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Nurses' Work Stress Prevention in Indonesian Hospitals with Structural Equation Modeling Approach

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Abstract
Background: *Stress is an inability to overcome threats faced by mental, physical, emotional, and spiritual human beings, which at one time can affect human physical health. The results showed that 30.0% of nursing nurses experienced work stress. The study aimed to identify structural models and equations based on individual characteristics, intrinsic factors, extrinsic factors, and personal factors as predictions of work stress events in implementing nurses in the inpatient ward.*
Methods: *This study uses a cross-sectional design. The sample is an executive nurse in the inpatient room of Dr. M. Yunus Bengkulu, amounting to 184 samples, was taken using techniques of proportional random sampling. The study conducted in 12 inpatient rooms of Dr. M. Yunus Bengkulu for ± two months. Data is collected by using questionnaires and analyzed with Structural Equation Modeling (SEM) to determine structural prediction models and equations as early detection of work stress.*
Results: *The results showed that the equation of the model structure formed was: Stress = 0.77 * Intrinsic + 0.035 * Characteristics - 0.37 * Extrinsic and no variables related to the work stress of nurses in the hospital (p> 0.05).*
Conclusion: *Structural equation model shows that the latent variables associated with the work stress of nurses in hospital wards are intrinsic occupational factors, demographic characteristics, and extrinsic work factors, while independent latent variables are individual factors.*
Keywords: *Prediction model, stress work, nurses implementing.*

Introduction

According to Ratnaningrum (2012), stress is an inability to overcome threats faced by human mental, physical, emotional, and spiritual, which at one time can affect human physical health. The cause of stress is called a stressor. Economic changes can cause stress, and technological progress can also cause by three categories of objectives, namely organizational, individual and environmental causes. The work environment that can create stress is poor working environment conditions, racial discrimination, sexual harassment, workplace violence, traffic jams when leaving and going home from work. One type of work that is considered to create stress was work as a nurse. According to Greenberg (2004), work

stress can lead to physical, cognitive and behavioral changes. Besides, work stress can also lead to absenteeism, turn over and errors in treatment. Stress is also proven to reduce the motivation and physical energy of workers to perform their tasks well

Given the effects that can be caused by work stress, it is necessary to detect early risk factors and symptoms that can lead to work stress. Specialized research is needed on systems scoring that can predict the occurrence of work stress on nurses in hospital inpatients. Research on the factors that can predict early on the presence of stress on the work of the nurse is complicated to find based on a literature search.

Job stress has not received special attention in the province Bengkulu especially in the Dr. M. Yunus Bengkulu, which is a hospital owned by the Bengkulu Provincial Government and is the highest referral hospital in the region of Bengkulu. The hospital has 358 beds, the number of nursing staff in the Hospitalization installation is 475 nurses scattered in 14 inpatient rooms. The results of Jaya's research (2011) showed that most (75.0%) nurses' work discipline was lacking, namely that nurses often did not arrive on time, often were not in the room during working hours. Based on the background described, researchers are interested in developing structural stress work models and equations based on individual characteristics, intrinsic factors, extrinsic factors, and personal factors to predict the onset of work stress in the nursing nurse in the inpatient room of Dr. M. Yunus Bengkulu, so that early can detect and prevent the occurrence of stress work on nurses.

Methods

This research is analytic with a cross-sectional study design. The study population was all nurses in the inpatient room of Dr. M. Yunus Bengkulu, numbering 475 nurses. The study sample consisted of 184 nurses. The sampling technique was carried out using method proportional random sampling in each inpatient room. Data analysis using univariate and multivariate. Univariate analysis for drawing variables categorically and numerically. Multivariate analysis was carried out using Structural Equation Modeling (SEM) analysis to determine the initial prediction model of work stress.

Results

The research data collection was carried out on the 15th of July until September 15, 2016, of 184 implementing nurses in twelve selected inpatient rooms. This demographic characteristic will describe the attributes of Respondents which include: age, gender, education, marital status, and length of work

Table 1 Age, Gender, Education, Marital Status, and Duration of Work

No.	Variable	f	%
1.	**Gender**		
	Female	158	85.9
	Male	26	14.1
2.	**Education**		
	Nursing Senior High	3	1.6
	Associate Degree 1	64	34.8
	Associate Degree IV	2	1.1
	Bachelor of Nursing	115	62.5
3.	**Status Marriage**		
	Not Married	8	4.3
	Married	176	95.7
4.	**Age**		
	20-30	10	5
	31-55	175	95
5	**Length Of Work**		
	≥ Ten Years	63	35.5
	≤ Ten Years	121`	65.5

Table 1shows that, the majority of respondents (85.9%) were female, more than part (62.5%) with Bachelor of nursing, and almost all (95.7%) are married. The average age of respondents was 34.08 years with a standard deviation of 5.689 years.

Table 2 Initial Model Estimation

Parameter	Factor Loading	SE	T- Value	*Error Variance*
Ages →DemographicCharacteristic	5.69	0.30	19.13	0.0010
Sex →Demographic Characteristic	0.56	0.026	2.17	0.12
Education →DemographicCharacteristic	0.11	0.037	1.51	0.097
Marital Status →DemographicCharacteristic	0.032	0.015	2.15	0.041
Tenure →DemographicCharacteristic	4.07	0.31	13.22	9.05
Work Load→IntrinsicFactor	2.58	-	-	6.30
Work Routine →IntrinsicFactor	0.48	0.11	4.39	1.24
Work Environment →IntrinsicFactor	1.06	0.21	5.02	4.17
Interpersonal Relationship →IntrinsicFactor	2.78	0.29	9.57	6.18
Career Development →IntrinsicFactor	0.65	0.13	4.87	2.27
Role in Organization →IntrinsicFactor	1.38	0.17	8.17	2.77
Supervision →ExtrinsicFactor	0.98	0.36	2.74	17.28
Family Problem →IndividualFactor	0.20	621.07	0.00032	3.85
Economic Problem →IndividualFactor	0.23	707.62	0.00032	4.04
Personality Type →IndividualFactor	0.052	161.25	0.00032	6.37
Physical Symptom →Stress	3.14	-	-	4.12
Psychological Symptom →Stress	4.08	0.25	16.22	1.79
Behavioral Symptom →Stress	4.12	0.28	14.69	6.97

The indicators with loading factors below 0.05 are excluded from the next processing as they are not considered as factors forming the work stress (Hair et.al, 2010). This way, education, marital status, work routine, family problem, and economic problem are excluded in the model re-specification.

Table 3 Overall Suitability Test Results Model of Factors Affecting Job Stress in Hospital Nurses

GOF Size	Target Compatibility Level	Estimation Results	Compatibility Level
mpatibility Size Absolut			
GFI	≥ 0.90	0.86	Marginal Fit
Standardized RMR	≤ 0,050	0.091	Marginal Fit
RMSEA	≤0.08	0.074	Good Fit
ECVI Small	value and close to saturated ECVI	Model = 1.87 Saturated = 1.87 Independent = 6.41	Good Fit
crementalSize			
AGFI	≥ 0.90	0.82	Good Fit
RFI	≥ 0.90	0 , 69	Marginal Fit
IFI	≥ 0.90	0.84	Marginal Fit
CFI	≥ 0.90	0.83	Marginal Fit
Size Parsimoni			
FI	> 0.6	0.65	Good
P value chi square	> 0.05	0.00	Not significant

Based on Table 3 it is known that the overall size shows a good level of overall model suitability or the model obtained is fit but not significant (p <0.05) which means the covariance matrix of the model prediction is different from the covariance matrix of samples data, in other words, there are theoretical differences in models with empirical data. Based on the absolute suitability measure (GFI, Standardized RMR, RMSEA, and ECVI), incremental size (AGFI, RFI, IFI, and CFI) and suitability parsimony PGFI's measure = 0.65 which almost all met the suitability level target, it is concluded that the model is acceptable and has good suitability.

The structural model obtained from the analysis results after re- specification is as follows:

Table 4 Direct and Indirect Effect

Latent Variables	Direct Effect	Indirect	Total Effect
Extrinsic Factors → Intrinsic Factors	0.88	-	-
Demographic Characteristics → Stress	0.03	-	0.03
Intrinsic Factors → Stress	0.77	-	0, 77
Extrinsic Factors → Intrinsic Factors → Stress	-0.37	0.88 * 0.77 = 0.68	-1.05

It can be seen that there is a significant relationship between Extrinsic Factors and Intrinsic Factors of nurses in the hospital (t count 8.02> 1.96) and there is a positive effect (coefficient path = 0.88). There is no significant relationship between intrinsic factors and the work stress of nurses implementing in hospitals (t count 1.33 <1.96) and there is a positive influence (coefficient path = 0.77). There is no significant relationship between demographics characteristics and work stress of nurses in the hospital (t count 0.48 <1.96) and there is a positive influence (coefficient path = 0.03). There is no significant relationship between extrinsic factors and the work stress of nurses in the hospital (t count 0.68 <1.96) and there is a direct negative effect (coefficient path = -0.37) and indirectly through intrinsic factors (coefficient path = 0.68).

Discussion

According to Jusnimar (2012), a factor that affected stresses to the employee are divided into demographic, intrinsic, and extrinsic factors. Demographic factors are age, gender, marital status, education and length of work. The results showed no significant relationship between demographic characteristics and work stress of nurses in hospital (t count 0.48 <1.96) and there was a positive influence (coefficient path = 0.03), which means that with increasing age, sex, increasing education, married, and the longer the working period the nurse will tend to experience work stress in the inpatient roomhospital.

Other factors that affected nurse job stress are intrinsic factors. The results showed no significant correlation between inherent factors and nurses' job stress in the hospital (t count 1.33 <1.96) and there is a positive influence (coefficient path = 0.77) which means that when the increasing intrinsic factor (workload, work routine and work environment) is felt by someone, then the nurse will tend to experience work stress in hospital. According to Munandar (2008), the essential factors that affected stress are physical demands and task demands. Physical needs include noise, vibration, and hygiene. Handayani (2003), stated that the task factors include: shift work/night work, workload, working conditions that use little activity physically, pressing work time, and appreciation of risks and hazards. Rahmaniaty (2010), also stated factors that the natural source of other work include work routines and work environment. The results of the study from Suerni (2012), showed that heavy workloads had moderate stress levels (63.2%) than light workloads (21.1%). There is a relationship between workload and stress level (p = 0.00), and heavy workloads have an opportunity of 6.429 times experiencing moderate stress levels compared to light workloads.

Results showed that there was no significant relationship between extrinsic factors and the work stress of nurses in the hospital (t count 0.68 <1.96) and there was a direct adverse effect (coefficient path = -0.37) and indirectly through intrinsic factors (coefficient path = 0.68). This means that the better interpersonal relationships, the better the career development, and the better the role in the organization, the nurses tend not to experience work stress in the inpatient room of hospital (Muthmainah, 2012).

The most appropriate model that can predict the prevention of work stress is the model that has been referred by excluding variables of family problems, economic problems, and personality types and latent variables of individual factors. The ECVI value on the model that has been referred is smaller than before being respected and

is getting closer to ECVI saturated, while the other GOF size values are not much different between models before being respected and after being respected. The model is an appropriate model even though the model obtained is not significant. According to Simbolon (2007), the structural equation model obtained can be accepted and has a good fit between theory and data. The insignificant p-value shows the covariance matrix of the model prediction is different from the covariance matrix of data samples, in other words, there are theoretical differences in models with empirical data. According to Spears (2008), the insignificance of the model can be caused by abnormal data usage caused by a sample that is too small, the existence of extremedata and the uneven distribution of data will cause the results of the statistical analysis to be meaningless or biased despite using asymptotic covariance matrix. By referring to this research, the model equations that are fit for predicting nurse work stress in hospital wards are as follows:

*Stress = 0.77 * Intrinsic + 0.035 * Characteristics - 0.37 * Extrinsic*

Structural equation model shows that the latent variables associated with the work stress of nurses in hospital wards are intrinsic occupational factors, demographic characteristics, and extrinsic work factors, whereas independent latent variables are individual factors. Overall when compared between the initial models presented by the structural equation model formed, the difference is in the final structural equation model, the latent variables of individual factors are excluded from the model (Siboro, 2009).

Conclusion

The results of this study concluded that more than some nurses showed physical symptoms of work stress in the mild category, more than some showed psychological signs of work stress in the soft category, and more than a part showed symptoms of work stress behavior in the light category. No relationship between factors individual, factors intrinsic, demographic characteristics, extrinsic factors, with work stress on the nursing nurse in the inpatient room of Dr. M. Yunus Bengkulu directly. The most appropriate model that can predict the prevention of work stress is a model that has been respected by excluding variables of family problems, economic problems, and latent variables of individual factors.

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