently the largest group of migrant workers and accounted for roughly 60% of Korea's migrant workers in 2009¹. Although Korean-Chinese make up such a large proportion of foreign workers in Korea, there is a lack of services for health promotion and disease prevention at work because most of the migrants work in small workplaces employing fewer than 50 employees². This increased need for services has prompted occupational health and safety professionals to pay increased attention to the health of migrant workers and the development of community-based interventions.

Depression has been shown to be one of the most commonly reported mental health problems among migrant workers in the United States³ and Australia⁴. Depressive symptoms predict health problems⁵ and poor health status⁶ as well as quality of work including work performance^{7,8}. In Korea, the percentage of migrant workers reporting scores of 16 or more on the Center for Epidemiologic Studies' Depression Scale (CES-D) was 35.5%⁹, which is higher than that of Korean adults (27.4%)¹⁰. This higher rate of depression among migrants in Korea may be explained by

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acculturative stress and work-related psychosocial factors. Among the many potential factors leading to depression, one factor accompanying the process of acculturation is acculturative stress, which refers to responses to life events that are rooted in intercultural contact¹¹. In a review of 60 studies examining the health status of migrant workers in Australia, migrants were exposed to various stressors, including difficulties with language acquisition and feelings of alienation and loneliness⁴. High levels of acculturative stress were associated with depression among various ethnic populations including Latino³ and Mexican immigrants¹² in the United States.

In addition, low levels of acculturation were positively correlated with high levels of job stress among Asian migrant workers, indicating that it is necessary to take acculturation into consideration to prevent stress-induced health outcomes for migrant workers¹³. In Karasek's job strain model¹⁴, adverse reactions of psychological strain such as depression occur when the psychological demands of the job are high, the worker's decision latitude in the task is low and social support from supervisors and colleagues is low. In empirical studies, work-related psychosocial factors (job stressors) experienced by migrant workers in Korea⁹ and Latino farm workers in the United States¹⁵ significantly increased the risk for depression.

Although migrant workers live in both acculturative and work-related psychosocial contexts, the growing body of literature examining depression among migrant workers has failed to adequately examine both acculturative- and work-related stressors together. A recent review of the impact of depression on workforce productivity¹⁶ found a mediating effect of job stressors on depression and pointed out lack of studies that evaluated whether job stressors play a role as a mediating factor for depression. Taken together with previous studies aforementioned^{3, 9, 12, 13, 15}, acculturative stress would lead indirectly to depression by increasing job-related stress; however, no empirical evidence supporting this pathway has been found. In Korean-Chinese migrant workers with rare opportunities for health promotion service at work, a community-based approach would be a feasible and necessary alternative way to decrease acculturative stress, which consequently leads to a decrease in job stress and depression. Prior to developing such culturally specific community-based interventions for preventing depression by decreasing acculturative stress among Korean-Chinese migrant workers, the purposes of this study were to 1) identify the relationships among acculturative stress, work-related psychosocial factors and depression among Korean-Chinese workers living in Korea and 2) determine whether work-related psychosocial factors mediate the relationship between accul-

turative stress and depression.

Subjects and Methods

Sample and recruitment

The methods used in the present study were described in a previous publication examining the influence of acculturation and job stress on work-related musculoskeletal disorders¹⁷. A cross-sectional survey was conducted using a convenience sample of 200 Korean-Chinese workers living in Seoul and Kyunggi Province, Korea. Historically, the ancestors of this Korean-Chinese group moved from Korea to China at the end of 1700s to escape severe famine in Korea, and many Koreans also migrated to China during Japanese colonization in the early 1900s. They have lived mostly in several provinces of the northeastern region of China, including Yunbyun City. Korean-Chinese have preserved aspects of the Korean language and traditions and started to migrate to South Korea to improve their standard of living¹⁸. Eligibility criteria included Korean-Chinese workers who can communicate in the Korean language and have worked full-time during the past 6 mo in Korea. Using G*power 3.1¹⁹, sample size was calculated as 180 for one-way ANOVA to obtain a power of 0.80 at a significance level of 0.05 with a moderate effect size of 0.25. For path analysis, 70 participants were calculated according to the rule of 5 subjects per parameter²⁰. A total of 200 participants were recruited to allow for incomplete questionnaire responses such as ambiguous responses and multiple choices to single-choice questions.

The sample was recruited in various community settings, including churches and free community clinics for migrants. During the survey, some of the participants left for church service or check-ups with doctors before completing all items and did not return. Thus, 30 of the 200 questionnaires that were missing answers to major questions or had no answers for questions on the last couple pages were excluded. A total of 170 questionnaires were included in the present analysis.

Instruments

Acculturative stress was assessed using the Korean version of the Acculturative Stress Scale developed by Sandh and Asrabadi²¹, which was translated into Korean by Yang and colleagues²². The original scale consisted of 36 items from 7 subscales, including perceived discrimination (7 items), homesickness (4 items), perceived hate (5 items), fear (4 items), stress due to change/culture shock (3 items), guilt (2 items) and nonspecific concerns (10 items). However, one item ("I am treated differently because of my color") was not applicable to the target popu-

lation; thus, the final scale included 35 items. Each item was rated on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The scores of all items were averaged, and higher scores indicate a greater level of acculturative stress. The Cronbach's alpha coefficient for this measure in the study sample was 0.95.

Of the seven dimensions assessed by the Korean Occupational Job Stress Scale (KOSS), three of the most common work-related psychosocial factors that were described by Karasek and colleagues¹⁴⁾ were measured in this study: job demand (8 items), insufficient job control (5 items) and interpersonal conflict (4 items). Job demand was defined as the effort required to carry out one's work. Insufficient job control was defined as the individual's decision authority and potential control over the performance of his or her job. Interpersonal conflict was defined as instrumental and socio-emotional support from coworkers and supervisors. All items were rated on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). The scores of each subscale were calculated using the formula $([\text{sum of each score} - \text{number of items}] / [\text{maximum score of the total dimension score} - \text{number of items}]) \times 100$. Possible total scores ranged from 0 to 100. The Cronbach's alphas for these scales in this sample were 0.79 for job demand, 0.62 for insufficient job control and 0.64 for interpersonal conflict.

Depression was assessed using the Korean version of the Center for Epidemiologic Studies Depression Scale (CES-D) scale²³⁾. The scale consists of 20 items, and each item was rated on a 4-point scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). All scores were summed, and a score of 16 or higher was considered to be the clinical cutoff for depression²⁴⁾. The Cronbach's alpha coefficient for this measure was 0.83 in this study sample.

Socio-demographic factors examined included gender, age, marital status, living with a spouse, job category and years of employment. Prior to survey administration, a pretest was conducted with 5 Korean-Chinese to refine the instruments and determine whether questions and response options were understandable and relevant to them. All but one question were found to be appropriate. The wording was changed for one of the Acculturative Stress Scale items to make it more relevant to Korean-Chinese.

Data collection

Data were collected by researchers and trained data collectors between August and December 2009. Self-administered surveys were conducted in public places (e.g., cafeteria, clinic's waiting room and park). The

principal investigator explained the entire questionnaire to data collectors, who were graduate and undergraduate students and had experience with a similar survey of a minority population and in collecting data in community settings. If participants had difficulties with understanding questions, data collectors provided further explanations. Face-to-face surveys were conducted for some participants who were not comfortable reading Korean. All participants who completed questionnaires were given a small gift to compensate them for their time. All procedures were approved by the Institutional Review Board of the Yonsei University College of Nursing, Korea.

Data analysis

Descriptive statistics were used to analyze the participants' characteristics, and *t*-tests and ANOVA were used to assess differences in depression according to participant characteristics. Pearson's correlation analyses were used to examine bivariate relationships between depression and acculturative stress, job demand, insufficient job control and interpersonal conflict. Multiple regression analyses were used to examine the relationships among acculturative stress, work-related psychosocial factors and depression. Path analysis was conducted to determine the strength of the relationships among acculturative stress, work-related psychosocial factors and depression using Analysis of Moment Structures (AMOS). Model fit of the path model was evaluated using the root mean square error of approximation (RMSEA) and goodness of fit index (GFI).

Results

Sample characteristics

The demographic characteristics of the participants are presented in Table 1. The participants included 52 male (30.6%) and 118 female workers (69.4%). The mean age of the sample was 55.53 yr (SD=8.23), and the majority (95.3%) of the sample was over 40 yr old. Almost all participants (97.6%) were married; however, only 99 (59.6%) of the participants lived with their spouses. More than half of the participants were service workers (59.4%). The remainder of the sample were construction workers (20.0%) and factory workers (15.9%). The average duration of employment in Korea was 4.34 yr (SD=4.19).

Depression

The mean depression score for the full sample was 12.72 (SD=7.22), ranging from 0 to 38. About 29.4% (n=50) of the participants had scores of 16 or more, which is the cutoff for depression. Female workers had significantly higher mean depression scores than male workers ($t=-2.064$, $p=0.04$), and service workers

had the highest depression scores ($F=2.928, p=0.035$). The percentage of female workers with depression scores of 16 or greater (34%) was higher than that of male workers (19%).

Relationships among acculturative stress, work-related psychosocial factors and depression

There were moderate positive correlations between depression and job demand ($r=0.293, p<0.001$), insufficient job control ($r=0.208, p=0.003$), interpersonal conflict ($r=0.240, p=0.001$) and acculturative stress ($r=0.408, p<0.001$). In the first multiple regression, socio-demographic factors (gender, age, marital

status and years of employment) and acculturative stress explained 17.1% of the variance in depression ($F=7.984, p<0.001$). Acculturative stress was associated with depression after controlling for socio-demographic factors. In model 2, the addition of work-related psychosocial factors increased the explanation of variance in depression by 9% ($F=8.528, p<0.001$) to 26.1%. After controlling for socio-demographic factors, acculturative stress and work-related psychosocial factors were both found to be associated with depression (Table 2). A path model showed a mediating effect of work-related psychosocial factors (i.e., job demands) on the relationship between accultura-

Table 1. Depression scores by general characteristics of participants

(N=170)						
Variable	Category	N	%	Depression M ± SD	t / F	p
Gender	Male	52	30.6	11.02 ± 6.76	-2.064	0.041
	Female	118	69.4	13.47 ± 7.31		
Age (yr)	<40	8	4.7	15.25 ± 9.25	1.932	0.126
	40-49	22	12.9	11.41 ± 5.36		
	50-59	85	50.0	13.76 ± 8.16		
	>60	55	32.4	11.27 ± 5.63		
	Marital status	Married	166	97.6		
	Unmarried	4	2.4	12.75 ± 10.08		
Living with spouse ^a (n=166)	Yes	99	59.6	11.70 ± 6.98	2.928	0.035
	No	60	36.1	13.92 ± 7.42		
Job category ^a	Manufacturing	27	15.9	12.93 ± 6.43	2.928	0.035
	Construction	34	20.0	12.74 ± 7.27		
	Service	101	59.4	13.15 ± 7.33		
	Others	6	3.5	4.33 ± 3.27		
Years of employment	<1	15	8.8	4.20 ± 7.97	2.262	0.083
	1-3	56	32.9	13.20 ± 7.51		
	3-5	43	25.3	14.14 ± 7.51		
	>5	56	32.9	10.77 ± 6.17		

^aIncludes missing values. F: A ratio of between group variance to within group variance.

Table 2. Multiple regression analysis of depression among Korean-Chinese migrant workers

	Model 1				Model 2			
	B	β	t	p	B	β	t	p
Gender	1.522	0.097	1.367	0.173	1.888	0.121	1.778	0.077
Age	-0.074	-0.085	-1.104	0.271	-0.049	-0.057	-0.750	0.454
Marital Status	-1.291	-0.027	-0.360	0.719	-1.559	-0.033	-0.454	0.651
Years of employment	-0.013	-0.093	-1.291	0.199	-0.013	-0.094	-1.374	0.171
Acculturative stress	4.109	0.380	5.349	<0.001	3.452	0.320	4.390	<0.001
Job demand					0.075	0.173	2.263	0.025
Insufficient job control					0.069	0.147	1.986	0.049
Interpersonal conflict					0.086	0.188	2.557	0.011
	F (p)	7.984 (<0.001)			8.528 (<0.001)			
	Adj. R ²	0.171			0.263			

B: Unstandardized regression coefficient. β: Standardized regression coefficient.

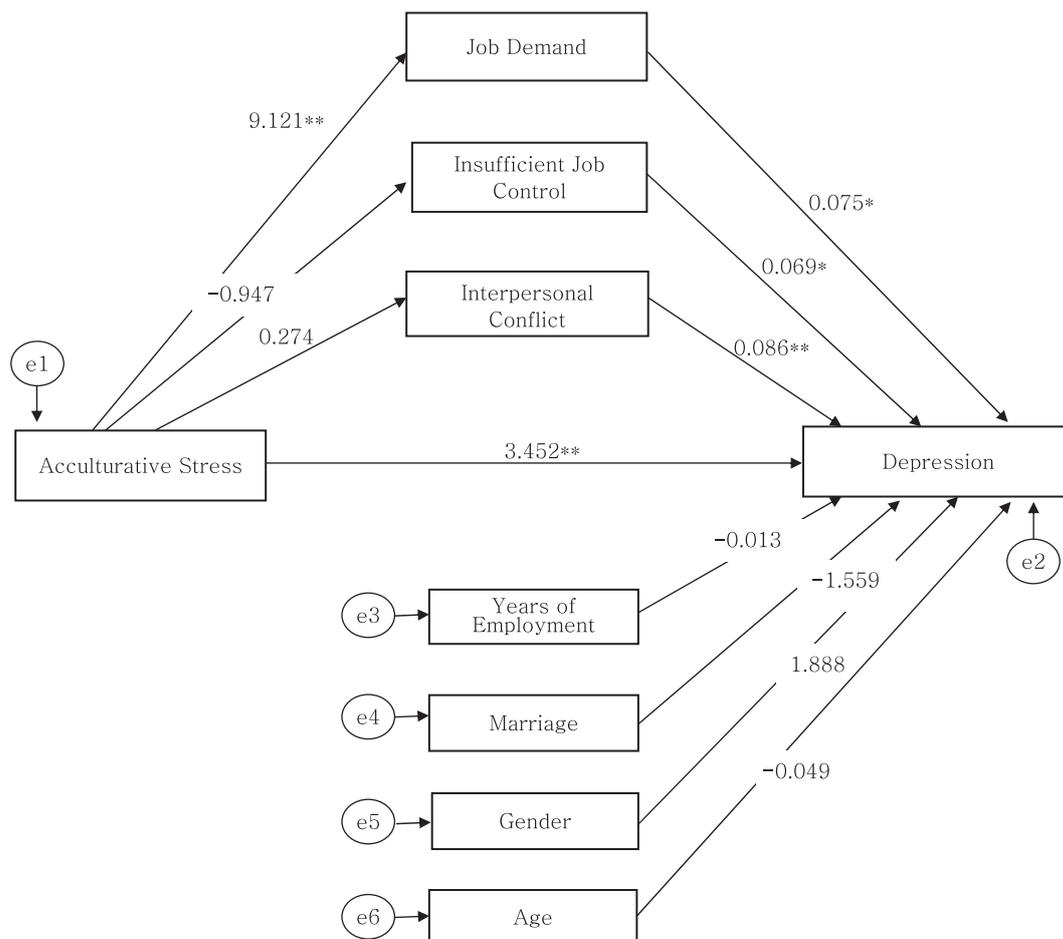


Fig. 1. Path model illustrating the relationship among acculturative stress, work-related psychosocial factors and depression.
* $p < 0.05$, ** $p < 0.001$.

tive stress and depression (Fig. 1). The model fit of the path model was acceptable, with an RMSEA of 0.108 and a GFI of 0.925.

Discussion

This study was conducted as a preliminary step for developing community-based interventions for preventing depression among migrant workers in Korea. As suggested in previous studies, migrant workers comprise a vulnerable population with an increased susceptibility to depression⁹. The present study showed that 29.4% of the participants had scores greater 16 or more on the CES-D, which was the clinical cut-off for depression. Depressive symptoms predict adverse health behaviors and certain health problems among Puerto Rican migrant populations in the United States, including emphysema, chronic bronchitis and asthma⁵. Additionally, depression has been shown to be a predictor of poor health status among the Hispanic/Latino population in the United States⁶.

Depression is also known to decrease work performance^{7,8} and increase absenteeism⁷. Nevertheless, depression among newly arrived migrant workers is rarely considered a priority by health-care professionals. Given that Asian immigrants are less likely to seek professional help for depression than other ethnic groups²⁵, there is an increased need to provide screening services for depression and prevention efforts among Asian communities of migrant workers.

According to the Beck's cognitive theory of depression, negative life events increase vulnerability to depression due to negative aspects such as loss and poorer outcome than expected performance²⁶. This cognitive theory provides a theoretical basis to explain depressive phenomena among migrant population and also serves as a basis for Berry's¹¹ acculturative stress model. It is important to note that acculturative stress was found to be a significant contributor to depression in other ethnic groups^{3,12}. The complex acculturation process, including language acquisition and changes

in behavior, identity and values, has been measured extensively among immigrant populations²⁷⁾; however, Asian countries have remained ethnically homogeneous until recently. Further studies more closely examining how ethnic migrant workers negotiate these changes may shed light on aspects of acculturation that facilitate successful adaptation for these workers, as well as how the process differs for temporary workers compared with immigrants.

In this study, Korean-Chinese migrant workers with high levels of acculturative stress were found to be more likely to experience depressive symptoms than those without acculturative stress. In previous studies, migrant workers expressed social stress due to lack of family support and difficulty in maintaining close social ties with friends and families²⁸⁾ and felt much homesickness when they faced crises or obstacles²⁹⁾. The perceived stress due to social isolation increases the risk for depression among migrant farmworkers¹⁵⁾. Few Korean-Chinese workers bring their families to Korea, and most of them seem to suffer from homesickness due to lack of social support from their families. Although there are significant disparities of lifestyle and culture between the Korean-Chinese and native Koreans, Korean-Chinese come with the expectation that they will be treated like native Koreans. However, Korean-Chinese perceive that native Koreans are instead prejudiced against them³⁰⁾. The gap between their expectations and reality may lead to increased acculturative stress.

The current study revealed that workers with high job demands, insufficient job control and high interpersonal conflict at work were more likely to experience depression. The results are consistent with earlier occupational health studies targeting manufacturing workers³¹⁾ and white-collar workers³²⁾. Depression among Hispanic/Latino farm workers in the United States was also significantly associated with discrimination at work¹⁵⁾. In Korea, most migrants are employed in unskilled and physically demanding jobs, and they often have difficulties becoming accustomed to the work process. Undesirable work conditions such as fast work pace, tight deadlines, performing multiple tasks at a time and long periods of concentration with insufficient break time are causes of increased job demand³³⁾ among migrants. Also, lack of support from Korean coworkers and supervisors is common because of cultural and language barriers as well as biases of coworkers and supervisors. Before starting new jobs in Korea, it would be beneficial for Korean-Chinese workers to participate in comprehensive programs for such things as stress management, communication skills and ability to handle unexpected situations to help them deal with such work-related stressors. Also, organizational efforts such as estab-

lishing an organizational culture valuing a diverse workforce and employers' commitment to support migrant workers are required.

In multiple regression analyses, the variance explaining depression increased significantly when work-related psychosocial factors were added to the model. Furthermore, in the path model, work-related variables were found to mediate the relationship between acculturative stress and depression. For example, Korean-Chinese migrant workers, who feel that they are treated differently or as inferior to native Korean colleagues, would perceive that they are asked to do a larger amount of work than Native Koreans. In fact, migrant workers who feel nervous about communicating in Korean may hesitate to ask to relocate multiple tasks requested at a time. Also, those who worry that people show hatred toward them may not intensely concentrate on a task. These are all examples indicating high job demand. People who feel that their status is low because of their background are also likely to perceive low authority to make work-related decisions.

To date, there has been only one published study attempting to identify the influence of work-related psychosocial factors on depression among migrant workers⁹⁾, but that study did not include acculturation-related factors. Although it is clear that migrant workers are affected by both acculturative- and work-related psychosocial stress, the present study is the first to investigate both aspects as contributors to the development of depression. Our findings suggest that acculturative stress affects depression in part through the influence of acculturation on work-related stressors. Information about the mediating effects of work-related psychosocial factors between acculturative stress and depression among Korean-Chinese migrants may emphasize other studies and interventions targeting components of the acculturation process that may affect the mental health of migrant workers. An intervention for assertive communication skills such as disagreeing or refusing requests, which increase self-esteem and decrease mental health problems^{34, 35)}, would be a way to deal with cultural difficulties that are being experienced, particularly in Korean workplace settings. Skills to cope with discrimination³⁶⁾ are also suggested to decrease acculturative stress. Practically, community organizations such as ethnic churches or migrant resource centers that are easily accessible to the migrant population would be appropriate intervention settings. A community-based participatory research approach that allows migrant workers to actively participate in interventions and practitioners to easily understand culturally specific contexts³⁷⁾ is recommended as an effective strategy.

For migrant research, instruments should be cultur-

ally and linguistically appropriate for the target population. In this study, instruments already used in other studies of migrants living in South Korea were used, and wordings and response options were confirmed by the target population during the pretesting. A few changes in wording were made during the pretesting process to be more understandable. It is important to recognize that despite ethnic similarity between the Korean-Chinese migrants and native Koreans, different levels of Korean language proficiency exist and should be addressed.

There were several limitations of the present study. Although the internal consistency reliability coefficients for the insufficient job control and interpersonal conflict instruments were somewhat low at 0.62 and 0.64, respectively, they were similar to the coefficients of the original scales³³⁾ and are considered acceptable levels of reliability³⁸⁾. The convenience sample recruited from churches and free health clinics in the capital city limits generalizability to Korean-Chinese migrant workers living in other regions. Because church has been used as one of the community settings to easily access hard-to-reach populations^{39, 40)}, a church-based recruitment approach was used to recruit the Korean-Chinese participants in this study. However, the churches were attended predominantly by women, and this resulted in undersampling of Korean-Chinese men. Gender was controlled in analyses predicting depression, but the generalizability of the findings would have been increased with a more representative sample in terms of region and gender. In addition, based on the past research, we hypothesized the pathway that acculturative stress increased job stress and found the mediating effect of job demand between acculturative stress and depression. However, caution is needed in interpreting the findings from this study because cross-sectional studies cannot infer causal relationships and longitudinal studies with a large sample size are required to draw conclusive results. Health problems such as arthritis, back or neck problems and heart problems⁴¹⁾ and pain have been found to be contributors to depressive symptoms⁴²⁾. The study participants tended to be a mixture of healthy workers and workers with acute and/or chronic health problems, but preexisting health problems were not assessed. This may weaken definitive conclusions drawn in the analysis.

This cross-sectional study precluded identification of whether depression was present prior to migration or was a result of the migrants' experiences in South Korea. Additionally, because one of the eligibility criteria was being able to communicate in Korean, it is possible that the extent of acculturative stress and depression was underestimated for these migrant workers, who are more isolated from Korean society

due to language and cultural barriers. In the current study, both self- and interviewer-administered data collection methods were used. Although no significant difference in the estimate of health indicators between these two different modes was found in earlier studies⁴³⁾, future studies should be performed to confirm the effect of the modes of data collection among the target population. Further, future studies would likely benefit from including data on level of acculturation.

In conclusion, this study demonstrated that depression is a common health problem among Korean-Chinese migrant workers. In line with previous studies, a significant relationship between depression and acculturative stress was observed, and the mediating effect of work-related psychosocial factors was also supported. The results of this study have implications for occupational health and safety research and practice by making occupational and safety professionals aware of the importance of a comprehensive approach to depression prevention in this vulnerable population.

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References

- 1) Statistics Korea. E-national indicators: Employment trends. [Online]. 2009 [cited 2010 Dec 10]; Available from: URL: <http://www.index.go.kr/egams/index.jsp>
- 2) Lee K, Cho H, Yoo G, Ahn A. Status of occupation safety and health and its protection among foreign workers in Korea. Seoul: Occupational Safety and Health Research Institute; 2010.
- 3) Torres L. Predicting levels of Latino depression: acculturation, acculturative stress, and coping. *Cultur Divers Ethnic Minor Psychol* 2010; 16: 256–63.
- 4) Anikeeva O, Bi P, Hiller J, Ryan P, Roder D, Han GS. The health status of migrants in Australia: a review. *Asia Pac J Public Health* 2010; 22: 159–93.
- 5) Henkin S, Tucker K, Gao X, Falcon L, Qawi I, Brugge D. Association of depression, psycho-social stress and acculturation with respiratory disease among Puerto Rican adults in Massachusetts. *J Immigr Minor Health* 2011; 13: 214–23.
- 6) Johnson K, Carroll J, Fulda K, Cardarelli K, Cardarelli R. Acculturation and self-reported health among Hispanics using a socio-behavioral model: the North Texas healthy heart study. *BMC Public Health* 2010; 10: 2–9.
- 7) Stewewart WF, Ricci JA, Chee E, Hahn SR, Morganstein D. Cost of lost productive work time among US workers with depression. *J Am Med*

- Asso 2003; 289: 3135–44.
- 8) Adler DA, McLaughlin TJ, Rogers WH, Chang H, Lapitsky L, Lerner D. Job performance deficits due to depression. *Am J Psychiatry* 2006; 163: 1569–76.
 - 9) Lee SW, Kim KS, Kim TG, et al. The relationship between job stress and depressive symptoms in migrant workers in Kyung-gi province in Korea. *Korean J Occup Environ Med*. 2009; 21: 76–86.
 - 10) Park SG, Min KB, Chang SJ, Kim HC, Min JY. Job stress and depressive symptoms among Korean employees: the effects of culture on work. *Int Ach Occup Environ Health* 2009; 82: 397–405.
 - 11) Berry JW. Contexts of acculturation. In: Sam DL, Berry JW, editors. *The Cambridge handbook of acculturation psychology*. New York: Cambridge; 2006.
 - 12) Hovey J, Magana C. Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the Midwest United States. *J Immigr Health* 2000; 2: 119–31.
 - 13) Leong FT, Lau AS. Barriers to providing effective mental health services to Asian Americans. *Mental Ment Health Serv Res* 2001; 3: 201–14.
 - 14) Karasek RA. Job demands, job decision latitude, and mental strain: implications for job redesign. *Adm Sci Q* 1979; 24: 285–308.
 - 15) Hiott A, Grzywacz J, Davis S, Quandt S, Arcury T. Migrant farmworker stress: mental health implications. *J Rural Health* 2008; 20: 32–9.
 - 16) McIntyre RS, Liauw S, Taylor VH. Depression in the workforce: the intermediary effect of medical comorbidity. *J Affect Disord* 2011; 128S1: S29–S36.
 - 17) Kim SJ, Lee HK, Ahn H. Relationships between work-related psychosocial and acculturative factors and work-related musculoskeletal disorders among Korean-Chinese migrant workers living in Korea. *Korean J Occup Health Nur* 2010; 19: 28–40.
 - 18) Choi WG. Ethnic Koreans from China: Korean dream, adaptation, and new identity. Paper presented at the Asia Culture Forum 2006, Gwangju, South Korea. [Online]. 2006 [cited 2011 Apr 25]. Available from: URL: http://www.cct.go.kr/data/acf2006/multi/multi_0203_Woo-Gil%20Choi.pdf
 - 19) Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods* 2009; 41: 1149–60.
 - 20) Kline RB. Latent variable path analysis in clinical research: a beginner's tour guide. *J Clin Psychol* 1991; 47: 471–84.
 - 21) Sandhu D, Asrabadi B. Development of an acculturative stress scale for international students: preliminary findings. *Psychol Rep* 1994; 75: 435–48.
 - 22) Yang OK, Kim YS, Lee BH. A study on acculturation and social support system for foreign wives in Seoul. *Seoul City Research* 2007; 8: 229–51.
 - 23) Chon KK, Rhee MK. Preliminary development of Korean version of CES-D. *Korean J Clin Psychol* 1992; 11: 65–76.
 - 24) Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas* 1977; 1: 385–401.
 - 25) Wong YJ, Tran KK, Kim SH, Kerne VV, Calfa NA. Asian Americans' lay beliefs about depression and professional help seeking. *J Clin Psychol* 2010; 66: 317–32.
 - 26) Beck AT, Rush AJ, Shaw BF, Emery G. *Cognitive therapy of depression*. New York: Guilford Press; 1979.
 - 27) Kumar A, Nevid J. Acculturation, enculturation, and perceptions of mental disorders in Asian Indian immigrants. *Cultur Divers Ethnic Minor Psychol* 2010; 16: 274–83.
 - 28) Weishaar HB. Consequences of international migration: a qualitative study on stress among Polish migrant workers in Scotland. *Public Health* 2008; 122: 1250–6.
 - 29) Leavwy G, Rozmovits L, Ryan L, King M. Explanation of depression among Irish migrants in Britain. *Soc Sci Med* 2007; 65: 231–44.
 - 30) Kim HK, Lee OJ. A phenomenological study on the experience of North Korean refugees. *Nurs Sci Q* 2009; 22: 85–8.
 - 31) Iennaco J, Cullen M, Cantley L, Slade M, Fiellin M, Kasl S. Effects of externally rated job demand and control on depression diagnosis claims in an industrial cohort. *Am J Epidemiol* 2010; 171: 303–11.
 - 32) Park KC, Lee KJ, Park JB, Min KB, Lee KW. Association between occupational stress and depression, anxiety, and stress symptoms among white-collar male workers in an automotive company. *Korean J Occup Environ Med* 2008; 20: 215–24.
 - 33) Chang SJ, Koh SB, Kang D, et al. Developing an occupational stress scale for Korean employees. *Korean J Occup Environ Med* 2005; 17: 297–317.
 - 34) Lee S, Crockett MS. Effects of assertiveness training on levels of stress and assertiveness experienced by nurses in Taiwan, Republic of China. *Issues Ment Health Nurs* 1994; 15: 419–32.
 - 35) Shimizu T, Kubota S, Mishima N, Nagata S. Relationship between self-esteem and assertiveness training among Japanese hospital nurses. *J Occup Health* 2004; 46: 296–8.
 - 36) Bacallao M, Smokowski P. "Entre Dos Mundos" (between two worlds): bicultural skills training with Latino immigrant families. *J Prim Prev* 2005; 26: 485–509.
 - 37) Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Review of Public Health* 1998; 19: 173–202.
 - 38) Hair JFJ, Anderson RE, Tatham RL, Black WC. *Multivariate data analysis with readings* (p.102). Englewood Cliffs (NJ): Prentice-Hall; 1998.
 - 39) Burns D, Soward A, Skelly A, Leeman J, Carlson J. Effective recruitment and retention strategies for older members of rural minorities. *Diabetes Educ* 2008; 34: 1045–52.
 - 40) Warren-Findlow J, Prohaska TR, Freedman D. Challenges and opportunities in recruiting and

- retaining underrepresented populations into health promotion research. *Gerontologist* 2003; 43: 37–46.
- 41) Wu B, Chi I, Plassman B, Guo M. Depressive symptoms and health problems among Chinese immigrant elders in the US and Chinese elders in China. *Aging Ment Health* 2010; 14: 695–704.
- 42) Bair M, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity. *Arch Intern Med* 2003; 163: 2433–45.
- 43) Tsakos G, Bernabé E, O'Brien K, Sheiham A, de Oliveira C. Comparison of the self-administered and interviewer-administered modes of the child-OIDP. *Health Qual Life Outcomes* 2008; 6: 1–8.