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Translation and psychometric testing of Indonesian Version of Chronic Kidney Disease–Symptom Burden Index

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ABSTRACT

Introduction: Chronic Kidney Disease Symptom Burden Index (CKD-SBI) is an instrument measuring symptom burden developed by Almutary and colleagues in 2015 to refine the identification of symptom burden in chronic kidney disease population. This instrument has not been tested for Indonesian language, thus, the aim of study was to translate and psychometrically testing the Indonesian version of CKD-SBI.

Methods: This study design was cross-sectional study. The study methods were divided into translation and psychometric testing. The translation was conducted by adapting Guillemin and Beaton's guidelines. The psychometric properties determined 320 hemodialysis patients with several inclusion criteria such as above 18 years old, regularly receiving hemodialysis for more than 3 months. Patients with cognitive impairment, psychiatric patients, and in critical condition were excluded.

Results: The item content validity index of the Indonesian version was 0.92, and the subscale content validity was 0.78. The instrument demonstrated convergent validity with the Kidney Disease Quality of Life. Excellent internal consistency was demonstrated based on a Cronbach's alpha coefficient of .91 and a subscale ranging from 0.86 to 0.92. The confirmatory factor analysis showed that the five factors of English Version did not fit the Indonesian version. The parallel analysis suggested that five factors be retained from the distress and frequency dimensions because they were statistically and conceptually acceptable.

Conclusions: Translated Indonesian versions of CKD-SBI can be used as instruments to assess symptom burden among patients with hemodialysis. By assessing symptom burden, we hope nurses in the hospital are able to decide effective symptom management to increase the health-related quality of life among these populations.

Keywords: chronic kidney disease, nurses, nursing, psychometric, symptom burden

Introduction

People with chronic kidney disease (CKD) encounter a disease burden in the form of multiple symptoms due to the accumulation of toxins resulting from a decline in kidney function (Vadakedath and Kandi, 2017). The number of symptoms among patients with CKD ranges from approximately 6-20 per patient (Almutary, Bonner and Douglas, 2013) and symptoms typically occur in clusters (Lee and Jeon, 2015; Almutary, Douglas and Bonner, 2016; Amro et al., 2016;). Previous studies investigating symptoms among the CKD population have focused on single symptoms rather than on clusters. However, two or more symptoms may be connected and may thus share the same etiology (Dodd, Miaskowski and Paul, 2001; Kim et al., 2005; Lockwood et al., 2019).

The number of patients who require hemodialysis in Indonesia increased rapidly from 52.8 thousand in 2016

to 77.8 thousand in 2017 (Pernefri, 2017). Among renal replacement therapy sections, hemodialysis is the default treatment among Indonesian patients in the advanced stages of CKD. As the major treatment choice, hemodialysis may contribute to the symptom burden experienced by patients along with the nature of the disease trajectory itself (Almutary, Bonner and Douglas, 2013). A limited number of studies have identified the symptom burden and symptom clusters in Indonesia, among which one study identified clinical symptoms among patients undergoing hemodialysis in Indonesia. The results revealed a small mean of total symptom burden (9.79 ± 12.594) ranging from 0-80 (Nurtiana and Agustiyowati, 2019), indicating a low rate of symptom burden compared to other countries. The results may have been due to the small sample size, which inherently leads to low reproducibility of results (Button et al., 2013). Also, there is no study in Indonesia which has investigated symptom clusters among this population.

Several instruments have been developed to measure symptoms in practice and research, but few tools exist that consider comprehensive domains and dimensions, which results in limitations related to capturing CKD symptom experiences (Almutary, Douglas and Bonner, 2016). The Chronic Kidney Disease Symptom Burden index (CKD-SBI) developed by Almutary et al. in 2015, was a refinement of the Dialysis Symptom Index (DSI). The CKD-SBI addresses the limitations of the DSI symptom dimension, and the symptom domains are considered comprehensive. Compared to other available instruments, the CKD-SBI can comprehensively identify symptom burden in the context of both physical and psychological domains, and adopts multidimensional assessments, such as occurrence, severity, distress, and frequency of symptoms, which is useful in terms of translating into renal nursing practice (Almutary, Bonner and Douglas, 2016). However, CKD-SBI is only available in Arabic and English versions. Therefore, we conducted this study to translate and psychometrically test the Indonesian version of the CKD-SBI to identify the symptom burden and symptom clusters among patients undergoing hemodialysis in Indonesia.

Materials and Methods

Study design

A cross-sectional descriptive study design was used with a convenience sample of patients undergoing hemodialysis in Indonesia. Data were collected from July 2019 to January 2020 at two hemodialysis units in Jakarta, Indonesia. The study comprised two steps. In Step 1, the original English version of the CKD-SBI was translated into Indonesian. In Step 2, the psychometric properties of the translated version, including content validity and internal consistency, criterion related validity, factor analysis which consisted of confirmatory factor analysis (CFA) an exploratory factor analysis (EFA), and parallel analysis, were evaluated.

Method

The study methods were divided into translating, cross-culturally adapting, and reporting an examination of the psychometric properties of the Indonesian version of the CKD-SBI. Patients over 18 years old receiving regular hemodialysis for more than three months were approached and given information about the study. Patients with cognitive impairment, psychiatric issues or who were critically ill were excluded. A factor analysis requires a rule of thumb of 10 observations per variable for stability and generalizability (Comrey and Lee, 2013). Because there are 32 items in the CKD-SBI, 320 respondents were required. Informed consent was obtained from 320 patients ranging in age from 18 to 93 years of age.

Data analysis

Step 1 Translation: A request for permission letter was sent to Almutary to translate the original 32-items in the CKD-SBI. The cross-cultural adaptation translation process was conducted using well-established procedures following Beaton et al. (2000). The content validity index (CVI) for 32 items and a subscale were examined based on relevancy on a scale where 1 = not relevant to 4 = highly relevant, where any item having a value less than 3 was re-evaluated. In addition, the equivalence, clarity, and readability of both translated versions were assessed by the panel using a 4-point Likert scale ranging from 1 = not clear to 4 = very clear. Equivalence was used to determine whether both languages had equal meaning, where clarity referred to the degree of ambiguity and readability as indicated by whether the items were understandable. The CVI was computed using the proportion of items awarded ratings by the three experts.

Quality of life, as measured by the Kidney Disease Quality of Life (KDQOL)-36, was used to examine the criterion-related validity of the CKD-SBI. The KDQOL-36 has been used widely worldwide among target populations. The Indonesian version of the KDQOL-36 was translated in 2014 and was found to have appropriate psychometrics (Hidayah, 2014). The KDQOL-36 consists of 36 questions divided into several

subscales, such as SF (items 1 to 12), burden of kidney disease (items 13-16), symptoms or problems (items 17-28), and effects of kidney disease (items 29-36). SF is divided into a physical component summary (PCS) and a mental component summary (MCS).

Step 2 Psychometric Analysis: The internal consistency of the CKD-SBI was assessed by determining the Cronbach's alpha coefficients for the overall scales and subscales. Cronbach's alpha coefficients above 0.70 were considered satisfactory (Polit and Beck, 2012). Several techniques were applied and compared to determine the factor structure of the Indonesian version of the CKD-SBI: a confirmatory factor analysis and an exploratory factor analysis (scree plot examination, eigenvalue greater than 1), and a parallel analysis.

In the CFA, model fit was appraised using the following criteria: (a) p-value of chi square test >0.05; (b) chi-square test divided by the degrees of freedom ($\chi 2/df$) < 3 or 5; (c) confirmatory fit index (CFI) ≥ 0.90; (d) normed fix index (NFI) ≥ 0.85; (e) standardized root mean square residual (SRMR) < .080; (f) root mean square error of approximation (RMSEA) < 0.08; (g) goodness of fit index (GFI) ≥ 0.95; and (h) adjusted goodness of fit index (AGFI) ≥ 0.90 (Kline, 2023). In the EFA, principal axis factoring was used for factor extraction, and a Promax rotation with Kaiser normalization was used for the rotation methods (Costello and Osborne, 2005). Number factors with eigenvalues greater than 1 were retained based on the screen plot and parallel analysis. Core symptoms in each cluster were determined based on stability across dimensions and clinical plausibility. The criteria for factor item retention included a minimum factor membership of two items, item loadings above 0.50, fewer cross-loaded items, and conceptual (Hair *et al.*, 2014).

Ethical consideration

The number of ethical approval from the Institutional Review Board (IRB) was ND-1020/UN2.F1/ETIK/PPM.00.02/2019. The number of approval research permission from Fatmawati hospital was DM 01.01/VIII.2/9375/2019, and from Cipto Mangunkusumo National Hospital was LB/1.4.12/0118/2020. Ethical consideration was followed by the investigator and research assistants including informed consent, autonomy, anonymity, beneficence, and justice (Polit and Beck, 2012).

Table 1. Demographic data of participants

Variable	n (%)	Mean and SD
Gender		
Female	145 (45.3)	
Male	175 (54.7)	
Body Mass Index		
Underweight (below 18.5)	24 (7.5)	
Normal (18.5–24.9)	214 (66.9)	
Overweight (25–29.9)	67 (20.9)	
Obese (30 and above)	15 (4.7)	
Marital Status		
Single	28 (8.7)	
Married	262 (81.9)	
Widowed	30 (9.3)	
Education		
Elementary school	30 (9.3)	
Junior high school	28 (8.7)	
Senior high school	171 (53.4)	
University	91 (28.4)	
Work Status		
Unemployed	192 (60.0)	
Employed	79 (24.7)	
Retired	49 (15.3)	
Comorbidities (CCI)		
0	107 (33.4)	
1-2	142 (44.3)	
Above 3	71 (22.1)	
Age		51.50 ± 14.56
Duration		46.28 ± 43.76

Results

Demographic data

The majority of the sample was male (n = 175; 54.7%), had a normal Body Mass Index (BMI) (n = 214; 66.9%), was married (n = 262; 81.9%), had graduated from senior high school (n = 171; 53.4%), not employed (n = 192; 60.0%), and had 1-2 comorbidities (n = 141; 44.3%) measured by using Charlson's Comorbidity Index (CCI) (Charlson et al., 1987). The participants ranged in age between 18 to 93 years old, and the average age was 51.50 (SD = 14.56). The mean hemodialysis duration was 46.28 (SD = 43.76), which was the equivalent of 3.8 years (Table 1).

Content validity

The equivalence, clarity, and readability of the Indonesian version of the CKD-SBI were 92%, 93%, and

Table 2. Pearson correlation between CKD – SBI symptom dimensions and KDQOL -36 subscales (N = 320)

Symptoms Dimension	KDQOL–36 Subscale					
	Total score KDQOL-36	MCS	PCS	Effect of Kidney Disease	Symptom or Problem list	Burden of Kidney Disease
Occurrence	r = -0.67**	r = -0.65**	r = -0.35**	r = -0.29**	r = 0.71**	r = -0.07
Distress	r = -0.74**	r = -0.56**	r = -0.45**	r = -0.57**	r = 0.47**	r = -0.42**
Severity	r = -0.73**	r = -0.54**	r = -0.45**	r = -0.56**	r = 0.45**	r = -0.44**
Frequency	r = -0.68**	r = -0.46**	r = -0.44**	r = -0.59**	r = 0.36**	r = -0.46**
Total symptom burden	r = -0.74**	r = -0.55**	r = -0.46**	r = -0.58**	r = 0.47**	r = -0.43**

*=p < 0,05; **= p < 0,01

Table 3. Exploratory factor analysis

Distress		Severity		Frequency	
Symptom	**Loading**	**Symptom**	**Loading**	**Symptom**	**Loading**
		Fluid volume symptoms			
Restless leg	0.64	Restless leg	0.70	Restless leg	0.59*
Diarrhea	0.61	Diarrhea	0.58	Diarrhea	0.55
Chest pain	0.55*	Swelling in legs	0.57	Shortness of breath	0.55*
Swelling in legs	0.53	Chest pain	0.51*	Chest pain	0.54*
		Dry mouth	0.51	Swelling in legs	0.52
		Neuromuscular or pain symptoms			
Dizziness	0.86	Headache	0.76	Dizziness	0.79
Headache	0.82	Dizziness	0.75	Headache	0.79
		Bone or joint pain	0.53*		
		Sexual symptoms			
Decreased interest in sex	0.97*	Difficulty becoming sexual aroused	0.93*	Decreased interest in sex	0.99*
Difficulty becoming sexually aroused	0.96*	Decreased interest in sex	0.92*	Difficulty becoming sexually aroused	0.99*
		Sleep symptoms			
Trouble falling asleep	0.91			Trouble staying asleep	0.89
Trouble staying asleep	0.85			Trouble falling asleep	0.83
		Psychological symptoms			
Feeling anxious	0.94*	Feeling sad	0.97*	Feeling anxious	0.95*
Feeling sad	0.92*	Feeling anxious	0.96*	Feeling sad	0.93*
Worrying	0.84*	Worrying	0.87*	Worrying	0.86*
Feeling Nervous	0.79*	Feeling nervous	0.86*	Feeling nervous	0.79*
Feeling irritable	0.63*	Feeling irritable	0.67*	Feeling irritable	0.60*
		Total variances			
55.11%		55.61%		48.81%	

*= p < 0,05

94%, respectively. The CVI in this study were 0.92 for item content validity index (I-CVI) and, and 0.87 for scale content validity index (S-CVI).

Internal consistency

Cronbach's alpha for the 32 items scale was 0.906, and for the distress, severity, and frequency dimensions it was 0.903, 0.923, and 0.863, respectively.

Criterion validity

Criterion-related validity was identified by correlating the CKD-SBI to the KDQOL-36. The symptom burden list of the KDQOL-36 was positively significant with the Distress dimension (r = 0.47; p< 0.001), Severity dimension (r =0.45; p< 0.001), and Frequency dimension (r = 0.36; p< 0.001) of the CKD-SBI. Respondents with higher scores of symptom distress, severity, and frequency had higher scores on the KDQOL-36 symptom problem list. Symptoms among the CKD patients were correlated with poor health-related quality of life. A negative correlation was found between the of CKD-SBI and the MCS, PCS, effects of kidney disease, and burden of kidney disease dimensions, showing a moderate to strong relationship (Table 1).

Confirmatory factor analysis

The five factors originally reported by Almutary were evaluated with a confirmatory factor analysis. The analysis for each dimension showed that the data didn't fit the model. Distress (χ2 998.515, df= 242; CMIN/DF = 4.12; P = 0.000; GFI = 0.794; RMR = 0.507; NFI = 0.760; CFI = 0.805; RMSEA = 0.099; AGFI = 0.745). Frequency (χ2 480.098, df= 179; CMIN/DF = 2.68; P = 0.000; GFI = 0.871; RMR = 0.469; NFI = 0.839; CFI = 0.892; RMSEA = 0.073; AGFI = 0.833). Severity (χ2 759.402, df= 220; CMIN/DF = 3.45; P = 0.000; GFI = 0.820; NFI = 0.775; RMR = 0.462; CFI = 0.855; RMSEA = 0.088; AGFI = 0.774). The CFA didn't fit the model.

Exploratory factor analysis

Principal Axis Factoring (PAF) was used for the factor extraction, and a Promax rotation with Kaiser normalization was conducted for the rotation methods. The Promax rotation assumed that the extracted factors of the CKD-SBI were correlated. The desirable convergent validity was items with loadings greater than 0.50, where divergent validity was defined as the absence of a relationship between the items and other subscales. The Kaiser Mayer Olkin (KMO) and Bartlett's sphericity test scores were observed for each dimension. An overall KMO score >0.80 indicated sampling adequacy (severity = 0.835; distress = 0.835; frequency = 0.802) and the overall Bartlett's sphericity score was significant for the factor analysis (p < 0.001). The results of the initial solution showed nine factors with eigenvalues greater than 1 for the Severity, Distress, and Frequency dimensions. Among these dimensions, the nine factors solution explained 55.11%, 55.61%, and 48.81%, respectively. The scree plot demonstrated five factors to be appropriate. The parallel analysis suggested the five factors most appropriate for the Distress and Frequency dimensions, and the four factors for the Severity dimension. After

conducting the parallel analysis, the EFA was repeated on a forced 5-factor for the Distress and Frequency dimensions, and four factors for the Severity dimension. The investigator included item loadings above 0.50, fewer cross-loadings, and more than two items in one cluster. No cross-loading items were found. The investigator found four clusters that were consistent along all dimensions, and one cluster was found only under two dimensions. Five clusters in the Distress dimension explained 23.97% of the total variance; five clusters in the Severity dimension explained 23.42% of the total variance, and five clusters in the Frequency dimension explained 19.23% of the total variance in the CKD-SBI Indonesian version. In summary, across three dimensions, the number of symptoms in all clusters ranged from two to 16 items.

Factor labeling

A total of five factors found in the EFA were reviewed and labelled. In the Distress dimension, factor 1 consisted of four items, labelled as fluid volume symptoms, which accounted for 23.97% of the variance. Factor 2 consisted of two items, labelled as neuromuscular or pain symptoms, which accounted for 8.41% of the variance. Factor 3 consisted of two items, labelled as sexual symptoms, which explained 5.12% of the variance. Factor 4 consisted of two items, labelled as sleep, which explained 3.93% of the variance. Factor 5 consisted of five items, labelled as psychological symptoms, which explained of 3.48% of the variance.

In the Severity dimension, factor 1 had five items, labelled as fluid volume symptoms, which accounted for 23.42% of the variance. Factor 2 had three items, labelled as neuromuscular or pain symptoms, which accounted for 8.89% of the variance. Factor 3 consisted of two items, labelled as sexual symptoms, which explained 5.59% of the variance. Factor 4 consisted of five items, labelled as psychological symptoms, which accounted for 3.65% of the variance.

In the Frequency dimension, factor 1 consisted of five items, labelled as fluid volume symptoms, which accounted for 19.23% of the variance. Factor 2 had two items, labelled as neuromuscular or pain symptoms, which accounted for 7.63% of the variance. Factor 3 had two items, labelled as sexual symptoms, which explained 6.47% of the variance. Factor 4 had two items, labelled as sleep symptoms, which explained 3.77% of the variance. Factor 5 had five items, labelled as psychological symptoms, which accounted for 3.50% of the variance.

Discussions

This study describes the translation procedures and provides an examination of the psychometric properties of the Indonesian version of the CKD-SBI. The CKD-SBI was designed to be a comprehensive assessment tool to address limitations related to symptom identification in chronic kidney disease (CKD) patients. The CKD-SBI has been translated into two languages across different stages of chronic kidney disease, including those receiving dialysis and those not receiving it (Almutary, Bonner and Douglas, 2015). This new Indonesian version is the initial cross-cultural version in South-Asian countries, following the previous version in English and Arabic. Three panels of experts reviewed the Indonesian version of the CKD-SBI, which had high scores for equivalence, clarity, and readability. All items in the Indonesian version of the CKD-SBI were deemed to be clear, to reflect the original meaning, and to be understandable. The I-CVI indicated good results, whereas the S-CVI had an acceptable score. The internal consistency was considered excellent based on the Cronbach's alpha, which indicated good reliability, and the score was close to the Almutary's version for the comparable reliability score. Criteria-related validity was also checked to identify the relationships between the CKD-SBI and the KDQOL-36. The findings were consistent with previous reports (Almutary, Bonner and Douglas, 2015).

The first process of the cross-cultural adaptation of the Indonesian version of CKD-SBI involved the use of a confirmatory analysis. The CFA showed that the results from our study did not fit Almutary's 5-factor solution in terms of consistency across dimensions. In the Distress dimension, the CMIN/DF score was acceptable; however, the CFI, NFI, GFI, and AGFI were lower than the recommended thresholds, and the RMSEA was higher. In the Frequency dimension, the RMSEA score was acceptable, but the CMIN/DF, CFI, NFI, GFI, and AGFI were lower than the recommended thresholds. Furthermore, in the Severity dimension, the CMIN/DF score was acceptable, but the RMSEA was higher and the CFI, GFI, NFI, and AGFI were lower than the recommended thresholds.

The parallel analysis suggested that five factors should be retained from the Distress and Frequency dimensions; however, in the Severity dimension, only four factors were retained. Only four factors remained consistent across all dimensions. The original version of the CKD-SBI reported five factors, including fluid volume symptoms, neuromuscular symptoms, gastrointestinal symptoms, sexual symptoms, and psychological

symptoms while the Indonesian version of the CKD-SBI included fluid volume symptoms, pain or neuromuscular symptoms, sleep symptoms, sexual symptoms, and psychological symptoms. Several factors from Almutary's original version were similar to the Indonesian version of the CKD-SBI: fluid volume symptoms, neuromuscular or pain symptoms, sexual symptoms, and psychological symptoms. The differences between Almutary's original version and the Indonesian version of the CKD SBI included not only the number of factors or clusters across dimension, but also the number of items in each factor or cluster and the name of the clusters.

The second factor in Almutary's original version (gastrointestinal symptoms) was not found in the current study. Different populations may have different occurrence of symptoms among patients. Among non-dialysis and peritoneal dialysis patients the risk of gastrointestinal symptoms has been found to be higher than in hemodialysis populations. According to the literature, gastrointestinal symptoms may appear in the CKD population due to the lower glomerular filtration rate (GFR), which leads to uremia (Lew and Radhakrishnan, 2020). Uremia causes pathological and physiological changes throughout the gastrointestinal tract, which leads to gastrointestinal symptoms (Nissenson et al., 2022). Gastrointestinal symptoms can improve with hemodialysis procedures (Lew and Radhakrishnan, 2020).

The first factor, fluid volume symptoms, comprised four items in the Distress dimension, and five items under the Severity and Frequency dimensions. Fluid volume symptoms result from the accumulation of fluids, excreta nitrogen, and electrolytes (Fernandes et al., 2017). Patients with chronic kidney disease are unable to regulate total body fluid, which results in an imbalance in body fluids. Restless leg, diarrhea, swelling in legs, and chest pain were common items in this cluster.

The second factor, in the Distress and Frequency dimensions, there were two items, and in the Severity dimension, there were three items. In Almutary's original version, the name of this factor was neuromuscular symptoms only. However, in the current study, neuromuscular and pain symptoms were viewed as having similar underlying characteristics, so they can occur together as one cluster (Lockwood et al., 2019). Several factors contribute to the occurrence of neuromuscular and pain symptoms: hyperkalemia (Arnold et al., 2016), comorbid conditions, and an impaired peripheral nervous system due to lower GFR, which is called peripheral neuropathy or uremic neuropathy (Almutary, Bonner and Douglas, 2015; Almutary, Douglas and Bonner, 2016; Abd El Naby et al., 2020). Dizziness and headache consistently appeared in three dimensions.

The third factor was sexual symptoms. The items reflect a decreased interest in sex and difficulty becoming sexually aroused, which were loaded together consistently along all dimensions. The items under sexual symptoms were similar to those of the original study (Almutary, Douglas and Bonner, 2016). Several factors contribute to the occurrence of sexual symptoms, including medications, anemia, zinc deficiency, comorbid diseases, vascular problems (occlusions in the veins and arteries), psychosocial problems, and comorbidities (Palmer, 2018). In Indonesian culture, talking about sexual is taboo, so attention to sexual symptoms is low. However, identifying this problem and applying appropriate symptom management is important.

The fourth factor, sleep symptoms, only loaded under the Distress and Frequency dimensions. Items related to sleep symptoms involved two issues: trouble falling asleep and trouble staying asleep. Sleep symptoms had relatively high item loadings (above 0.80). Uremia, psychological problems, and sleep during dialysis contributed to the occurrence of sleep symptoms (Palmer, 2018). In Almutary's original version, items related to sleep symptoms co-occurred with fluid volume symptoms. Sleep symptoms related to multiple factors, such as comorbidities (dementia, congestive heart failure, obstructive sleep apnea), medications, and lifestyle behavior (caffeine consumption, sleeping or napping during dialysis) (Scherer, Combs and Brennan, 2017).

In the fifth factor, psychological symptoms, five items were consistent along all dimensions and involved feeling anxious, feeling sad, worrying, feeling nervous, and feeling irritable. The items found in the current study were similar to those in Almutary's study (Almutary, Douglas and Bonner, 2016). Living with CKD and routine hemodialysis results in many stressors, such as facing death, fear of dialysis, uncertainty about the future, the changes or dysfunctions in family and social roles, dietary restrictions, changes in lifestyle, and dependence on healthcare and medications, all of which lead to psychological symptoms (Niu and Liu, 2017).

The final version of the Indonesian version of the CKD-SBI showed that 32 items had statistically validity, reliability, and were equivalent to the original version. However, these findings are limited in terms of

measuring symptom burden and symptom clusters among patients with CKD undergoing hemodialysis. Further research is needed to validate the 5-factor model used here to measure symptom burden and symptom clusters among patients at different stages of CKD, such as stages involving pre-dialysis, peritoneal dialysis, and kidney transplantation.

Conclusion

Symptoms commonly occur as clusters rather than as a single symptom. Identifying symptom clusters is important in terms of maintaining patient's health-related quality of life. The Indonesian version of the CKD–SBI was demonstrated to be a valid and reliable instrument to identify symptom clusters among patients with hemodialysis in Indonesia. The Indonesian version of the CKD-SBI was shown to be suitable for specific characteristics and can be used in clinical settings in Indonesia to identify symptom burden and symptom clusters among patients with hemodialysis. For further study, research about symptom management among patients with hemodialysis can be the main focus.

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Conflict of interest

The authors declare that there is no conflict of interest.

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