

Research Article

Korean version of the convalescence and recovery evaluation: translation and linguistic validation



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ABSTRACT

Background: To develop a Korean version of the original English version of the convalescence and recovery evaluation (CARE) questionnaire. The linguistic validation of the CARE questionnaire was tested on Korean patients who underwent abdominal and pelvic surgery.

Methods: The CARE questionnaire was translated and validated linguistically in the following steps. Permission to translate the Korean version of the original version, forward translation into the Korean, reconciliation, backward translation into English, cognitive debriefing through patient interviews, and finally proofreading.

Results: The forward translation was carried out by two independent bilingual translators with non-medical backgrounds. In the translation step to Korean, the terms “bloated and gassy” and “trouble concentrating” were adjusted to make them easier to understand. Backward translation was performed by another translator who was not included in the forward translation. At the backward-translation stage, the Korean version was accepted without any objection, almost matching the original version except for a few words. Cognitive debriefing by means of patient interviews was performed with 10 patients admitted to the department of urology for renal, bladder, and prostate cancer for cancer treatment. There was no difficulty in understanding the content of the questionnaire. Because most of the terms were clear and understandable, no further changes were made in the panel discussion.

Conclusions: The Korean version of the CARE questionnaire has been verified and is ready for use. Additional testing steps are required for the psychometric performance of the Korean version of CARE.

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1. Introduction

Surgical treatment has traditionally been evaluated in terms of life-related recurrence, progression, survival, death, or recovery of organ function.¹ However, it is difficult to evaluate the surgical treatment of patients with these traditional methods alone.^{2,3} To make up for this, tools were developed to confirm the postoperative recovery of health status, one of which is the convalescence and recovery evaluation (CARE) questionnaire.⁴ The CARE

questionnaire is a multidimensional health-related quality-of-life (QoL) instrument developed focusing on abdominal and pelvic organ surgery.⁴ It was developed by Hollenbeck et al.⁴ in 2008. The CARE questionnaire consists of 20 simple items and is a tool for evaluating the postoperative pain, gastrointestinal-related symptoms, cognitive functions, and activity of patients who underwent abdominal and pelvic surgery.⁴ The questionnaire is a standardized measure of recovery of health status after abdominal and pelvic surgery.⁴ It is known that there are reproducibility and validity in the postoperative recovery process and in measuring the QoL of patients.^{4–6} The CARE questionnaire has been validated in clinical applications by several articles.^{4–6} Translating a questionnaire written in one language into another language is not simple and should reflect the differences in the cultures and customs of the language being translated.⁷ In this questionnaire translation, linguistic validation is the first step.⁸

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The objectives of the present study were to objectify the degree of recovery in postoperative care and treatment of abdominal and pelvic organ surgery patients in Korea, to translate and validate a Korean version of the CARE questionnaire from English.

2. Materials and methods

2.1. Ethics considerations

Our study was approved by the ethics review committee (IRB No: H1807-133-961), and the patient was exempted from the consent form because it was not the subject study.

2.2. Original CARE questionnaire

The CARE questionnaire is a self-contained questionnaire consisting of four individual-scored domains and twenty question items. The four individual-scored domains are pain, gastrointestinal, cognitive, and activity categories. The 20 question items consist of a pain domain with nine questions, a gastrointestinal domain with five questions, a cognitive domain with two questions, and an activity domain with four questions. Each item response consists of a choice of five responses depending on the severity of the symptoms. The total score is calculated by adding the response scores of all items. The lower the score, the slower the recovery after surgery, and the higher the score, the better the recovery.

The final score can be calculated based on three steps. First, the response of each question item is converted on a scale of 0 to 100. The second is to average the converted response scores for each domain. The third is to sum the domain scores to obtain the overall average.

Theoretically, the sum of all these items is the total score, which can range from 0 (the most severe maximum score) to 100 (no problem at all). We gained permission to translate the Korean version from a licensed Springer publisher and proceeded with the study for about 10 months, from March to December 2017.

2.3. Research process

The research process was a six-step process. The first step was the forward translation. The two translators were informed by the researcher about the original English CARE questionnaire and then independently translated the CARE questionnaire into Korean (versions 1.0 A and 1.0 B). Neither translator had majored in medicine at university. Both were born in Korea and had lived in the United States for more than eight years. They were quite bilingual.

The second step was the reconciliation process. Review panels composed of researchers and translators reviewed versions 1.0 A and version 1.0 B and reconciled them into a single Korean version (version 1.1).

The third step was the backward translation. The third translator translated version 1.1 into an English version, and the original questionnaire and the backward translation were compared by review panels. Items where the concept of the backward translation did not agree with the concept of the original were reviewed and revised (version 1.2).

The fourth step was the cognitive debriefing. The Korean version 1.2 questionnaire was administered to ten patients who had been admitted to the urology department and had undergone abdominal or pelvic surgery for prostate, renal, or bladder cancer. The time required for the questionnaire was measured. Afterward, by interviewing the patients, we received feedback on whether the patient could understand the meaning of the question correctly for each item and whether the question was ambiguous or not smooth.

The fifth step was the harmonization. By means of panel discussions, we reviewed the opinions raised in the feedback and arrived at version 1.3.

The sixth step was the final proofreading. After correcting the errors, such as in spelling and style of version 1.3 questionnaire, the final Korean version 1.4 was completed.

2.4. Prospective use of the Korean version of CARE in urologic abdominal pelvic surgery patient population

We applied the validated Korean version of the CARE questionnaire in patients registered at the Seoul National University Prospectively Enrolled Registry for Genitourinary Cancer. Among patients registered in the database, we compared CARE scores before and after surgery. The individuals included 98 patients with bladder cancer who underwent radical cystectomy.

3. Results

In the forward translation, in item 2, “abdominal or belly area” translated into abdominal or belly area in version 1.0 A and abdomen in version 1.0 B. In item 3, “flank or side areas” translated into flank or side areas in version 1.0 A and flank in version 1.0 B. In item 10 “had nausea” translated into had nausea in version 1.0 A and had experienced nausea in version 1.0 B. In item 11, “had poor appetite” translated into had a poor appetite in version 1.0 A and had experienced poor appetite in version 1.0 B. In item 13, “had diarrhea” translated into had diarrhea in version 1.0 A and experienced diarrhea in version 1.0 B. In item 14, “bloating and gassy” translated into symptoms of a swollen stomach and a lot of gas in version 1.0 A and abdominal distension in version 1.0 B. In item 19, “pushing a vacuum cleaner” translated into pushing a vacuum cleaner in version 1.0 A and use cleaner in version 1.0 B. In item 20, “25 lbs” translated into 25 pounds (lbs) in version 1.0 A and 10 kilograms (Kg) in version 1.0 B Korea (Table 1).

In the reconciliation, in Item 2, “abdominal or belly area” was replaced by the “abdomen” in version 1.1. The “flank or side areas” of Item 3 were replaced by “flank” in version 1.1. In Item 8, ibuprofen (Motrin or Advil) was changed to the popularly used ibuprofen name Brufen in Korea. In Item 9, Percocet and Darvocet were changed to oxycodone (OxyContin). Percocet and Darvocet were not available in Korea, but oxycodone (OxyContin) was popularly used in Korea. The meaning of “bloating and gassy” in Item 14 was changed because “abdominal distension” is a more natural expression in Korean. In Item 15, “trouble concentrating” was changed because “decreased concentration” was a more natural expression in Korean. In Item 20, “25 lbs” was changed to the 10 kilograms (Kg) because pounds (lbs) were not used in Korea, but kilograms (Kg) were popularly used in Korea (Table 1).

In the backward translation, there were no differences in the meaning of the remaining parts except for the parts that were modified in the forward translation process Korea (Table 2).

Ten patients participated in the cognitive debriefing process (Supplementary Table 1). All had been admitted for abdominal and pelvic surgery for urologic cancer. The mean age was 60 years (range: 50-77 years), eight were males and two were females (Supplementary Table 2). All patients were high-school graduates and 50% were university graduates. In Item 9, unpleasant expressions such as “nonprescription painkillers” were corrected by rewording them as “analgesics that do not require a prescription”. The panel reviewed each issue that raised a need for a translation change at the meeting. The panel reviewed each issue to decide whether the translated term requires a change. However, all translated terms are relatively accurate, easy to understand, and did not require any changes (Table 3).

Table 1
Reconciliation and forward translation of CARE questionnaire

Original English version of CARE	Forward Korean translation version (version 1.0 A)	Forward Korean translation version (version 1.0 B)	Reconciled Korean version (version 1.1)
1. Over the past seven days, how much pain have you experienced in your bladder, pelvic, and/or genital areas?	1. 지난 일주일 동안 방광, 골반, 비뇨기 부위의 통증이 어느 정도였습니까?	1. 지난 일주일 동안 방광, 골반, 비뇨기 통증이 어느 정도였습니까?	1. 지난 일주일 동안 방광, 골반, 비뇨기 통증이 어느 정도였습니까?
2. Over the past seven days, how much pain have you experienced in your abdominal or belly areas?	2. 지난 일주일 동안 복부나 배의 통증이 어느 정도였습니까?	2. 지난 일주일 동안 복부 통증이 어느 정도였습니까?	2. 지난 일주일 동안 복부 통증이 어느 정도였습니까?
3. Over the past seven days, how much pain have you experienced in your flank or side areas?	3. 지난 일주일 동안 옆구리나 측면 부위 통증이 어느 정도였습니까?	3. 지난 일주일 동안 옆구리 부위 통증이 어느 정도였습니까?	3. 지난 일주일 동안 옆구리 부위 통증이 어느 정도였습니까?
4. Over the past seven days, how much pain have you experienced in your lung, heart and/or chest areas?	4. 지난 일주일 동안 폐, 심장, 가슴 통증이 어느 정도였습니까?	4. 지난 일주일 동안 폐, 심장, 가슴 통증이 어느 정도였습니까?	4. 지난 일주일 동안 폐, 심장, 가슴 통증이 어느 정도였습니까?
5. Over the past seven days, how much pain have you experienced in your arms?	5. 지난 일주일 동안 팔 부위 통증이 어느 정도였습니까?	5. 지난 일주일 동안 팔 부위 통증이 어느 정도였습니까?	5. 지난 일주일 동안 팔 부위 통증이 어느 정도였습니까?
6. Over the past seven days, how much pain have you experienced in your legs?	6. 지난 일주일 동안 다리 부위 통증이 어느 정도였습니까?	6. 지난 일주일 동안 다리 부위 통증이 어느 정도였습니까?	6. 지난 일주일 동안 다리 부위 통증이 어느 정도였습니까?
7. Over the past seven days, how much pain have you experienced in your head or neck areas?	7. 지난 일주일 동안 머리나 목 부위 통증이 어느 정도였습니까?	7. 지난 일주일 동안 머리, 목 부위 통증이 어느 정도였습니까?	7. 지난 일주일 동안 머리, 목 부위 통증이 어느 정도였습니까?
8. During the last seven days, how many days have you taken nonprescription pain pills like acetaminophen (Tylenol®) or ibuprofen (Motrin® or Advil®) (0-7)?	8. 지난 일주일 동안 아세트아미노펜 (타이레놀)이나 이부프로펜 (모트린, 애드빌) 같은 의사 처방이 필요 없는 진통제를 몇 일간 복용했습니까? (0-7일)	8. 지난 일주일 동안 아세트아미노펜이나 이부프로펜 같은 의사 처방이 필요 없는 진통제를 몇 일간 복용했습니까? (0-7일)	8. 지난 일주일 동안 타이레놀이나 부루펜 같은 의사 처방이 필요 없는 진통제를 몇 일간 복용했습니까? (0-7일)
9. During the last seven days, how many days have you taken prescription pain pills like codeine (Tylenol#3®), hydrocodone (Vicodin®), Percocet®, Darvocet®, Celebrex®, or Bextra® (0-7)?	9. 지난 일주일 동안 코데인 (타이레놀#3), 하이드로코돈 (바이코딘), 펄코셋, 다보셋, 세레브렉스, 벡스트라 같은 의사 처방이 필요한 진통제를 몇 일간 복용했습니까? (0-7일)	9. 지난 일주일 동안 코데인, 옥시코틴, 세레브렉스, 벡스트라 같은 의사 처방이 필요한 진통제를 몇 일간 복용했습니까? (0-7일)	9. 지난 일주일 동안 코데인, 옥시코틴, 세레브렉스, 벡스트라 같은 의사 처방이 필요한 진통제를 몇 일간 복용했습니까? (0-7일)
10. I have had nausea over the past seven days. How much of a problem has nausea been for you during the past seven days?	10. 나는 지난 일주일 동안 오심이 있었던 적이 있다. 지난 일주일 동안 오심이 얼마나 문제가 되었습니까?	10. 나는 지난 일주일 동안 구역감을 경험한 적이 있다. 지난 일주일 동안 구역감으로 인해 얼마나 문제가 되었습니까?	10. 나는 지난 일주일 동안 구역감을 경험한 적이 있다. 지난 일주일 동안 구역감으로 인해 얼마나 문제가 되었습니까?
11. I have had a poor appetite over the past seven days. How much of a problem has a poor appetite been for you during the past seven days?	11. 나는 지난 일주일 동안 식욕저하가 있었던 적이 있다. 지난 일주일 동안 식욕저하가 얼마나 문제가 되었습니까?	11. 나는 지난 일주일 동안 식욕저하를 경험한 적이 있다. 지난 일주일 동안 식욕저하로 인해 얼마나 문제가 되었습니까?	11. 나는 지난 일주일 동안 식욕저하를 경험한 적이 있다. 지난 일주일 동안 식욕저하로 인해 얼마나 문제가 되었습니까?
12. I have been unable to eat over the past seven days. How much of a problem has being unable to eat been for you during the past seven days?	12. 나는 지난 일주일 동안 음식을 먹지 못한 적이 있다. 지난 일주일 동안 음식 먹지 못한 것이 얼마나 문제가 되었습니까?	12. 나는 지난 일주일 동안 음식을 섭취하지 못한 적이 있다. 지난 일주일 동안 음식 섭취를 못해서 얼마나 문제가 되었습니까?	12. 나는 지난 일주일 동안 음식을 섭취하지 못한 적이 있다. 지난 일주일 동안 음식 섭취를 못해서 얼마나 문제가 되었습니까?
13. I have had diarrhea over the past seven days. How much of a problem has diarrhea been for you during the past seven days?	13. 나는 지난 일주일 동안 설사가 있었던 적이 있다. 지난 일주일 동안 설사가 얼마나 문제가 되었습니까?	13. 나는 지난 일주일 동안 설사를 경험한 적이 있다. 지난 일주일 동안 설사로 인해 얼마나 문제가 되었습니까?	13. 나는 지난 일주일 동안 설사를 경험한 적이 있다. 지난 일주일 동안 설사로 인해 얼마나 문제가 되었습니까?

Table 1 (continued)

Original English version of CARE	Forward Korean translation version (version 1.0 A)	Forward Korean translation version (version 1.0 B)	Reconciled Korean version (version 1.1)
14. I have been bloated and gassy over the past seven days. How much of a problem has being bloated and gassy been for you during the past seven days? COGNITIVE DOMAIN	14. 나는 지난 일주일 동안 배가 부풀고 가스가 많이 차는 증상을 경험한 적이 있다. 지난 일주일 동안 배가 부풀고 가스가 많이 차는 증상이 얼마나 문제가 되었습니까? 인지 영역	14. 나는 지난 일주일 동안 복부 팽만을 경험한 적이 있다. 지난 일주일 동안 복부 팽만으로 인해 얼마나 문제가 되었습니까? 인지 영역	14. 나는 지난 일주일 동안 복부 팽만을 경험한 적이 있다. 지난 일주일 동안 복부 팽만으로 인해 얼마나 문제가 되었습니까? 인지 영역
15. I have had trouble concentrating over the past seven days. How much of a problem has having trouble concentrating been for you during the past seven days?	15. 나는 지난 일주일 동안 집중력이 저하된 적이 있다. 지난 일주일 동안 집중력 저하로 인해 얼마나 문제가 되었습니까?	15. 나는 지난 일주일 동안 집중력 저하를 경험한 적이 있다. 지난 일주일 동안 집중력 저하로 인해 얼마나 문제가 되었습니까?	15. 나는 지난 일주일 동안 집중력 저하를 경험한 적이 있다. 지난 일주일 동안 집중력 저하로 인해 얼마나 문제가 되었습니까?
16. I have been forgetful over the past seven days. How much of a problem has being forgetful been for you during the past seven days?	16. 나는 지난 일주일 동안健忘증을 경험한 적이 있다. 지난 일주일 동안健忘증이 얼마나 문제가 되었습니까?	16. 나는 지난 일주일 동안健忘증을 경험한 적이 있다. 지난 일주일 동안健忘증으로 인해 얼마나 문제가 되었습니까?	16. 나는 지난 일주일 동안健忘증을 경험한 적이 있다. 지난 일주일 동안健忘증으로 인해 얼마나 문제가 되었습니까?
17. During the last seven days, I have been able to drive whenever I wanted.	17. 지난 일주일 동안 내가 원할 때 언제든지 운전을 할 수 있었다.	17. 나는 지난 일주일 동안 내가 원할 때는 언제든지 운전을 할 수 있었다.	17. 나는 지난 일주일 동안 내가 원할 때는 언제든지 운전을 할 수 있었다.
18. During the last seven days, I have been able to participate in light activities such as dressing myself, walking a block or climbing up a flight stairs.	18. 지난 일주일 동안 스스로 옷 입기, 한 블록 걷기, 계단 한 층 오르기과 같은 가벼운 활동을 할 수 있었다.	18. 나는 지난 일주일 동안 스스로 옷 입기, 한 블록 걷기, 계단 한 층 오르기 같은 가벼운 활동을 할 수 있었다.	18. 나는 지난 일주일 동안 스스로 옷 입기, 한 블록 걷기, 계단 한 층 오르기 같은 가벼운 활동을 할 수 있었다.
19. During the last seven days I have been able to participate in moderate activities such as moving a small table or pushing a vacuum cleaner.	19. 지난 일주일 동안 작은 테이블 옮기기, 진공 청소기 밀기와 같은 중간 정도 활동을 할 수 있었다.	19. 나는 지난 일주일 동안 작은 테이블 옮기기, 진공 청소기 사용과 같은 중간 정도 활동을 할 수 있었다.	19. 나는 지난 일주일 동안 작은 테이블 옮기기, 청소기 사용과 같은 중간 정도 활동을 할 수 있었다.
20. During the last seven days I have been able to participate in vigorous activities such as running or lifting heavy objects (25 lbs.).	20. 지난 일주일 동안 달리기, 무거운 물건 들기(25 파운드)와 같은 격렬한 활동을 할 수 있었다.	20. 나는 지난 일주일 동안 달리기, 무거운 물건 들기(10kg)와 같은 격렬한 활동을 할 수 있었다.	20. 나는 지난 일주일 동안 달리기, 무거운 물건 들기(10kg)와 같은 격렬한 활동을 할 수 있었다.

CARE, convalescence and recovery evaluation.

Table 2

Backward translation of CARE questionnaire

Original English version of CARE	Reconciled Korean version (version. 1.1)	Backward English translation version (version 1.2).
1. Over the past seven days, how much pain have you experienced in your bladder, pelvic, and/or genital areas?	1. 지난 일주일 동안 방광, 골반, 비뇨기 통증이 어느 정도였습니까?	1. How much pain have you experienced in your bladder, pelvic and/or genital areas during the last seven days?
2. Over the past seven days, how much pain have you experienced in your abdominal or belly areas?	2. 지난 일주일 동안 복부 통증이 어느 정도였습니까?	2. How much pain have you experienced in your abdominal areas during the last seven days?
3. Over the past seven days, how much pain have you experienced in your flank or side areas?	3. 지난 일주일 동안 옆구리 부위 통증이 어느 정도였습니까?	3. How much pain have you experienced in your flank areas during the last seven days?
4. Over the past seven days, how much pain have you experienced in your lung, heart and/or chest areas?	4. 지난 일주일 동안 폐, 심장, 가슴 통증이 어느 정도였습니까?	4. How much pain have you experienced in your lung, heart and/or chest areas during the last seven days?
5. Over the past seven days, how much pain have you experienced in your arms?	5. 지난 일주일 동안 팔 부위 통증이 어느 정도였습니까?	5. How much pain have you experienced in your arms during the last seven days?

(continued on next page)

Table 2 (continued)

Original English version of CARE	Reconciled Korean version (version. 1.1)	Backward English translation version (version 1.2).
6. Over the past seven days, how much pain have you experienced in your legs?	6. 지난 일주일 동안 다리 부위 통증이 어느 정도였습니까?	6. How much pain have you experienced in your legs during the last seven days?
7. Over the past seven days, how much pain have you experienced in your head or neck areas?	7. 지난 일주일 동안 머리, 목 부위 통증이 어느 정도였습니까?	7. How much pain have you experienced in your head or neck areas during the last seven days?
8. During the last seven days, how many days have you taken nonprescription pain pills like acetaminophen (Tylenol®) or ibuprofen (Motrin® or Advil®) (0-7)?	8. 지난 일주일 동안 타이레놀이나 부루펜 같은 의사 처방이 필요 없는 진통제를 몇 일간 복용했습니까? (0-7일)	8. How many days have you taken nonprescription pain pills like Tylenol or buprofen during the last seven days (0-7)?
9. During the last seven days, how many days have you taken prescription pain pills like codeine (Tylenol#3®), hydrocodone (Vicodin®), Percocet®, Darvocet®, Celebrex®, or Bextra® (0-7)?	9. 지난 일주일 동안 코데인, 옥시콘틴, 세레브렉스, 벡스트라 같은 의사 처방이 필요한 진통제를 몇 일간 복용했습니까? (0-7일)	9. How many days have you taken prescription pain pills like codeine, oxycontin, Celebrex, or Bextra during the last seven days (0-7)?
10. I have had nausea over the past seven days. How much of a problem has nausea been for you during the past seven days?	10. 나는 지난 일주일 동안 구역감을 경험한 적이 있다. 지난 일주일 동안 구역감으로 인해 얼마나 문제가 되었습니까?	10. I have had nausea during the last seven days. How much of a problem has nausea been for you during the last seven days?
11. I have had a poor appetite over the past seven days. How much of a problem has a poor appetite been for you during the past seven days?	11. 나는 지난 일주일 동안 식욕저하를 경험한 적이 있다. 지난 일주일 동안 식욕저하로 인해 얼마나 문제가 되었습니까?	11. I have had a poor appetite during the last seven days. How much of a problem has a poor appetite been for you during the last seven days?
12. I have been unable to eat over the past seven days. How much of a problem has being unable to eat been for you during the past seven days?	12. 나는 지난 일주일 동안 음식을 섭취하지 못한 적이 있다. 지난 일주일 동안 음식 섭취를 못해서 얼마나 문제가 되었습니까?	12. I have been unable to eat during the last seven days. How much of a problem has being unable to eat been for you during the last seven days?
13. I have had diarrhea over the past seven days. How much of a problem has diarrhea been for you during the past seven days?	13. 나는 지난 일주일 동안 설사를 경험한 적이 있다. 지난 일주일 동안 설사로 인해 얼마나 문제가 되었습니까?	13. I have had diarrhea during the last seven days. How much of a problem has diarrhea been for you during the last seven days?
14. I have been bloated and gassy over the past seven days. How much of a problem has being bloated and gassy been for you during the past seven days?	14. 나는 지난 일주일 동안 복부 팽만을 경험한 적이 있다. 지난 일주일 동안 복부 팽만으로 인해 얼마나 문제가 되었습니까?	14. I have been abdominal distension during the last seven days. How much of a problem has being bloated and gassy been for you during the last seven days?
15. I have had trouble concentrating over the past seven days. How much of a problem has having trouble concentrating been for you during the past seven days?	15. 나는 지난 일주일 동안 집중력 저하를 경험한 적이 있다. 지난 일주일 동안 집중력 저하로 인해 얼마나 문제가 되었습니까?	15. I have had trouble concentrating during the last seven days. How much of a problem has having trouble concentrating been for you during the last seven days?
16. I have been forgetful over the past seven days. How much of a problem has being forgetful been for you during the past seven days?	16. 나는 지난 일주일 동안 건망증을 경험한 적이 있다. 지난 일주일 동안 건망증으로 인해 얼마나 문제가 되었습니까?	16. I have been forgetful during the last seven days. How much of a problem has being forgetful been for you during the last seven days?

Table 2 (continued)

Original English version of CARE	Reconciled Korean version (version. 1.1)	Backward English translation version (version 1.2).
17. During the last seven days, I have been able to drive whenever I wanted.	17. 나는 지난 일주일 동안 내가 원할 때는 언제든지 운전할 수 있었다.	17. During the last seven days, I have been able to drive whenever I wanted.
18. During the last seven days, I have been able to participate in light activities such as dressing myself, walking a block or climbing up a flight stairs.	18. 나는 지난 일주일 동안 스스로 옷 입기, 한 블록 걷기, 계단 한 층 오르기 같은 가벼운 활동을 할 수 있었다	18. During the last seven days, I have been able to participate in light activities such as dressing myself, walking a block or climbing up a flight stairs.
19. During the last seven days I have been able to participate in moderate activities such as moving a small table or pushing a vacuum cleaner.	19. 나는 지난 일주일 동안 작은 테이블 옮기기, 청소기 사용과 같은 중간 정도 활동을 할 수 있었다.	19. During the last seven days I have been able to participate in moderate activities such as moving a small table or pushing a vacuum cleaner.
20. During the last seven days I have been able to participate in vigorous activities such as running or lifting heavy objects (25 lbs.).	20. 나는 지난 일주일 동안 달리기, 무거운 물건 들기(10kg)와 같은 격렬한 활동을 할 수 있었다.	20. During the last seven days I have been able to participate in vigorous activities such as running or lifting heavy objects (10 Kg.).

CARE, convalescence and recovery evaluation.

Table 3

Resolve the topic comprehension problem during cognitive debriefing interviews of CARE questionnaire

Original English version of CARE	Reconciled Korean version (version 1.1)	Comprehension issue of individuals	Resolution
1. Over the past seven days, how much pain have you experienced in your bladder, pelvic and/or genital areas?	1. 지난 일주일 동안 방광, 골반, 비뇨기 통증이 어느 정도였습니까?	Pain of bladder, pelvic, genital area (1)	Translated term is the same as original English term. No changes needed
2. Over the past seven days, how much pain have you experienced in your abdominal or belly areas?	2. 지난 일주일 동안 복부 통증이 어느 정도였습니까?	Abdominal pain (1)	Translated term is the same as original English term. No changes needed
3. Over the past seven days, how much pain have you experienced in your flank or side areas?	3. 지난 일주일 동안 옆구리 부위 통증이 어느 정도였습니까?	Flank pain (1)	Translated term is the same as original English term. No changes needed
4. Over the past seven days, how much pain have you experienced in your lung, heart and/or chest areas?	4. 지난 일주일 동안 폐, 심장, 가슴 통증이 어느 정도였습니까?	Pain of your lung, heart, chest (1)	Translated term is the same as original English term. No changes needed
5. Over the past seven days, how much pain have you experienced in your arms?	5. 지난 일주일 동안 팔 부위 통증이 어느 정도였습니까?	Arm pain (1)	Translated term is the same as original English term. No changes needed
6. Over the past seven days, how much pain have you experienced in your legs?	6. 지난 일주일 동안 다리 부위 통증이 어느 정도였습니까?	Leg pain (1)	Translated term is the same as original English term. No changes needed
7. Over the past seven days, how much pain have you experienced in your head or neck areas?	7. 지난 일주일 동안 머리, 목 부위 통증이 어느 정도였습니까?	Pain of head and neck (1)	Translated term is the same as original English term. No changes needed
8. During the last seven days, how many days have you taken nonprescription pain pills like acetaminophen (Tylenol®) or ibuprofen (Motrin® or Advil®) (0-7)?	8. 지난 일주일 동안 타이레놀이나 부루펜 같은 의사 처방이 필요 없는 진통제를 몇 일간 복용했습니까? (0-7일)	Nonprescription pain pills (1)	Translated term is the same as original English term. No changes needed
9. During the last seven days, how many days have you taken prescription pain pills like codeine (Tylenol#3®),	9. 지난 일주일 동안 코데인, 옥시코틴, 세레브렉스, 백스트라 같은 의사 처방이 필요한 진통제를 몇 일간 복용했습니까? (0-7일)	Prescription pain pills (1)	Translated term is the same as original English term. No changes needed

(continued on next page)

Table 3 (continued)

Original English version of CARE	Reconciled Korean version (version 1.1)	Comprehension issue of individuals	Resolution
hydrocodone (Vicodin®), Percocet®, Darvocet®, Celebrex®, or Bextra® (0-7)? 10. I have had nausea over the past seven days. How much of a problem has nausea been for you during the past seven days?	10. 나는 지난 일주일 동안 구역감을 경험한 적이 있다. 지난 일주일 동안 구역감으로 인해 얼마나 문제가 되었습니까?	Nausea (1)	Translated term is the same as original English term. No changes needed
11. I have had a poor appetite over the past seven days. How much of a problem has a poor appetite been for you during the past seven days?	11. 나는 지난 일주일 동안 식욕저하를 경험한 적이 있다. 지난 일주일 동안 식욕저하로 인해 얼마나 문제가 되었습니까?	Poor appetite (1)	Translated term is the same as original English term. No changes needed
12. I have been unable to eat over the past seven days. How much of a problem has being unable to eat been for you during the past seven days?	12. 나는 지난 일주일 동안 음식을 섭취하지 못한 적이 있다. 지난 일주일 동안 음식 섭취를 못해서 얼마나 문제가 되었습니까?	Unable to eat (1)	Translated term is the same as original English term. No changes needed
13. I have had diarrhea over the past seven days. How much of a problem has diarrhea been for you during the past seven days?	13. 나는 지난 일주일 동안 설사를 경험한 적이 있다. 지난 일주일 동안 설사로 인해 얼마나 문제가 되었습니까?	Diarrhea (1)	Translated term is the same as original English term. No changes needed
14. I have been bloated and gassy over the past seven days. How much of a problem has being bloated and gassy been for you during the past seven days?	14. 나는 지난 일주일 동안 복부 팽만을 경험한 적이 있다. 지난 일주일 동안 복부 팽만으로 인해 얼마나 문제가 되었습니까?	Abdominal distension (1)	Translated term is the same as original English term. No changes needed
15. I have had trouble concentrating over the past seven days. How much of a problem has having trouble concentrating been for you during the past seven days?	15. 나는 지난 일주일 동안 집중력 저하를 경험한 적이 있다. 지난 일주일 동안 집중력 저하로 인해 얼마나 문제가 되었습니까?	Trouble concentrating (1)	Translated term is the same as original English term. No changes needed
16. I have been forgetful over the past seven days. How much of a problem has being forgetful been for you during the past seven days?	16. 나는 지난 일주일 동안 건망증을 경험한 적이 있다. 지난 일주일 동안 건망증으로 인해 얼마나 문제가 되었습니까?	Forgetfulness (1)	Translated term is the same as original English term. No changes needed
17. During the last seven days, I have been able to drive whenever I wanted.	17. 나는 지난 일주일 동안 내가 원할 때는 언제든지 운전할 수 있었다.	Driving (1)	Translated term is the same as original English term. No changes needed
18. During the last seven days, I have been able to participate in light activities such as dressing myself, walking a block or climbing up a flight stairs.	18. 나는 지난 일주일 동안 스스로 옷 입기, 한 블록 걷기, 계단 한 층 오르기 같은 가벼운 활동을 할 수 있었다	Light activities (1)	Translated term is the same as original English term. No changes needed
19. During the last seven days I have been able to participate in moderate activities such as moving a small table or pushing a vacuum cleaner.	19. 나는 지난 일주일 동안 작은 테이블 옮기기, 청소기 사용과 같은 중간 정도 활동을 할 수 있었다.	Moderate activities (1)	Translated term is the same as original English term. No changes needed
20. During the last seven days I have been able to participate in vigorous activities such as running or lifting heavy objects (25 lbs.).	20. 나는 지난 일주일 동안 달리기, 무거운 물건 들기(10kg)와 같은 격렬한 활동을 할 수 있었다.	Vigorous activities (1)	Translated term is the same as original English term. No changes needed

Table 4
Mean CARE score before and after undergoing radical cystectomy

Domain	Preoperative	Postoperative 2 weeks	Postoperative 4 weeks	Postoperative 8 weeks	P-value
	(N = 98)	(N = 98)	(N = 98)	(N = 98)	
Pain	3.4 ± 4.4	7.6 ± 6.1	5.8 ± 7.9	4.1 ± 6.1	0.028
Gastrointestinal	3.8 ± 6.2	9.2 ± 7.9	7.5 ± 7.3	6.1 ± 7.4	0.005
Cognitive	1.5 ± 2.3	3.5 ± 4.2	3.3 ± 3.3	3.1 ± 3.2	0.018
Activity	6.8 ± 2.7	6.0 ± 4.5	7.0 ± 4.1	7.1 ± 2.7	<0.001
Total	14.6 ± 12.3	27.5 ± 14.4	22.5 ± 13.0	21.5 ± 15.3	0.001

CARE, convalescence and recovery evaluation.

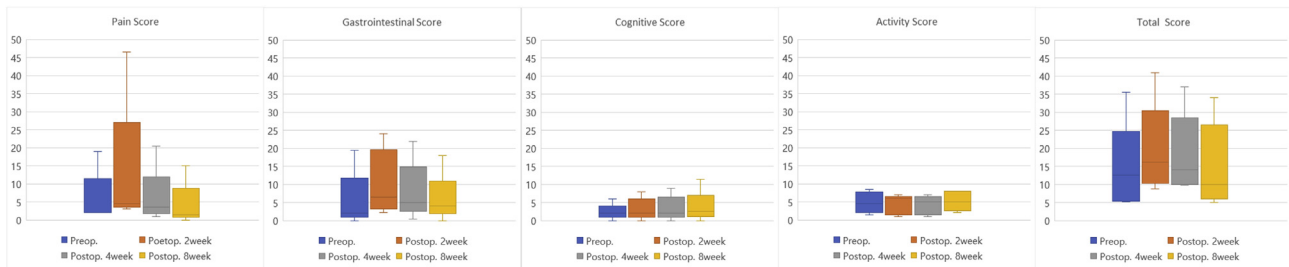


Fig. 1. CARE domain scores of bladder cancer patients who underwent radical cystectomy

When applied prospectively to patients with bladder cancer who underwent radical cystectomy, CARE Score showed a significant increase in pain, gastrointestinal, and cognitive domains 2 weeks after surgery compared with before surgery, and decreased 4 and 8 weeks after surgery. The pain showed improvement relatively quickly after surgery, but the gastrointestinal and cognitive domains did not. The activity domain decreased significantly after surgery, and after 4 weeks and 8 weeks after surgery, it increased and approached the preoperative value. At 4 weeks after surgery, the activity domain appeared to return to the same state as before surgery (Table 4 and Fig. 1).

4. Discussion

Over the past few decades, interest in QoL has increased, especially because of the developments of new surgical techniques and equipment.⁹ This increase in interest has led to the devising of a variety of tools for assessing patient QoL after surgery,¹⁰ especially new questionnaires.¹¹ However, the topics covered by the questionnaires have differed, and most of them have focused on the long-term postoperative outcomes.¹² In addition, the importance of the questions asked in a questionnaire may depend on a patient's individual values, which can change over time.¹⁰ The CARE questionnaire focuses on short-term postoperative recovery of abdominal and pelvic surgery patients.⁵ It has proved to be sensitive to various factors affecting recovery shortly after surgery^{4,5} and thus makes it possible to observe recovery during a short-term postoperative period, which was difficult to assess using the existing questionnaires or thus to compare the outcomes of different surgical methods.

In measuring postoperative recovery, what the patient describes is important.¹³ Many of the available measures of postoperative recovery were made through what the patient described.¹³ The CARE questionnaire also takes the patient's self-described form.⁴ The questionnaire contains a variety of factors that are generally thought to affect recovery and is sensitive to these factors. The questionnaire responses by the patient can quantify the differences of these factors objectively.⁵ There can be important differences

between the patient's expectations and the actual recovery process.⁵

It can provide an objective basis for the average recovery process according to the surgical method or organ. In addition, it can pay attention to patients who differ from the average recovery process and expect early detection of complications. In addition, information about the difference between patient expectations and the actual recovery period after surgery can be helpful in understanding the patient's recovery after surgery.

These validated questionnaires can also be used to compare the results of various studies.^{14,15} The goal of the questionnaire translation for clinical and clinical research is that it should be as similar as possible to the original. In addition to the linguistic characteristics, differences in cultural characteristics and customs should also be considered.¹⁶ Therefore, detailed instructions and appropriate documentation for each step of the translation process are followed to ensure the successful implementation of a high-quality translation.^{17,18} Linguistic, conceptual, and technical equivalence should be maintained.¹⁹ Although the questions are simple and clear, and few are difficult to translate, each language has a unique structure and form, so even if the grammatical structure and words are similar, it is difficult to completely match them. In our study, there was a change from "trouble concentrating" to "decreased concentration" and a change to "abdominal distension" from "bloating and gassy". We attempted to convey meaning by translating the source language as much as possible, but there was a modification of the word as a paraphrase for some natural expressions. This study was approved by the original author for the translation of the Korean version of the CARE questionnaire, who also confirmed the suitability and reliability of the questionnaire for official use with Korean patients. Korean individuals had no difficulty understanding the translated questionnaires, but there were some unclear expressions or expressions that were not natural in Korean. We made minor changes to improve cultural and linguistic suitability, such as Korean expressions. These results showed a high linguistic validity. The limitations of this study are its validation with only a few patients. The reliability and validity of the Korean translation should be further verified in the future, and further validation of the psychometric properties is also required.

In conclusion, we translated the English version of the CARE questionnaire into Korean. The Korean version of the CARE questionnaire can be used as a useful tool to evaluate the recovery of patients undergoing pelvic and abdominal surgery. We hope that the validated Korean version of the CARE questionnaire will be actively used in various clinical studies.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or non-commercial relationships that could be construed as a potential conflict of interest.

Acknowledgments

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pnrl.2020.05.001>.

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