



## Short Report

# Psychometric properties of a Korean version of the summary of diabetes self-care activities measure

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## ABSTRACT

**Background:** The summary of diabetes self-care activities (SDSCA) questionnaire is one of the most widely used self-report instruments for measuring diabetes self-management in adults.

**Objectives:** This study aimed to examine the psychometric properties of a Korean version of the SDSCA questionnaire.

**Methods:** The 11-item English version of the SDSCA was translated into Korean following the standard translation methodology. The questionnaire was administered to 208 patients with type 2 diabetes. Exploratory and confirmatory factor analyses (EFA and CFA) were carried out for construct validity. Content validity index (CVI), internal consistency and a diabetes management self-efficacy scale (DMSES) were assessed.

**Results:** The CVI of a Korean version of the SDSCA was .83. The EFA yielded a 9-item measure with a four factor solution with the same labels for original scales. The results of CFA showed the goodness of fit in the 9-item Korean SDSCA version (SDSCA-K). The internal consistency of SDSCA-K was moderate (Cronbach's  $\alpha = .69$ ) and the positive correlation between the SDSCA-K and the DMSES was identified.

**Conclusion:** The current study provides the initial psychometric properties of SDSCA-K modified to 9 items and supports SDSCA-K as a reliable and valid measure of diabetes self-management in Korean patients.

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## What is already known about the topic?

- Diabetes self-care is an essential component in achieving glycemic control. A measure of self-care activities can provide nurses essential information on patients' behavioral changes.
- The SDSCA has been widely used in diabetes self-care studies because of its practical utility.

## What this paper adds

- The results from exploratory and confirmatory factor analysis (EFA and CFA) showed the best of fit in the 9-item Korean SDSCA version (SDSCA-K).

## 1. Introduction

Patients with diabetes are expected to perform daily self-management activities to obtain glycemic control and

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to prevent diabetes-related complications. Therefore, many researchers and health care providers have been concerned about educating patients in daily diabetes self-management and require reliable and valid measures to assess diabetes self-management improvement.

The SDSCA scale measures the frequency of performing diabetes self-care activities, including diet, exercise, blood glucose testing, foot care, and tobacco use over the past 7 days. This scale was originally developed by Toobert and her colleagues in the U.S. and used internationally (Vincent et al., 2008; Xu et al., 2008; Yin et al., 2008). Recently, the revised version of the SDSCA consisting of a core set of 11 items, along with the expanded list of 14 additional questions was introduced (Toobert et al., 2000). Before the revised SDSCA measures can be applied more broadly in Korea, assessment of the validity and reliability of the measures among the Korean population is necessary. Therefore, this study aimed to verify the psychometric properties of a Korean version of the revised SDSCA.

## 2. Methods

### 2.1. Participants

The survey was conducted in an outpatient clinic of a diabetes center in Korea from January to July 2009 and an ethical approval was obtained. During the research period, 208 patients with type 2 diabetes were recruited.

### 2.2. Instruments

#### 2.2.1. Summary of diabetes self-care activities (SDSCA)

Eleven core items of the revised version of the SDSCA scale was used.

#### 2.2.2. Diabetes management self-efficacy scale (DMSES)

In this study, the diabetes management self-efficacy scale (DMSES) was used to assess and predict patients' self-care behaviors. The DMSES is a 20-item self-report questionnaire comprised of four subscales that assess specific nutrition, weight, general nutrition, medical treatment, physical exercise, and blood sugar (McDowell et al., 2005). Recently, DMSES was proved as a significant predictor of the SDSCA, accounting for 33.6% of the variance in the total SDSCA scores (Xu et al., 2008). Therefore, the DMSES is expected to have an empirical association with the SDSCA and used for convergent validity. Cronbach's  $\alpha$  of DMSES in this study was .90.

### 2.3. Procedure

#### 2.3.1. Translation and content validity

SDSCA was translated into Korean by two bilingual investigators with consideration of the cultural background. The two translated versions were compared by an expert panel consisting of 3 endocrinologists, 2 dietician, and 2 nurses for content equivalence to the English version, and consensus was reached. During this stage, SDSCA was adapted to the special situation in Korea. Then, the Korean version was sent to a bilingual Korean-American registered nurse for back translation. The back translation was compared with the original English version

and finalized by the expert panel. A 4-point Likert scale was used to evaluate content validity index (CVI), with the components ranging from 1 = not relevant to 4 = very relevant. CVI is the percentage of those items rated by the experts as either 3 or 4. A CVI score of .8 or more is considered to have good content validity.

Finally, language and content validity were approved after a pilot test was performed with 30 patients from a diabetes outpatient clinic.

#### 2.3.2. Construct validity

Factor analysis was performed in two steps. In the first step, exploratory factor analysis (EFA) was performed to determine the factor loading of the items and their dimensions. The factor loading criterion of the items was set to .50 or above in this study. Confirmatory factor analysis (CFA) was used as a second step to confirm the EFA results, to check relationships between factors and error terms, and to determine a more streamlined form of the Korean SDSCA version.

#### 2.3.3. Reliability

Cronbach's alpha and item to total correlation analysis were implemented to evaluate internal consistency.

#### 2.3.4. Data analysis

Statistical analyses were carried out using SPSS version 12.0 (SPSS, Chicago, IL, USA) and AMOS version 7.0 (SPSS, Chicago, IL, USA).

## 3. Results

### 3.1. Characteristic of participants

A total of 208 patients with type 2 diabetes mellitus participated. The characteristics of the participants are shown in Table 1.

**Table 1**  
Characteristics of participants (n = 208).

	Mean or N	SD or %
Age (years)	56	10.16
Gender		
Men	93	44.7
Women	115	55.3
Education		
Elementary school	36	17.3
Middle and high school	120	57.7
College and university	52	25.0
Occupation		
Employed	93	44.7
Unemployed	115	55.3
Marital status		
Married	182	87.5
Single	7	3.4
Divorced/widowed	19	9.1
Treatment regimen		
OHA	137	65.9
Insulin	31	14.9
OHA + insulin	38	18.3
Missing	2	1.0
Years with type 2 DM	10.37	7.08
HbA <sub>1c</sub> (%)	7.66	1.28

OHA, oral hypoglycemic agents.

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