



## Original Article

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# Linguistic Validation of the Intermittent Self-catheterization Questionnaire for Patients With Neurogenic Bladder Who Perform Intermittent Catheterization for Voiding Dysfunction

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**Purpose:** In recent years, the importance of patient satisfaction and quality of life — referred to as patient-related outcomes — has been emphasized, in addition to the evaluation of symptoms and severity through questionnaires. However, the questionnaires that can be applied to Korean patients with neurogenic bladder are limited. Therefore, the current study linguistically validated the Intermittent Self-Catheterization Questionnaire (ISC-Q) as an instrument to evaluate the quality of life of Korean patients with neurogenic bladder who regularly perform clean intermittent catheterization (CIC).

**Methods:** The validation process included permission for translation, forward translations, reconciliation, backward translation, cognitive debriefing, and proofreading. Two bilingual translators independently translated the original version of the ISC-Q into Korean and then combined the initial translations. A third bilingual translator performed a backward translation of the reconciled version into English. Five Korean-speaking patients with neurogenic bladder carried out the cognitive debriefing.

**Results:** During the forward translation process, the 24 questions of the ISC-Q were translated into 2 Korean versions. The terms used in each version were adjusted from the original version to use more conceptually equivalent expressions in Korean. During the backward translation process, several changes were involving substitutions of meaning. In the cognitive debriefing process, 5 patients were asked to complete the questionnaire. All patients agreed that the questionnaire explained their situation well.

**Conclusions:** This study presents a successful linguistic validation of the Korean version of the ISC-Q, which could be a useful tool for evaluating treatment satisfaction in patients with neurogenic bladder performing CIC regularly.

**Keywords:** Catheterization; Neurogenic urinary bladder; Urination

• **Research Ethics:** This study was approved by the Institutional Review Board of the Seoul Metropolitan Government - Seoul National University Boramae Medical Center (approval number: 26-2016-64).

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## INTRODUCTION

Patients with neurogenic bladder should be treated with appropriate behavioral therapy such as adequate water intake and restriction of caffeinated drinks to promote proper urination. Although medications such as alpha-blockers, anticholinergic agents, beta-3 agonists, and antidiuretic hormone are very common as therapies, these drugs are often not fully effective in achieving complete control of frequent lower urinary tract symptoms such as urinary frequency, urgency, and persistence. A large amount of residual urine and urinary tract infections are more common in patients with neurogenic bladder than in the general population, and neurogenic bladder patients are at a higher risk of kidney damage in the long term [1]. Therefore, to overcome the limitations of behavioral therapy and pharmacotherapy, a catheter can be used to perform clean intermittent catheterization (CIC), which regularly empties the bladder, at least 4–6 times a day.

To date, nelaton catheters, which are mainly composed of rubber, are most commonly used in patients with neurogenic bladder who need to perform self-catheterization because they are the cheapest and most affordable options. However, nelaton catheters are so weak that they are difficult to insert into the urethra. Additionally, it is difficult to store and transport them cleanly and smoothly, and they have disadvantages, such as an increased risk of urinary tract infections and urethral trauma that occurs during reuse [2]. To overcome these shortcomings, various types of catheters have been marketed. However, very few tools are available in Korea for evaluating patient satisfaction, ease of use, and quality of life when using these catheters. Therefore, doctors cannot objectively evaluate patients' perspectives about performing catheterization in the outpatient clinic.

In recent years, the importance of patient satisfaction and quality of life—referred to as patient-related outcomes—has been emphasized, in addition to the evaluation of symptoms and severity through questionnaires. However, the questionnaires that can be applied to Korean patients with neurogenic bladder are limited. Therefore, the current study linguistically validated the Intermittent Self-Catheterization Questionnaire (ISC-Q) as an instrument to evaluate the quality of life of patients with neurogenic bladder who regularly perform CIC.

## MATERIALS AND METHODS

### Intermittent Self-Catheterization Questionnaire

The ISC-Q is used to evaluate aspects of quality of life specific to the needs of individuals performing intermittent self-catheterization [3]. It focuses on 4 issues: ease of use, convenience, discreetness, and psychological well-being.

### Translation and Linguistic Validation

The Institutional Review Board of Seoul Metropolitan Government - Seoul National University Boramae Medical Center approved this study (approval number: 26-2016-64). This procedure was conceptually the same as that of previous studies designed to obtain translated versions of other questionnaires in Korean. The linguistic validation of the ISC-Q consisted of forward translation, reconciliation, backward translation, cognitive debriefing, and proofreading [4,5]. Two different bilingual translators performed forward translations, and in the process of the first forward translation left comments on difficulty, meaning, and alternative options for translation. Then, in the backward translation, cases where words were differently translated were reconciled into one English word. Comments on difficulty, meaning, and alternative options for translation were reflected in the backward translation, cognitive debriefing, and proofreading process.

### Permission

Acquisition of consent was received directly from the researcher who developed the ISC-Q.

### Forward Translation

Two independent bilingual speakers each performed a standard translation and also translated expressions and meanings from the original questionnaire into conceptually equivalent Korean words.

### Reconciliation

Two bilingual speakers compared their differences in translation, and agreed on the most relevant Korean words for the final forward translated Korean version.

### Backward Translation

A third bilingual speaker performed a backward translation of the reconciled version of the Korean questionnaire into English. Afterwards, the 3 bilingual speakers met to discuss the differ-

ences among the original questionnaire, the reconciled version of the forward translation of the questionnaire, and the backward translation of the questionnaire. During this process, some comments on difficult-to-understand phrases were made on the basis of comparing the original text and the translated questionnaire in English, and alternative options for translation were suggested.

### Cognitive Debriefing

The final questionnaire was given to 5 patients with different backgrounds in terms of age, sex, pathology, and educational level. The questionnaire was evaluated as being understandable, difficult to understand, or meaningless. Survey interviews were performed to interpret each question in the questionnaire and to provide participants with an opportunity to indicate whether there were difficulties in understanding the questions or whether there were any confusing terms.

### Final Proofreading

The final questionnaire was prepared considering not only the various grammatical constructions and forms, but also its utility for evaluating patients' status.

## RESULTS

### Forward Translation and Reconciliation

As shown in Table 1, the 24 questions of the ISC-Q were translated into Korean. The subject of the questionnaire (ISC-Q) was translated as *ganheoljeok jagadonyo seolmunji*. The word "intermittent" was translated as *bijeonggi* and *ganheoljeok* in translations 1 and 2, respectively. The panel agreed on *ganheoljeok* ("intermittent").

#### Ease of use

Question 1, "It is easy to prepare my catheter for use each time I need it" in the original version, was translated as *naneun piryosi sayonghal su itdorok kateteoreul swipge junbihal su itda*. The word "easy" was translated as *yongi* and *swipge* in translations 1 and 2, respectively. The panel agreed on *swipge* ("easy").

Question 2, "It is messy to prepare my catheter for use" in the original version, was translated as *naneun kateteoreul sayonghal su itdorok junbihaneunge bokjapada*. The word "messy" was translated as *golchiapeuda* ("troubled") in translation 1, and *bokjapada* ("complicated") in translation 2. The phrase "for use" was translated as *piryosi* and *sayonghal su itdorok* in translations

1 and 2, respectively. Finally, the panel agreed on *bokjapada* and *sayonghal su itdorok*.

Question 3, "It is easy to insert my catheter" in the original version, was translated as *naneun kateteoreul sabipaneun ge swipda*. The word "easy" was translated as *eoryeopji anta* and *swipda* in translations 1 and 2, respectively. The panel agreed on *swipda*.

Question 4, "I find inserting the catheter is uncomfortable sometimes" in the original version, was translated as *naneun kateteo sabip si gakkeum bulpyeonhameul neukkinda*.

Question 5, "The design of the catheter makes it easy to insert" in the original version, was translated as *kateteoui dijaini sabipagie swipge doeoo itda*.

Question 6, "The catheter is fiddly to use" in the original version, was translated as *kateteoreul sayonghagie seonggasida*. The word "fiddly" was translated as *seonggasida* by both translators.

Question 7, "The lubrication on the catheter makes it difficult to use" in the original version, was translated as *kateteoui yunhwaraegeuro inhae sayonghagiga eoryeopda*. The word "lubrication" was translated as *yunhwal* in translation 1, and *yunhwaryu* in translation 2. The panel agreed on *yunhwaraek*.

Question 8, "I feel confident in my ability to use my catheter" in the original version, was translated as *naneun kateteoreul jahwaryonghaneunde jasini itda*.

#### Convenience

Question 9, "Storage of catheters at home is inconvenient" in the original version, was translated as *jibeseo kateteoreul bogwanhagie bulpyeonhada*.

Question 10, "Taking enough catheters for a weekend away is very inconvenient" in the original version, was translated as *jumaldongan oechulsi kateteoreul chungbunhi gajyeoganeun geosi maeu bulpyeonhada*.

Question 11, "Taking enough catheters for a 2-week holiday is very inconvenient" in the original version, was translated as *2 weeks hyugasi kateteoreul chungbunhi gajyeoganeun geosi maeu bulpyeonhada*. The word "weekend" was translated as *yeohaeng* in translation 1, and as *hyuga* in translation 2. The panel agreed on *hyuga*.

Question 12, "Disposal of my catheter is inconvenient when away from home" in the original version, was translated as *jip bakke inneun gyeongu kateteoreul pyegihaneun geosi bulpyeonhada*. The phrase "when away from home" was translated as *jibeul tteonasseul ttae* and *jip bakke inneun gyeongu* in translations 1 and 2, respectively. The panel reconciled it as *jip bakke*.

**Table 1.** Grid for the first forward translation of questionnaire into Korean

US English item	First forward Korean translation	Comments on difficulty, meaning, or alternative options for translation
Intermittent Self-Catheterization Questionnaire	간헐적 차기 카테터 사용 설문지	Intermittent의 의미가 불명확한 것 같음. 간헐적 차기 카테터 설문지
<b>Ease of use</b>		
Q1) It is easy to prepare my catheter for use each time I need it.	필요 시 카테터를 준비하는 게 용이하다. 나는 필요할 때마다 사용할 수 있도록 쉽게 카테터를 준비할 수 있다.	(나는) 필요 시 사용할 수 있도록 카테터를 쉽게 준비할 수 있다.
Q2) It is messy to prepare my catheter for use	필요 시 카테터를 준비하는 게 어렵고 끌지 어렵다. 나는 사용할 수 있도록 카테터를 준비하기가 복잡하다.	Messy의 표현이 시체물/어수선의 의미가 적절치 않음. Complicated와 이 상황에서는 동일하다. (나는) 카테터를 사용할 수 있도록 준비하는 게 복잡하다.
Q3) It is easy to insert my catheter	자신에게 카테터를 삽입하는 게 어렵지 않다. 나는 카테터를 쉽게 삽입한다.	(나는) 카테터를 삽입하는 게 쉽다.
Q4) I find inserting the catheter is uncomfortable sometimes	자신에게 카테터를 삽입하는 게 때로는 불편하다. 나는 기끔 카테터 삽입 시 불편함을 느낀다.	(나는) 카테터 삽입 시 기끔 불편함을 느낀다.
Q5) The design of the catheter makes it easy to insert	카테터의 디자인 덕분에 삽입이 용이하다. 카테터의 형태가 삽입하기가 쉽게 되어 있다.	디자인의 외래어라서 고민. 수동적인 표현이 약간 어색하다. 카테터의 디자인이 삽입하기에 쉽게 되어 있다.
Q6) The Catheter is fiddly to use.	카테터를 사용하는 게 성가시다.	Fiddly라는 표현이 원래 바늘, 실과 같은 작은 것을 다룰 때 느끼는 불편함을 의미하는데, '성가시다'라는 단어가 가장 적절해 보임. 카테터를 사용하기에 성기시다(카테터를 사용하는 것이 성기시다).
Q7) The lubrication on the catheter makes it difficult to use	카테터가 윤활되었기 때문에 카테터를 사용하기가 어렵다. 카테터의 윤활유로 인해 사용하기가 어렵다.	Lubrication의 용이한 표현이 부적절함. 카테터의 윤활유으로 인해 사용하기가 어렵다.
Q8) I feel confident in my ability to use my catheter	나는 카테터를 잘 사용할 수 있다는 자신이 있다. 나는 나의 카테터 사용 능력에 자신 있다.	현재 카테터 사용 여부가 명확지 않다. 나는 카테터를 잘 활용하는데 자신이 있다.
<b>Convenience</b>		
Q9) Storage of catheters at home is inconvenient	집 안에 카테터를 보관하는 게 불편하다. 집에 카테터를 보관하기 불편하다.	집에서 카테터를 보관하기에 불편하다.
Q10) Taking enough catheters for a weekend away is very inconvenient	주말에 집을 떠날 때 카테터를 충분히 챙겨 다니는 게 불편하다. 주말에 충분한 카테터를 준비하는 것은 매우 불편한 일이다.	주말 동안 외출 시 카테터를 충분히 가져가는 것이 매우 불편하다.
Q11) Taking enough catheters for a 2-week holiday is very inconvenient	2주간 여행을 갈 때 카테터를 충분히 챙겨가는 게 불편하다. 2주 후기를 위해 충분한 카테터를 준비하는 것은 매우 불편한 일이다.	2주 후기 시 카테터를 충분히 가져가는 것이 매우 불편하다.
Q12) Disposal of my catheter is inconvenient when away from home	집을 떠났을 때 카테터를 처리하는 게 불편하다. 집 밖에 있는 경우 카테터를 처리하는 것이 어렵다.	'집 밖에 있는 경우'가 구어체? 집 밖에 있는 경우 카테터를 폐기하는 것이 불편하다.
<b>Discreetness</b>		
Q13) I find it easy to carry enough catheters around with me on a day-to-day basis	일상 생활을 할 때 카테터를 충분히 챙겨 다니는 게 어렵지 않다. 나는 일일 필요로 양의 카테터를 가지고 다니는 것이 쉽다.	(나는) 하루에 필요한 만큼의 카테터를 가지고 다니는 것이 쉽다.
Q14) I find it easy to dispose of my catheter when I am away from home	집을 떠났을 때 카테터를 처리하는 게 어렵지 않다. 나는 집 밖에 있을 때 카테터를 처리하는 것이 쉽다.	(나는) 집 밖에 있는 경우 카테터를 폐기하는 것이 쉽다.

*(Continued to the next page)*

Table 1. Continued

US English item	First forward Korean translation	Comments on difficulty, meaning, or alternative options for translation
Q15) My catheter is discreet	내가 사용하는 카테터는 쉽게 눈에 띄지 않는다. 나의 카테터는 삽기다.	Discreet의 의미가 핵심적이어서 약간의 서술이 필요하다. 내 카테터는 쉽게 눈에 띄지 않는다.
Q16) I can use my catheter discreetly when I am away from home	내가 집에 없을 때 카테터를 은밀하게 사용할 수 있다. 나는 집 밖에 있을 때 카테터를 조심스럽게 사용할 수 있을까?	(나는) 집 밖에 있는 경우 (남을 의식하지 않고) 카테터를 사용할 수 있다.
Q17) I can easily dispose of my catheter without it being obvious to people	나는 카테터를 사용한 이후 남들의 시선을 끌지 않고 카테터를 처리 할 수 있다. 나는 다른 사람들을 눈에 띄지 않게 카테터를 처분할 수 있다.	Obvious가 정확히 표현하라면 '뻔하다'라는 게 추가되며 좋을 듯. (나는) 카테터를 눈에 띄지 않게 쉽게 폐기할 수 있다.
Q18) My catheter allows me to feel confident when away from home	집을 떠났을 때 카테터 덕분에 자신감이 생긴다. 집 밖에 있을 때 카테터는 나에게 자신감을 준다.	집 밖에 있는 경우 카테터 덕분에 '자신감'이 있다. 카테터로 인해 vs. 카테터 덕분에, '자신감'이 있다 vs. '자신이 있다'는 집 밖에 있는 경우 카테터로 인해 자신이 있다.
Psychological well-being	심리적 행복(만족) 정신적 훈련	심리적 행복
Q19) I am self-conscious about my need to self-catherize	나는 자가도뇨의 필요성을 스스로 의식할 수 있다. 나는 나의 자가 카테터 필요를 의식하고 있다.	(나는) 자가도뇨의 필요성을 의식하고 있다.
Q20) I would feel embarrassed if people saw my catheter in its packet	다른 사람이 풀선과 결합된 나의 카테터를 발견한다면 부끄러움을 느낄 것 같다. 나는 다른 사람들이 나의 카테터 틀을 본다면 부끄러울 것 같다.	(나는) 다른 사람들이 내 카테터 용기를 본다면 부끄러움을 느낄 것 같다.
Q21) My need to use catheter sometimes makes me feel embarrassed	내가 카테터를 사용해야 한다는 사실이 때로는 부끄럽다. 나는 가끔 나의 카테터 필요성으로 인해 부끄러움을 느낀다.	(나는) 카테터 사용이 가끔 필요하다는 점으로 인해 부끄러움을 느낀다.
Q22) I worry that my catheter doesn't always empty my bladder fully	나는 내가 사용하는 카테터가 방광에 있는 소변을 완전히 배출시키지 못할까 봄 청한다. 나는 카테터가 나의 방광을 항상 완전히 비우지 못할까 봄 청한다.	나는 카테터가 방광을 항상 완전히 비우지 못할까 봄 청한다.
Q23) My need to use catheters stops me from visiting friends and family as often as I would like	나는 카테터를 사용하기 때문에 내가 원하는 만큼 친구와 가족을 만날 수 없다. 나의 카테터 사용 필요로 인해 가족과 친구들 방문 번도수가 낮아졌다. 수 없다.	나는 카테터 사용이 필요하다는 점으로 인해 원하는 만큼 친구와 가족을 자주 만날 수 없다.
Q24) I worry about the risk of long-term problems from using my catheter	나는 카테터 사용으로 인한 장기적인 문제에 대해 걱정된다.	나는 카테터 사용에 의한 장기적 문제의 발생 위험에 대해 걱정된다.

*inneun gyeongu*. The category of “discreetness” was translated as *eunmilseong* in translation 1, and as *sinjungseong* in translation 2. The panel agreed on *eunmilseong*.

#### Discreetness

Question 13, “I find it easy to carry enough catheters around with me on a day-to-day basis” in the original version, was translated as *naneun harue piryohan mankeumui kateteoreul gajigo danineun geosi swipda*.

Question 14, “I find it easy to dispose of my catheter when I am away from home” in the original version, was translated as *naneun jip bakke inneun gyeongu kateteoreul pyegihaneun geosi swipda*. The phrase “when I am away from home” was translated as *jibeul tteonasseul ttae* and *jip bakke inneun gyeongu* in translations 1 and 2, respectively. The panel reconciled it as *jip bakke inneun gyeongu*. The word “dispose” was translated as *cheori* in translation 1, and as *cheobun* in translation 2. The panel agreed on *pyegi*.

Question 15, “My catheter is discreet” in the original version, was translated as *nae kateteoneun swipge nune ttuji anneunda*. The word “discreet” was translated as *swipge nune ttuji anneunda* in translation 1, and as *samgada* in translation 2. The panel agreed on *swipge nune ttuji anneunda*.

Question 16, “I can use my catheter discreetly when I am away from home” was translated as *naneun jip bakke inneun gyeongu nameul uisikaji anko kateteoreul sayonghal su itda*. The word “discreetly” was translated as *eunmilhage* in translation 1, and as *josimseureopge* in translation 2. The panel agreed on *nameul uisikaji anko*.

Question 17, “I can easily dispose of my catheter without it being obvious to people” in the original version, was translated as *naneun kateteoreul nune ttuji anke swipge pyegihal su itda*.

Question 18, “My catheter allows me to feel confident when away from home” in the original version, was translated as *jip bakke inneun gyeongu kateteoro inhae jasini itda*.

#### Psychological well-being

Question 19, “I am self-conscious about my need to self-catherize” in the original version, was translated as *naneun jagadonyoui piryoseongeul uisikago itda*.

Question 20, “I would feel embarrassed if people saw my catheter in its packet” in the original version, was translated as *naneun dareun saramdeuri nae kateteo yonggireul bondamyeon bukkeureoumeul neukkil geot gatda*.

Question 21, “My need to use a catheter sometimes makes

me feel embarrassed” in the original version, was translated as *naneun kateteo sayongi gakkeum piryohadaneun jeomeuro inhae bukkeureoumeul neukkinda*.

Question 22, “I worry that my catheter doesn’t always empty my bladder fully” in the original version, was translated as *naneun kateteoga naui banggwangeul hangsang wanjeonhi biuji motalkka bwa geokjeongdoenda*. The word “empty” was translated as *baechulsikida* in translation 1, and as *biuda* in translation 2. The panel agreed on *biuda*.

Question 23, “My need to use catheters stops me from visiting friends and family as often as I would like” in the original version, was translated as *kateteo sayongi piryohadaneun jeomeuro inhae wonhaneun mankeum chinguwa gajogeul jaju mannal su eopda*. The phrase “my need to use catheters” was translated as *naneun kateteoreul sayonghagi ttaemune* and *naui kateteo sayong piryoro inhae* in translations 1 and 2, respectively. The panel agreed on *kateteo sayongi piryohadaneun jeomeuro inhae*.

Question 24, “I worry about the risk of long-term problems from using my catheter” in the original version, was translated as *naneun kateteo sayonge uihan janggiyeok munjeui wiheome daehae geokjeongdoenda*.

#### Backward Translation and Retranslation

As shown in Table 2, the panel discussed the differences between translations of “the catheter is fiddly to use” in the original version and “it is bothersome to use the catheter” in the reconciled version. The panel finally agreed to change the translated term *seonggasida* in Korean to *darugi himdeulda*. The panel agreed to change the translated question *kateteoui yunhwaraegeuro inhae sayonghagiga eoryeopda* in Korean to *kateotega yunhwaldoeeo sayonghagiga eoryeopda*.

For the category of “discreetness,” the panel ultimately agreed to change the translated term *eunmilseong* to *bunbyeolseong*. The panel discussed the differences between “I find it easy to dispose of my catheter when I am away from home” in the original version and “it is easy (for me) to dispose the catheter when I’m outside the house” in the reconciled version. The panel commented on whether or not it would be suitable to change *jip bakke inneun gyeongu* (“when away from home”) to *oechulsi* (“when I’m outside the house”). The panel finally agreed to change the term. The panel agreed to change the translated question *nae kateteoneun swipge nune ttuji anneunda* to *kateteoneun taineul uisikaji anko manjokseureopge sayongdoelman hada*. The panel discussed the differences between “I can use my catheter discreetly when I am away from home” in

**Table 2.** Grid for the back translation of questionnaire

US English Item (original text)	US English (The third translator)	Korean (The first, second translators)	Comments on difficulty, meaning, or alternative options for translation
Intermittent Self-Catheterization Questionnaire	Intermittent self catheterization questionnaire	간헐적 자기도뇨 설문지	
Ease of use	Ease of use	사용, 편의성	
Q1) It is easy to prepare my catheter for use each time	(1) Can easily prepare the catheter when needed	(나는) 필요 시 사용할 수 있도록 카테터를 쉽게 준비할 수 있다.	
I need it			
Q2) It is messy to prepare my catheter for use	It is complicated (for me) to prepare to use the catheter	(나는) 카테터를 사용할 수 있도록 준비하는 게 번거롭다.	The preparation process to use the catheter is complicated (for me). 'messy' vs. 'complicated' '별걸하나' vs. '별거롭다'
Q3) It is easy to insert my catheter	It is easy (for me) to insert the catheter	(나는) 카테터를 삽입하는 게 쉽다.	
Q4) I find inserting the catheter is uncomfortable sometimes	Sometimes I experience discomfort when/while inserting the catheter	(나는) 카테터 삽입 시 가끔 불편함을 느낀다.	'uncomfortable' vs. 'discomfort' 'find' vs. 'experience' '느낀다' vs. '겪는다'
Q5) The design of the catheter makes it easy to insert	The design of the catheter is made easy to insert	카테터의 디자인이 삽입하기에 쉽게 되어 있다.	
Q6) The Catheter is fiddly to use.	It is bothersome to use the catheter	카테터를 사용하기에 성가시다. (카테터를 사용하는 것이 성가시다).	카테터 사용 시 다루기 힘들다.
Q7) The lubrication on the catheter makes it difficult to use	The catheter's lubricant makes it hard to use	카테터의 윤활액으로 인해 사용하기가 어렵다.	카테터가 윤활되어 사용하기 어렵다.
Q8) I feel confident in my ability to use my catheter	I am confident in using the catheter very well	나는 카테터를 잘 활용하는데 자신이 있다. 나는 카테터 활용능력에 자신이 있다.	'Add ability' or not
Convenience	Convenience	편리성	
Q9) Storage of catheters at home is inconvenient	It is uncomfortable/ difficult to store the catheter at home	집에서 카테터를 보관하기에 불편하다.	
Q10) Taking enough catheters for a weekend away is very inconvenient	It is very uncomfortable to bring plenty (amount) of catheters with me when I go out during the weekends	주말동안 외출 시 카테터를 충분히 가져가는 것이 매우 불편하다.	
Q11) Taking enough catheters for a 2-week holiday is very inconvenient	It is very uncomfortable to bring plenty (amount) of catheters with me during the 2-week vacation/leave	2주 휴가 시 카테터를 충분히 가져가는 것이 매우 불편하다.	
Q12) Disposal of my catheter is inconvenient when away from home	It is uncomfortable to dispose the catheter when I'm outside the house	집 밖에 있는 경우 카테터를 폐기하는 것이 불편하다.	
Discreetness	Discreetness	1. 분별성 2. 조심스러움 3. 타인에 대한 의식.	
Q13) I find it easy to carry enough catheters around with me on a day-to-day basis	It is easy (for me) to carry/bring enough amount of catheters needed for a day	(나는) 하루에 필요한 만큼의 카테터를 가지고 다니는 것이 쉽다.	
Q14) I find it easy to dispose of my catheter when I am away from home	It is easy (for me) to dispose the catheter when I'm outside the house	(나는) 집 밖에 있는 경우 카테터를 폐기하는 것이 쉽다.	When I'm outside the house, the process of disposing the catheter is easy (나는) 외출 시 카테터를 폐기하는 것이 쉽다.

*(Continued to the next page)*

Table 2. Continued

US English Item (original text)	US English (The third translator)	Korean (The first, second translators)	Comments on difficulty, meaning, or alternative options for translation
Q15) My catheter is discreet	My catheter is not easily seen/ noticed (by others)	내 카테터는 쉽게 눈에 띄지 않는다.	
Q16) I can use my catheter discreetly when I am away from home	I can use the catheter (when I'm) outside my house (without being conscious of others)	(나는) 집 밖에 있는 경우(남을 의식하지 않고) 카테터를 사용할 수 있다.	카테터는 타인을 의식하지 않고 만족스럽게 사용될만 하다(휴대성, 사용 편리성 포함 의미).
Q17) I can easily dispose of my catheter without it being obvious to people	I can dispose my catheter without being seen/ noticed (by others) easily	(나는) 카테터를 눈에 띄지 않게 쉽게 폐기할 수 있다.	(나는) 외출 시 (남을 의식하지 않고) 카테터를 사용할 수 있다.
Q18) My catheter allows me to feel confident when away from home	I am/ feel confident because of my catheter when I'm outside the house	집 밖에 있는 경우 카테터로 인해 자신감이 있다.	
Psychological well-being	Psychological well-being	심리적 행복	Psychological happiness
Q19) I am self-conscious about my need to self-catherize	(I am) aware of the self catheterization's necessity	(나는) 자가도뇨의 필요성을 의식하고 있다.	(나는) 자가도뇨의 필요성을 스스로 의식하고 있다.
Q20) I would feel embarrassed if people saw my catheter in its packet	I would feel embarrassed if other people see my catheter container	(나는) 다른 사람들이 내 카테터 용기를 본다면 부끄러움을 느낄 것 같다.	
Q21) My need to use catheter sometimes makes me feel embarrassed	I feel embarrassed by the fact that I sometimes need to use the catheter	(나는) 카테터 사용이/가끔 필요하다는 점으로 인해 부끄러움을 느낀다.	(나는) 카테터를 사용해야 한다는 필요성 때문에 기분 부끄럽다.
Q22) I worry that my catheter doesn't always empty my bladder fully	I am worried that my catheter won't always be able to completely empty my bladder	나는 카테터가 나의 방광을 항상 완전히 비우지 못할까봐 걱정된다.	
Q23) My need to use catheters stops me from visiting friends and family as often as I would like	I can't meet my family and friends as often as I want due to the fact that I need to use the catheter	카테터 사용이 필요하다는 점으로 인해 원하는 만큼 친구와 가족을 자주 만날 수 없다.	The fact that I need to use the catheter prevents me from being able to meet my family and friends as often as I want
Q24) I worry about the risk of long-term problems from using my catheter	I am worried about the dangers of the long-term problems due to the usage of the catheters	나는 카테터 사용에 의한 장기적 문제의 위험에 대해 걱정된다.	나는 카테터 사용에 의한 장기적 문제가 발생할까 걱정된다.
	The Indevus (Urinary) Urgency Severity Scale	(가운데) Indevus 요 질박학의 심각성 정도	

**Table 3.** Patient data summary sheet

Subject	Age (yr)	Sex	Pathology (stress/urge/mixed)	Profession/ educational level	Time to complete questionnaire (min)
1	60	M	Parkinsonism	High school	8
2	70	M	Spinal cord injury	Elementary school	15
3	70	F	Spinal cord injury	Elementary school	15
4	45	F	Transverse myelitis	Middle school	10
5	53	F	Radiation cystitis	Middle school	15

**간헐적 자가도뇨 설문지 (ISC-Q)**

	지극히 동의하지 않음	약간 동의하지 않음	의견 없음	약간 동의함	지극히 동의함	바닥효과 (Floor effect)
<b>사용 편의성</b>						
1. (나는) 필요시 소변줄 (카테터)를 <u>쉽게 준비</u> 할 수 있다.						
2. (나는) 소변줄을 사용할 수 있도록 <u>준비하는게 번거롭다</u> .						
3. (나는) 소변줄을 <u>삽입하는게 쉽다</u> .						
4. (나는) 소변줄 삽입 시 가끔 불편함을 느낀다.						
5. 소변줄의 디자인이 삽입하기에 쉽게 되어 있다.						
6. 소변줄 사용 시 다루기 힘들다.						
7. 소변줄이 <u>윤활되어 (미끄러워)</u> 사용하기 어렵다.						
8. 나는 <u>소변줄을 활용하는데 자신이 있다</u> .						
<b>편리성</b>						
9. 집에서 소변줄을 <u>보관하기에 불편</u> 하다.						
10. 주말동안 소변줄을 외출시 충분히 가져가는 것이 매우 불편하다.						
11. 소변줄을 2주 휴가시 충분히 가져가는 것이 매우 불편하다.						
12. 소변줄을 <u>집 밖에 있는 경우 폐기</u> 하는 것이 불편하다.						
<b>분별성</b>						
13. (나는) 소변줄을 <u>하루에 필요한 만큼 가지고 다니는</u> 것이 쉽다.						
14. (나는) 외출 시 소변줄을 <u>폐기하는</u> 것이 쉽다.						
15. 소변줄은 <u>타인을 의식하지 않고 만족스럽게</u> 사용할만 하다.						
16. (나는) 외출 시 ( <u>타인을 의식하지 않고</u> ) 소변줄을 사용할 수 있다.						
17. (나는) 소변줄을 <u>눈에 띠지 않게 쉽게 폐기</u> 할 수 있다.						
18. 소변줄로 인해 외출 시 <u>자신감이</u> 생긴다.						
<b>심리적 행복</b>						
19. (나는) 자가도뇨의 <u>필요성을 스스로 알고</u> 있다.						
20. (나는) 다른 사람들이 내 소변줄 <u>용기통</u> 을 본다면 부끄러울 것 같다.						
21. (나는) 소변줄을 사용해야 한다는 <u>필요성</u> 때문에 가끔 부끄럽다.						
22. (나는) 소변줄이 나의 <u>방광</u> 을 완전히 비우지 못할까 봐 항상 걱정된다.						
23. 소변줄을 사용해야 하기 때문에 <u>원하는 만큼 친구와 가족을 자주 만날 수 없다</u> .						
24. (나는) 소변줄을 사용함으로써 <u>장기적 문제</u> 가 발생할까 걱정된다.						

**Fig. 1.** Korean version of the Intermittent Self-Catheterization Questionnaire (ISC-Q).

the original version and “I can use the catheter (when I’m) outside my house (without being conscious of others)” in the reconciled version. The panel commented on whether or not it would be suitable to change *jip bakke inneun gyeongu* (“when away from home”) to *oechulsi* (“when I’m outside the house”). The panel agreed to change the translated question *jip bakke inneun gyeongu kateteoro inhae jasini itda* to *oechul si kateteoro inhae jasingami saengginda*. The panel agreed to change the translated question *naneun kateteo sayongi gakkeum piryohadneun jeomeuro inhae bukkeureoumeul neukkinda* to *naneun kateteoreul sayonghaeya handaneun piryoseong ttaemune gakkeum bukkeureopda*. The panel also agreed to change the translated question *naneun kateteo sayonge uihan janggijeok munjeui wiheome daehae geokjeongdoenda* to *naneun kateteo sayonge uihan janggijeok munjega balsaenghalkka geokjeongdoenda*.

### Cognitive Debriefing and Proofreading

The translated questionnaire was tested by 5 patients with neurogenic bladder who regularly performed CIC. As shown in Table 3, age, pathology, level of education, and time to complete the questionnaire varied across all 5 patients. The patients aged 70 years or older were not able to answer the questionnaire correctly, and the time required for the questionnaire ranged from 10 to 15 minutes. A 60-year-old male patient did not know the meaning of “catheter,” so he used his cell phone to search for the meaning of that word in the questionnaire. When asked whether the questionnaire explained the situation of the patient well, all the patients answered “yes.” In addition, the format of the questionnaire was not particularly inconvenient for all patients. The final version is shown in Fig. 1.

## DISCUSSION

Reviewing some words that had comments in the translation process, the word “messy” in question 2 was changed to “complicated” when translating into Korean because the meaning of “dirty, clutter” was inappropriate. As a result, it was translated as “complicated” in the backward translation process.

For question 5, the opinion was raised that the word for ‘design’ was difficult to translate into Korean because the word for “design” is a loanword in Korea, and it was felt that the passive expression was a bit awkward. However, it was backward-translated as “design,” and therefore the panelists agreed to use the word “design” as a loanword.

The expression “fiddly” from question 6 was reconciled and

backward-translated to “bothersome” because it refers to inconveniences when dealing with small objects, such as a needle and thread. Furthermore, in question 15, the meaning of “discreet” was implicative, so the decision was made that some further description was needed, and the expression was changed to “not easily noticeable.” As a result, it was backward-translated into “not easily seen/noticed (by others).”

In conclusion, this present study presents the successful linguistic validation of the Korean version of the ISC-Q. The Korean version of the ISC-Q will play an important role in assessing the quality of life and the satisfaction of Koreans who are performing CIC, and it will serve as a tool that allows physicians to objectively evaluate patients who are performing CIC.

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## AUTHOR CONTRIBUTION STATEMENT

- Full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis: SHK, SJO, SJ, SYC
- Study concept and design: SHK, SJO, SJ, SYC
- Acquisition of data: SHK, SYC
- Analysis and interpretation of data: SHK, SYC
- Drafting of the manuscript: SHK, SYC
- Critical revision of the manuscript for important intellectual content: SHK, SYC
- Statistical analysis: SHK, SYC
- Obtained funding: SHK, SYC
- Administrative, technical, or material support: SHK, SYC
- Study supervision: SHK, SYC

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