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Validity and Reliability Test on Sleep Quality Scale (SQS) Instruments in Indonesia Version on Cancer Patients

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ABSTRACT

Many cancer patients experience sleep disturbances or have poor sleep quality. The measurement of sleep quality in cancer patients has not been carried out in hospitals in Indonesia. The tools for measuring sleep are costly. Sleep quality measurement with sleep quality instruments has not been applied as a standard for patient assessment. To test the validity and reliability of the Indonesian version of the Sleep Quality Scale instrument to measure the quality of one's sleep and to test the internal consistency and retest reliability of the Indonesian version of the Sleep Quality Scale instrument to measure the quality of one's sleep. The instrument used was SQS with six components and 28 items. This research is a quantitative approach with a cross-sectional design. This research is a study of the validity and reliability of the instrument. The content validity test was measured using Aiken's V formula. The construct validity was measured using the product-moment, and using factor analysis, the reliability of SQS was measured using the Cronbach Alphand the reliability of the retest was using the ICC test. The Sleep Quality Scale shows good validity, namely the content validity value of Aiken's value V0.976, the validity of the extract of all SQS items, is valid. Internal consistency reliability shows good results. Cronbach Alpha 0.849, the ICC value on the test-retest test is 0.903. The goodness of fit test shows unsatisfactory results with a p-value of chi-square 0.00, RSMEA = 0.067, GFI = 0.750 and CFI = 0.869. Clinicians can use the Indonesian version of the Sleep Quality Scale instrument as an instrument to measure sleep quality in cancer patients.

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INTRODUCTION

Cancer is one of the leading causes of death worldwide. According to GLOBOCAN data, the International Agency for Research on Cancer (IARC) found that in 2012 there were 14,067,894 new cases of cancer and 8,201,575 deaths from cancer worldwide (Siegel *et al.*, 2015). In Indonesia, cancer is the cause of death of about 8.2 million people (Kemenkes, 2015). The prevalence of cancer patients in the population of all ages in Indonesia, with a majority of 1.4%. Cancer patients generally

experience pain, fatigue, distress, and sleep disorders (Trill, 2013). Based on literature studies, over 60% of cancer patients have problems with their sleep disorders (Mercadante *et al.*, 2004).

Every year, estimated that there are 20% - 70% experiences sleep problems, and about 17% are diagnosed with severe sleep disorders (Li *et al.*, 2017). Low sleep quality affects the increased risk of cancer until death (St-Onge *et al.*, 2016), declining physical health, psychology, and quality of life (Harvey *et al.*, 2008).

Sleep quality measurement can be carried out by various methods, such as subjective and objective methods. One of the objective methods is polysomnography; it is the standard gold of sleep quality measurement (Schabus *et al.*, 2014).

The most common instrument used for measuring sleep quality in clinical patients is the PSQI instrument for measuring sleep quality of breast cancer patients (Effendy *et al.*, 2015). Another instrument that can be used, such as the Sleep quality scale (SQS) developed by Yi *et al.* (2009).

This instrument uses for a comprehensive assessment of sleep quality in the general population. Nevertheless, SQS instrument has never been tested both of the validity and reliability in clinical patients, especially cancer patients in Indonesia, so that it is essential to research with aiming to test the validity and reliability of SQS instruments in cancer patients in which the result of this research can be utilized on sleep quality and more comprehensive on sleep quality assessment of cancer patients.

MATERIALS AND METHODS

Research Method

The SQS instrument consists of six components: daytime dysfunction, restoration after sleep, insomnia, difficulty waking, sleep satisfaction, and difficulty maintaining sleep. Also, the SQS instrument consists of 28 items covering questions about symptoms of insomnia. SQS instruments using a Likert scale with five choices of answer those are Not at all (0), Little (1), Good Enough (2), Good (3), and Very Good (4). Respondents will mark the checklist on one the answer from 0 to 4 responses according to the respondent's condition. The score range is 0 to 84, with a higher score indicating a lower quality of sleep. Research about the validity and reliability test on this instrument has not been held in Indonesia. Therefore, before doing the validity and reliability test, the researcher conducted the translation process into SQS Indonesian version. The method of translation is undertaken by using Brislin's theory. After translating into Bahasa Indonesia, the researcher then asks for an opinion and assesses the translated SQS instrument. Furthermore, researchers will conduct back translation with different translators.

Sample

The populations in this study were male and female patients under the age of 18 - 65 who were diagnosed with cancer by doctors at RSUD Prof. Dr MargonoSoekardjoPurwokerto. Sampling was determined by non-probability sampling in consecutive sampling by taking all patients who meet the criteria until the numbers of samples are met.

The numbers of a sample are based on the literature to test the validity and reliability of health problems. The sample required based on Rules of Thumb determination that the number of instrument items multiplied by 3. Therefore, The sample size in this study was 90 people.

Reliability Validity

The content validity test carried out SQS validity instrument test was measured its coefficient relevance using Aiken's V Construction validity measured with Pearson product-moment, with significance level 0,05 and R table with several respondents 90 that was 0.205. Internal consistency reliability test using Cronbach Alpha with coefficient α> 0.7 indicated that the item was reliable.

The reliability test of retest using correlation coefficient test between the total score of respondents' answers during the initial examination and the second test. Researchers also conducted a correlation test to measure the relationship between factors.

RESULTS

In this study, the majority of respondents aged were between 46 - 55 years old. All of the respondents consisted of males and females. Of the respondents, 33.33% were male, and 52.2% of respondents were female. Most respondents were self-employed (36.7%), and 64.7% of respondents had income below Rp. 1.400.000.

The disease's condition was dominated by nasopharyngeal cancer (36.7%), with illness duration, the majority of fewer than 12 months (86.7%). Most research respondents had undergone chemotherapy were 82.2%, and only one respondent had ever taken sleeping pills. Demographic characteristics could be seen in Table 1.

Validity

In this study, the assessment of the content validity coefficient was based on Aiken's V formula. The

Table 1: Demographic Characteristics and Health Conditions

Demographic Characteristics	Frequency (f)	Percentage (%)
Age		
17-25 years old	4	4,4 %
26-35 years old	7	7,8 %
36-45 years old	24	26,7 %
46-55 years old	30	33,3 %
56-65 years old	25	27,8 %
Sex		
Male	43	47,8 %
Female	47	52,2 %
Income Level		
< Rp 1.400.000	64	71,1 %
≥ Rp 1.400.000	26	28,9 %
Cancer Types		
Nasopharynx	33	26,7 %
Breast	24	36,7 %
Colorectal	17	18,7 %
Cervical	12	13,3 %
Others (testicular seminoma, thyroid)	4	4,6%
Occupation		
Jobless	27	30,0 %
Civil-Servant	7	7,8 %
Enterprise	33	36,7 %
Others	23	25,6 %
illness Duration		
< 12 month	78	86,7 %
> 12 month	12	13,3 %
Therapy Types		
Chemotherapy	74	82,2 %
Surgery	16	17,8 %
Sleeping Pill Usage		
Yes	1	1,1
No	89	89,9

data in Table 2 showed that the value of the content validity coefficient hadAikens' value 0.976. From 28 items in the SQS instrument covered 24 things of questions with Aiken value of 1.00, while four items had Aiken value 0.833. This means that this instrument had an excellent Aiken coefficient value.

Internal consistency testing using Cronbach's Alpha and reliability test of retest using correlation coefficient between 2 answers from the same respondent but at a different time. In this study, the time interval between the first test and the second test was two weeks. The number of respondents to do a retest was 31 respondents. Internal consistency reliability results could be seen in Table 3.

In the internal consistency reliability test, the value of Cronbach alpha was 0.849. This value was considered consistent in the instrument to be used was more than 0.70, and it was considered very good if the cost was more than 0.90. The results of the retest on the SQS instrument SQS Indonesian version in 31 respondents showed an excellent stability level; it was 0.903. The instrument was considered had good reliability if the ICC value was 0.75 to 0.9.

DISCUSSION

The calculation result of the content validity SQS instrument revealed that the SQS instrument had an excellent relevance to the concept of sleep quality. The overall item of the SQS instrument got a value of Aiken equal to 0,976. All of the tools SQS belongs to

Table 2: Content Validity and Assessment of Two Experts on SQS instruments based Aiken's V (n = 90)

No	Items	First Expert Assessment	Second Expert Assessment	V
1	Difficulty in thinking due to poor sleep	4	4	1
2	Difficulty in concentrating due to poor sleep	4	4	1
3	Increase of mistakes due to poor sleep	4	4	1
4	Irritated feeling due to poor sleep	4	4	1
5	Decrease of interest in work or others due to poor sleep	4	4	1
6	Getting tired quickly at work due to poor sleep	4	4	1
7	Sleepiness that interferes with daily life	4	4	1
8	painful life due to poor sleep	4	4	1
9	Decrease of desire due to poor sleep	4	4	1
10	Increase of forgetfulness due to poor sleep	4	4	1
11	Headache due to poor sleep	4	4	1
12	Decrease of appetite due to poor sleep	3	4	0,833
13	Relief of fatigue after sleep	4	4	1
14	Regaining vigour after sleep	3	4	0,833
15	The clear-headed feeling after sleep	4	4	1
16	Refreshed feeling of the body after sleep	4	4	1
17	Difficulty in getting back to sleep after Nocturnal awakening	4	4	1
18	Never falling asleep after awakening	3	4	0,833
19	Difficulty in falling asleep	4	4	1
20	Tossing and turning sleeplessly	4	4	1
21	Wish for more sleep after getting up	4	4	1
22	Difficulty in getting up after sleep	3	4	0,833
23	Feeling unlikely to sleep after sleep	4	4	1
24	Satisfaction with sleep	4	4	1
25	Deep sleep	4	4	1
26	Enough sleep time	4	4	1
27	Waking up quickly due to noise)	4	4	1
28	Waking up during sleep	4	4	1

V= Koefisien Validitasisi Aiken's

an excellent category or has good content relevance to measuring sleep quality because Aiken's value V was closed to 1. It was indicated from the calculation of each item in the SQS instrument.

The number of SQS Instrument was 28 items and only four items whose value was below 1. However, those four items were still maintained because the cost was high enough that was 0.833.

The results of calculating the original SQS instrument's content validity showed that the values obtained were not much different because the original instrument used the CVI formula to assess the content validity.

The result of r value in all items 1-28 was in the range of 0.220-0.561. Based on this result, it could be considered that the SQS instrument was valid since all of the respondent's answers have high diversity so that r value was significant.

Furthermore, the reliability test results for all items of the SQS instrument were stated very reliable with Cronbach's Alpha value 0.849. This result has the same consistency level as the original instrument of SQS that was 0,87, while the retest value was 0,903. This was indicated by the SQS instrument consistency level and good stability. This result showed a good similarity of consistency with the original SQS instrument of 0.87 (Yi *et al.*, 2009).

This research also performed a reliability test of retest with an interval time between the first and second test was 1-2 weeks considering to get the

Table 3: The reliability test of SQS instrument items in cancer patients

No	Items	α
1	Difficulty in thinking due to poor sleep	0,844
2	Difficulty in concentrating due to poor sleep	0,847
3	Increase of mistakes due to poor sleep	0,845
4	Irritated feeling due to poor sleep	0,840
5	Decrease of interest in work or others due to poor sleep	0,843
6	Getting tired quickly at work due to poor sleep	0,841
7	Sleepiness that interferes with daily life	0,845
8	painful life due to poor sleep	0,838
9	Decrease of desire due to poor sleep	0,839
10	Increase of forgetfulness due to poor sleep	0,843
11	Headache due to poor sleep	0,845
12	Reduction of appetite due to poor sleep	0,845
13	Relief of fatigue after sleep	0,848
14	Regaining vigour after sleep	0,848
15	The clear-headed feeling after sleep	0,848
16	Refreshed feeling of the body after sleep	0,849
17	Difficulty in getting back to sleep after Nocturnal awakening	0,840
18	Never falling asleep after awakening	0,840
19	Difficulty in falling asleep	0,842
20	Tossing and turning sleeplessly	0,842
21	Wish for more sleep after getting up	0,842
22	Difficulty in getting up after sleep	0,841
23	Feeling unlikely to sleep after sleep	0,842
24	Satisfaction with sleep	0,849
25	Deep sleep	0,849
26	Enough sleep time	0,849
27	Waking up easily due to noise)	0,847
28	Waking up during sleep	0,842

same respondents and carried out retest it was the fastest time respondents to come back to the hospital.

From the results of the retest, the value obtained 0.903. It showed that the score of the SQS instrument in retest has high stability. This could be due to the distance of time being relatively close, so respondents could still remember the first test answers.

CONCLUSION

Regarding the discussion above, the researcher concluded that the Sleep Quality Scale instrument that had been translated into Indonesian and tested either the validity or reliability in cancer patients at RSUD Prof.Dr. Margono Soekaedjoindicated to be valid and reliable. SQS instruments had an adequate level of internal consistency and stability.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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