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ORIGINAL ARTICLE

TRANSLATION, ADAPTATION, AND PSYCHOMETRIC VALIDATION OF THE INDONESIA VERSION OF JOB DIAGNOSTIC SURVEY: HOSPITAL NURSE SETTING

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ABSTRACT

A job diagnostic survey is used to measure work or job characteristics. However, there is limited study exploring the psychometric properties of the Indonesian version. This study aimed to validate the Indonesian version of the Hack and Oldham Job Diagnostic Survey.
Cronbach's alpha coefficient value showed a significant value for all evaluated dimensions. As for concurrent validity, a significant correlation was discovered between all dimensions. Construct validity for job characteristics, experienced psychological states, and affective responses to the job were significant. Cronbach's alpha coefficient value was ≥0.825 for all evaluated dimensions. As for concurrent validity, a significant correlation was found between all dimensions (r = 0.357-0.752). Construct validity for job characteristics, experienced psychological states, and affective responses to the job were significant ($\chi 2$ = 0.00, CFI = 0.99, GFI = 0.91, RMSEA = 0.06 and SRMSR = 0.05). The Job Diagnostic Survey Indonesian version (JDS-I) has been validated, exhibits good psychometric properties, and retains the original features of the instrument.

Keywords: *Job characteristics; job diagnostic; nurse working conditions; translation; validation*

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INTRODUCTION

The work dimension plays a crucial role in enhancing productivity and quality (Juanamasta et al., 2018). Hackman and Oldham introduced the notion of job characteristics, building upon the work of Turner and Lawrance (1965) as well as Hackman and Lawler (1971). Hackman and Oldham (1974, 1975) developed a model that incorporates the fundamental dimensions of work, crucial psychological states, personal and work outcomes, and the importance of individual growth (Kamani, 2020). This model, known as the Job Characteristics Theory, suggests that certain job characteristics such as skill variety, task identity, task significance, autonomy, and feedback are able to lead to higher motivation and satisfaction levels among employees (Ali et al., 2014; Hackman & Oldham, 1975). Additionally, the theory emphasizes the importance of individual growth and development through meaningful work experiences, which can ultimately contribute to enhanced productivity and work quality (Juanamasta, 2018).

Based on the job characteristics model, a Job diagnostic survey (JDS) assess job characteristics, worker reactions, and growth and development needs (Sever & Malbašić, 2019). The tool consists of three critical psychological states, such as knowledge of results, responsibilities, and the meaning of work (Oldham & Hackman, 2010; Pedroso et al., 2014), which have the potential to impact motivation in the workplace. These critical psychological states play a

significant role in determining an individual's level of motivation and satisfaction with their job. According to Chang Junior and Albuquerque (2022), work management cannot influence them. Knowledge of results refers to the extent to which employees receive feedback on their performance, allowing them to gauge their progress and to make necessary improvements. Responsibilities refer to employees' autonomy and decision-making authority, contributing to a sense of ownership and empowerment. The meaning of work relates to how employees perceive the purpose and significance of their job, which can influence their level.

Hackman and Oldham (1975) propose two supplementary dimensions, i.e extrinsic and interpersonal feedback relationships, which enhance comprehension of the nature of work and workers' behavior concerning their work. Extrinsic feedback refers to the external rewards or recognition that employees receive for their work, such as promotions or bonuses. It acts as a motivator and can increase job satisfaction. In contrast, Interpersonal feedback relates to the quality of relationships and communication between employees and their supervisors or colleagues. Positive interpersonal feedback fosters a supportive work environment and enhance employee engagement.

The critical psychological state influences both personal and work outcomes. The findings can be categorized into four dimensions: internal work motivation, overall work satisfaction, satisfaction with productivity, and absenteeism and replacement (Gil Sánchez, 2017; Hackman & Oldham, 1975; Juanamasta et al., 2023). These dimensions highlight that positive interpersonal feedback impact on various aspects of an employee's experience at work. For instance, when employees receive constructive feedback and feel valued by their supervisors or colleagues, they are motivated to perform well and to feel satisfied with their overall work experience. Additionally, this positive feedback may also contribute to lower absenteeism and turnover rates, and tend to feel a sense of loyalty and commitment to their organization.

Individual growth is closely linked to key aspects of work and personal outcomes. These factors are both influenced by and impact critical psychological states. They are also considered dimensions of analysis in the assessment of work (Gil Sánchez, 2017). For example, when employees have opportunities for growth and development within their organization, they tend to experience higher job satisfaction and engagement. It can increase productivity and performance as individuals continually feel motivated to improve their skills and knowledge. Additionally, organizations prioritizing individual growth frequently attract top talent and have a competitive advantage in the market.
Furthermore, when employees are allowed to develop their skills and knowledge, they become more valuable assets to the organization (Dong et al., 2017). Not only benefits the individual employee, but also it contributes to the company's overall success. By investing in the growth and development of their workforce, organizations can foster a culture of continuous learning and improvement. This condition leads to a more skilled and adaptable workforce better equipped to handle challenges and seize opportunities. Moreover, employees given opportunities for growth and development are more likely to feel valued and appreciated by their organization, which can enhance their commitment and loyalty.

This instrument would give many benefits to measure employees' situation and thoughts about their job. Additionally, this instrument is widely used worldwide compared to other instruments (Charalambous et al., 2013; Martinez-Gomez et al., 2016). Work and multimethod job design questionnaire were developed based on the JDS concept. Moreover, the majority of studies in Indonesia applied JDS (Bagus et al., 2021; Muhammad Nazri et al., 2022; Saputra et al., 2022). However, limited studies have been conducted to establish the validity and reliability of the job design survey used in Indonesia. This study aimed to develop and validate an Indonesian version of the Hackman and Oldham Job Design Survey instrument.

METHOD

Research design

This research was conducted in May 2021–June 2022 and applied a cross-sectional design.

Setting and samples

Selecting a sufficient sample size is a crucial decision. Regrettably, no agreed-upon criteria for validation studies exist in the existing literature (Gunawan et al., 2021). In the majority of studies, approximately ranged from 3 to 20 items per variable (Mundfrom et al., 2005). There were 80 items on the JDS scale, so the 299 participants fall within the established norms.

Two hundred and ninety-nine nurses from various Indonesian hospitals participated in this study. Convenience sampling was used in this study.

Most respondents were women (79.5%), and 55.7% held at least a high school diploma. A random number generator was applied to pick the eight participating hospitals. All registered nurses from the hospital's medical, surgical, intensive care, and outpatient settings involved in this research. Nurses who did not have permanent contracts with the hospital were also included. Nurses on leave or vacation during data collection were excluded from this study.

Measurement and data collection

Procedures for translation and cultural adaptation of the instrument

A researcher-adopted procedure was used for the translation and cultural adaptation of the instrument (Tsang et al., 2017). The survey was originally in English, then translated to Indonesian, and back into American English. Two translators were recruited to translate the American English questionnaire into Indonesian. Both translators had degrees and prior experience translating in the medical and nursing fields. Each translator obtained a copy of the tool and translation instructions. The English and Indonesian versions of the JDS were combined to form a single and definitive edition. The consolidated version of the Indonesian translation was delivered to two bilingual translators with experience in the in medical and nursing fields and back-translated from Indonesian to American English. Once both versions were available, their discrepancies were discussed and resolved so that the translated version was as faithful to the original version and continued to final version revision.

Measures of JDS's validity and reliability were tested. The JDS's ability to accurately assess the state of the practice setting was evaluated using internal consistency and reliability analyses. The level of overall correlation between all questionnaire items, as internal consistency was assessed.

All questions of the instrument have been arranged in their original order. In some passages, the answer scale appears

only at the beginning of the section, and the respondent is instructed to mark the number on the scale that corresponds to the question. The answer scale was placed after all instrument questions to facilitate and avoid errors in filling out the instrument.

Content validity index (CVI)
Content validity refers to the extent to which the components of an assessment tool are pertinent and indicative of the intended construct for a specific assessment objective (Yusoff, 2019).

Six registered nurses with doctoral degrees and substantial clinical experience, fluency in English and Indonesian, recent experience in the healthcare system, and familiarity with the research process were sent the translated questionnaire. They were asked about how accessible the English version was, how effectively it accounted for Indonesian cultural norms, and whether it could be used in Indonesia to evaluate ideas that were originally measured in the United States. The nurses obtained a file with two columns for each language to compare in both version and add notes in the next column.

Concurrent validity
Concurrent validity showed how well test scores predict an individual's performance on a given measure by comparing those estimates to a set of criterion scores obtained simultaneously. Both scales could evaluate similar or identical constructs (Lin & Yao, 2014). Pearson correlation between JDS variables was applied to analyze concurrent validity.

Structural validity
Measurements (usually questionnaires) are considered to have construct validity when they can consistently test the hypothesis or theory being measured. The test results accurately anticipate the theoretical attribute, which is an important component of construct validity (Ginty, 2013). The JDS has three variables: job characteristics, experienced psychological responses, and affective job responses.

Internal consistency reliability
The focus of internal consistency reliability analysis is measurement instruments' ability to generate comparable results for the same construct(Rodríguez-Martín et al., 2022). The study measured reliability in the four variables of JDS that make up the instrument in all scores and questions.

The Job Design Survey measures job dimensions, psychological work experience, affective responses to work, and the strength of growth needs (Table 1). Answers have a score range of 1–7, with 1 strongly disagreeing and 7 strongly agreeing. This questionnaire uses favorable and unfavorable questions. Questionnaires were distributed in envelopes and online. The form must be filled out completely, with no missing pages and all questions completed.

Table 1. Job Design Survey Instruments Summary

Variable	Define
Job Characteristics	
Skill variety	The degree to which a wide variety of skills are necessary for a certain position
Task identity	The degree to which one's work entails completing a whole, well-defined task with a measurable outcome, as opposed to just a subset of tasks
Task significance	The degree of impact of the substance of work on the lives and works of others, both within the organization and the external environment
Autonomy	The degree to which the job provides freedom and independence in making decisions about the work schedule as well as the procedures that must be followed to carry out the work
Feedback from the job itself	The degree to which, during the activities required to carry out the work, direct and objective feedback is obtained in regard to their work performance
Feedback from agents	The degree to which employees receive clear information about their work performance from their supervisors and colleagues. This dimension is not a part of the job itself but it is included in this prospectus to add additional information in the feedback dimension.
Dealing with others	The degree to which the job itself requires employees to work in contact with others during their work, including relationships with external organizational members and customers
Experienced psychological states	
The meaningfulness of the work	The extent to which workers perceive their work as meaningful, valuable, and useful
Experienced responsibility for the work	The degree to which workers feel responsible for the results of their work
Knowledge of results	The degree to which an employee knows and comprehends ss how well he or she is doing a job
Affective response to the job	
General satisfaction	The level of satisfaction and happiness that workers have with what they do
Internal work motivation	The degree to which the worker is motivated to develop his or her job, meaning the positive internal feelings he/she experiences when his/her performance at work is satisfactory and the negative internal feelings he experiences when his/her performance at work is unsatisfactory,
Spesific satisfaction	It involves different determinants for the job satisfaction, salary and other compensation, job security, partners and co-workers, supervision, and growth opportunities.
Individual growth needs strength.	It discusses the individual and specific differences that each worker has, with a focus on the degree to which workers desire to obtain satisfaction related to their growth and development as a result of work. The strong trend in this measure is indicated by positive responses with high satisfaction and motivation internally at work in complex and competitive positions. Weak tendencies toward this measure are evident when the position is unsatisfying or unmotivating.

Data analysis
Indexing for Content Validity (CVI) was used to analyze the content quality. Conventional valuing and assessing (CVI) is commonly used in survey instrument development. Six experts rated the questionnaire and provided feedback. They

were a professor in nursing field, a medical doctor, a nurse director, and three doctoral degree nurses.

Then, the 10 registered nurses who had previously completed the questionnaires were asked to provide feedback on the items' relative importance from 1 to 4 (1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = very relevant).

The concurrent validity was determined using Pearson's correlation to quantify how close one another (the r = 0.10–0.29, weak relationship, r = 0.30–0.49, medium relationship, and r =0.50–1.0, strong relationship) (Hair et al., 2018).

A confirming factor analysis was carried out with LISREL 8.72 (CFA). Hair et al. (2018) established criteria for evaluating measurement model fit with research data, including a p-value of 0.02, a goodness-of-fit index (GFI) of >0.90, a normed fit index (CFI) of >0.97, a root-mean-square error of approximation (RMSEA) of 0.08, and a standardized root-mean-square residual (SRMR) of 0.08. To include items with a factor loading of 0.4 or higher in the analysis, at least 200 respondents are required (Hair et al., 2018).

Cronbach's alpha is the most commonly used metric of internal consistency and reliability (Rodríguez-Martín et al., 2022). The coefficient was calculated using SPSS version 22. Means were used to report correlations between items and the total. When the former falls between 0.3 and 0.7, it is regarded normal, but the latter is appropriate when it exceeds 0.3. (Juanamasta et al., 2023).

Ethical considerations

This research obtained an ethical license from the Bali Health Institute with the number 04.0437/KEPITEKES-BALI/V/2022. Before completing the major surveys, participants were acquired the informed consent form by applying the principles of beneficence, nonmaleficence, confidentiality, equity, and voluntary participation. Before data is collected, a participant involved should give their consent to the information shared. The respondent was able to discontinue the survey at any time. The informed consent was documented at the time of the study's Ethics Review and Consent Form submission.

RESULTS

Content validity index (CVI)

CVI score from six experts ranged from 0.75 to1 for each item with the overall score was 0.82-0.98 (Appendix Concurrent validity)

The validity of the criteria was carried out using the Pearson correlation coefficient from each other's dimensions, and the following results were displayed in Table 2).

Table 2. Correlation between variables of the job design survey

	1	2	3
Job characteristics (1)			
Experienced psychological states (2)	0,723**		
Affective response to the job (3)	0,729**	0,752**	
Individual growth needs strength.	0,357**	0,419**	0,330**

*p < 0,01 = ***

Structural validity

The loading factors of job characteristics ranged from 0.05 to 0.76; experienced psychological states were between 0.14 and 0.88, affective responses to the job score were from 0.01 to 0.83; and individual growth needs strength ranged from 0.16 to 0.94. Regarding with Hackman and Oldham's (1975), the majority of dimensions obtained loading factor higher than 0.4, except for internal work motivation.

Table 3. Job design survey loading factor on each dimension

Job Characteristics	Factor Loading	Experienced Psychological States	Factor Loading	Affective Response to The Job	Factor Loading	Individual Growth Needs Strength	Factor Loading
Skill variety	0.70	The meaningfulness of the work	0.56	General satisfaction	0.62	Would like	0.88
	0.76		0.40		0.66		0.93
	0.08		0.88		0.21		0.94
Task identity	0.59		0.44		0.79		0.93
	0.66	Experienced responsibility for the work	0.48		0.31		0.90
	0.05		0.14	Internal work motivation	0.64		0.90
Task significance	0.70		0.38		0.12	Job choice	0.16
	0.68		0.33		0.01		0.23
	0.18		0.88		0.83		0.52
Autonomy	0.51		0.88		0.13		0.14
	0.44	Knowledge of results	0.43		0.55		0.72
	0.26		0.35	Specific satisfaction	0.70		0.66
Feedback from the job itself	0.73		0.86		0.74		0.41
	0.74		0.26		0.78		0.07

Job Characteristics	Factor Loading	Experienced Psychological States	Factor Loading	Affective Response to The Job	Factor Loading	Individual Growth Needs Strength	Factor Loading
	0.74				0.74		0.31
Feedback from agents	0.54				0.69		0.91
	0.53				0.79		0.59
	0.10				0.83		0.69
Dealing with others	0.76				0.81		
	0.73				0.65		
	0.18				0.78		

In measuring the fit of indexes, items with factor loadings below the standard were deleted (<0.4). Modification indices of error covariance were carried out to assess the fitness of the model (Table 4).

Table 4. Fit of Indexes

Fit Index	χ2 (p value)	CFI	GFI	SRMR	RMSEA
Job characteristics**	0.0023	0.99	0.96	0.059	0.071
Experienced psychological states	0.073	0.99	0.98	0.035	0.057
Affective response to the job	0.00	0.99	0.91	0.051	0.064

***Job characteristics are measured with five dimensions (skill variety, task identity, task significance, autonomy, and feedback) and modification indices.*
Following modification indices, error covariance

The initial model of job characteristics had a significant result for χ2 (.00), CFI (.99), GFI (.96), RMSEA (.07), and SRMSR (.06). The results showed that five dimensions and 10 items were significantly constructed validity of job characteristics of the I-JDS.

The initial model of experienced psychological states demonstrated significant results for χ2 (.07), CFI (.99), GFI (.98), RMSEA (.05), and SRMSR (.03). The findings revealed that three dimensions and eight items had significant construct validity for I-JDS-experienced psychological states. While affective responses were considerably construct valid across three dimensions and 20 items, with χ2 (.00), CFI (.99), GFI (.91), RMSEA (.06) and SRMSR (.05) respectively.

Internal consistency reliability
Internal consistency of work diagnosis was measured through item-total correlation and Cronbach's alpha coefficient in the four dimensions that made up the instrument in all scores and questions (Table 5).

Table 5. Cronbach's alpha coefficient

Item	Cronbach's alpha (item-total correlation)
Job characteristics	0.872 (0.436-0.678)
Experienced psychological states	0.839 (0.342-0.701)
Affective response to the job	0.947 (0.374-0.805)
Individuals Growing Need Strength*	0.911 (0.642-0.819)
All scores	0.825
All questions*	0.963

The highest Cronbach's alpha was affective response to the job (0.94) and the lowest was experienced psychological states (0.84). Overall questions displayed good reliability (0.96). Additionally, all item-total correlation were greater than standard (0.3).

DISCUSSION

The researchers discovered that 60 of the 83 items met the construct validity and reliability criteria. The majority of adverse questions and reversed score were neither genuine or dependable. These results were consistent with those of a prior study (Codery & Sevastos, 1993), which revealed that negative questions affected construct validity more than positive ones (Clark & Watson, 2016; Clark & Watson, 2019). They discovered that the negative questions contained contradictions. To retain construct validity and reliability, some questions were eliminated and modification indices was applied to determine model fit. Further research utilizing positive questions is required. Job characteristics (skill variety, task identity, task significance, autonomy, and feedback) were validated with 10 out of 15 questions, two questions on each dimension. When compared with the prior study (Cordery & Sevastos, 1993), the current study achieved a better model fit. The previous study found that the revised JDS with positive questions had greater construct validity and reliability (Buys et al., 2007). Furthermore, favorable and unfavorable questions were difficult to measure through CFA, which did not produce significant results (Hair et al., 2018; Hair et al., 2021). More research with positive questions is required to compare the model fit amongst studies in similar settings.

Meanwhile, 10 of 14 items tested positive for psychological state experience, and 19 of 25 items were valid for affective responses. These are the new findings because no studies examined the construct validity of these variables.

The Cronbach's alpha coefficient literature did not specify a reference value to determine whether or not the results are consistent or not. Typically, for the questionnaire to be declared compatible with the Cronbach alpha coefficient, the question must have an index equal to or greater than 0.70 (Hair et al., 2018; Hair et al., 2021). Cronbach's alpha coefficient scores and questions showed significant in all dimensions, indicating that the instruments' internal consistency is satisfying. Because several items were removed in order to get a strong Cronbach alpha, test-retesting may be preferable for the questionnaire.

The Indonesian version of the Hackman and Oldham Job Diagnosis Survey instrument was validated, demonstrating satisfactory psychometric properties while retaining the instruments' original characteristics. This procedure avoids errors in data collection for hypothesis testing in research with

instruments.

All questions in the instrument have been kept in their original sequence and sections. To facilitate the interpretation of the response scales, some of which have a modified structure in sections, just the aesthetics of the questionnaire were changed, without deviating from the original instrument.

This study had several drawbacks. First, the study did not assess the composite reliability since the number of items in one item was less than three. The result may not meet the standard. Second, the study did not measure test-retest reliability. It is suggested for further investigation. Finally, because data collection occurred nearly entirely during the pandemic, several circumstances may have influenced the nurses' responses to the questionnaire.

CONCLUSION AND RECOMMENDATION

The study findings demonstrate that the I-JDS has satisfactory structural validity, content validity, concurrent validity and internal consistency. This instrument can be used separately to assess job characteristics, experienced psychological states, affective responses to the job, and individual growth needs. The user can utilize the it the measuring tools in Indonesian hospitals. The I-JDS can be applied by the hospital, chief nursing officer, or nurse first-line management to evaluate the work environment.

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