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Reliability and Validity of the Korean version of autonomy preference index among patients with chronic disease

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만성질환자 대상 한국어판 자율성 선호도 도구 (K-Autonomy Preference Index)의 신뢰도 및 타당도 검증

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Abstract The purpose of this study was to validate the Korean version of autonomy preference index (K-API) for chronic patients. Participants were 569 chronic patients. Construct validity and reliability of K-API were examined using exploratory and confirmatory factor analysis, and Cronbach's α test. Original API was translated to Korean, and we conducted contents validity test, and pilot test. The K-API consisted of 10 items divided into two domains: (i) Decision making preference (DMP); (ii) Information seeking preference (ISP). K-API explained 53.4% of autonomy preference; the two-factor structure showed an acceptance fit. Cronbach's α was. 77 for DMP, and. 75 for ISP. Validity and reliability of the K-API were established, and this study provides additional evidence for the usage of the API in Asian region.

Key Words : Patient preferences, Decision making, Chronic disease, Relational autonomy, Patient-centered care

요 약 본 연구의 목적은 만성질환자를 대상으로 한국어판 자율성 선호도 측정 도구(K-API)의 타당도와 신뢰도를 검증하는 것이다. 총 569명의 만성질환자가 참여하였다. 구성타당도를 검증하기 위하여 탐색적, 확인적 요인분석을 시행하고, 신뢰도는 Cronbach's α 값으로 확인하였다. 원도구를 한국어로 번역한 후 내용 타당도 검증, 예비 조사를 시행하였다. 연구결과, K-API는 두 총 10개의 문항으로 구성되며 (i) 의사결정 선호도, (ii) 정보추구 선호도의 두 영역으로 구성되었다. K-API는 자율성 선호도의 53.4%를 설명하며, 2개 요인으로 구성된 도구의 적합도 지수가 충족되었다. Cronbach's α는 의사결정 선호도는 .77, 정보추구 선호도는 .75로 나타났다. 본 연구를 통하여 K-API의 타당도가 신뢰도가 확인되었으며, 이는 아시아 지역에서의 API 도구의 적용 가능성에 대한 추가적인 근거를 제공한다.

주제어 : 환자선호도, 의사결정, 만성질환, 자율성, 환자중심간호

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1. Introduction

In recent years, healthcare has shifted from a provider-centered to a patient-centered paradigm, where patients actively participate in treatment plans [1]. This induces patient to participate in their health care processes by communicating with healthcare providers or exploring information [2]. In particular, patients with chronic diseases need to engage in self-care by understanding the stages and process of their illness, taking their medications consistently, and selecting or modifying treatment approaches [3,4].

Patient autonomy signified a self-sufficient, able to function as a rational decision-maker, owning both freedom of will and action [5]. It is about how much involvement in patients' own care patients really want [6] and grant patients final authority to decide on health-related issues and behavior [7]. Thus, it is important to understand the degree of patients' autonomy preferences in treatment decision-making.

In accordance with the trend of patients' choices and individual rights being respected, studies have been actively conducted in foreign countries on the demand for participation in treatment decision-making. To measure patient's autonomy preference, several instruments have been developed in US and Europe. One of the instruments is autonomy preference index (API) [8], which was developed by medical doctors in US. API is initially developed to measure general patient's preferences for two dimensions of autonomy: desire to make medical decisions, and desire to be informed [8]. It has been widely used to measure patient's autonomy, translated into several languages and validated by many studies in US and Europe [9-11]. However, few studies developed and validated similar instruments in Asia; except Japan where it was used with the general population [12] and hypertensive outpatients [13], and among older adults in Korea [14]. These studies only translated the English-language API without testing their reliability and validity in their respective cultures. In addition, to our knowledge, there is no prior study to measure autonomy preference among chronic patients, although chronic patients need to participate actively in their treatment. An instrument to measure autonomy preference for chronic patients in Asian countries need to be developed.

This study translated original, English- language API into Korean, and tested the reliability and validity of the translated instrument to finalize the Korean version of the Autonomy Preference Index (K-API).

2. Methods

2.1 Study design

This is a methodological study aiming to develop a K-API, based on the version by Ende et al. [8], for patients with chronic diseases.

2.2 Participants

Total 569 participants were convenience sampled from a population of adult patients with chronic disease who attended a public health center in a province. For factor analysis, the sample size must be more than 10 times greater than the number of questions to ensure the analysis's reliability [15]. Our sample size satisfied the minimum number for significance. The inclusion criteria were adults between the age of 19–65 years who were diagnosed with at least one chronic disease by a physician at least one year prior, registered as a patient at a public health center, and received periodic care there. The study excluded patients with a mental or behavioral disorder, patients with intracranial injury, patients with cognitive impairment or mental illness, and patients who required a legal guardian to provide consent.

2.3 Measurements

2.3.1 Autonomy Preference Index

API is consisted with 23 items in two domains [8]. The first domain assessed decision-making preference (DMP), and consisted of 6 general items and 9 vignette items. The general items were measured on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The scores for the general items were summed and converted into a total score ranging 0–100. Nine vignette items are measured with three vignettes which represent varying illness severity (upper respiratory tract infection, hypertension, and myocardial infarction related to a general medical illness). Each vignette is measured with three items for a total of nine items, using a five-point scale (1=the doctor, 2=mostly the doctor, 3=the doctor and, 4=mostly, 5=you alone). The general items for DMP and nine vignette items are considered as separate subscales to generate separate scores. In this study, the reliability and validity of the instrument were verified excluding vignette items. Based on expert advice, the three vignettes were irrelevant in the Korean context. In addition, 20 participants who participated in a pilot study mentioned that the items were difficult to understand, and that they were unsuitable for Korean patients because they required extreme responses. Some of the previous studies verifying the API excluded vignette items, since they should be modified according to the characteristics of participants' diseases [9,16], or vignette items were analyzed separately as a sub-scale apart from the six general items [17]. The Cronbach's α of the first domain was .82 [8]. The second domain consisted of eight items pertaining to information-seeking preference (ISP), with each item rated on a five-point Likert scale (1=Strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree), and Cronbach's α was .82 [8]. After adding the scores for eight items, the total score was adjusted to range from 0–100, and a higher score indicated higher ISP.

We obtained permission to use the original instrument. It was translated into Korean by a translator specializing in nursing terminology, and then back-translated into English by the other translator. We compared the back-translated instrument with the original and examined its accuracy. It was confirmed that the Korean version of the instrument could be used because there was no difference from the meaning of the original instrument.

2.3.2 Self-As-Carer Inventory

Criterion validity was assessed based on its correlation with the Self-As-Carer Inventory (SCI), which was originally developed by Goden, & Taylor [18] and translated and modified by So [19]. It measures one's strength and ability to perform self-care, and we used it to test the criterion validity of the K-API. The SCI is a self-reported questionnaire comprising 34 items in six domains (i.e., cognitive aspects of self-care, physical skills, judgement and decision-making process, information-seeking behaviors, perception of self-monitoring, attention to self-management), with each item rated on a 6-point Likert scale, where a higher score indicates higher self-care competence. Cronbach's α was .96 [18], and .92 in the So [19] study. Cronbach's α was .83 in this study.

2.4 Data collection/Procedure

2.4.1 Content validity test

A panel of seven experts (two nursing professors, two internists, two nurses working in health center, and a medical doctor working in health center) tested the instrument's content validity. The content validity index for item (I-CVI) and content validity index for scale/average (S-CVI/Ave) were examined with cut off of .78, and .90, respectably [20]. The content validity of the K-API was established, as the S-CVI/Ave was .95, meeting the cutoff of .90. One item, “You should be given information only when you ask for it” (Item 11), did not meet the criteria (I-CVI=.57), but all remaining items met the criteria (I-CVI=.85–1.0). Item 11 was revised to “I should receive information about disease when I want it,” so that the meaning was conveyed more smoothly and clearly in Korean.

2.4.2 Pilot test and finalization of the preliminary instrument

A pilot test was conducted with 30 patients with chronic disease who met the eligibility criteria in order to improve each item's appropriateness. Questionnaire duration, appropriateness of language, order, and term comprehension were assessed. 21 participants “agreed” and 9 “strongly agreed” that the “Questionnaire items are easy to understand,” while all 30 agreed “The language and vocabulary used in the items flow naturally.”

Additionally, individual interviews were conducted with 10 pilot test participants to improve the questionnaire. The interview questions were “What did you think the questionnaire items were asking for?”; “What items were difficult to understand and why?” and “What items seem inappropriate for you to answer, and why?” The personal interviews confirmed the opinion that some unnecessary modifiers were used in the process of translating English into Korean, and that the inconsistent direction of some items (reverse scoring) made them difficult to answer. Hence, we revised the items in terms of their comprehensibility and language.

2.4.3 Construct validity

To determine the suitability of the data for EFA, the Kaiser-Meyer-Olkin (KMO) test and Bartlette's test of sphericity were performed. It was determined based on a KMO value of .60 and factor loading of .30 [21]. EFA was performed with principal component analysis (PCA) and Varimax rotation. An eigenvalue of 1.0 or higher was used as the criterion for factor extraction, and a factor loading of .50 or higher was used as the criterion for item selection [22].

Construct validity was tested with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Of the 569 participants in this study, about 50% were randomly assigned to EFA, and the remaining 50% were assigned to CFA. EFA was firstly performed because the contents of some items were revised in the course of content validity and pilot testing, and the perception of and reaction to the items may differ according to participants' characteristics and cultural differences [23].

CFA was conducted to verify the fit of the model identified through EFA. In general, the chi-square statistic is presented as a criterion for model fit; however, it is significantly affected by sample size. Therefore, in this study, root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), incremental fit index (IFI), Tucker-Lewis index (TLI), and comparative fit index (CFI) were used as a surrogate index. If the RMSEA is less than .80, and GFI, IFI, TLI, and CFI are more than .90, the model is considered acceptable [24].

2.4.4 Convergent validity and discriminant validity

To verify the convergent validity, construct reliability (CR) and average variance extracted (AVE) were used (acceptable if AVE≥.50, and CR ≥.70) [25]. In order to verify the discriminant validity, we tried to apply the criterion that the squared value of the correlation coefficient, which is the most stringent method. But this condition was not met in this study because the squared correlation coefficient of two factor ($\emptyset^2$=.57) was higher than AVE of the factor 1 (AVE=.52). As a second-best option, we verified whether 1 was not included between the lower and upper limits calculated by adding or subtracting the standard error multiplied by 1.96 to the correlation coefficient(Ø±(1.96×S.E)) [26].

2.4.5 Criterion validity

Since higher preferences for autonomy for one's health-related decisions induce more self-care behavior [1], criterion validity was tested by examining the Pearson's correlation coefficient between K-API and the SCI [19].

2.4.6 Internal consistency reliability

Internal consistency of the instrument was assessed using Cronbach's α, and the values were presented separately for EFA and CFA participants.

2.5 Data analysis

Data were analyzed with descriptive statistics, EFA, CFA, and Pearson's correlation coefficient using the software SPSS/WIN 21.0.

2.6 Ethical consideration

This study was granted ethical approval from the Institutional Review Board of researchers' institution (IRB No. 201812-0021-02). The researchers explained the purpose of the study, that participation was voluntary, and the rights of participants. Written consent was obtained from all participants.

3. Results

3.1 Demographic characteristics

Of the 569 participants, 432 person (75.9%) were women; the mean age was 58.05±7.29 years. A total of 238 (41.8%) were high school graduates, 241 (42.4%) had a bachelor's degree or higher, and 90 (15.8%) had completed middle school or less. The most common diagnoses were diabetes (n=349, 61.3%) and hypertension (n=168, 29.5%). There were no significant differences in general characteristics between EFA and CFA participants, as in Table 1.

3.2 Construct validity

3.2.1 Exploratory factor analysis

The KMO value (=.77) and Bartlett's test of sphericity (χ^2= 834.79, p 〈.001) indicated the suitability of the data for EFA. PCA yielded two factors with an eigenvalue 1.0 or more, and the

Table 1. General Characteristics of the Participants (N=569)

Variables	Categories	Total (N=569)	EFA participants (n=293)	CFA participants (n=276)	*p*
		n (%) or M±SD	n (%) or M±SD	n (%) or M±SD	
Gender	Female	432 (75.9)	229 (78.2)	203 (73.6)	.199
	Male	137 (24.1)	64 (21.8)	73 (26.4)	
Age (yr)		58.05±7.29	58.13±7.19	57.97±7.40	.791
Education	≤Middle school	90 (15.8)	37 (12.6)	53 (19.2)	.092
	High school	238 (41.8)	125 (42.7)	113 (40.9)	
	≥Bachelor's degree	241 (42.4)	131 (44.7)	110 (39.9)	
Diagnosis	Diabetes	349 (61.3)	187 (63.8)	162 (58.7)	.174
	Hypertension	168 (29.5)	86 (29.4)	82 (29.7)	
	Cancer	35 (6.2)	11 (3.8)	24 (8.7)	
	Nervous system disease	10 (1.8)	5 (1.7)	5 (1.8)	
	Chronic renal failure	7 (1.2)	4 (1.4)	3 (1.1)	

EFA = Exploratory factor analysis; CFA=Confirmatory factor analysis; M=mean; SD=Standard deviation explained variance was 25.3% for factor 1 and 28.11% for factor 2, with the cumulative variance being 53.4%. Four items with factor loadings of less than .50 were deleted: "The important medical decisions should be made by your doctor, not by you" (Item 1), "As you become sicker, you should be told more information about your illness" (Item 7), "Even if the news is bad, you should be well informed" (Item 9), and "I should receive information about disease when I want it" (Item 11). The factors were named in order of greatest factor loading. Factor 1 was named "DMP," and factor 2 was named "ISP," following the original version of the API. The correlation coefficient of two factors was .62 for which the discriminant validity was obtained, as in Table 2.

3.2.2 Confirmatory factor analysis

The model fit was confirmed with two factors and 10 items identified through EFA. In this study, RMSEA was .90, within the range of .80–1.0, indicating a mediocre model fit [27], and GFI=.93, IFI=.92, TLI=.88, CFI=.92, suggesting a good model fit.

3.2.3 Convergent validity and discriminant validity

Convergent validity was confirmed for factor 1 (AVE=.52, CR=.83) and factor 2 (AVE=.63, CR=.89). Discriminant validity was established, as the lower limit of the correlation coefficient was .72 and the upper limit was .80; thus, 1 was not included, as in Table 3.

3.3 Criterion validity

In Table 4, the K-API showed a weak correlation with the overall SCI score (r=.24, $p<.001$) and the cognitive aspects of self-care domain (r=.37, $p<.001$); and a moderate correlation with information-seeking behaviors (r=.42, $p<.001$). The DMP domain showed a weak correlation with the overall SCI score (r=.27,

Table 2. Exploratory Factor Analysis (N=293)

Factor	Item no.	Factor Loading	
		Factor 1	Factor 2
Decision making preference	1. You should go along with your doctor's advice even if you disagree with it.	**.660**	.007
	2. When hospitalized, you should not be making decisions about your own care	**.809**	.043
	3. Doctors should make decisions about your everyday medical problems.	**.708**	-.194
	4. If you were sick, as your illness became worse you would want your doctor to take control.	**.625**	.224
	5. Doctor should decide how frequently you need a check-up.	**.626**	.423
Information seeking preference	1. You should completely understand what is happening inside your body as a result of your illness.	.080	**.746**
	2. Your doctor should explain the purpose of your laboratory tests.	.310	**.714**
	3. It is important for you to know all the side effects of your medication.	-.176	**.678**
	4. Information about your illness is as important to you as treatment.	-.008	**.647**
	5. When there is more than one method to treat a problem, you should be told about each one.	.159	**.774**
Eigen value		2.53	2.81
Explained variance (%)		25.3	28.1
Cumulative variance (%)		25.3	53.4
KMO value		.77	
Bartlett's test of sphericity		x^2= 834.79, $p<.001$	

Table 3. Convergent Validity and Discriminant Validity (N=276)

Fact-or	Item no.	Convergent validity								Discriminant validity				
		Non-standa r-dized estimates	Standar-dized estimates (β)	SE	C.R.	*p*	AVE	CR		Esti-mate	SE	−1.96	+1.96	*p*
DMP	2	1.00	0.42	−	−	−			DMP↔ISP	0.76	0.02	0.72	0.80	〈.001
	3	0.90	0.45	0.12	7.54	〈.001	0.52	0.83						
	4	1.11	0.44	0.16	6.80	〈.001								
	5	1.28	0.64	0.19	6.60	〈.001								
	6	2.90	0.99	0.42	6.94	〈.001								
ISP	8	1.00	0.54	−	−	−	0.63	0.89						
	10	1.19	0.84	0.14	8.39	〈.001								
	12	0.52	0.36	0.11	4.93	〈.001								
	13	0.53	0.38	0.10	5.19	〈.001								
	14	0.95	0.64	0.13	7.51	〈.001								

SE=Standard error; C.R.=Critical ratio; AVE=Average variance extracted; CR=Construct validity; DMP=Decision making preference; ISP=Information seeking preference

Table 4. Correlations among K-API and SCI (N=569)

Measures	r (*p*)		
	K-API	DMP	ISP
SCI	.24 (〈.001)	.27(〈.001)	.09(.029)
Cognitive aspects of self-care	.37(〈.001)	.40(〈.001)	.14(.001)
Physical skills	.00(.926)	−.04(.353)	.05(.252)
Judgement and decision-making process	.06(.201)	.22(〈.001)	−.21(〈.001)
Information-seeking behaviors	.42(〈.001)	.31(〈.001)	.38(〈.001)
Perception of self-monitoring	−.09(.045)	−.10(.026)	−.03(.468)
Attention to self-management	−.04(.374)	.01(.910)	−.08(.057)

p〈.001), the judgement and decision-making process domain (r=.22, *p*〈.001), and information-seeking behaviors (r=.31, *p*〈.001); and a moderate correlation with cognitive aspects of self-care (r=.40, *p*〈.001). The ISP showed a very low correlation with the SCI score (r=.09, *p*=.029) and cognitive aspects of self-care (r=.14, *p*=.001); a weak negative correlation with judgement and decision-making process (r=-.21, *p*〈.001); and a weak correlation with information-seeking behaviors (r=.38, *p*〈.001).

3.4 Internal consistency reliability

Cronbach's α was .77 for the DMP domain, and .75 for the ISP domain. The internal consistency of the instrument is respectable [28].

4. Discussion

This study aimed to develop the Korean version of the API. The K-API showed satisfactory results, as its construct, convergent, discriminant, and criterion validity, and internal consistency were confirmed, and the scale was finalized to 10 items in two domains. This study provides additional evidence for the transcultural use of the API.

One notable fact in the development of the K-API in this study was that nine vignette items in the original version of the API were excluded. Participants commented that the responses were too extreme to be applied to Korea's Confucian social norms, which values shared decision-making with family or a group. In a Confucian society, autonomy is a collaborative process with friends and family. This is distinct from western bioethics that stress individual autonomy. Because the nine vignette items identified specific treatment situations, some studies excluded them [9,16]. In particular, vignette items should be tailored to the illness under study, and as suggested by our findings, cultural issues must be taken into consideration.

The results of EFA to verify the construct validity of 14 items, yielded two domains and 10 items. The two domains were consistent with the factors identified in the original instrument [8]. Factors 1 and 2 explained a similar percentage of the total variance, at 25.1% and 28.1%, respectively, confirming that both factors appropriately explained the level of autonomy preference for treatment among patients with chronic diseases. Four items with factor loadings of less than .50 were deleted [20]. "The important medical decisions should be made by your doctor, not by you" (Item 1), which belonged to the DMP domain of the original API, was excluded, which could be because therapeutic experiences vary, and patients adopt different standards for important medical decisions. Moreover, "As you become sicker, you should be told more information about your illness" (Item 7), "Even the news is bad, you should be well informed" (Item 9), and "I should receive information about disease when I want it" (Item 11), which belonged to the ISP domain of the original API, were deleted. Considering the characteristics of Items 7 and 9, these two items are questions about the patient's preference for information seeking in the case of bad news. Regarding negative information about their health, it is thought that individuals accept it differently from general health information. In particular, negative health information might be relevant to important medical decisions. Koreans, who are strongly influenced by Confucian culture, have a passive attitude toward medical decisions [29], so that information seeking preference for bad news might have unique attributes. In the case of Item 11, it was also deleted in a study by Simon et al. [17], as it was the only one describing active information-seeking from the patient's perspective. In addition, the original instrument was developed for adults in U.S. and is believed to have had cultural differences with Korea. Factors affecting participation in the decision-making process in Korean patients were sufficient medical hours, easy explanations, and opportunities to ask questions [30]. Therefore, future studies reflecting the situation in Korea should be conducted.

The criterion validity was tested by examining the correlation between the K-API and SCI, and the results showed a weak correlation in total scores for two instruments ($r= .24$, $p < .001$). This is in line with the results reported by Ende et al. [8] that showed diabetic patients with a high API score were more motivated to undertake self-care, although the study did not use the SCI. In the assessment of criterion validity according to the domains of SCI, the cognitive aspects of self-care domain and the information-seeking behaviors domain, which are similar to the two domains of the K-API, showed a relatively strong correlation with the K-API compared to other domains of the SCI. Thus, criterion validity was established. However, since the correlation was moderate, it should be verified through further studies.

In the study that developed the API, Cronbach's α was .84 and .83, respectively, and the lower Cronbach's α values in our study may be due to the use of fewer items (n=12). To establish internal consistency, measures such as adding more items, clarifying existing items, or conducting another survey on a dramatically different study population should be considered [31]. Therefore, it is necessary to add the number of items to the instrument to improve the internal reliability through replication study, or to enhance the instrument's stability through an expanded study of group with different characteristics of the subject.

The K-API developed in this study is convenient to use in clinical practice because it is a short questionnaire, and it can measure the level of autonomy preference in nursing care among patients with chronic diseases. The benefits of the K-API are that it reflects the cultural context of Korea, as it was developed based on the opinions of patients with chronic diseases through a questionnaire survey and individual interview; it also measures the autonomy preference level from the patient perspective instead of healthcare providers. Furthermore, as the number of chronic patients is expected to increase gradually due to aging, environmental pollution, and changes in living style [32], we believe this study would contribute to the quality of patient-centered nursing. However, we think that more qualitative and quantitative studies for diverse types of chronic disease are needed to settle API in Korea.

Based on the results of this study, we would like to make the following suggestions. First, suggest qualitative research, which explores the nursing experience of patients with chronic disease to find ways to increase their participation in nursing. Second, a comparative study of autonomy for healthcare process based on severity of the chronic disease needs to be implemented.

This study had several limitations. First, although we tried to recruit patients with various chronic diseases, the participants were mainly limited to those with hypertension, diabetes, and cancer. Thus, it would be necessary to expand recruitment to include participants with other chronic disease for further verification. Second, the original version of the API was developed in the USA; thus, bias may have occurred due to differences in cultural characteristics and the medical environments. Therefore, the possibility of systematic errors cannot be completely excluded.

5. Conclusions

This was a methodological study that adapted the API into Korean to assess its validity and reliability. This study proposed an instrument to understand autonomy preference levels in health management among patients with chronic diseases in an Asian country. Healthcare providers, including nurses, will be able to share necessary health-related information with patients and provide efficient care through active partnership between healthcare provider and patients by using K-API. Hence, using the K-API among patients with chronic diseases in clinical practice would offer new insights. It would contribute to managing the quality of care as well as enhancing patient satisfaction.

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