Developed A Standard Instrument for Measuring The Skills of Teaching Elderly Brain Gymnastics for Nursing Students

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Article Info	Abstract
	The current instrument has not been able to assess the skills of nursing students individually. The research aims to develop a standard instrument for measuring the elderly brain gymnastics teaching skills for nursing students that are valid and reliable. The method used is research development with 9 steps of development. Content validity of the instruments tested to three experts in the field, the construct validity, construct validity with *Exploratory Factor* Analysis (EFA), and reliability with *Cronbach*Alpha. The results show the validity of the contents of 30 items having a value of ≥ 0.3 in a limited-scale instrument trial with a sample of 34 nursing students showing a percentage of the 87% readability test, which means a standard instrument for measuring the skills of teaching elderly brain gymnastics to eligible nursing students for used in large-scale trials. The KMO results in large-scale instrument testing in the field with the number of respondents 90 nursing students showing a value of 0.821, MSA> 0.5 and Bartlett's significance test of 0.000 this means the data is feasible for further analysis.The exploratory factor analysis show seven factors from 30 statement items. The value of factor is 0.3, which signify the whole item was valid. Based on the reliability test using Alpha Cronbach obtained value of 0.946 so that the instrument is reliable. The conclusions of the standard instrument for measuring the skills of teaching elderly brain gymnastics for nursing students developed were valid, reliable and feasible to be used. Benefits of the research is to provide information and thought contribution in an effort to improve the quality of nursing gerontik teaching during practicum activity of elderly brain gym exercises.

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INTRODUCTION

According to the Ministry of Health RI (2013) the competence standards of Indonesian nurses are guidelines that should be used as guidance in carrying out professions that include service standards, professional standards, and standard operational procedures supported by health service facilities as a means used to carry out health promotion efforts either promotive, preventive, curative, or rehabilitative, conducted by the Government, local government, and / or community. Meanwhile, according PPNI (2013) Indonesian nurse competency standards is a benchmark size or agreed, while competence can be defined as the ability of a person who can be observed include the knowledge, skills and attitudes in completing a job or task to the standard performance*(performance)*is determined.

The basic competence standard of nursing gerontik is to meet the comfort of the elderly, maintain body function, and help elderly face death calmly and peacefully through gerontik nursing science and technique. While the scope of nursing care gerontik is prevention of disability as a result of the aging process, care to meet the needs of the elderly, and recovery to overcome the limitations of the elderly (Maryam, et al. 2008).

Instrument of performance appraisal in gerontik nursing course which is devoted to training material of brain gymnastics in elderly is expected to help lecturer and supervisor of gerontik nursing to be easier in doing assessment especially performance appraisal. The performance appraisal instrument for assessing brain gymnastics skills in the elderly for nursing students is very important to be used as a reference for observation and value criteria and students' ability induvidu. The use of performance appraisal rubrics makes it easier for lecturer nursing tutors and tutors to assess individual student skills. According to Stiggins 1994 (in Masrukan 2014, p.32) performance assessment is a form of test in which students are required to undertake special activities (demonstrations) under the supervision of examiners who will observe their performance and make decisions about the quality of the outcomes they show.

The ideal assessment instrument for measuring the skills of nursing students of Ngudi Waluyo University when elderly gymnastics brain education is performance assessment. According to Yessy (2015, p.44) assessment of performance is an assessment done by observing the activities of learners in doing something. This assessment is suitable for assessing the achievement of competencies that serve learners to show performance. This way of assessment is considered more authentic than written tests because what is considered more reflects the actual ability of learners. Performance can be observed such as using laboratory equipment, calibrating tools, and demonstrating a movement.

Coates (in Haryani, 2012) mentions the skills one has in managing oneself, such as time management, stress management, change management, transformational characters, creative thinking, positive goals, and fast learning techniques. skills related or interacting with the environment of community groups and work environment as well as interaction with the individual human being so as to develop maximum performance, motivation ability, leadership ability, negotiation ability, presentation ability, communication ability, relationship building ability, and public speaking ability. According to Cimatti (2015) soft skill is a very popular term today, which is used to show one's personal competence such as social talent, communication skills and language, friendliness and team work skills and personality traits that characterize relationships between people. While the hard skill is the mastery of science, technology and technical skills related to their respective fields of science (Purwoastuti & Walyani, 2015).

Based on the result of preliminary observation at home of elderly social services Wening Wardoyo Ungaran Semarang Regency and interview with nursing lecturer Ngtiwaluyo Ungaran University revealed that only 1 nursing student who educate elderly brain gymnastics, and unequal student skill in educating brain

gymnastics in elderly, because lecturers and nursing tutors have no assessment instruments that assess individual students' skills, have no assessment rubric, do not have a grid on the instruments used to assess the skills of nursing students during elderly gymnastics training, and the instruments they have not tested their validity and reliability so that only 1 student is skilled to give brain gymnastics education to elderly, other group member or student just arrange the process of brain gymnastics activity without assessed its skill in educating brain gymnastics in elderly.

METHODS

This research uses the development research design proposed by (Mardapi 2016, p. 132) there are ten steps to be followed in developing an instrument. These ten steps include: (1) determining the instrument specification; (2) writing instruments; (3) determine the scale of the instrument; (4) determine the scoring system; (5) analyzing the instrument; (6) conducting a product trial; (7) analyzing test results; (8) revisions; (9) assemble and refine the instrument; and (10) evaluation of the whole instrument.

This development research was conducted at Ngudiwaluyo Ungaran University, Semarang Regency. Research subjects or samples used during the limited-scale trial of 34 nursing students who have been taken at random (random sampling) without considering the strata in the population and 90 nursing students for large-scale trials. This research becomes important as a study in the process of product development, helping to develop the standard instrument for measuring the skills of teaching elderly brain gymnastics for nursing students. The developed instrument is tested for validity (content and construct), readability test, reability, so as to produce a usable product.

RESULTS AND DISCUSSION

The form of an assessment instrument of nursing students' skills when teaching elderly

brain gymnastics developed in the form of an observation sheet with 30 items included 3 items in preparation, 4 items in logic, 7 items in organization skill, 4 items on comunication skill, 10 items on implementation and 2 items on written reporting, each item has three alternative scores that is the lowest score 1 and the highest score 3.

Based on expert validation of 30 standard instrument items for measuring the skills of teaching elderly brain gymnastics for nursing students shows that all aspects assessed have Aiken coefficiency (> 0.30) (see Table 1), meaning that the initial insrumen meets the desired number of validities and can be used on product trial in the field.

Table 1. Values of Instrument Validation Results

Items	Rater 1	Rater 2	Rater 3	∑S	Coefficient Aiken	Criteria
1	2	2	2	6	1	Valid
2	2	2	2	6	1	Valid
3	2	2	1	5	0.833333333	Valid
4	2	1	2	5	0.833333333	Valid
5	2	2	2	6	1	Valid
6	2	2	2	6	1	Valid
7	2	2	2	6	1	Valid
8	2	1	2	5	0.833333333	Valid
9	2	1	2	5	0.833333333	Valid
10	2	1	2	5	0.833333333	Valid
11	2	2	1	5	0.833333333	Valid
12	1	2	2	5	0.833333333	Valid
13	2	2	2	6	1	Valid
14	2	2	1	5	0.8333333	Vali

					33	d
15	2	2	2	6	1	Valid
16	2	2	2	6	1	Valid
17	2	2	2	6	1	Valid
18	2	2	2	6	1	Valid
19	2	2	2	6	1	Valid
20	2	2	2	6	1	Valid
21	2	2	2	6	1	Valid
22	2	2	2	6	1	Valid
23	2	2	2	6	1	Valid
24	2	2	2	6	1	Valid
25	1	2	2	5	0.833333333	Valid
26	2	2	2	6	1	Valid
27	2	2	2	6	1	Valid
28	2	2	2	6	1	Valid
29	2	2	2	6	1	Valid
30	2	2	2	6	1	Valid

Based on the results of the development of the instrument performed several steps, then generated a valid assessment instrument of nursing students skills. Based on the research of the experts, 30 itempenaluasi nursing students skills when practicum aged brain education educational each score> 0.3, which means that items in the instrument able to represent or reflect the entire content or material tested or that must be controlled so that the developed instrument relevant and can be used in field trials. This is in accordance with the criteria expressed by Azwar (2014, p.34) that if the validity coefficient ≥ 0.3 means the grain can be said to be valid (otherwise) if the validity coefficient ≤ 0.3 then the item is declared inadequate (invalid).

The comparison of results obtained by researchers with previous research conducted by Asmara in 2015 entitled the validity and reliability of the assessment instrument soft skills of nursing students is on research Asmara instrument developed in the form of koesioner while the instrument developed by researchers in the form of observation sheet, then the number of grains assessed in the instrument developed Asmara as much as 23, from 23 items derived from the existing indicators, based on expert review said all the relevant items although it needs a little improvement. While the results of previous research conducted by Astuti, P., Widya., Wibawanto, H., & Khumaed, M, 2015 entitled the development of assessment instrument of the practice of facial skin care based on competence in public universities semarang, expert (expert judgment) stated that the assessment instrument of facial skin care practice consisting of jobsheet, assessment instrument 22 massage movement, and performance appraisal instrument have very good category and deserve to be used as a form of assessment.

The results of the construct validity test for standard instruments for measuring the skills of teaching elderly brain gymnastics for nursing students using Exploratory Factor Analysis (EFA). The valid data is based on the explanatory factor analysis procedure, if the data qualifies the Keizer-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA)> 0.5 and at Chi-Square the significance value <0.05 then the data is feasible and can be continued to be tested validity. Based on field data of large-scale trials obtained value of KMO> 0.5 is 0.821 and Chi-Square value of sig 0.000. The results of the test can be seen in Table 2.

Table 2. Construct Validity Test Results

Kaiser-Meyer-Olkin Construction Measure of Sampling Adequacy	0.821
Bartlett's Test of Sphericity Approx. Chi-Square Sig.	0.000

Based on the above results in accordance with the existing criteria that if the value of MSA greater than 0.5 then the item is sufficient for further analysis, if there is an MSA value of the initial items less than 0.5 should be issued one by one from the analysis. If the KMO value is between 0.5 to 1 and the significance value of Bartlett'sTes Of Sphericity is less than the significance level (α) used, it can be interpreted that the exact factor analysis is used (Bilson, 2005, p.123).

The comparison of results obtained by researchers with previous research is a study conducted by Ginting in 2016 entitled Devoloping Soft Skill Measure at the University of Indonesia: Procedures, Validity, and Reliability, an instrument developed to assess a gentle questionnaire, only the instrument is not in in the instrument developed by Ginting there are 15 dimensions of softskill measured by the number of items 133 which are analyzed together using an explanatory factor analysis obtained by KMO value 0.630 with significance of Bartlett 0,02 test, and in research done by Aworanti, Taiwon and Iluobe in 2015 titled Modified Validation Modified Soft Skill Assessment Instrument (MOSSAI) for use in Nigeria, a soft skill instrument developed also in the form of a questionnaire with a total of 63 items, only KMO values obtained 0.965 with Bartlett 0.000 test significance.

Output Results Factor analysis consists of 4 main parts to consider: (1) Total Variance Explained; (2) Scree Plot; (3) Component Matrix; (4) Rotation of Matrix Components. Based on the total variance, the number of factors is 7 factors. The number of factors is determined from the value of the eigenvalues that are still above 1. The eigenvalues figure shows the relative importance of each factor in

computing the variance of up to 30 items analyzed.

In addition to viewing the Total Variance Explained table the number of factors can also be done by looking at the Scree Plot which can be seen in Figure 1.
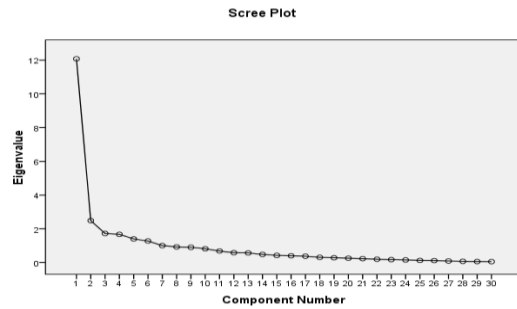

Figure 1. Scree Plot Performance Assessment Factor Analysis

Based on the Scree Plot above it appears that from factor 1 to 2 decreased quite sharply, then from facto 2 to 3 still decreased, so also factor 3 to 7 but with smaller slope, while from factor 8 and so on eigenvalue already under 1, so the number of factors that formed from 30 grains assessment of elderly brain gymnastics teaching skills for nursing students that is there are 7 factors.

The magnitude of the component factor must be ≥ 0.3, if there is an equal component factor ≥ 0.3 then the largest is taken. The result of component matrix if no distribution of rotation is done to 30 items included in the results of the analysis as follows: Items 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, and 30 fall into the factor 1 component; Item 1 is included in factor 2 component; Item 28 is included in the factor 4 component; Items 23, and 27 fall within the 5 factor component; Item 29 is included in factor 6 component. For factor component 3 and 7 has no item.

Meanwhile, if the rotation of the matrix component distribution then the component or the big loading factor is increasingly enlarged while the smaller ones are further weakened and this shows a clearer and more obvious factor distribution. Here are the results after the

Rotated Components Matrix, Items 1, 2, 3, and 4 enter the component of factor 1; Items 1, 2, 3, 4, 7, 16, 17, and 18 fall within factor 1 components; Items 10,19, 20, 21, 22, 24, 25, and 30 fall within factor 2 components; Items 5, 9, 12, 14, and 15 fall within factor 3 components; Items 11, 13, 26, and 28 fall within the factor component 4; Items 6 and 8 fall within the 5-factor component; Items 23 and 27 fall within the 6-factor component; and Item 29 is included in the factor 7 component.

Alpha Cronbach reliability measurement results obtained value of instrument reliability coefficient of 0.946. The results of the analysis on the SPSS version 16.0 output for the wide-scale reliability test can be seen in Table 3.

Table 3. Results of Broad Scale Reliability Test Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.946	.946	30

The results obtained from the reliability test obtained a value of 0.946 which means the instrument of skills assessment of nursing students when practicum of aged brain gym exercising consistently used in the assessment.

The comparison of results obtained by researchers with previous research conducted by Novitasari, A., Ridlo, S., & Kristina, T, N. 2017 entitled Self-Appraisal Instrument of Clinical Student Competence, there are results of reliability test using Alpha Cronbach showed results Alpha value 0.949> r table 0.361 (5% significance). This indicates that the items on the self-assessment instrument of clinical competence for medical students can be said to be reliable.

The benefit gained from this research is to find and develop a standard instrument for measuring the skills of teaching elderly brain gymnastics for nursing students who can be used for assessment. While the benefits for educational institutions into information and thoughts in an effort to improve the quality of nursing gerontik learning when practicum activities educational gymnastics brain elderly.

CONCLUSION

This study produced a standard instrument for measuring the skills of teaching elderly brain gymnastics for nursing students to measure nursing students' skills with 30 valid and reliable instrument items. Validity of the content of expert judgments obtained 30 valid items with validity value> 0.3, and reliability of 0.821. The result of grain validity analysis on large scale trial of 30 grains obtained correlation coefficient rhitung ≥ 0.254 rtabel. The validity of the construct using Exploratory Factor Analysis (EFA) was obtained by Keizer-Meyer-Olkin Measure (KMO)> 0.5 which was 0.821, Bartlett's Test of Sphericity was 0.000, while the Measure of Sampling (MSA) coefficient from 30> 0, 5 which means that the instrument meets the criteria of factor analysis testing. The total variance explained shows the number of factors formed are 7 factors. The number of factors is determined from the value of eigenvalues that is still above 1. This is supported by the scree plot produced by the test. Component matrix shows the distribution to 30 items of instrument on 7 factors formed. The results obtained in the rotated component matrix table that 30 grains have a high loading factor on one factor and have a small enough loading factor on other factors. The loading factor value found on 30 instrument items is> 0.3 so that the instrument grain is included in 7 factors. The reliability coefficient is 0.946.

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