

Anxiety and Depression among North Korean Young Defectors in South Korea and Their Association with Health-Related Quality of Life

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Purpose: This study examined anxiety and depression among 108 North Korean adolescent and young adult (age, 12-29 years) defectors who settled in South Korea, and evaluated the relationship between their mental health and health-related quality of life (HRQoL). **Materials and Methods:** Subjects completed a questionnaire that included the Hospital Anxiety and Depression Scale (HADS), the Short Form with 36 questions (SF-36; consists of mental and physical health components) for measuring HRQoL, and items related to the period of time since defection and settlement and socio-demographic variables. **Results:** Among the participants, 53.7% scored ≥ 8 on the anxiety measure questionnaire, and 22.2% scored ≥ 11 ; 36.1% of the participants scored ≥ 8 on the depression measure questionnaire and 14.8% scored ≥ 11 . Both anxiety and depression subscales were associated with lower scores of total SF-36, physical component and mental component score. Depressive symptom appeared more frequently among the subjects who had lived in South Korea for <1 year than among the subjects who had lived in South Korea for 2 year or longer (odds ratio=3.77, 95% confidence intervals=1.12 to 12.70). **Conclusion:** Among North Korean adolescent and young adult defectors, anxiety and depression were associated with lower HRQoL. Therefore, it is needed to develop strategies to screen for mental health and intervene to reduce anxiety and depression during their early resettlement stage.

Key Words: Anxiety, depression, mental health, quality of life, North Korea

INTRODUCTION

Since 1995, natural disasters and economic difficulties have resulted in severe food shortages in North Korea. Consequently, the number of North Korean defectors has continuously increased, and more than 17,000 had settled in South Korea by October, 2009.¹ This figure does not include individuals who escaped from North Korea but remained in China or in other Asian countries while seeking an opportunity to settle in South Korea. North Korean defectors in China are estimat-

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ed to be around 11,000,² therefore, the actual number of North Korean defectors may be approximately 30,000. In particular, a steady growth has been observed in the number of North Korean adolescent and young adult defectors including teenagers and those in their twenties, who now comprise about 40% of all North Korean defectors.¹

North Korean defectors experience many dangerous situations, violence, and mental anguish prior to and during escape, as well as during settlement. Several previous studies³⁻⁵ have shown that many defectors experience post-traumatic stress disorder (PTSD), anxiety, and depression. These psychosocial problems could impair their quality of life⁶⁻⁸ and obstruct their adaptation to life in a new culture.⁹ As adolescents and young adult defectors are undergoing the additional stresses of physical and mental development, school education, and career development, more specific attention is needed for them. Previous studies evaluating the quality of life of North Korean defectors were carried out only with adults,^{9,10} and North Korean adults' quality of life was found to be associated with mental health status such as depression and PTSD.⁹ However, little is known about the status of anxiety and depression, and its effect on the quality of life among North Korean adolescents and young adult defectors who settled in South Korea.

A questionnaire with satisfactory psychometric properties is required to identify subjects with significant anxiety and depression. Because mental disorders tend to be under-recognized, it could be helpful to include a screening test such as the Hospital Anxiety and Depression Scale (HADS) in routine primary care.¹¹ This test has only 14 items and is available in Korea.¹²

The goals of the present study were to investigate the status of anxiety and depression among North Korean adolescents and young adult defectors in South Korea, and to evaluate the relationship between their mental health and health-related quality of life (HRQoL). To identify high risk group of poor mental health, we also analyzed the factors associated with their anxiety and depression.

MATERIALS AND METHODS

Subjects

Subjects were recruited between January 2007 and July 2008. With the support of two alternative schools that provide middle and high school courses for North Korean settlers, we identified North Korean adolescents and young

adult students (n=116) who had settled in South Korea. Alternative school is non-traditional schools for students who have trouble adjusting regular schools or do not want to learn traditional curriculum. Due to the difference of educational system and culture, several North Korean adolescents and young adult defectors could not adjust to the regular school in South Korea. Some maladjusted North Korean students dropped out the regular school, and some of them chose to study in the alternative schools.¹³ To be eligible to participate in this study, subjects were required to be 14-29 years old, provide informed consent, and be able to understand and complete the questionnaires. Any subjects who provided incomplete information in the HADS or the Short Form with 36 questions (SF-36) were excluded (n=8). Total 108 subjects were included in the final analysis.

Instruments

A questionnaire including HADS and SF-36 was used to collect general characteristic data such as gender, age, household monthly income, religion, number of family members, use of tobacco and alcohol, subjects' duration of escape and settlement, anxiety, depression and HRQoL.

The HADS questionnaire is composed of 14 items to assess depression and anxiety: 7 items for depression (HADS-D) and 7 for anxiety (HADS-A). Each subscale is scored from 0-21, where higher scores indicate more severe depression or anxiety (0-7: normal, 8-10: mild, 11-14: moderate, and 15-21: severe).¹⁴

The SF-36 is a tool to assess HRQoL; it consists of 9 subscales: physical functioning, physical limitations, bodily pain, general health, vitality, social functioning, emotional limitations, mental health, and health transition. Higher scores indicate a better HRQoL.¹⁵

Ethics

The survey protocol was approved by the Institutional Review Board at the School of Public Health, Seoul National University.

Statistical analysis

We scored HADS and SF-36 items according to the developers' scoring manuals.^{14,16} Descriptive statistics for socio-demographic variables and HADS were expressed by frequency, mean and standard deviation (SD). We used general linear regression model to evaluate the independent contribution of HADS and variables to HRQoL. Total SF-36 scores, physical component score (PCS) and mental com-

ponent score (MCS) were used as dependent variables, and gender, age, religion (dummy coded), household monthly income, duration of escape and settlement, number of family members, HADS-A and HADS-D were used as independent variables.

To identify variables associated with subjects' anxiety and depression, we used multiple logistic regression analysis. Before multivariate analyses, we used multiple imputation method to handle the missing values of duration of escape and settlement. Categorical missing variables such as religion and household monthly income were replaced by the mode of its known values.

For multivariate analyses, we adjusted socioeconomic variables such as age, gender and the following variables, which are known variables affecting mental health status: religion (non-religious, religious), household monthly income (1,000 thousand won>, 1,000 thousand won≤), duration of escape (1<, 1-2 years, 2≥), duration of settlement in South Korea (1<, 1-2 year, 2≥), and number of live-in family members (none, 1≥). Based on previous studies which demonstrated that HADS-A and HADS-D scores ≥8 indicated anxiety and depression symptoms,¹⁴ we used dichotomized HADS-A (≤7, ≥8) and HADS-D (≤7, ≥8) as dependent variables in multiple logistic regression.

All statistical tests were performed using the SAS statistical package version 9.1 (SAS Institute Inc, Cary, NC, USA). We used a 5% level of statistical significance, and all tests were bilateral.

RESULTS

Table 1 lists the general characteristics of subjects; the average age was 19.4 years (SD=3.1), and 50.0% were male. On average, subjects took 3.0 years (SD=2.8) to escape from North Korea until entering South Korea, and average 2.4 years to settle in South Korea (SD=1.9).

Table 2 shows the distribution of HADS-A and HADS-D scores. Mean score of HADS-A was 8.0±4.0, and HADS-D was 7.0±3.5. No significant difference in HADS-A and HADS-D was seen between male and female subjects. The standardized Cronbach's alpha of the total HADS was 0.73 (0.74 for HADS-A and 0.60 for HADS-D). Of the 108 North Korean adolescents and young adults, 53.7% scored ≥8 on the anxiety measure questionnaire, and 22.2% scored ≥11; 36.1% of participants scored ≥8 on the depression measure questionnaire and 14.8% scored ≥11. Females had a higher

proportion of anxiety cases than males (59.3% vs. 48.1%≥8; 27.8% vs. 16.7%≥11). Depression prevalence was almost the same between males (37.0% scored ≥8; 14.8% scored ≥11) and females (35.2% scored ≥8; 14.8% scored ≥11). Distribution of HADS-A and HADS-D status showed no significant difference between males and females.

Table 3 shows the contribution of HADS to HRQoL. Both anxiety and depression were associated with HRQoL including MCS and PCS. Subjects with higher anxiety or depression symptoms were more likely to have lower HRQoL.

Multivariate analysis revealed that the duration of settlement in South Korea was the only variable significantly associated with depression (Table 4). Subjects who had settled in South Korea for <1 year were more likely to have a depression than those who had settled in South Korea for 2 year or longer (odds ratio=3.77, 95% confidence intervals, 1.12 to 12.70).

DISCUSSION

The present data revealed that North Korean adolescents and young adult defectors in South Korea exhibit high levels of anxiety and depression. Subjects at early stages of settlement in South Korea were at risk most for depression. It also showed that poor mental health and low HRQoL had a relationship.

More than half of 108 North Korean adolescent and young adult defectors in South Korea had an anxiety (HADS-A≥8), and 36.1% had a depression (HADS-D≥8). When the subjects' HADS scores were compared to those of the general South Korean population -500 men and 500 women≥20 years old - from a previous study,¹⁷ we found that North Korean adolescent and young adult defectors had twice the prevalence of anxiety (53.7% vs. 29.0%≥8, 22.2% vs. 8.9%≥11).

In contrast to their high levels of anxiety, North Korean adolescents and young adult defectors' prevalence of depression was similar to that of the general South Korean population (36.1% vs. 43.3%≥8, 14.8% vs. 16.1%≥11).¹⁷ Several studies have suggested that anxiety and depression might have different patterns of development and prognosis in adolescence.¹⁸ PTSD or anxiety might be related to earlier traumas, while depression might be closely linked more to recent events.^{18,19} However, when we focused on the depression scores subjects, we found that our subjects scored higher on the HADS-D than the general South Korean population, aged 20-29 years. North Korean defectors in their

Table 1. General Characteristics of the Study Population

Variables	Males (n=54)		Females (n=54)	
	n	%	n	%
Age group (yrs) (n=108)				
14-19	21	38.9	34	63.0
20-29	33	61.1	20	37.0
Smoking status (n=101)				
Non smoker	17	32.7	45	91.8
Past smoker	9	17.3	0	0.0
Current smoker	26	50.0	4	8.2
Alcohol drinking status (n=103)				
No drinking	19	35.9	27	54.0
Past drinking	2	3.8	1	2.0
Current drinking	32	60.4	22	44.0
Household monthly income (thousand won)* (n=84)				
<1,000	35	76.1	28	73.7
1,000-1,999	7	15.2	7	18.4
≥2,000	4	8.7	3	7.9
Religion (n=106)				
Christianity (Protestant and Catholic)	38	70.4	46	88.5
None	16	29.6	6	11.5
Duration of escape [†] (yrs) (n=95)				
<1	20	41.7	13	27.7
1-2	6	12.5	8	17.0
2-3	5	10.4	6	12.8
≥3	17	35.4	20	42.6
Duration of settlement [‡] (yrs) (n=99)				
<1	8	16.3	15	30.0
1-2	13	26.5	15	30.0
2-3	16	32.7	9	18.0
≥3	12	24.5	11	22.0
Number of live-in family members (n=94)				
0	11	22.9	13	28.3
1	18	37.5	12	26.1
2	7	14.6	11	23.9
≥3	12	25.0	10	21.7
Economic status in North Korea (n=94)				
High	0	0.0	4	8.9
Middle	27	55.1	29	64.4
Low	22	44.9	12	26.7

*The current exchange rate is 1,200 won: 1 US dollar.

[†]Duration of escape: the period from escaping North Korea to entering South Korea.

[‡]Duration of settlement: the period from entering South Korea to present.

twenties scored 6.8 for males and 8.7 for females, while the South Korean population scored 5.5 for males and 6.0 for females on the HADS-D.¹⁷

The present results also suggested that adolescents and young adults during the early stages of settlement (duration of settlement in South Korea <1 year) were more likely to have depression. Usually, North Korean defectors who settle in South Korea are given about 2 or 3 months of adapta-

tion education at Hanawon, the government resettlement center for North Korean defectors. After this period, they must leave and face their new circumstances with little support. Mental health issues are major problems related to the process of adapting to new circumstances.²⁰ Our results suggest that during the first year of resettlement in South Korea, North Korean adolescent and young adult defectors experience difficult adaptation and have high levels of de-

Table 2. Distribution of Anxiety and Depression Status of Subjects

	Total (n=108)		Males (n=54)		Females (n=54)		p value*
	Mean score±SD	n (%)	Mean score±SD	n (%)	Mean score±SD	n (%)	
Anxiety	8.0±4.0		7.3±4.3		8.6±3.6		0.070
Normal (0-7)		50 (46.3)		28 (51.9)		22 (40.7)	0.308
Mild (8-10)		34 (31.5)		17 (31.5)		17 (31.5)	
Moderate (11-14)		19 (17.6)		6 (11.1)		13 (24.1)	
Severe (14-21)		5 (4.6)		3 (5.6)		2 (3.7)	
Depression	7.0±3.5		7.1±3.6		7.0±3.5		0.875
Normal (0-7)		69 (63.9)		34 (63.0)		35 (64.8)	1.000
Mild (8-10)		23 (21.3)		12 (22.2)		11 (20.4)	
Moderate (11-14)		12 (11.1)		6 (11.1)		6 (11.1)	
Severe (14-21)		4 (3.7)		2 (3.7)		2 (3.7)	

*Compared to male and female.

Table 3. General Linear Models for Health-Related Quality of Life

	Total SF-36*			Physical component score			Mental component score		
	β	SE	p value	β	SE	p value	β	SE	p value
Sex†	-19.12	23.84	0.423	-3.23	12.52	0.797	-12.52	13.75	0.362
Age (yrs)	-7.40	3.85	0.054	-4.22	2.02	0.037	-2.18	2.23	0.328
Religious‡	-54.59	35.16	0.121	-30.66	18.48	0.097	-8.84	20.30	0.663
Household monthly income	-47.71	27.41	0.082	-50.73	14.43	<0.001	4.98	15.82	0.753
Duration of escape	2.14	4.02	0.595	1.74	2.10	0.408	-0.09	2.33	0.969
Duration of settlement	0.58	6.38	0.927	2.63	3.31	0.427	-0.76	3.66	0.835
Number of live-in family members	-19.08	8.74	0.029	-13.85	4.60	0.003	-2.54	5.05	0.614
HADS-D	-12.15	3.73	0.001	-4.48	1.96	0.023	-5.86	2.15	0.007
HADS-A	-15.31	3.05	<0.001	-4.59	1.60	0.004	-9.15	1.76	<0.001
Model adjusted R ²	0.374			0.244			0.372		

HADS-D, hospital anxiety and depression scale for depression; HADS-A, HADS for anxiety.

*High SF-36 score indicates high health-related quality of life.

†Sex: male 1, female 2; Religious-none: 0, religious: 1.

pression. Taking action at this early stage of depression could prevent their mental health problem from worsening. In addition, the prevalence of depression among subjects who settled in South Korea over 1 year was still 28.4% (data not shown), and these findings indicate that time will not completely solve mental health problem of North Korean young adult defectors. Therefore, during and after the period of adaptation education at Hanawon, the young adult defectors should receive an appropriate mental health care.

In our study, North Korean subjects who were living without family members had a tendency of increasing anxiety and depressive symptoms, although it did not reach the statistical significance. Family members are one of important source for social support, and lack of family support is related to depressive symptom in adolescents.²¹ In a previous study, the number of relatives who stay in South Korea was negatively related to acculturative stress of North Korean adult defectors.²² Recently, North Korean young adult

defectors who entered South Korea alone are increasing.²³ Also, separation from family is one of predictors of psychological distress²⁴ and North Korean defectors who entered with no family members feel guilty for leaving their family in North Korea.²⁵ However, due to not enough sample size, we could not show clear relationships between the family numbers and anxiety/depression. More research is needed to clarify these associations.

Several studies have shown that North Korean defectors report high levels of trauma exposure and psychiatric distress, and PTSD was suspected in half of the defectors in China⁵ and in about 30% of those who resided in South Korea.⁴ North Korean children's degree of depression was higher than that of South Korean children, even patients with depression.²⁶ Previous studies that evaluated the quality of life of North Korean defector adults (mean age 37.6 years old) have reported that quality of life was related to their depression status.^{9,10} This present result is in good

Table 4. Variables Associated with Anxiety and Depression of Subjects

Variables in each dimension	Anxiety [†]		Depression [‡]	
	Multivariate odds ratio (95% CI)	<i>p</i> value	Multivariate odds ratio (95% CI)	<i>p</i> value
Age	0.88 (0.75-1.04)	0.129	0.97 (0.82-1.15)	0.754
Sex				
Male	1.00		1.00	
Female	1.46 (0.58-3.66)	0.419	0.94 (0.35-2.52)	0.902
Religion				
Religious	1.00		1.00	
None	2.93 (0.89-9.70)	0.078	2.83 (0.87-9.22)	0.084
Household monthly income*				
1,000 thousand won>	1.00		1.00	
1,000 thousand won≥	0.82 (0.26-2.61)	0.742	0.99 (0.28-3.47)	0.986
Number of live-in family members				
≤1	1.00		1.00	
0	1.85 (0.63-5.39)	0.260	2.24 (0.72-6.97)	0.163
Duration of escape (years) [‡]				
≤2	1.00		1.00	
1-2	0.75 (0.19-2.96)	0.681	0.79 (0.15-4.07)	0.771
>1	0.92 (0.30-2.80)	0.885	0.86 (0.26-2.77)	0.796
Duration of settlement in South Korea (yrs) [§]				
≤2	1.00		1.00	
1-2	1.07 (0.30-3.77)	0.916	1.13 (0.30-4.26)	0.859
>1	1.46 (0.43-4.94)	0.541	3.77 (1.12-12.70)	0.032

CI, confidence interval.

*The current exchange rate is 1,200 won: 1 US dollar.

[†]Dichotomized HADS-A (≤7, ≥8) was used as the dependent variable.

[‡]Dichotomized HADS-D (≤7, ≥8) was used as the dependent variable.

[‡]Duration of escape: the period from escaping North Korea to entering South Korea.

[§]Duration of settlement: the period from entering South Korea to present.

agreement with the previous research by showing that anxiety and depression could impair the HRQoL of North Korean adolescent and young adult defectors in South Korea.

We found that, among North Korean adolescent and young adult defectors, poor mental health status such as anxiety and depression are related to lower HRQoL. Several previous studies on the different nationalities have also demonstrated that individuals with anxiety or depression have a low quality of life.⁶⁻⁸ Australians with depression, as measured by the Primary Care Evaluation of Mental Disorders (PRIME-MD) instrument, perceived a worse quality of life than normal people.⁶ An investigation of cancer patients, using The Center for Epidemiological Studies Depression Scale (CES-D) to assess depression, showed that depression was relevant to patients' quality of life and one of the main predictors for quality of life.⁸ A review of studies investigating quality of life in relation to anxiety disorders has shown a reduction in quality of life related to anxiety disorders.⁷ Our study supported these findings. As our subjects are part of a vulnerable population and are undergoing the process of resettlement,

physical and mental development, and school education, they require more specific attention. Especially, our study showed that anxiety and depression level were associated with impaired HRQoL, including mental and physical components which were predictors for social adaptation difficulties during new settlement among young defectors.²⁷ Anxiety or depression may impair their quality of life. Likewise, low quality of life could increase their anxiety and depression level also.⁶⁻⁸ Such a vicious spiral may interrupt settlement and better life of North Korean defectors.⁹

This finding highlights the need for health care providers, teachers, and policy makers to develop strategies to screen for mental health and intervene to reduce anxiety and depression among North Korean adolescent and young adult defectors.

This study had several limitations. First, the sample size was relatively small and we included only students in alternative schools for North Korean adolescent and young adult defectors, therefore, our results cannot be generalized to all North Korean adolescent and young adult defectors.

This is a preliminary study, and the findings need to be verified using larger representative samples. Second, our identification of anxiety and depressive symptoms was based on self-reported questionnaires and diagnostic tests have not been done, which could lead to misclassification. In addition, although HADS is validated and available in South Korea,¹² there might be cultural differences between South Koreans and North Korean defectors. Also, as the standardized Cronbach's alpha of the HADS-D was not high (0.60), there was a possibility to underestimate the depressive symptom of our subjects. Third, we could not collect the information about premigration stressors and traumatic experiences in the subjects' native countries and third countries, which could be associated with mental health.^{19,28,29} Further studies are needed to examine the relationship between pre- and postmigration stressors and mental health in North Korean adolescent and young adult defectors.

Despite its limitations, this study is important because it highlights the need to develop strategies to screen for mental health and develop interventions to reduce anxiety and depression among North Korean adolescent and young adult defectors during the early resettlement stage.

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