Journal : *JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit), 12 (1): 46-55, April 2023*
Website : https://jmmr.umy.ac.id/index.php/jmmr
DOI : https://doi.org/10.18196/jmmr.v12i1.6

Validity and Reliability of Research Instruments on the Effect of Motivation on Nurse Perfomance in Moderation with Nurse Credentials

Rio Dimas Sugiarta[1*], Fitri Arofiati[2], Elsye Maria Rosa[3]
* *Correspondence Author : riodimassugiarta@gmail.com*
[1] Hospital Management Study Program, Universitas Muhammadiyah Yogyakarta, Indonesia
[2] Master of Nursing, Universitas Muhammadiyah Yogyakarta, Indonesia
[3] Master of Hospital Management, Universitas Muhammadiyah Yogyakarta, Indonesia

INDEXING

Keywords:
Validity;
Reliability;
Motivation;
Performance;
Credential

ABSTRACT

Instruments with indicators must match the variables to be observed and declared valid and reliable before being used for research. Work motivation variables and credential variables affect nurse performance. Credentials can moderate the effect of work motivation on nurse performance. The research objectives were then analyzed using internal validity and reliability conducted by experts and external reliability validity using a questionnaire filled out by research respondents about the effect of motivation on nurse performance in moderation with nurse credentials. This research used quantitative methods with a cross-sectional design. The research population consisted of 58 nurses and the chairman of the nursing committee served as the validator. The sampling technique was total sampling. All nurses registered as permanent employees and had received credentials from as many as 56 nurses. The research instrument used a questionnaire. The validity and reliability of the data were analyzed using SPSS and Structural Equation Modeling (SEM) analysis through PLS. The research instrument influenced motivation on nurse performance moderately, with credentials declared valid and reliable.

Kata kunci:
Validitas;
Reliabilitas;
Motivasi;
Kinerja;
Kredensial

Instrumen dengan indikator harus sesuai dengan variabel yang akan diamati serta dinyatakan valid dan reliabilitas sebelum digunakan untuk penelitian. Variabel motivasi kerja dan variabel kredensial berpengaruh terhadap kinerja perawat. Kredensial mampu memoderasi pengaruh motivasi kerja terhadap kinerja perawat. Tujuan penelitian selanjutnya dianalisis menggunakan validitas dan reliabilitas internal yang dilakukan oleh ahli dan validitas reliabilitas eksternal menggunakan kuesioner penelitian yang diisi oleh responden penelitian tentang pengaruh motivasi terhadap kinerja perawat di moderasi dengan kredensial perawat. Jenis penelitian ini menggunakan metode kuantitatif, dengan desain cross sectional. Populasi penelitian adalah perawat sebanyak 58 orang, dan ketua komite keperawatan sebagai validator. Teknik pengambilan sampel adalah total sampling yaitu seluruh perawat yang terdaftar sebagai pegawai tetap dan telah mendapat surat kepercayaan sebanyak 56 perawat. Instrumen penelitian menggunakan kuesioner. Analisis validitas dan reliabilitas data menggunakan aplikasi SPSS dan analisis Structural Equation Modeling (SEM) dengan aplikasi PLS. Instrumen penelitian pengaruh motivasi terhadap kinerja perawat secara moderat dengan kredensial perawat dinyatakan valid dan reliabel.

Article history: Received 2023-02-09; Revised 2023-03-12; Accepted 2023-03-14

INTRODUCTION

To measure research instruments, researchers should understand the methods and types. Instruments include questionnaires, checklists, observation sheets or others. Researchers develop parameters or indicators in research. Of course, according to these indicators, every instrument must be valid and reliable as a measuring tool in a population and sample. The tool should match the variable.

Performance is the result of an assessment carried out over a period for a worker. Nurse performance is an endogenous Latin variable or dependent variable that independent

variables can influence. According to Mangkunegara, the work results in quality and quantity achieved by employees in carrying out their duties are under their responsibilities (Mangkunegara, 2017). For the quality of service and community protection, it is necessary to develop a credential system to ensure that nursing service institutions meet established standards. The Credential evaluation is reliable and high quality to ensure nurses are safe and competent in practice (Tse, 2015).

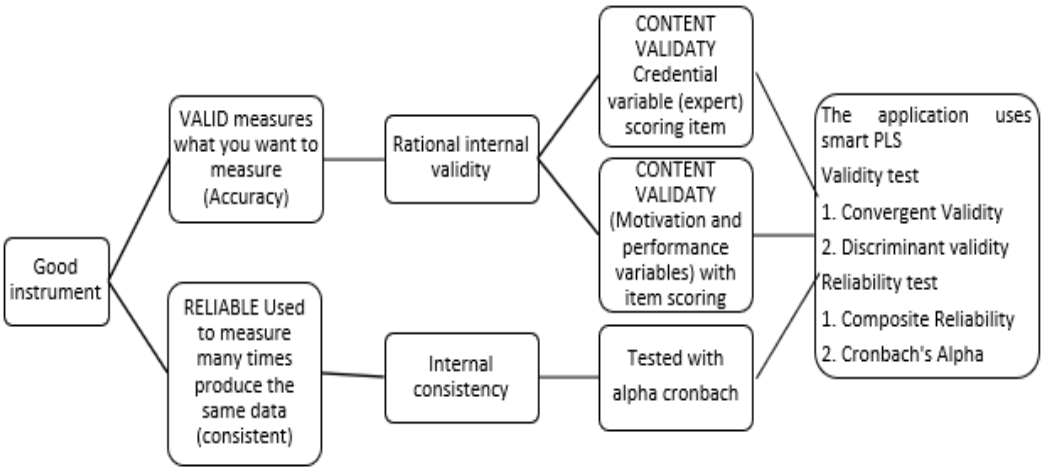
Motivation is one of the factors influencing nurses in carrying out their duties and responsibilities at work. Motivation is an exogenous variable or independent variable that influences the dependent variable. Work motivation greatly influences performance, especially the intrinsic motivation factor; such as salary, relationships with friends, and the work environment are considered more important than extrinsic motivational factors; such as payment, job security, and an environmentally friendly place (Sari et al., 2017).

This study used a questionnaire consisting of motivational and performance variables and critical variables as moderating using written tests, oral tests and application observation tests to obtain clinical authority and review of the nursing committee issuing assignment letters. The motivational questionnaire includes physiological, security and safety indicators, social, valued and actualization. The performance questionnaire consists of indicators of targets, quality, service time and adherence to principles with the answer choices Strongly Agree (SA), Agree (A), Disagree (DA) and Strongly Disagree (SD). In a quantitative study, the accuracy of a study is influenced by an evaluation of the validity and reliability of the measuring instruments used in the study. Validity refers to an accurately measured concept, while reliability refers to the accuracy of a measuring instrument (Heale & Twycross, 2015).

The reliability and validity of the research questionnaire and the validity of the research instrument on the effect of motivation on nurse performance in moderation with nurse credentials were measured before conducting the study. Information on the reliability and validity of a questionnaire is important, so the measurement of the questionnaire uses appropriate and reliable measuring instruments (Sjamsuddin dan Anshari, 2023). In quantitative studies, the accuracy of a study is influenced by the validity and reliability of the measuring instruments used in the study. This study's focus was to conduct further analysis using internal validity and reliability conducted by experts and external reliability validity carried out using a questionnaire by research respondents. Based on the background above, researchers will conduct research entitled " Validity and Reliability of Research Instruments on the Effect of Motivation on Nurse Performance in Moderation with Nurse Credentials."

RESEARCH METHOD

The instruments used in this study were questionnaires on nurses' work motivation, nurse performance and critical assessment. The research population was all nurses at the PKU Muhammadiyah Kutowinangun General Hospital, consisting of 58 people. The sampling technique was total sampling, meaning all nurses registered as permanent employees and have received credentials of 56 nurses. The validity and reliability test used expert judgment, SPSS, and SmartPLS analysis. The following is a chart explaining the flow of research studies.



Picture.1 *Chart Explaining The Flow Of Research Studies*

The variables of motivation and performance in this study were tested for validity using the SPPS analysis tool using the Pearson correlation formula and the reliability test with the Cronbach alpha formula. A judgment expert from the hospital tested the credential instrument. Structural Equation Modeling (SEM) analysis using the PLS tool also conducted validity and reliability tests. Validity testing is carried out by using the Bivariate Person (Moment Product Person) test. The validity test is carried out by correlating each item score with the total score of the existing instrument. Two-tailed test examiners with a significance level of 0.05 have testing criteria: if r count > r table (two-sided test with a significance of 0.05). The instrument or question item correlates significantly with the total score declared valid. If r count < r table (two-tailed test with a significance of 0.05), the instrument or question item correlated with significance to the total score is declared invalid.

The reliability test determines the extent to which the measurement results will remain consistent or basic if the measurement is carried out twice or more for the same symptoms using the same measuring instrument. Reliability calculations should be performed only on questions that already have validity. The test results using Cronbach's alpha with a questionnaire measuring tool are reliable if Cronbach's alpha value is greater than or equal to (0.70).

Content validity was carried out through expert judgment. A question expert is a person who has expertise in the field of credential assessment. The instrument is said to have high content validity if the questions posed can be considered to represent the entire content of the field of knowledge being taught. Content validity is estimated by testing the feasibility or relevance of the test content through rational analysis by a competent panel or expert judgment.

The next step, the theoretical model built in the first step, will be described in a path diagram. The constructs built in the flowchart are divided into exogenous constructs, endogenous constructs, and model evaluation. The model evaluation used the Outer Model, which aims to specify the relationship between latent variables and their indicators. This outer model test used the PLS Algorithm procedure.

RESULT AND DISCUSSION

1. Validity and Reliability Testing with SPSS

Table 1. Work Motivation and Performance Variable Validity Test Results

Question Items Motivation	r	p	Information	Question Items Performance	r	p	Information
M01	0.589	0.000	Valid	K01	0.539	0.00 2	Valid
M02	0.687	0.000	Valid	K02	.651	0.000	Valid
M03	0.736	0.000	Valid	K03	0.578	0.00 1	Valid
M04	0.620	0.000	Valid	K04	0.731	0.000	Valid
M05	0.545	0.00 2	Valid	K05	0.550	0.00 2	Valid
M06	0.633	0.000	Valid	K06	0.573	0.00 1	Valid
M07	0.730	0.000	Valid	K07	0.6 32	0.000	Valid
M08	0.718	0.00 0	Valid	K08	0.509	0.00 4	Valid
M09	0.595	0.00 1	Valid	K09	0.500	0.00 5	Valid
M10	0.6 51	0.000	Valid	K10	0.514	0.00 4	Valid
				K11	0.611	0.00 0	Valid
				K12	0.510	0.00 4	Valid
				K13	0.596	0.00 1	Valid
				K14	0.724	0.00 0	Valid
				K15	0.599	0.00 1	Valid

Based on Table 1, all the question items are from the variables, namely work motivation. Ten question items are declared valid because they have a significance level of less than 0.05. All the question items from the variables' performance and the 15 question items' performance are declared valid because they have a significance level of less than 0.05.

The reliability test presented in this study uses SPSS as follows:

Table 2. Test Results of Research Variable Item Reliability

Variable	Alpha value	Critical Value	Information
Work motivation	0.845	0.70	Reliable
Performance	0.863 _	0.70	Reliable

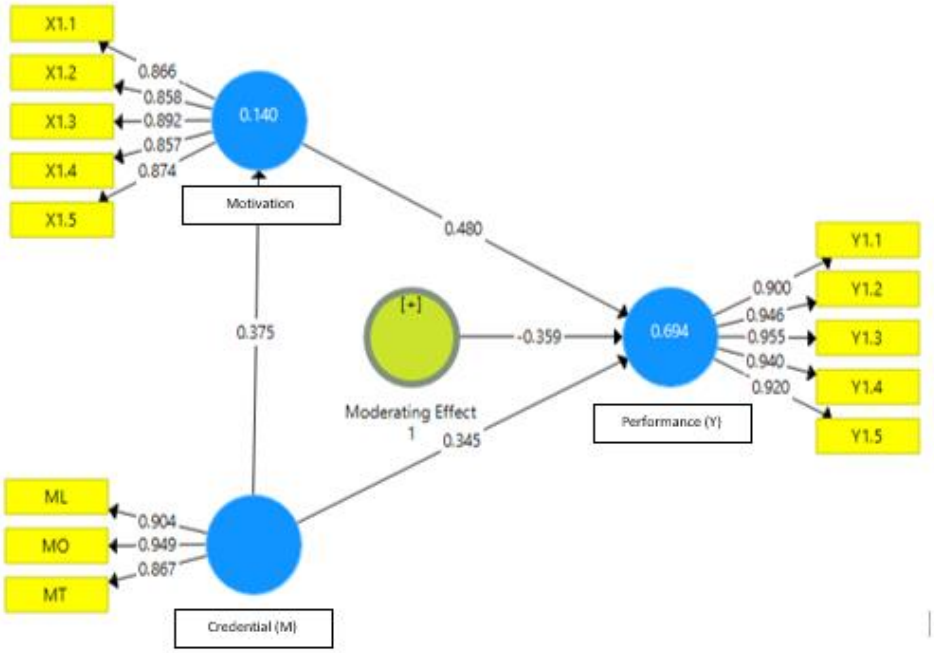
Table 2 shows the Reliability test obtained for the 2 question variables. Work motivation and performance, with a Cronbach Alpha coefficient value of more than 0.70 in all dimensions, declare the question items reliable.

2. Testing the Validity and Reliability *of Expert Judgment*

Content validity can be used as an expert opinion (expert judgment) on performance variables. This step is after the instrument is constructed about the aspects to be measured based on a certain theory, then further consulted with the competent or through expert judgment. The results of the assessment of written instrument validation, observation and sub-credential interviews of the nursing committee of the PKU Muhammadiyah Kutowinangun General Hospital, which were filled in by the validator, showed that from the aspects of clarity, accuracy, relevance, content validity, there was no bias. The accuracy of the language as a whole got an answer score of 5, namely very good, which means that based on the assessment carried out, the credential instrument is declared suitable for use for trials without revision. Complete written instrument assessment data, observations and interviews are contained in the appendix of this study.

3. Outer Model Testing with PLS

The measurement or outer model with reflective indicators is evaluated with the indicators' convergent and discriminant validity.



Picture 2. Outer Model testing with PLS

Code Description:
Motivational Dimensions:
X1.1: Physiological
X1.2: Security and safety
X1.3: Own, social, love
X1.4: Appreciated
X1.5: Update
Credential Dimensions:
MK: Oral Test
MO: Observation Test
MT: Written Test
Performance Dimensions:
X1.1: Timely service
X1.2: Conformity of educational skills with the field of work
X1.3: Effective and efficient service
X1.4: Service Quality
X1.5: Appropriateness of supporting facilities

a. Convergent Validity

Table 3. Validity Test Results of Motivational Variables (M) and Credentials (M) and Performance (Y)

Indicator	Motivation	Credentials	Performance	Information
X1.1	0.865			Valid
X1.2	0.856			Valid
X1.3	0.890			Valid
X1.4	0.854			Valid
X1.5	0.872			Valid
ML		0.902		Valid
MO		0.950		Valid
MT		0.865		Valid
Y1.1			0.901	Valid
Y1.2			0.945	Valid
Y1.3			0.954	Valid
Y1.4			0.939	Valid
Y1.5			0.919	Valid

Based on Table 3, the Convergent Validity of the measurement model with reflexive indicators is determined based on the correlation between the item score/component score estimated by the PLS Software. The loading value measurement scale of 0.5 to 0.6 is considered sufficient. All measuring items have loading factors greater than 0.5 so that the variables of work motivation, credentials and nurse performance are all declared valid.

b. Discriminant Validity

Measurement of the discriminant validity of the model is assessed based on cross-loading measurement with the construct or by comparing the AVE roots for each construct with the correlation between the construct and the other constructs in the model. Furthermore, Table 4 will show the discriminant validity.

Table 4. AVE Values and AVE Roots

Variable	AVE	AVE root
Performance	0.870	0.933
Credentials	0.823	0.907
Motivation	0.756	0.870

Table 4 shows that the AVE root of each construct is greater than the correlation between the construct and the other constructs in the model, so this model has high discriminant validity.

c. Reliability

The reliability test *was* done by looking at Cronbach's Alpha and Composite Reliability values.

Table 5. Reliability Test Results

Variable	*Composite Reliability*	*Cronbach's Alpha*
Performance	0.971	0.962
Credentials	0.933	0.894
Motivation	0.939	0.919

The analysis results show that Composite Reliability and Cronbach's Alpha in all constructs have satisfactory values, namely the value of each variable above the minimum value of 0.70. Based on this value (Table 5), the consistency and stability of the instrument used is very high. In other words, the instrument's reliability is met.

DISCUSSION

The item statement of work motivation variables is 10 items, and performance is 15 items. The validation test results show that the question regarding the work motivation variable is valid and can be used in research with a significant value of less than 0.05. So The probability value [sig. (2-tailed)] The correlation results of each question item score with a total score must be less than the value of α (0.05). Otherwise, the questionnaire questions are invalid. The SPSS output results show that all work motivation variable statement items have a significantly smaller value than α (0.05), so the question items on the questionnaire used in the validation research proved valid.

To prepare instruments or measuring instruments in research, researchers should understand the methods and types of instruments, whether using questionnaires, checklists, observation sheets or others. After that, the researchers compiled the parameters/indicators for the study. The tool that must be used should follow the variable to be observed. In addition, the researchers must know the results of the last calibration (if it is a measurement tool) and then test the instrument's validity and reliability. The instruments that will be used are two categories of standard/existing instruments (without making their own) and instruments that are not good (by compiling their own) (Hidayat, A., 2021)

Research instruments that can be accepted in a study must comply with standards through validation and data reliability tests. The validation test can use the Pearson Product Moment formula and is tested using the t-test, and the interpretation of the correlation index is seen with the total score (Puspasari & Puspita, 2022). It is also conveyed in the book that for a measuring instrument or an instrument that will be carried out by research to become an acceptable or standard measuring instrument, the measuring instrument must go through a validity and reliability test of the data, validity testing in the opinion of experts can use the Pearson product-moment formula, then after that it is tested using the t-test and after that, it is seen the interpretation of the correlation index. In testing the validity of data collection instruments with the SPSS program, researchers often use validity tests such as bivariate Pearson (Pearson moment product) and corrected item-total correlation (Hidayat, A., 2021)

Content validity can be used expert opinion (expert judgment) on the credential variable. The results of the assessment of written instrument validation, observation and sub-credential interviews of the nursing committee of the PKU Muhammadiyah Kutowinangun General Hospital, which were filled in by the validator, showed that from the aspects of clarity, accuracy, relevance, content validity, there was no bias. The accuracy of the language as a whole got an answer score of 5 or very good, which means that based on the assessment carried out, the credential instrument is declared suitable for use for trials without revision.

Content validity provides evidence about the degree to which elements of an assessment instrument are relevant and represent a targeted construct for a particular assessment objective. Content validity assessment relies on using a panel of experts to evaluate the elements of the instrument and assess them based on their relevance and representativeness to the content domain (Almanasreh et al., 2019). A validity test through expert judgment is considered capable by paying attention to the items' material, construction, and language (Prihono, 2020). The validity stage conducts content validity with expert judgment to ensure that each item measures the dimensions and indicators in the variable. The content validity

of each core indicator, sub-indicator, and variable description can be measured using the expert judgment method (Sumiati et al., 2022).

The reliability analysis results show that the Composite Reliability and Cronbach's Alpha results using the PLS application on all constructs have a satisfactory value, namely the value of each variable above the minimum value of 0.70. Based on this value, it shows that the consistency and stability of the instrument used is very high. In other words, the instrument's reliability is met. Erida's research (2021) showed that changing instruments could be trusted to be used as a data collection tool because the test results for this instrument have been tested well. A good instrument never directs the sample to choose a particular answer. An instrument trusted with high results will produce data that follows reality. Judging from the results of its reliability, using the instrument repeatedly will remain the same. Based on the reliability test results, the reliability test value is 0.77, so the reliability is high.

Instrument research is a measuring tool used in collecting data (Taufiqurrahman, Heryandi, M. T., 2018). A test is needed to determine whether an instrument is feasible. The test is a validity test and reliability test. Validity comes from the word validity which means accuracy or accuracy (Ovan & Saputra). The reliability test aims to determine how much the instrument can be trusted. Instruments that have been standardized and are reliable must still be tested again every time they are used (Islam, 2021).

The reliability test is meant to determine the consistency of an instrument in collecting research data. The Alpha formula is used to test the reliability of the instrument. This formula is usually used for questionnaires or questionnaires. A good instrument is never to direct the sample to choose a particular answer; an instrument that is trusted with high results will produce data that follows reality (Erida, 2021).

The strength of this study lies in the sampling technique, namely total sampling, with a large enough sample size of more than 30 people to provide a representative picture of the results. Another strength is the number of questions that are not too many while paying attention to the indicators in each variable. The time required to complete the questionnaire did not take more than 30 minutes for respondents, so biased responses were avoided.

The limitation of the research lies in the characteristics of the respondents used and the limited sample of nurse respondents, so it does not reflect the characteristics of other health workers in the health sector. This research also has limitations in terms of geographical location, which is limited to only 1 hospital, data collection is only done by distributing questionnaires online via the Google form, so it is not known how the condition of the respondents was when filling out the questionnaire.

CONCLUSION

Test the validity and reliability of research instruments on the influence of motivation on nurse performance in moderation with nurse credentials at PKU Muhammadiyah Kutowinangun Hospital in the Covid-19 Pandemic Era with the SPSS and SmartPLS SEM applications declared valid and reliable. For further research, researchers suggest understanding motivation and performance variables fully. Researchers must understand what and how the variables will be studied, prepare the instrument and then test it in a smaller scope than the sample placement. Future researchers should test the instrument with validity and reliability before using it on a larger population or sample.

Hospitals need to create regulations and continuous training programs so that nurses can communicate in various cases and situations, collaborate with other units or professions in making problem-solving decisions, practice critical thinking according to their abilities, hone leadership skills, and get recognition from other individuals for their abilities and learn to appreciate the abilities and limitations of others in a team.

Researchers assume that the measurement of safety incident reporting will be complete if carried out by direct observation using more diverse instruments to get a picture of a healthy work environment. The multiple linear regression model in this study could only conclude that the variables in the study only influenced patient safety incident reporting by 46.2%. The remaining 53.8% was caused by other factors not examined in this study.

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