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Korean Version of the Care-Receiver Efficacy Scale:

Factor Structure Identification and Validity Test of the Short Form (KCRES-SF) and the Revised Shorter Form (KCRES-SR)

Jung, Soyon (Seoul Women's University)
Seo, Honglan* (Seoul Women's University)

Noticing the potential utility of the Care-Receiver Efficacy Scale-Short Form for elderly Koreans, this study aimed (a) to investigate the factor structure of the Korean version of the scale (KCRES-SF), (b) to make the instrument a more abbreviated and culturally suitable (KCRES-SR), and (c) to compare the psychometric qualities of both versions. Face-to-face survey interviews were conducted with 377 Korean community dwelling elders who lived alone and received at least two hours of home care services from certified care assistants. A series of confirmatory factor analyses and descriptive analyses were performed. The results supported the 1st order four-factor model of KCRES-SF. This model fitted the data reasonably well, satisfying all cutoff criteria. The KCRES-SR was validated with better model fits than KCRES-SF. Overall KCRES-SR is considered superior to KCRES-SF in that the former is more theoretically justifiable, concise, and culturally proper than the latter. However, it is recommended that one of the two versions should be selected based on study objectives.

Keywords: Self-Efficacy, Elderly Care-Receiver, Validity Test, Confirmatory Factor Analysis

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* Corresponding Author: Seo, Honglan/ Seoul Women's University (hlseo@swu.ac.kr)

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Ⅰ. Introduction

The Republic of Korea (hereafter referred to as Korea) is one of the fastest ageing countries in the world (United Nations, 2015). According to national statistics (Statistics Korea, 2017), people aged 65 and over comprised 13.8% of the total population of Korea in 2017. The proportion of the elderly population is projected to jump to 47.7% by 2045 (Statistics Korea, 2017). The life expectancy of Korean people is estimated to be 78 years for men and 85 years for women (World Health Organization, 2015). Overall, the average life expectancy is ten years longer than the healthy life expectancy in the country. These statistical figures imply that Korea will become one of the most aged countries in near future, and it is imperative to seek effective ways to manage the quantity and quality of elderly care.

In this challenging situation, the roles of elderly care-receivers are worth noting. Traditionally, care-receivers have been seen as chronic stressors to family caregivers (Bevans & Sternberg, 2012) and also regarded as potential burden at the personal, familial and societal levels (Lyons, Zarit, Sayer, & Whitlatch, 2002). In addition the roles of caregivers have been heavily stressed for effective care (Russell, Bunting, & Gregory, 1997). Yet, there have been increasing awareness that the roles of elderly care-receivers are also a key component of the care process (Cox & Dooley, 1996; Lyons et al., 2002). Health professionals have emphasized the importance of patient responsibility and initiative in terms of self-care performance (Berman & Iris, 1998). In fact, elderly care-receivers play diverse roles such as developing self-care strategies, directing assistance to a caregiver, coping with feelings about increased dependence, engaging in supportive social networks, and utilizing resources (Cox, Green, Seo, Inaba, & Quillen, 2006). This indicates that the quality of care depends, at least partly, on how care-receivers participate in the care process. Furthermore, active involvement of care-receivers in the care process in general and a reciprocal relationship with their caregiver in particular can enhance the wellbeing of both care-receivers and caregivers. Not only could such desirable behaviors and

relationships reduce the role strains and burden of caregivers (Archbold, Stewart, Greenlick, & Harvath, 1990; Sebern, 2005), but also they preserve independence, integrity, and sense of control of elderly care-receivers (Pruchno, Burant, & Peters, 1997; Brown, 2007).

Thus, it is not surprising that a growing number of health and psychosocial intervention programs designed to enhance the self-efficacy and self-care performance of elderly care-receivers have been facilitated. At the same time researchers, in a wide range of disciplines, including rehabilitation, nursing, and social work, have conducted empirical studies to determine the effects of the programs designed to enhance the participant's self-efficacy (e.g., Yu, Kim, Kim, & Baik, 2001; Kim & Song, 2015). To the best of our knowledge, however, there has been no valid instrument focusing on elderly care-receivers' self-efficacy to date in Korea.[1] This might imply that the efficacy of Korean elderly care-receivers has not been properly assessed, nor has the effectiveness of the relevant programs been accurately evaluated.

In this situation, the Care-Receiver Efficacy Scale – Short Form (CRES-SF), which was originally developed by Cox and colleagues (2006), appeared to have great potential to fill the gap between practice and research. Thus, we conducted this study with the primary purpose to validate the Korean version of the instrument. More specifically, the current study has three research objectives. The first objective is to translate CRES-SF from English into Korean and to investigate the factor structure of the Korean version of the instrument (KCRES-SF). The second one is to make the scale briefer and culturally more suitable (KCRES-SR) for Korean older adults. The final objective is to examine and compare the psychometric properties of the two versions of the instrument.

1) In order to identify the studies on self-efficacy of Koreans, we utilized the RISS which combines many nationwide databases such as DBPIA, KOREASCHOLAR, KISS, etc., as well as worldwide databases such as EBSCO, PQDT, SCOPUS, etc. When we searched the academic database several times in 2017 with the key words of self-efficacy in combination with care, either in Korean or in English, over 700 research articles and more than 1,000 theses or dissertations were found. Yet, none of them addresses care-receiver self-efficacy among Koreans.

Ⅱ. Literature Review

1. The Importance of Self-Efficacy in Care Process

Self-efficacy can be briefly defined as an individual's belief in his or her capability of successfully performing a given task or activities that affect daily life (Bandura, 1997). Theoretically, it is postulated that people's perceptions of their capabilities affect not only their cognitive mechanism including motivation, thought pattern, and emotional reactions, but also behaviors in taxing situations (O'Leary, 1985). Self-efficacy is known to help a person cope with various life challenges more effectively and be more functional in given situations (Maddux, 2013). Previous studies have revealed that self-efficacy in later life is related to depression (Blazer, 2002), psychological well-being (Kim & Seo, 2009), management of daily activities and self-care health behaviors (Seeman et al., 1999; Perkins, Multhaup, Perkins, & Barton, 2007), and maintenance of interpersonal relationships with their care providers in a healthy manner (Cox et al., 2006).

In light of the importance of care-receivers' roles in elderly care, self-efficacy deserves more attention because it can help the elderly continue to play functional roles and enjoy their lives. The higher self-efficacy older adults have, the more effective they are in managing daily activities, performing self-care behaviors (Konopack, Marquez, Hu, Elavsky, McAuley, & Kramer, 2008; Resnick, 2012), participating in desirable activities (Perkins, et al., 2008), and forming and maintaining good relationships with others including their caregivers (Caprara & Patrizia, 2005; Cox, Green, Hobart, Jang, & Seo, 2007). Efficacy is also known to reduce the impact of chronic pain which makes older adults feel difficult doing exercise and taking medications (Krein, Heisler, Piette, Butchart, & Kerr, 2007).

Accordingly, many intervention programs for promoting efficacy of older adults have been proposed, and a great number of studies have consistently reported the desirable effects of those programs (e.g., Blazer, 2003; Lorig & Holman, 2003;

Allison & Keller, 2004; Marks, Allegrante, & Lorig, 2005a; 2005b; Cox, et al., 2007; Lee, Arthur, & Avis, 2008). In Korea, numerous researchers and clinicians have also noticed the importance of self-efficacy among older adults. A growing number of intervention programs designed to enhance self-efficacy of Korean older adults have been introduced to various institutions including senior day care centers, nursing homes, and community welfare centers for senior citizens. In line with this trend, Korean researchers have conducted empirical studies to determine the effects of those programs (e.g., Yu et al., 2001; Park & Oh, 2006; Kim, Lee, Kim, & Min, 2007; Kim & Song, 2015; Lee, 2008). Without a valid instrument, however, many of the studies are not free from the criticism that self-efficacy of older adults, the dependent variable of the studies, were not be properly assessed. For instance, Yu and colleagues (2001) developed and used 25 questions to measure Korean older adults' efficacy in their study but the items had never been validated as a scale. A thorough review of the studies on Korean elderly care-receivers and intervention programs designed to promote self-efficacy of Korean older adults indicate an urgent need for a valid measure for care-receiver self-efficacy construct among the population.

2. Care Receiver Efficacy Scale: Factor Structure and Relevant Problems

With regard to the conceptual structure, Bandura (1997) underlined that the self-efficacy is a multidimensional construct which encompasses many aspects. Based on Bandura's theory, and their extensive qualitative and quantitative research with American older adults, Cox and colleagues (2006) developed not only the original form of Care-Receiver's Efficacy Scale with 48 items (CRES) but also its short form with 25 items (CRES-SF). The scales were designed to measure the five factors as follows: (a) Self-Care Performances, (b) Relational Coping with Caregivers, (c) Performance-Related Quality of Life, (d) Accepting Help, and (e) Perception of Dependence. *Self-care performance (SCP)* in late life involves older adults' learning

and adjusting to their chronic health problems, finding the appropriate health care services, and managing their overall health care (Wu et al., 2004). SCP is associated with a sense of empowerment, locus of control, and autonomy (Bandura, 1995). *Relational coping with caregivers (RC)* is linked to an effective care partnership between a caregiver and a care-receiver. Particularly, it emphasizes a care-receiver's kind and caring attitudes toward his or her caregiver, which effectively prevent a caregiver from experiencing burnout, and facilitate mutually beneficial relationships. *Performance - related to quality of life (QOL)* includes pursuing meaningful life and participating in various activities to improve one's satisfaction with his or her life. Developing new interests and finding methods of participating in social activities are representative examples. *Accepting help (AH)* implies acknowledging one's current situation, and being comfortable with receiving necessary assistance, rather than taking a pessimistic view over one's future and life conditions. It is often the greatest challenge for many elderly people who have been independent most of their lives (Cox et al., 2006). *Perception of dependency (PD)* indicates one's own values about increasing dependency and fear of being a burden on others. Theoretically PD is hypothesized to be negatively associated with the other four factors of care-receiver's self-efficacy construct.

Several years later, Ma, Green, and Cox (2012) validated the CRES-SF, employing confirmatory factor analysis. The two studies, however, were not consistent with one another in terms of the factor structure of the scale. Specifically, Cox and colleagues (2006) presented a 1st order five-factor structure while Ma and colleagues (2012) suggested a 2nd order factor structure with four-factor at a lower level (excluding PD) and an overall factor at a higher level. This discrepancy indicates the need for further empirical validation regarding the factor structure of the CRES-SF and is directly related to the first purpose of the current study.

Given that the subjects of the present study are not American older adults but Korean counterparts, cultural appropriateness of the CRES-SF should be thoroughly examined. When we checked the face validity of the CRES-SF in consideration of

Korean older adults as a target population, we found several items culturally insensitive. A representative example is the item "I often tell my caregiver that I love or care about him/her." The communication styles of Koreans are often characterized as indirect and ambiguous (Kim, 2006). It has been reported that Koreans use a lot of euphemism not to mention the words that possibly evoke negative emotions (Cho, 2013) Furthermore, Korean people, particularly those who were influenced by Confucianism and authoritarian culture tend to refrain from expressing their emotions outwardly (Kim, 2014). Korean older adults often express gratitude to others through unspoken means rather than verbalization. Moreover, Korean older adults tend to consider it inappropriate to use affectionate words or gestures to members of the opposite sex because they grew up in a culture that emphasized gender differences and discouraged mixed-gender gatherings. If the gender of a care-receiver is not same as that of a caregiver, his or her saying 'I love you' might create unintended consequences such as being misunderstood as wanting a romantic relationship or sexual harassment in the worst case. Moreover culturally improper questions might result in failure in a research interview by making respondents feel offensive and ceasing answering the questions before the interview ends. The issue regarding the cultural sensitivity of the CRES-SF and its related measurement errors are linked to the second and third purposes of this study.

Ⅲ. Methods

1. Participants and Procedures

The subjects of this study were the entire eligible recipients of the *'Public Home-Care Services for Seniors Living Alone'* in a mid-sized city located in the southeast region of Korea. The eligibility criteria for the services were: (a) community-dwelling

men and women who lived alone, (b) who were 65 years and older, and (c) who agreed to use various services, such as personal and health care, emotional support, and safety check. Additional inclusion criteria were applied for this study. Namely, they had to be cognitively able to participate in the interview survey and have no formal medical record of dementia or Alzheimer's disease. Through one-on-one interviews utilizing a structured survey booklet, data were collected at the participants' home by the certified caregivers from the beginning of July 2009 to the end of August 2009. Prior to conducting the interview, the interviewers participated in a training session focusing on interview skills with the elderly. The interviews lasted approximately 30-40 minutes, no specific time-frames for answering each question was given. Of the 406 initially eligible elderly adults, 29 were excluded due to poor cognitive functioning (22), hospitalization (4), or no response for all the scale questions (3). The final study sample was composed of 377 participants.

The age of the participants ranged from 65 to 95 years (mean=78.2, sd=5.54). A majority of the participants were female (80.6%). A total of 60.1% of the participants reported their health status as very poor or poor, while 9.5% perceived their health status as very good or good. The remaining 30.4% considered their health status to be fair. Approximately half of the participants (46.3%) never went to school while 35.6% experienced elementary school education. The proportions of the participants who completed middle school and high school were 9.0% and 7.7%, respectively. Those with some college education or higher comprised 1.4%.[2)]

2) This study sample showed the socio-demographic characteristics similar to those of the entire Korean older adults who were 65 years and older, and lived alone reported in 2010 Korean population and Housing Census (Hwang, 2012), which was the Census closest in time to the period when the study data were collected. According to Hwang (2012), for example, the gender ratio of males to females was 18.7 to 81.3 in the population. In addition, the composition of educational backgrounds in the population were as follows: no schooling (46.6%); elementary school (35.7%); middle school (7.6%); high school (6.6%), and some college or higher (3.4%)

2. Measure

The Care-Receiver Efficacy Scale-Short Form (Cox, et al., 2006) is a 25-item instrument that measures self-efficacy in elderly care-receivers. The instrument consists of five subscales, and each scale is comprised of 5 items, with a 5-point response scale ranging from 1=strongly disagree to 5=strongly agree. For this study, the CRES-SF was translated into Korean by the second author of this study. To ensure accuracy and high quality of translation, the initial Korean version of the CRES-SF (KCRES-SF) was reviewed by a panel of three bilingual professors in the field of gerontology. The initial version of the KCRES-SF was revised several times until the three professors and the author reached a complete agreement. Content validity was established by a panel of social workers who worked in the field of gerontology. As a result of reviewing the scale, minor corrections (e.g., rewording) were made.

3. Data Analysis

The data analysis procedure was composed of four stages. At the first stage, two types of important preliminary data analyses were performed as follows: (1) The basic assumptions of confirmatory factor analysis (CFA) as well as the basic psychometric qualities of the scale items (e.g., means, standard deviations) were examined: and (2) inter-item correlations utilizing Pearson product-moment correlation coefficients were computed. At the second stage, a series of CFA were conducted in order to identify the factor structure of the KCRES-SF. To this end, we assessed the 1^{st} order five-factor model proposed by Cox et al. (2006), the 2^{nd} order factor model revised by Ma et al. (2012), and some other models suggested by post hoc modification indices. Then, we found the model showing the best fits to the data among the models tested. At the third stage, the KCRES-SR was proposed after scrutinizing the properties of the KCRES-SF items and excluding those considered undesirable. This

process aimed to make the KCRES-SF more psychometrically sound and culturally suitable for Korean older adults. Then the model fits of KCRES-SR were examined. At the last stage, the qualities of the KCRES-SF and the KCRES-SR were compared. The comparison was made based on the results of CFA and internal consistencies. A correlation between the two versions of the instrument was also checked.

With regard to CFA, model estimation method and model fit criteria need to be specified. For model estimation, Maximum Likelihood was used because it is not only the most widely used but also fairly robust to violations of the assumptions, such as small sample size and non-normal distributions (DiStefano & Hess, 2005). Along with the χ^2 test, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR) were employed to assess model fits based on the criteria suggested by Hu and Bentler (1999), and Hooper, Coughlan, and Mullen (2008). The criteria for an excellent model are CFI $\geq$ .95, TLI $\geq$ .95, RMSEA $\leq$ .05, and SRMR $\leq$ .08 while those for an acceptable model are CFI $\geq$ .90, TLI $\geq$ .90, RMSEA $\leq$ .08, and SRMR $\leq$ .10. If the meaning of fit statistics for a model were not consistent, the decision as to whether the model should be accepted was decided based on Hu and Bentler's (1999) combination rule. According to this rule, RMSEA $\leq$ .06 or CFI (or TLI) $\geq$ .95 suggests adequate fit if the fit statistic is combined with SRMR $\leq$ .08.

To identify convergent and discriminant validity of the instrument, we used two constructs, morale and depression following the original scale developers' approach. In Cox and colleagues' study (2006), care-receiver efficacy was negatively associated with depression and positively connected with morale. In the present study, morale was measured with The Philadelphia Geriatric Center Morale Scale (PGCMS) (Lawton, 1975) and depression was assessed with Geriatric Depression Scale-Short version (GDS-SF) (Sheikh & Yesavage, 1986)

All CFA models were estimated with Mplus 6.0. In addition, descriptive analysis such as computing means and standard deviations, and basic analysis such as

correlations and Cronbach's alpha calculation were performed with SPSS 20.0

Ⅳ. Results

1. Assumption Check and Item Analysis

In order to assess the quality of the scale items and check the underlying assumptions of CFA, we thoroughly examined the means, standard deviation (SD), skewness, kurtosis, and bar graph of the individual scale items. Given that West, Finch, and Curran. (1995) suggested |2| and |7| as the criteria for excessive skewness and kurtosis, respectively, normality of the KCRES-SF items appeared all fine. The absolute values of kurtosis and skewness for most items of the instrument were less than 1, and none of them exceeded 3. The bar graphs for the items did not indicate serious departure from a normal distribution.

The means and SD of the items were checked based on the following criteria: A good scale item should have (a) a mean close to the center of the distribution (Meir & Gati, 1981; DeVellis, 2003) (b) enough dispersion (i.e., the SD is higher than 0.75 on a 5-point scale) (Meir & Gati, 1981); and (c) a roughly equal SD (i.e., the ratio of the maximum to minimum SD is less than 2:1) (Julious, 2004). As shown in Table 1, the means of the most KCRES-SF items were at an approximate center of their distributions. The means ranged from 1.87 to 3.71. Out of 25 items, 19 items had a mean between 2.5 and 3.5. In addition, most items had large and roughly equal SD. Except for one item (AH03), all had a SD higher than 0.75, and the ratio of the largest (PD01) to smallest SD (AH05) was 1.48. However, a few items displayed problems, such as a somewhat extreme mean (PD05, AH05), small SD (AH03), or large kurtosis and skewness (PD05).

Table 1. Descriptive Statistics for the Items

Items	Mean	SD	Skew	Kurto
• I am very involved in any planning that is initiated in my behalf (SCP01)	3.45	0.96	-0.53	-0.59
• I have learned about the knowledge and skills that various health professionals have and can offer to my situation (SCP02)	2.63	0.91	0.46	-0.41
• I find out as much as possible about the medical conditions that I have (SCP04)	3.55	0.85	-0.81	0.09
• I often give my doctor information about my situation that helps her/him make decisions about my care (SCP10)	3.34	0.92	-0.76	-0.45
• I frequently make care decisions that my professional caregivers agree to follow (SCP12)	3.1	0.93	-0.27	-0.81
• I often tell my caregiver that I love or care about him/her (RC01)	3.01	1.05	-0.02	-1.18
• My caregiver and I are good friends (RC02)	3.41	0.82	-0.55	-0.21
• I try to fit my needs in to my caregiver's schedule (RC03)	3.49	0.84	-0.79	-0.25
• I make every effort to know about my caregiver's needs and problems (RC04)	3.08	0.86	-0.13	-1
• I often provide emotional support for my caregiver (RC05)	3.29	0.89	-0.58	-0.53
• I am able to contribute to my community (QOL01)	2.64	0.93	0.36	-0.69
• I have developed a number of new interests in the last few years (QOL03)	2.43	0.94	0.72	-0.28
• I can still do a number of things that I enjoyed all of mylife (QOL04)	2.72	0.96	0.28	-1.25
• I am still able to find ways to participate in meaningful activities (QOL05)	2.63	0.95	0.33	-0.98
• I have a number of friends that enjoy the same activities as Ido (QOL06)	2.68	1.06	0.24	-1.12
• Taking help when I need it is easy (AH01)	2.85	0.98	0.19	-1.2
• I have found ways to accept the need for assistance and still enjoy life (AH02)	2.93	0.91	-0.1	-1.16
• I have decided to just accept the fact that I need assistance (AH03)	3.63	0.7	-1.05	0.79
• I believe that I can handle my feelings about increased dependency well (AH04)	3.27	0.88	-0.38	-0.66
• I just accept the fact that I need help and don't dwell on it (AH05)	3.71	0.77	-1.12	1.43
• I hate to ask for help* (PD01)	2.62	1.14	0.33	-1.16
• I feel very angry about having to be dependent on others* (PD02)	2.89	1.04	-0.01	-1.13
• My greatest fear is being a burden on others* (PD03)	2.1	0.91	0.94	0.72
• I feel like my freedom has been taken away* (PD04)	3.11	0.98	-0.24	-1.03
• I don't like being dependent on anyone-It'shard* (PD05)	1.87	0.83	1.43	2.94

* indicates reverse-coded items; skew means skewness while kurto indicates kurtosis.

Table 2. Inter-item Correlations

	S01	S02	S04	S10	S12	R01	R02	R03	R04	R05	Q01	Q03	Q04	Q05	Q06	A01	A02	A03	A04	A05	P01	P02	P03	P04	P05
SCP01	1																								
SCP02	.468	1																							
SCP04	.401	.270	1																						
SCP10	.364	.195	.440	1																					
SCP12	.401	.365	.396	.422	1																				
RC01	.330	.267	.365	.208	.237	1																			
RC02	.329	.289	.421	.232	.324	.687	1																		
RC03	.303	.254	.291	.249	.359	.393	.499	1																	
RC04	.284	.351	.345	.338	.481	.385	.474	.563	1																
RC05	.268	.319	.294	.355	.393	.288	.423	.360	.586	1															
QOL01	.251	.207	.198	.251	.239	.064	.129	.153	.172	.139	1														
QOL03	.240	.302	.191	.245	.276	.115	.208	.174	.159	.126	.414	1													
QOL04	.298	.236	.202	.323	.253	.092	.174	.146	.209	.191	.431	.511	1												
QOL05	.302	.304	.208	.314	.278	.057	.203	.123	.210	.212	.487	.564	.679	1											
QOL06	.196	.198	.165	.294	.245	.061	.171	.097	.142	.202	.369	.502	.522	.526	1										
AH01	.164	.200	.213	.162	.225	.221	.244	.242	.203	.157	.075	.208	.193	.191	.134	1									
AH02	.310	.240	.304	.305	.350	.219	.274	.271	.279	.166	.314	.458	.441	.420	.396	.488	1								
AH03	.162	.051	.252	.276	.188	.204	.254	.268	.205	.139	.061	.258	.256	.212	.189	.308	.381	1							
AH04	.238	.204	.297	.345	.201	.239	.270	.240	.252	.173	.163	.179	.335	.311	.220	.379	.436	.410	1						
AH05	.116	.004	.236	.262	.145	.155	.213	.253	.170	.129	.095	.073	.217	.178	.175	.073	.180	.383	.394	1					
PD01	.042	.082	-.044	-.041	.032	.024	.050	-.074	.078	.107	-.053	-.075	-.109	-.051	-.152	-.038	-.117	-.037	-.037	-.130	1				
PD02	.102	.122	.060	.097	.095	.055	.102	.037	.151	.161	.030	.130	.070	.115	.074	.120	.219	.080	.134	-.012	.354	1			
PD03	.035	.073	-.132	-.144	.001	-.128	-.078	-.145	.020	.023	-.020	.020	-.072	-.018	-.037	-.084	-.013	-.059	-.107	-.242	.294	.309	1		
PD04	.090	.001	.080	.175	.066	.046	.103	.101	.063	.068	.173	.222	.193	.284	.218	.115	.314	.188	.230	.104	.069	.336	.170	1	
PD05	-.075	-.021	-.273	-.208	-.040	-.180	-.136	-.173	-.034	-.040	.018	.040	-.028	.057	.109	-.116	.003	-.125	-.101	-.232	.161	.163	.599	.166	1

S=SCP; R=RC; Q=QOL; A=AH; P=PD

2. Correlations between the Items

Before conducting CFA, inter-item correlations were examined. As shown in Table 2, the items measuring SCP, RC, QOL and AH were moderately correlated with those measuring the same factor. However, there were a few exceptions. For instance, the correlation between AH05 and AH01 was only .073. More serious problems were found in the items measuring PD, each of which displayed low levels of correlations with the other items. The average of the inter-item correlations involving any of the five items measuring PD was only .079. In addition, the directions of the inter-item correlations were not consistent. That is, the item PD01, PD02, PD03, and PD05 showed negative correlations with some of the items, and positive correlations with the other items. Regarding these inconsistent directions of the inter-item correlations, no clear pattern or reasonable explanation was identified.

3. Factor Structure of the KCRES-SF

To determine the factor structure of the KCRES-SF, a series of CFA were performed. The analysis procedures can be classified into several steps. In Step 1, we tested the 1st order five-factor model, which was proposed by Cox et al. (2006). In this model, each of the 5 factors was measured with 5 items and allowed to be correlated with one another. This model, labeled as Model A in Table3, did not adequately fit the data. A more serious limitation was that PD was not associated with the other four factors in theoretically expected manners[3].

In Step 2, we examined the fits of 1st order 4-factor models, which excluded the problematic five items measuring PD, based on the suggestion by Ma et al. (2012). This model (Model B in Table3) showed slightly better fit than Model A, but it still

3) As noted earlier, theoretically, PD is hypothesized to be negatively linked to the other factors. Because the items measuring PD were all reverse-coded, however, PD was expected to be positively associated with the other factors in the current study. As opposed to this expectation, the directions of the correlations between PD and the other four factors were all negative.

did not represent the observed data well. A thorough review of CFA results, however, indicated that this model had potential as a good model in that all indicators loaded significantly on their hypothesized factors (p<.001), inter-factor correlations were all positive and significant (p<.001), and the model fit statistics reached close to the acceptable levels. Therefore, host-hoc model fitting procedures were considered worth trying. Modification indices suggested that correlating two pairs of error terms (RC01 and RC02; AH05 and AH03) would improve the model fit substantially. More importantly, adding these correlations were considered to be justifiable because each pair of the two items had overlapping contents (e.g., 'just accept the fact that I need' help/assistance), and a systematic error seemed unavoidable to some extent. The Model with two error-term correlations (Model C) fitted to the data fairly well. As exhibited in Table 3, this model satisfied Hu and Bentler's (1999) combination rule, as well as all of the individual cut-off criteria of model fit indices.

In Step 3, we tested a 2nd order factor model that was proposed by Ma and colleagues (2012). This model hypothesized an overall factor of self-efficacy directly affecting the 4 factors, SCP, RC, QOL, and AH. As Model D in Table 3 indicates, most fit statistics supported this model. Yet the TLI statistic,. 890, did not reach the cut-off criterion, and Hu and Bentler's combination rule was not met either. Among the five CFA models tested, Model C was the only model that exceeded all cut-off criteria used in the present study, supporting the 1st order four-factor model for the care-receiver efficacy construct.

Table 3. Fit indices of the CFA Models

Models	χ^2	df	χ^2/df	RMSEA	CFI	TLI	SRMR
Model A	818.962	265	3.090	.074	.822	.799	.078
Model B	498.331	164	3.039	.074	.874	.854	.055
Model C	380.179	162	2.347	.060	.918	.903	.051
Model D	416.074	164	2.540	.064	.905	.890	.060
Model E	209.581	98	2.139	.055	.945	.932	.043

4. Development of the KCRES-SR and its Factorial Validity

To make the KCRES-SF more psychometrically sound and culturally suitable for Korean older adults, we first evaluated the properties of the scale items based on the scale item inclusion criteria suggested by Stanton, Sinar, Balzer, and Smith (2002). The criteria have three categories which are internal, external, and judgmental ones. In this study, the criteria for internal properties were factor loadings and residuals; those for external properties were item correlations with two other related scales; and those for judgmental properties were face validity (cultural appropriateness) and semantic redundancy. By excluding one item assessed as least desirable for each factor, we produced a shorter version of the KCRES-SF composed of 16 items (KCRES-SR) (see the Appendix A and B for more detailed information about the evaluation criteria and the excluded items). Then, we performed CFA for the KCRES-SR. This CFA model, labeled as Model E in Table 3, was the 1st order four-factor model allowing inter-factor correlations but no error term correlations. The fit statistics for the KCRES-SR were all beyond the cut-off criteria and satisfied Hu and Bentler's Combination Rule. It is particularly noteworthy that the KCRES-SR was more parsimonious, and its fit statistics were all improved compared to the KCRES-SF.

Table 4. Parameter Estimates for the KCRES-SF and the KCRES-SF (standardized)

	Model C (KCRES-SF with two error term correlations)	Model E (KCRES-SR)
Factor Loadings (Standardized)		
SCP01 ← SCP	.624***	.590***
SCP02 ← SCP	.540***	-
SCP04 ← SCP	.611***	.630***
SCP10 ← SCP	.602***	.636***
SCP12 ← SCP	.681***	.683***
RC01 ← RC	.517***	-
RC02 ← RC	.649***	.647***
RC03 ← RC	.676***	.675***
RC04 ← RC	.807***	.809***
RC05 ← RC	.662***	.665***
QOL01 ← QOL	.572***	-
QOL03 ← QOL	.693***	.688***
QOL04 ← QOL	.793***	.800***
QOL05 ← QOL	.829***	.822***
QOL06 ← QOL	.660***	.662***
AH01 ← AH	.567***	.573***
AH02 ← AH	.773***	.786***
AH03 ← AH	.531***	.533***
AH04 ← AH	.629***	.612***
AH05 ← AH	.335***	-
Inter-Factor Correlations		
SCP ↔ RC	.755***	.737***
SCP ↔ QOL	.558***	.531***
SCP ↔ AH	.626***	.629***
RC ↔ QOL	.322***	.323***
RC ↔ AH	.498***	.485***
QOL ↔ AH	.618***	.627***
Error Term Correlations		
RC01 ↔ RC02	.541***	-
AH03 ↔ AH05	.258***	-

*** p < 001

5. Comparison between the KCRES-SF and the KCRES-SR.

Factor loadings and inter-factor correlation. In Table 5, factor loadings and inter-factor correlations of the KCRES-SR were compared with those of the KCRES-SF. In general, the values of the inter-factor correlations of the KCRES-SR were similar to those of the KCRES-SF, and the order of the inter-factor correlations from the weakest to the strongest was exactly same in both models. All items loaded on their hypothesized factors significantly ($p<.001$) in both models, but the average of the standardized factor loadings of the KCRES-SR (.676) was slightly higher than that of the KCRES-SF (.638). The factor loadings of the KCRES-SR ranged from .533 to .822, indicating moderate to strong in magnitude. Most items of the KCRES-SF also showed factor loadings higher than .500. However, the factor loading of AH05 in the model was .335, which was interpreted as somewhat weak.

Correlation between the KCRES-SF and the KCRES-SR. A Pearson product-moment correlation coefficient was computed to assess how strongly the scores from the KCRES-SR were related to those from the KCRES-SF. As expected, there was positive and strong correlation between the two instruments ($r=.988$, $p<.001$). The correlation coefficient close to the whole number indicates that the KCRES-SR would not differ greatly from the KCRES-SF in detecting variability of self-efficacy among the elderly.

Internal consistency. Both the KCRES-SF and the KCRES-SR displayed high levels of internal consistency for the subscales and the entire scales. The Cronbach's α for the KCRES-SF and the KCRES-SR were .881 and .869, respectively. The α for the subscales of the KCRES-SF ranged from .720 to .832 and those for the subscales of the KCRES-SR ranged from .725 to .828. Note that the internal consistencies of the KCRES-SR remained sound, even though the number of the items was reduced.

V. Discussion and Conclusion

Noticing the lack of a proper instrument measuring self-efficacy of elderly care-receivers in Korea, the current study aimed to validate the Care-Receiver Efficacy Scale-Short Form (CRES-SF) developed by Cox and colleagues (2006) with Korean older adults. More specifically, this study first aimed to identify the factor structure of care-receiver efficacy. For this construct, Cox and colleagues (2006) proposed the 1st order five-factor structure, which specified Self-Care Performance (SCP), Relational Coping (RC), Performance-Related Quality of Life (QOL), Accepting Help (AH), and Perception of Dependence (PD). In this study, however, we found that the model proposed by Cox *et al.*, (2006) did not fit the data well. In contrast, the 1st order four-factor model that excluded PD and allowed two pairs of error-term correlations fit the data reasonably well. We also tested its 2nd order factor model that hypothesized the overall self-efficacy construct, but the model failed to surpass all the cut-off criteria in the current study. These results partially supported Ma and colleagues' study (2012). On one hand, this study did not confirm the overall self-efficacy factor (the 2nd order factor model) proposed by them. On the other hand, the present study supported Ma and colleague's conclusion that PD had poor qualities and that excluding it was justifiable.

Secondly, this study aimed to revise the instrument so that it could have psychometrically better properties and increased cultural suitability for Korean older adults. Based on the criteria suggested by Stanton and colleagues (2002), all the items of the KCRES-SF were examined, and those assessed as the least desirable for each factor were eliminated. As a result, the KCRES-SR was created. The KCRES-SR was successfully validated with the good model fits. Among the four items excluded from the KCRES-SR, three were determined to be culturally insensitive and to have low face validity. The problem of the item (RC01) "I often tell my caregiver that I love or care about him/her" might not need to be explained here again because it was detailed in the earlier section of this study.

Another item (QOL01) considered culturally inappropriate is "I am able to contribute to my community." For many Korean older adults who experienced extreme poverty and political conflicts during the Japanese Colonial Period and Korean War, surviving the severe life conditions and taking care of their own families were top priorities (Choi, 1999). To them, performing volunteer activities for others and contributing to a community might be somewhat unfamiliar. This strong familism or so-called family egoism is considered to be one of the critical obstacles keeping the Korean elderly from participating in various public interest activities (Lee, 2003). According to a recent report co-published by Ministry of Health and Welfare of the Korean Government, and Korean Institute for Health and Social Affairs (Jung et al., 2014), the rates of older adults who participated in volunteer activities are very low, ranging from 0.2% for those aged 85 and older to 6.0% for those aged 65-69 years. Therefore, using the item asking their contribution to the community in order to measure the efficacy of Korean older adults might be improper.

The item (SCP02) "I have learned about the knowledge and skills that various health professionals have and can offer to my situation" was also identified as culturally insensitive. This is because Koreans can hardly expect to get detailed information about their health conditions and care management skills from their medical professionals. In Korea, the national health insurance system is relatively well established and access to health care services is not a critical issue. A downside of this meritorious situation is that Koreans want to use health care services at general hospitals even for somewhat mild illness, and the doctors at those institutions have to see too many patients. According to Korea Joong-Ang Daily (Shin, Bae, & Jang, 2014), doctors often see more than 150 patients a day, and in order to manage the overwhelming workload they could not help allocating 30 seconds to 3 minutes for each patient. Considering this situation, measuring the efficacy with a question asking about their learning the knowledge and skills from health professionals might not be appropriate.

To determine which scale, either the KCRES-SF or the KCRES-SR, is more recommendable to use with Korean older adults, the two versions of the instrument were compared. Although the KCRES-SF and the KCRES-SR are similar to one another, the two versions have different strengths and weaknesses. Compared to the KCRES-SR, the KCRES-SF has some noticeable drawbacks. First, it allowed two pairs of error-term correlations. Although correlated error terms are not rare in social science research, there are many opponents against it because errors are assumed to be independent, and correlating the errors is usually data-driven (MacCallum, 1995). The KCRES-SF is not free from such criticisms. Second, some items of the KCRES-SF have poor qualities. For instance, AH05 had low correlations with other items measuring the same factor, as did SPC02. In addition, AH05 has repetitive contents with other items, indicating item redundancy. Third, six pairs of correlations were found to have residuals higher than .100 in the residual matrix of CFA, which implies that the KCRES-SF has limitations in explaining the observed correlations.

By deleting the four items with poor qualities, the KCRES-SR solved most of these problems. In addition, the KCRES-SR showed improved model fits and higher factor loadings on average compared to the KCRES-SF. The KCRES-SR is also briefer in length. Assessing the elderly with this instrument would be more efficient because it would require less energy and time from both interviewers and interviewees. The biggest merit of the KCRES-SR is that it is considered to be more appropriate for Korean culture.

Regarding the weakness of the KCRES-SR, two issues must be mentioned. The first is internal consistency. The Cronbach's α of the KCRES-SR is lower than that of the KCRES-SF. However, it may not be a concern because the alpha value of the KCRES-SR (.869) is considered high. The other is that the KCRES-SR cannot be recommended for international and/or comparative studies of which primary objective is to compare the characteristics of multiple samples from different countries or racial-ethnic groups because the KCRES-SR has not yet been validated in elderly populations other than Koreans, and little information about its norms

is available at this time point. Therefore, it is a promising future research topic to assess the reliability and validity of the shorter version of CRES with various cultural groups.

For studies of Korean elderly care-receivers, choosing the KCRES-SF or the KCRES-SR would be an important issue. As the two instruments have unique merits and weaknesses, the decision should be made based on the study objective. For instance, if the primary objective is to compare Korean elderly people with those with different cultural backgrounds, the KCRES-SF would be preferable. However, if a study is interested in the Korean elderly populations only, then the KCRES-SR would be a better choice because it is a more efficient tool, has psychometrically better qualities and is culturally suitable than the other.

The present study can be considered to be meaningful in that it identified the factor structure of care-receiver efficacy, and it validated the KCRES-SF in the setting geographically and culturally different from the one where the original scale was developed. In addition, this study proposed a more abbreviated version of the scale which has improved psychometric qualities and is culturally suitable for Korean older adults compared to the KCRES-SF. As KCRES-SF and KCRES-SR were validated in this study, it is expected that the effectiveness of the intervention programs designed to enhance Korean elderly care receivers' self-efficacy can be more properly measured than ever before. Such utilization of the instruments in research and/or clinical settings can contribute to improved quality of those programs in the long run. Yet the instruments should be used cautiously because they were validated with a study sample whose representativeness was not clearly assessed. The study sample of this study are community-dwelling elderly individuals who are 65 years and older, and live alone. This implies that the study results might not be generalizable to the entire population of Korean elderly people, and particularly those institutionalized. It is therefore a promising research topic to validate the instruments with Korean older adults whose characteristics are different from those of this study sample.

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정소연은 미국 University of Texas at Austin에서 박사학위를 취득하였으며, 현재 서울여자대학교 사회복지학과에 부교수로 재직 중이다. 여러 사회복지학의 분야 중 사회복지 개입 및 실천 분야에 기여할 수 있는 개입 효과성 검증, 척도 개발 등에 관심을 가지고 있다.
(E-mail: jungsy@swu.ac.kr)

서홍란은 미국 University of Denver에서 사회복지학 전공으로 석사 및 박사학위를 취득한 후 현재 서울여자대학교 사회복지학과의 부교수로 근무하고 있다. 주요 관심분야는 증거기반 실천, 노인복지 등이다.
(E-mail: hlseo@swu.ac.kr)

〈Appendix A〉 Item Inclusion Criteria

(based on the guidelines of Stanton, et al., (2002)).

Internal Item qualities

- Average residual: Among the residual correlations in CFA, all the pairs in which an item is involved were identified and then averaged. The average residual for an item should be very low.
- Factor loading: The factor loading of an item on its hypothesized sub-construct in CFA should be moderate to high.

External Item qualities

- Correlation with morale: An item should be positively and significantly related with moral which is used an external criterion for convergent validity in this study.
- Correlation with depression: An item should be negatively and significantly related with depression which is used an external criterion for discriminant validity in this study.

Judgmental Item qualities

- Face validity: An item should appear to adequately reflect and measure the sub-construct that it is supposed to measure.
- Semantic redundancy: An item should not highly overlap with other items in contents.

〈Appendix B〉 Reasons for Item Exclusion

- SCP02; High residual; Low factor loading; Low face validity (culturally inappropriate)
- RC01: High residual; Low factor loading; Insignificant relationship with Morale (PGCMS score); Low face validity (culturally inappropriate)
- QOL01: Low factor loading; Low face validity (culturally inappropriate)
- AH05: High residual; Low factor loading; Insignificant relationship with Morale (PGCMS score) and Depression (GDS-SF score); Semantic redundancy

〈Appendix C〉 한글판 돌봄수혜자 자기효능감 척도 간략형

하위 요소	문항	전혀 그렇지 않다	그렇지 않다	보통	그렇다	매우 그렇다
자기 케어 수행 정도 (SCP)	1. 나는 나의 케어를 위해 시도되는 계획이라면 무엇이든지 적극적으로 참여하고 있다	1	2	3	4	5
	2. 나는 전문직들이 보유하고 있는 케어와 관련한 특별한 지식과 기술들을 학습해 왔다*	1	2	3	4	5
	3. 나는 내가 의료적으로 어떤 상태에 놓여 있는지 가능한 많이 알고자 한다	1	2	3	4	5
	4. 나는 나의 상황에 관한 정보를 종종 의사에게 전달하여 나의 케어에 관한 결정을 하는 데 도움이 될 수 있도록 한다	1	2	3	4	5
	5. 나는 전문 케어제공자들이 동의할 수 있는 정도의 수준으로 나 자신의 케어와 관련한 결정을 종종 내리는 편이다	1	2	3	4	5
케어 제공자와의 관계 (RC)	6. 나는 종종 케어제공자에게 사랑한다거나 좋아한다고 말한다*	1	2	3	4	5
	7. 나는 케어제공자의 좋은 친구이다	1	2	3	4	5
	8. 나는 나의 욕구가 케어제공자의 스케줄에 맞도록 노력한다	1	2	3	4	5
	9. 나는 나의 케어제공자의 욕구와 문제들이 무엇인지 알아내기 위해 모든 노력을 기울인다	1	2	3	4	5
	10. 나는 종종 나의 케어제공자에게 정서적인 지원을 제공한다	1	2	3	4	5
삶의 질과 관련된 활동 수행 (QoL)	11. 나는 내가 거주하고 있는 지역사회에 도움이 되는 역할을 수행할 수 있다*	1	2	3	4	5
	12. 나는 지난 몇 년 동안 몇 가지 새로운 취미들을 개발해왔다	1	2	3	4	5
	13. 나는 평생 동안 즐겨 해왔던 몇 가지 일들을 여전히 할 수 있다	1	2	3	4	5
	14. 나는 여전히 의미 있는 활동들에 참여할 수 있는 방법들을 찾는 것이 가능하다	1	2	3	4	5
	15. 나는 나와 좋아하는 활동들이 같은 여러 명의 친구들이 있다.	1	2	3	4	5
도움 수용 (AH)	16. 필요할 때 도움을 받는 것은 나에게 쉬운 일이다	1	2	3	4	5
	17. 나는 도움이 필요하다는 사실을 인정하는 방법들을 발견했고 또한 여전히 삶을 즐기고 있다	1	2	3	4	5
	18. 나는 도움이 필요하다는 사실을 그대로 받아들이기로 결심했다	1	2	3	4	5
	19. 나는 의존성이 늘어 가고 있다는 것에 대해서 내 스스로의 감정을 잘 다스릴 수 있다고 믿는다	1	2	3	4	5
	20. 나는 내가 도움이 필요하다는 사실을 받아들이지만 그것을 당연시하지는 않는다*	1	2	3	4	5

* 표시는 KCRES-SF 척도에는 포함되나 KCRES-SR 척도에는 비포함된 문항을 가리킴

한국어판 돌봄수혜자 자기효능감 척도:
KCRES-SF 척도와 수정된 KCRES-SR 척도의 요인구조 확인 및 타당도 검증

정 소 연 (서울여자대학교)
서 홍 란 (서울여자대학교)

돌봄수혜자 자기효능감 척도 단축형(Care Receiver Efficacy Scale-Short Form)의 한국 적용에 대한 잠재적 유용성에 주목하면서 기획된 본 연구는 다음과 같은 세 가지 목적을 가진다. 첫째, 돌봄수혜자 자기효능감 단축형 척도를 한국어로 번역한 후(KCRES-SF)의 요인구조를 확인한다. 둘째, 이 척도를 한국문화에 적합하게 더욱 간략하게 만든 후(KCRES-SR), 모형적합도를 확인한다. 셋째, 두 척도의 타당도와 신뢰도 등 심리측정적 특성을 비교한다. 본 연구의 대상자는 지역사회에 거주하면서 독거노인 생활관리사로부터 주 2시간 이상의 서비스를 받고 있는 377명의 노인이다. 자료수집을 위해 구조화된 설문지를 활용한 대면인터뷰가 실행되었다. 수집된 자료에 대해 일련의 확인적 요인분석과 기술분석이 실행되었다. 분석결과는 KCRES-SF 척도가 4개의 하위차원으로 구성된 1차 요인구조를 가지고 있음을 지지하였다. 이 모형의 적합도는 우수한 편이었으며, 모형수용도의 기준으로 제시된 지수를 모두 충족시켰다. 한편, 수정판인 KCRES-SR은 KCRES-SF 보다도 우수한 모형적합도를 보였다. 또한 이 수정판은 KCRES-SF 보다 이론적으로 보다 적절하고, 간략하며, 한국문화에 더욱 적합한 것으로 평가되었다. 그러나 두 척도가 서로 유사한 특징을 가지고 있고, 각기 다른 장단점을 가지고 있는 만큼, 어느 것을 선택하여 사용할 것인지를 결정하기 위해서는 구체적인 연구목적이 고려될 필요가 있다.

주요 용어: 자기효능감, 노인 돌봄수혜자, 타당도 검증, 확인적 요인분석