



A Study of Predictive Factors Affecting Health: Promoting Behaviors of North Korean Adolescent Refugees

Jin-Won Noh¹, Hyo-Young Yun², Hyunchun Park³, Shi-Eun Yu^{4*}

¹Department of Healthcare Management and Institute of Global Healthcare Research, Eulji University, Seongnam; ²Department of Korean Unification Studies, Yonsei University, Seoul; ³Department of Healthcare Management, Eulji University, Seongnam; ⁴Department of North Korea Studies, Korea University, Sejong, Korea

Objectives: The present study aimed to analyze the factors that could affect the health-promoting behaviors of North Korean adolescent refugees residing in South Korea.

Methods: Questions about their sociodemographic variables, subjective health status, healthy living habits, and health-promoting behaviors were asked.

Results: Statistically significant differences were found in religion ($t=2.30, p<0.05$), having family members in South Korea ($t=2.02, p<0.05$), and subjective health status ($t=4.96, p<0.01$). Scores on health-responsible behaviors were higher with higher age ($t=2.90, p<0.01$) and for subjects without family or friends ($t=2.43, p<0.05$). Higher physical-activity behaviors were observed in males ($t=3.32, p<0.01$), in those with better subjective health status ($t=3.46, p<0.05$) and lower body mass index ($t=3.48, p<0.05$), and in smokers ($t=3.17, p<0.01$). Nutritional behaviors were higher in those who followed a religion ($t=2.17, p<0.05$). Spiritual growth behaviors were higher in those who followed a religion ($t=4.21, p<0.001$), had no family in South Korea ($t=2.04, p<0.05$), and had higher subjective health status ($t=5.74, p<0.01$). Scores on interpersonal relationships and stress-management behaviors were higher for those with higher subjective health status. A multiple regression analysis showed greater effects on health-promoting behaviors when subjective health status was better. Older people and non-smokers exhibited more health-responsible behaviors, while more physical-activity behaviors and spiritual growth activities were observed when subjective health status was better. Interpersonal relationship behaviors had positive effects on those with good subjective health status and on non-smokers.

Conclusions: Based on the results of the current study, an alternative was suggested for promoting health in North Korean adolescent refugees.

Key words: Democratic People's Republic of Korea, Refugees, Adolescent, Health promotion

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Corresponding author: Shi-Eun Yu, PhD

2511 Sejong-ro, Sejong 30019, Korea

Tel: +82-44-860-1276, Fax: +82-44-860-1278

E-mail: seyou1224@hanmail.net

*Current affiliation: Clinical Trial Center, Korea University Medical Center, Seoul, Korea

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INTRODUCTION

By the June of 2015, 28 133 North Korean refugees had entered South Korea. As the number of North Korean female refugees sharply increased since 2002, the entry of family units and adolescents increased [1]. Among those entrants, 1055 (3.8% of all entrants) were adolescents over 14 years old and less than 24 years old who attend middle school and high school [2]. Health gave positive influence on the adjustment

of these North Korean refugees to the new South Korean society, and became the foundation for the North Korean adolescent refugees' education and adaptation [3,4].

Generally, the concept of health is used in contrast with that of disease. Health can be defined as a relative concept that is formed by interactions between personal perceptions and sociocultural factors, rather than by an absolute reference [5,6]. In addition, health is essential for a person to maintain physical independence, functionally live daily life, and carrying out one's social role or accomplish social integration [7]. In a broad sense, health behavior can be defined as a variety of behaviors of people, to maintain, promote, and recover health. The World Health Organization emphasized changing from a passive attitude in which health is considered as the state of no disease, to an active one that involves changing lifestyles, through efforts like exercising to become healthy [8]. In addition, eating habits for promoting health, physical-activity behaviors, and health are considered as wellness [9]. Therefore, lifestyle diseases can be prevented with appropriate health behaviors during adolescence, when habits are being formed. In addition, the appropriate health habits formed during adolescence will continue even after entering adulthood, such that it will have positive influences not only on individuals, but also on families and local communities.

Until now, no empirical studies have examined the health of North Korean adolescent refugees who experienced starvation in North Korea. Research related to the health of North Korean adolescent refugees mostly includes qualitative studies on nutritional status and health risk factors in North Korea. Yoon [10] stated that malnutrition in North Korea and physical and mental trauma from the long-term tense living during the escape from North Korea caused illness in North Korean adolescent refugees after they entered South Korea. Jeon and Park [11] identified North Korean adolescent refugees' experiences of folk remedies in North Korea, repatriation to North Korea, and prolonged stay in a third country as health risk factors. Yoon [3], who studied the health and economic adaptations of North Korean refugees, said that health is the most significant factor preventing these refugees from employment. Kim and Yu [12] reported that the subjective health of North Korean refugees is about five times worse than that of South Koreans. In addition, illnesses that North Korean refugees were either suffering from or being treated for were 3.8 times higher than that of South Koreans in general, and 1.4 times higher than that of those from the low-income group. That is, North Kore-

an refugees had relatively more bodily and chronic illnesses as compared to South Koreans [12]. Kang et al. [13] studied the health-promoting lifestyle of North Korean refugees and revealed an average score of 1.78 ± 0.35 (out of 4 points). This score was significantly lower as compared to those of immigrants or health vulnerability groups using the same instrument. In other words, North Korean refugees' score on the Health-Promoting Lifestyle Profile (HPLP) was relatively low as compared to those of unmarried adolescent Canadian mothers (2.8 ± 0.39) [14] and Brazilian immigrants in the US (2.53 ± 0.46) [15].

The studies discussed above suggest the seriousness of health problems of North Korean adolescent refugees, and it appears to be an important influential factor affecting their new life. In other words, it suggests that an empirical study is needed to improve the health, which is a human capital, of North Korean adolescent refugees settled in South Korea, where the social and cultural systems are different. Such health studies on North Korean adolescent refugees have significance not only in promoting the health of North Korean adolescent refugees but also in finding solutions for the health disparities between the people of South and North Korea after unification.

Accordingly, the present study attempted to examine the subjective health status, healthy living habits, and health-promoting behaviors of North Korean adolescent refugees living in South Korea, and to identify the factors that affect their health-promoting behaviors. Based on the results, an alternative to improve the health-promoting behaviors of North Korean adolescent refugees has been suggested.

METHODS

Subjects

The present study was carried out from December 11, 2013 to February 26, 2014, with cooperation from an educational institution for North Korean adolescent refugees. The subjects were 150 North Korean adolescent refugees living in South Korea, who are over 14 years old and less than 24 years old. The age of the subjects was limited to 24 years was because it corresponded to the school age described in the Elementary and Secondary Education Act, under the provision of Article 45, paragraph 2 of the North Korean Refugees Protection and Settlement Support Act.

The research team carried out convenience sampling that focused on alternative schools for North Korean adolescent

refugees, local Hana Centers, and communities. Out of the 150 questionnaires distributed, 123 copies were included in the final analysis, after excluding missing or insincere answers.

Instruments

Sociodemographic variables, subjective health status, healthy living habits, and health-promoting behavior were examined in the present study.

The sociodemographic variables included sex, age, current grade, religion, location of residence, status of receiving the National Basic Living Security, duration of stay in South Korea, and presence of family members in South and North Korea.

Subjective health status was assessed on a five-point scale by asking, "What do you think about your health?"

Healthy living habits were assessed using the body mass index (BMI), and smoking and drinking habits. BMI was categorized as follows: underweight = 18.5 or less, normal = 23 or less, overweight = 25 or less, and obese = 25 or more. Smoking was categorized as "currently smoking" and "currently not smoking." Similarly, drinking was classified as "currently drinking" and "currently not drinking."

To assess health-promoting lifestyle, the HPLP-II developed by Walker et al. [16] and translated by Yun and Kim [17] was used. It is composed of 52 questions, including 9 questions on health responsibility, 8 on physical activity, 9 on nutrition, 9 on interpersonal interactions, 9 on spiritual growth, and 8 on stress management. A higher average score is indicative of higher degree of implementation of health-promoting behaviors. In Walker et al.'s study [16] the Cronbach's α of the tool was 0.94, while the same in Yun and Kim's study [17] was 0.93. In the present study, its Cronbach's α was 0.799.

The current study was approved by the institutional review board of Eulji University (EU 13-36).

Statistical Analysis

The data were analyzed using SPSS version 21.0 (IBM Corp., Armonk, NY, USA). First, frequencies and percentages on the sociodemographic characteristics, subjective health status, and healthy living habits of North Korean adolescent refugees were computed. Subsequently, the means and standard deviations on the health-promoting behaviors were calculated. Sociodemographic characteristics, subjective health status, and health-promoting behaviors according to lifestyle were then analyzed using the *t*-test and one-way ANOVA. To check for multicollinearity, variance inflation factors (VIF) were calculated, and

the Shapiro-Wilk's test was performed to check for normal distribution of the dependent variables. It was found that all the VIF values were less than 10, which indicates that there was no problem of multicollinearity. Additionally, the *p*-values of the Shapiro-Wilk's tests were all 0.05 or greater, which indicates that all dependent variables were normally distributed. Lastly, a multiple regression analysis was performed to identify the factors that affect the subjects' health-promoting behaviors.

RESULTS

The average score on health-promoting behaviors was 2.51. Further, the averages of the six sub-scales were as follows: the average score on interpersonal relationship behaviors was the highest (2.87), followed by spiritual growth behaviors (2.80), nutritional behaviors (2.45), stress-management behaviors (2.41), physical-activity behaviors (2.28), and health-responsible behavior (2.21) (Table 1).

On comparing health-promoting behaviors according to the characteristics of the North Korean adolescent refugees, we found that religion, absence of family in South Korea, and subjective health status affected the health-promoting behaviors. In other words, the score on health-promoting behaviors was significantly higher when the subject followed a religion, had no family in South Korea, and had better subjective health status. Further, the health-responsible behavior score was significantly higher when the subject's age was higher and when his/her family was not in South Korea. Significantly higher physical-activity behaviors were observed in males, in those with better subjective health status and lower BMI, and in smokers. Nutrition behaviors were significantly better when the subject had a religion. Further, the score on spiritual growth behaviors was higher when the subject had a religion, had no family in South Korea, and had better subjective health status. Similarly,

Table 1. Mean scores on the health-promoting behaviors of North Korean adolescent refugees

Characteristics	Categories	Mean \pm SD
Health-promoting behavior	Overall	2.51 \pm 0.32
	Health responsibility	2.21 \pm 0.41
	Physical activities	2.28 \pm 0.55
	Nutrition	2.45 \pm 0.39
	Spiritual growth	2.80 \pm 0.50
	Interpersonal relationship	2.87 \pm 0.43
	Stress management	2.41 \pm 0.41

SD, standard deviation.

interpersonal relationship behaviors and stress-management behaviors were significantly higher when subjective health status was better (Table 2).

A multiple regression analysis was performed to identify the variables that affect health-promoting behaviors of North Korean adolescent refugees.

When we examined the factors that affected the overall health promoting behavior score and the scores on the six subscales, we found that the subjective health status of subjects influenced their health-promoting behavior. That is, the better the subject health status, the higher the health promoting behavior score. With reference to health-responsible behavior, the higher the age was, and when the subject was a non-smoker, the more they tended to indulge in health-responsible behavior. Subjects showed more physical-activity behaviors when their subjective health status was better, and showed more spiritual growth behaviors when they had a religion, and their subjective health status was better. Finally, their interpersonal relationship behaviors were better when they had a good subjective health status and when they were non-smokers (Table 3).

DISCUSSION

The purpose of the current study was to present empirical data for North Korean adolescent refugees to live healthier lives by analyzing the factors that affect their health-promoting behaviors.

When the results of the current study were compared to those of previous studies that used the same instrument (HPLP-II) on North Korean adult refugees, the health-promoting behaviors of North Korean adolescent refugees can be positively evaluated because their average score and all sub-scale scores were higher. Comparing the average health-promoting behaviors score of 1.78 ± 0.35 revealed in the study by Kang et al. [13] and 2.38 ± 0.57 revealed in the study by Choe et al. [18], where both studies used North Korean adult refugees as subjects, we found that the health-promoting behaviors of North Korean adolescent refugees (2.51 ± 0.32) were better than those of the adults. Meanwhile, the health-promoting behaviors of North Korean adolescent refugees were similar to the average score of South Korean high school students (2.49 ± 0.39) [19]. However, with reference to health-promoting behaviors, the proportion of North Korean adolescent refugees who skipped breakfast was higher than that of South Korean adolescents [20]. Based on the results of the current study, following sug-

gestions were made to promote the health of North Korean adolescent refugees.

First, a social support network should be promoted for these adolescents. Specifically, we found that North Korean adolescent refugees who did not have a family in South Korea showed higher health-responsible behaviors than those who had a family in South Korea. This may indicate that they are managing their health better with the hope of meeting their families in North Korea. On one hand, even though they lack of blood relatives who would support their health environmentally, they may be receiving more private and public support because they comprise the vulnerable class for the social support network. North Korean adolescent refugees without a family or friends are placed in alternative boarding schools, specialized schools, group homes, and shelters until they become a 20-year-old adult, after which, they are provided a rental house. In addition to basic provisions such as medical and educational protection according to the Act on Protection and Settlement Support of Residents Escaping from North Korea, they receive educational benefits such as after-school learning from Korea Hana Foundation and other related organizations [21,22]. Therefore, if multifaceted support is possible for North Korean adolescent refugees through support from the family as well as the improved social support network, it will positively influence the promotion of their health.

Second, the health-promoting behaviors of the North Korean adolescent refugees should lay a balanced emphasis on mental health. It was found that activities related to interpersonal relationships and spiritual growth of the subjects were more vigorous than their physical-activity behaviors. In addition, those living religious lives were more actively involved in health-promoting behaviors than those who did not. This means that the Juche Ideology, which is similar to religion, had been socialized and internalized as a spiritual value. In other words, as the North Korean adolescent refugees may feel that they betrayed their country and "escaped" and settled in the enemy country, South Korea, religion is carrying out a role in forming a new sense of belonging and achieving psychological stability. In addition, as they develop new relationships in South Korea, a need for the sense of social belonging and support network arises. Indeed, religion has an important function in overcoming the uncertainty and pursuing values in the lives of North Korean adolescent refugees [23]. In a study on North Korean refugees by Jeon and Cho [24], they stated that a religious life could help them gain peace of mind, find direc-

Table 2. Characteristics of North Korean adolescent refugees and their health-promoting behaviors

Characteristics	n (%)	Health-promoting behaviors													
		Overall	Health responsibility	Physical activities	Nutrition	Spiritual growth	Interpersonal relationship	Stress management							
		Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)				
Sex															
Male	48 (39.0)	2.50	-0.21	2.16	-1.09	2.47	3.32**	2.41	-0.85	2.75	-1.09	2.79	-1.79	2.42	0.07
Female	75 (61.0)	2.52		2.24		2.14		2.47		2.85		2.93		2.41	
Age (mean ± SD [min, max])	19.9 ± 2.4 (14, 24)	1.35		2.90**		0.50		1.14		1.48		0.99		0.94	
Current grade															
Middle school	13 (10.4)	2.54	0.32	2.25	0.39	2.40	0.21	2.51	1.28	2.68	0.59	2.79	2.18	2.65	0.07
High school	82 (65.6)	2.53		2.22		2.25		2.47		2.88		2.91		2.40	
College	13 (10.4)	2.50		2.13		2.26		2.42		2.72		2.97		2.48	
Religion															
Yes	82 (67.2)	2.56	2.30*	2.26	1.72	2.30	2.74	2.50	2.17*	2.92	4.21***	2.92	1.25	2.43	0.13
No	40 (32.8)	2.42		2.12		2.23		2.36		2.58		2.83		2.42	
Residence															
Seoul	60 (49.6)	2.54	1.09	2.25	1.31	2.25	-0.64	2.51	1.92	2.84	0.84	2.92	1.14	2.41	-0.08
Others	61 (50.4)	2.48		2.16		2.31		2.38		2.76		2.83		2.42	
Status of receiving the National Basic Living Security															
Yes	70 (60.90)	2.53	0.59	2.24	1.20	2.27	-0.08	2.48	0.86	2.87	1.38	2.88	-0.52	2.39	-0.49
No	45 (39.1)	2.49		2.15		2.28		2.42		2.74		2.92		2.43	
Duration after entry into South Korea (y)															
Yes	0.57			1.17		1.15		0.54		1.10		0.91		1.04	
Family in South Korea															
No	30 (25.9)	2.61	2.02*	2.36	2.43*	2.35	1.17	2.51	1.07	2.97	2.04*	2.93	0.67	2.47	0.79
Yes	86 (74.1)	2.47		2.15		2.22		2.43		2.75		2.87		2.40	
Family in North Korea															
No	31 (26.5)	2.54	0.56	2.21	0.04	2.33	0.90	2.48	0.49	2.84	0.49	2.90	0.11	2.46	0.70
Yes	86 (73.5)	2.50		2.20		2.23		2.44		2.82		2.89		2.40	
Subjective health status															
Good	56 (45.2)	2.61	4.96**	2.26	0.45	2.38	3.46*	2.50	0.81	2.95	5.74**	3.00	5.50**	2.53	3.74*
Average	52 (41.9)	2.43		2.18		2.23		2.40		2.64		2.80		2.32	
Bad	16 (12.9)	2.41		2.19		2.00		2.44		2.77		2.65		2.35	
Body mass index (kg/m ²)															
Underweight	15 (10.7)	2.66	1.39	2.36	1.48	2.69	3.48*	2.48	0.23	2.80	1.17	3.02	2.14	2.63	2.01
Normal	96 (78.7)	2.49		2.18		2.21		2.45		2.82		2.86		2.38	
Overweight	8 (6.6)	2.51		2.37		2.45		2.35		2.54		2.78		2.59	
Obese	5 (4.1)	2.63		2.38		2.18		2.40		3.04		3.27		2.43	

(Continued to the next page)

Table 2. Continued from the previous page

Characteristics	n (%)	Health-promoting behaviors															
		Overall		Health responsibility		Physical activities		Nutrition		Spiritual growth		Interpersonal relationship		Stress management			
		Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)	Mean	t(F)		
Smoking																	
Yes	21 (16.8)	2.56	0.77	2.12	-1.15	2.61	3.17**	2.52	0.95	2.85	0.47	2.72	-1.74	2.49	0.96		
No	104 (83.2)	2.50		2.23		2.21		2.43		2.79		2.90		2.40			
Drinking																	
Yes	37 (29.6)	2.51	0.05	2.18	-0.56	2.32	0.59	2.44	-0.17	2.83	0.40	2.84	-0.53	2.40	-0.28		
No	88 (70.4)	2.51		2.22		2.26		2.45		2.79		2.89		2.42			

SD, standard deviation; Min, minimum; Max, maximum.
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3. Factors affecting the health-promoting behaviors of North Korean adolescent refugees

	Overall			Health responsibility			Physical activities			Nutrition			Spiritual growth			Interpersonal relationship			Stress management		
	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t	
Sex	-0.047	-0.319	-0.141	-0.984	-0.230	-1.596	0.186	1.230	0.008	0.059	0.039	0.267	-0.005	-0.035							
Age	0.201	1.488	0.297	2.265*	-0.034	-0.258	0.186	1.352	0.148	1.151	0.132	0.997	0.187	1.290							
Current grade	-0.179	-1.206	-0.241	-1.675	-0.091	-0.628	-0.223	-1.470	0.056	0.396	-0.101	-0.692	-0.235	-1.474							
Religion	-0.156	-1.247	-0.027	-0.221	-0.068	-0.556	-0.185	-1.454	-0.304	-2.562*	-0.084	-0.687	0.036	0.270							
Residence	-0.140	-1.153	-0.183	-1.560	0.006	0.048	-0.228	-1.854	0.018	0.159	-0.167	-1.408	-0.037	-0.287							
Status of receiving the National Basic Living Security	0.034	0.276	-0.078	-0.654	0.008	0.069	-0.012	-0.100	0.016	0.135	0.091	0.762	0.134	1.018							
Duration of staying in South Korea	-0.048	-0.351	-0.086	-0.649	0.048	0.359	0.160	1.144	-0.210	-1.611	-0.010	-0.076	-0.086	-0.588							
Family in South Korea	-0.209	-1.666	-0.175	-1.442	-0.216	-1.774	-0.054	-0.421	-0.158	-1.329	-0.123	-1.005	-0.101	-0.754							
Family in North Korea	0.028	0.227	0.003	0.025	0.064	0.531	-0.028	-0.224	0.021	0.179	0.076	0.625	-0.060	-0.453							
Subjective health status	-0.268	-2.196*	0.095	0.808	-0.309	-2.608*	-0.095	-0.764	-0.293	-2.524*	-0.335	-2.812**	-0.130	-0.997							
Body mass index	-0.017	-0.135	0.180	1.444	-0.171	-1.369	0.075	0.573	-0.132	-1.079	0.045	0.359	-0.022	-0.157							
Smoking	-0.046	-0.328	-0.303	-2.235*	0.159	1.166	0.068	0.477	0.040	0.298	-0.286	-2.085*	0.065	0.434							
Drinking	0.116	0.884	-0.005	-0.042	0.114	0.895	0.008	0.058	0.180	1.438	0.093	0.721	0.023	0.167							
R square	0.227		0.274		0.269		0.198		0.300		0.260		0.112								
F for R square	1.375		1.774		1.725		1.160		2.014		1.650		0.589								

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

tion and values of life, and make friends. Therefore, it appears that a religious life is closely related to the promotion of health. Thus, the spiritual life of North Korean adolescent refugees could help them pursue a healthy life by providing psychological stability and positive power in daily life.

Third, education and programs should be conducted to facilitate the health-promoting behaviors of North Korean adolescent refugees. Such refugees have lived an unstable and irregular life, which requires constant moving for survival during their stay in North Korea and other countries. That is, after experiencing food shortage, as the education system collapses, they had to wander around to find a market or food rather than continuing their studies. For the North Korean adolescent refugees who lived such lives, the competitive educational environment in South Korea would lead to psychological pressure and physical lethargy. Accordingly, as a means to promote psychological and physical health and to support the adjustment of the North Korean adolescent refugees, practical programs that are fun to participate should be provided. Such programs will not only provide them an opportunity to promote physical health but also to support mental health by avoiding depression and fostering interpersonal relationships. This is supported by previous studies [25-27] which shows that a moderate level of physical-activity behaviors through exercise programs positively affects adolescents' subjective health status. Therefore, it is necessary to develop programs and continuous recommendations to facilitate active and aggressive participation of North Korean adolescent refugees in physical-activity behaviors not only in school, but also during leisure activities.

Lastly, education on a regular and balanced diet should be provided. North Korean adolescent refugees did not have an opportunity to experience regular and balanced diet during their stay in North Korea and other countries. According to Hwang and Chang [28], 74% of their subjects had regular meals without skipping the same while they were living in North Korea, but they used substitute food to fulfill the lack of food intake. Kim and Jeong [29] stated that the lower the age of the North Korean refugees, the more they preferred salty taste and white rice than multi-grain, and frequently consumed noodles. In addition, they preferred the North Korean diet culture to South Korean eating habits or food supplies. Such results indicate that irregular and unbalanced diet of North Korean refugees may lead to chronic malnutrition. Accordingly, by specifically educating them about regular and balanced diet, their health could be improved. For example, it is necessary to

educate and provide information to North Korean refugee families about the 10 healthy life indicators for Koreans advocated by the Korea Health Promotion Foundation. In particular, due to the differences in diet between South and North Korea, it is important to provide informational support for healthy living by conducting education on a balanced diet.

The health-promoting behavior of North Korean adolescent refugees is the foundation for adjusting to the new society of South Korea. Therefore, promotion of and prescription for bodily health should be done well before adulthood, that is, since childhood and adolescence. In case of North Korean adolescent refugees, since not many of them attend regular South Korean schools, the health-promoting education should be conducted not only at schools but also through Hanawon, Hana Centers, and local social welfare organizations. In particular, preventive education on diseases is necessary, and specific programs that can focus on health-promoting behaviors related to the growth during adolescence should be provided. Findings of this study on the health of North Korean adolescent refugees will be utilized as a model to resolve the health differences between South and North Korean adolescents and to promote the health of North Korean adolescents.

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CONFLICT OF INTEREST

The authors have no conflicts of interest with the material presented in this paper.

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