

## Investigating the Productivity Model for Clinical Nurses

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**Abstract-** One of the main objectives of quantitative researches is assessment of models developed by qualitative studies. Models validation through their testing implies that the designed model is representative of the existed facts. Hence, this study was conducted to assess the clinical nurses' productivity model presented for Iranian nurses' productivity. The sample of the study consisted of 360 nurses of Tehran University of Medical Sciences. The research tool was a questionnaire for measuring the components of clinical nurses' productivity. After completing all steps of instrument psychometric and getting answers from the participants, the factors introduced in the questionnaire were named and then Lisrel Path Analysis tests were performed to analyze the components of the model. The results of the model test revealed there is an internal relationship among different components of the model. Regression Analysis showed that each increasing unit in components of the model was to be added to central variable of productivity model -human resource. Model components altogether explained 20 % of clinical nurses' productivity variance. This study found that the important component of productivity is human resources that are reciprocally related to other components of the model. Therefore, it can be stated that the managers can promote the productivity by using efficient strategies to correct human resource patterns.

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### Introduction

In today's world, one of the biggest challenges facing organizations is how to provide services efficiently with the least cost, so productivity is the main component for access to this aim (1). In fact, productivity is an index of organizational progress and success including health care systems (2-4). Productivity has been one of the most reported human resource theme in the literatures (5) and is considered among the priorities for improving health systems (2). Productivity has been defined as staff perception of being efficient, effective, committed and good at their job (6). In addition, productivity is considered as an important index of professional development in every work group (7).

For most organizations, especially health care system, human resources are the most important assets and the main sources in achieving any mission, vision and improvement (5,8-10). Human resources play an important role in increasing productivity (2) and accordingly, performance can be monitored by

measuring productivity (11). No organization can expect a successful future without the engagement of active human resources (7). Human resources in health care are more important than any other organizational elements since they affect the quality of care and outcomes (5). However, health care systems often fail to realize using human assets effectively (10). So, issues of human resources have a considerable effect on productivity.

Nurses are considered as one of major human resources and a significant portion of service providers for the hospitals in Iran (12; 13). They play a significant role in providing high-quality care to patients (14) and they also have a profound effect on total productivity of relevant organizations.

Due to the limitation of resources for health care provision, nurses must be efficient and productive and at the same time, hospitals ought to aim at maximizing health outcomes (12,15,16). Therefore, knowing the factors related to nurses' productivity is important for health system and it could lead to its improvement (6).

Despite the widespread body of literature dealing

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with the productivity of service provision in health care, few studies have been already conducted in developing countries (17). Besides, many studies have taken a mere one-dimensional approach toward studying the factors affecting productivity. However, nursing productivity cannot be considered as an independent entity; it is established on multi-dimensional parameters. Hence, it is needed to explore the effect of different factors on productivity and investigate them according to the particular environment of hospitals (18). Accordingly, in order to describe the productivity and its process, initially, productivity theory of the clinical nurses was offered alongside with the Grounded Theory Approach (7,14).

Following the introduction of theories, they must be then tested, confirmed, and modified. Model's test is viewed as one of comprehensive evaluation elements in nursing. During the test process, the researcher tends to create an opportunity for his/her models propositions to be investigated and finally to use the achieved results to confirm or modify his/her propositions for its further development and affirmation. Model test completed the loop connecting theory, research, and theory with each

other (19). In this section, the Productivity Model of Iranian clinical nurses will be introduced.

### Productivity model of the Iranian clinical nurses

In this model, based on the experiences of the participants, productivity is defined as: "offering effective, efficient, professional, and direct care to the patients". The central variable of productivity theory is human resources, including the enough number of personnel with adequate knowledge, qualification, skill, and experience. The other parameters which were obtained from data collection and analysis included "nurses' engagement, effective management and evaluation, organizational structure, dignity, job security and financial wealth" (7,14). Figure 1 displays the relationship among different parts of the model. Based on the model, effective management involves influential behavior and performance in different areas, such as staff evaluation and coordination. Organizational structure involves the educational and physical structures of the hospital, its rules and equipment, and the dominant hierarchy of the organization.

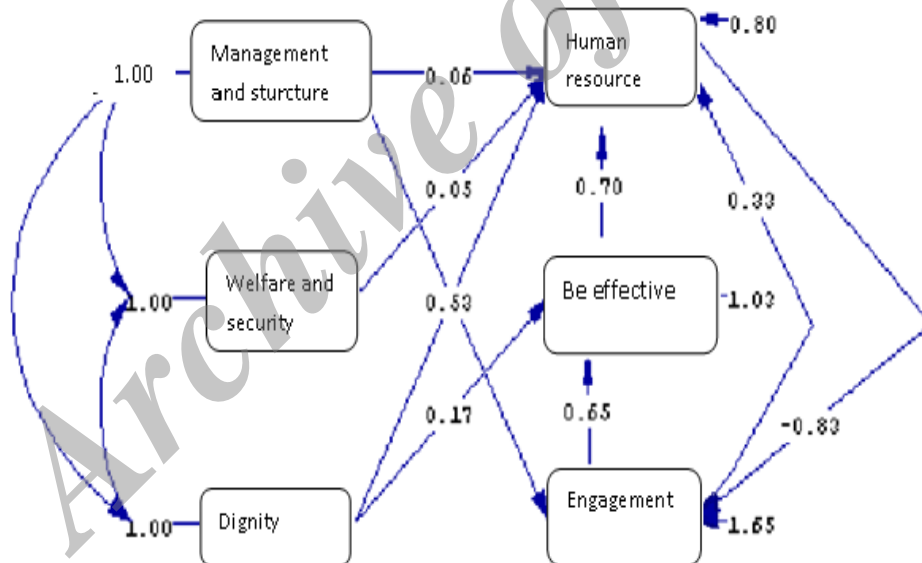


Figure 1. Lizrel test of the model

Chi square=3.93, df=3, P-value=0.26891, RMSEA=0.030

The dignity in this research includes nurses' social status and their respect for professional groups. Nurses' engagement is the way in which the nurses are engaged in their duties, encompassing different areas like doing their job, routines, involvement in patient education, and communication with patients and its consequences (7).

So, regarding necessity of offering an appropriate model for productivity promotion, this study, whose overall aim was testing the clinical nurses' productivity model, was carried out. The main proposition that had to be tested was Human resources in conjunction with other elements of the model.

## Materials and Methods

In this cross-sectional study, dimensions of clinical nurses' productivity were tested. All the nurses working in hospitals affiliated with the Tehran University of Medical Sciences formed the population of this study. Sampling was performed through cluster and random methods. First, half of the hospitals were randomly selected. Then, according to the number of nurses working in each hospital, the total number of nurses and the total number of samples, the samples were selected from any of the hospitals. The overall number of samples, according to confidence level of 95 % and power of 0.80, was 360. In order to obtain a final corpus of 360 completed questionnaires, a host of 400 questionnaires was distributed. In other words, the response rate was assumed to be 90%. The samples answered the questionnaires and returned them.

The instrument used in this research was a questionnaire, which was based on findings of the Grounded Theory research (7,14), especially the emergent categories presented before, as well as reviewing the literatures. Researchers believe that personal productivity can be investigated just by the individuals themselves. For this reason, the self-reported questionnaire was designed in which productivity and other dimensions of the model were included.

This questionnaire, after initial design and several reviews by a panel of experts including faculty member of nursing management in the Tehran University, Tarbiat modares, Shahid Behashti and Iran, included 52 questions on Likert scale which was then reduced to 34 questions after passing the validation steps such as assessing the qualitative face and content validities, relevant indices (with content validity index of 0.8 and above for items), and Factor Analysis for establishing construct validity. The remaining 34 questions could describe 57.45 % of the productivity variance. Dimensions of this questionnaire, based on factor analysis, were respectively named as: Human resources (9 questions), management and organizational structure (8 questions), job security and financial wealth (6 questions), effectiveness and efficacy (5 questions), nurses' dignity and respect (3 questions), and finally nurses' engagement (3 questions). It is noteworthy that the items for organizational structure were placed in the management dimension.

To achieve the objectives of this study, the Lisrel Test (Structural Equation Modeling (SEM)) and Path Analysis were applied. Path analysis is a multivariate statistical technique in which a group of simple linear

and multiple regression models are used to test the robustness of the causal relationship among variables (20;21). This multivariate analysis for model testing with several variables is more comprehensive in contrast to bivariate method. This method is mainly used simultaneously to show several effects of variables on a structure based on the applied theory in this research.

### Ethical consideration

The ethical committee of our institute approved this project and supervised its different aspects. The researchers, after getting permission and being introduced to hospitals managers, and obtaining participants' consent, asked the participants to fill out the questionnaire and return it. They were ensured of the confidentiality of their personal information.

### Results

The Some demographic characteristics of the studied nurses are shown in table 1. The findings of the research show that about half (51.9%) of subjects had strong views about effectiveness and efficacy in the model, and just 11.1 % had negative views about it. In this section, items such as the importance of nurse's work in the medical team, being professional in giving care, effectiveness of the caring for patient's healing, etc. were questioned.

In addition, about half of nurses (48.1 %) believed that the management efficiency is at low or even very low level and just about 7.8 % of them believed in the existence of an ideal level of the management. The items such as supportive behavior, good communication with personnel, solving staff problems, evaluation based on performance and competency of the staff are dealt with in the management section.

In most research participants' views, human resource factors were at high and very high level and just about less than 5 % of them had low or very low view about it. The items such as effort for professional progress, commitment and responsibility toward the profession, specialty in the needed skills, and doing the duties in a precise way (even when the supervisors are not present), are placed in this category.

In the view of most research subjects, "job security and financial wealth" was at a medium level. The items such as received payments in contrast to the other jobs, job security, and offering adequate free times were placed in this category.

Finally, about 10 % of participants had low views for "dignity". Pride and esteem toward the job, importance of job, and job motivators were placed in this group.

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Moreover, the equation of regression analysis was revealed in Table 3.

As can be seen above, the equation and the regression analysis revealed that for each unit increase

in independent variables, the rate of human resources is subsequently increased. So, it can be claimed that the model's propositions that were already provided in the qualitative research are confirmed.

**Table1. Demographic characteristics of nurses**

Variable	Category	Frequency (percent)
Age Mean =32.52±6.46	<30	148(41.1)
	31-40	170(47.2)
	>41	42(11.6)
Sex	male	62
	female	298
Marriage status	married	218(60.8)
	single	134(37.2)
	other	8(2.2)
Number of children	0	190(52.8)
	1-2	130(36)
	3-4	40(11.2)
Working Unit	general	116(32.2)
	critical	32(8.9)
	other	212(58.8)
Experience (year) Mean=8.2±6.2	<5	130(36.1)
	5-10	110(30.6)
	11-15	71(19.7)
	16-20	22(6.1)
	>20	20 (5.6)
	missing	7(1.94)
Overtime	<30 hours	200(55.4)
	31-100	153(42.5)
	>100	7(1.94)

**Table 2. Relations of different variables together**

	Management	Human Resource	Effective	Economic welfare and Security	Dignity	Engagement
Management	1	--	--	--	--	--
Human resource	0.318	1	--	--	--	--
Effective	0.198	0.54	1	--	--	--
Economic welfare and Security	0.662	0.197	0.062*	1	--	--
Dignity	0.308	0.225	0.129	0.405	1	--
Engagement	0.242	0.142	0.273	0.130	-0.063*	1

\*P-value is >0.05

**Table 3. Results of the regression equation**

F2 Human resource=	0.70*f3 be effective	+ 0.33 *f6 engagement	+ 0.064 *f1 management	+ 0.053*f4 welfare and security	+ 0.14*f5 dignity
	(0.12)	(0.11)	(0.079)	(0.063)	(0.053)
	5.73	3.07	0.81	0.84	2.64

## Discussion

The findings of the current study that was conducted on the basis of Lisrel Test indicated that the model components are in close relationship with each

other and accordingly, the models' propositions are confirmed. It must be mentioned that "Clinical Nurses' Productivity Model" had not been tested before in this

way, and the present study is the first in this regard.

The findings revealed that nurses' productivity depends on "human resources" factor which acts as a central variable". As shown in the model, this parameter has direct or indirect significant relationship with the other components of the model – namely for every one unit of increase in "effectiveness and efficacy", human resources will increase 0.7 in the nurses' views. The research on 39 hospitals also showed that productivity depends on personnel pattern, organizational methods, and the degree of trust on nurses (22). There is a relationship between quality of care, patient outcomes and staffing status, particularly about the registered nurses (23,24). Also, it was shown that human characteristics, such as education, experiences, skills, knowledge, and competency are the predictors of job productivity and that they are all related to enhanced clinical care among the nurses (23,25). Although there is a shortage of competent nurses in some European countries, this is worse in developing countries (26). In general, the shortages of human resources influence health outcomes (5,10), while a change toward more favorable staffing is associated with improvement toward having better quality (27). However, factors related to human resource enhancement often receive very little attention (10). Hence, lack of nurses remains as the main problem in the hospitals (15,28-30), and work overload harms the nurses' productivity (1).

The researches show that the majority of nursing staff is not fully trained and has been selected in an improper way (31). The training needs for supporting the staff are continually changing and must be pursued in order to improve organizational performance (10,32).

"Nurses' job security and financial wealth" is another important finding that was found to be in a relationship with productivity so much so that for every unit of increase in job security and financial wealth, 0.053 human resource score increases. Studies have shown that professional nurses' practices are closely related to issues affecting economic prosperity (33). Researchers emphasize that a fair system of payment based on individuals' performance and effectiveness can increase their productivity (18,22). Nevertheless, some studies in Iran have shown that only a few nurses (12.2%) are satisfied with their financial status and salary (6).

The results of the study showed that productivity is associated with "management and structure of the organization." Management and organizational factors

play a great role in promoting the productivity culture (2,23,30). It is found that management and leadership styles influence staff productivity, effectiveness and quality of care (34,35). Some conditions, particularly directive leadership, can threaten team productivity (36).

Findings indicated "nurses' productivity is influenced by their engagement." Nurses' routine engagement causes burnout and stress. "Job burnout" is an ongoing concern that affects employees' productivity (37). Minimizing the time spent on non-nursing activities are necessary to reduce burnout and spare the nursing resources needed for providing high-quality care. This can increase patients' satisfaction and nurses' productivity (22,38).

Another aspect of nurses' engagement was long work hours. According to recent researches, longer shifts have been found to contribute to accidents, sickness, absence and an increase in work-related mistakes and finally decreased productivity (39,40). However, the existence of the balance between work and life has a positive effect on productivity (41).

Another finding indicated "nurses' productivity is mutually related to nurses' dignity and respect." The model obtained from Lisrel Test shows that respect and dignity per se influence on effectiveness and efficacy (0.17). Dignity and respect toward job are the indications of a respectful environment (42). However, some studies showed that workplace incivility is common in nursing-related settings (32). Nurses' experience of respect was linked to cooperation, acknowledgment, independence, support, and justice. However, there are many barriers to respect such as lack of time and roles ambiguity (32,43). Lack of trust and respect in the workplace are related to destructive outcomes such as an increase in expenses and decrease in productivity (32,44).

In general, the researchers in this study have detected sources of productivity reduction especially human resource issues. While issues related to human resource cannot change dramatically (5), nursing managers have to try to create necessary changes for work progression toward lowering the job stress and enhancing nurses' potentials for offering high-quality care to ensure nurses' health and safety (40).

Although the results of this study were significant, only 20 % of the variance in productivity is accounted for by this model. This could be due to several reasons. First of all, the concept of productivity is multidimensional and at the same time abstract and it is associated with numerous variables. In addition, the

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instrument for carrying out this study was made based on previous qualitative researches; even the most reliable instruments have some error. Nonetheless, the instrument used in this study was a questionnaire that participants filled out in a self-reported manner. Finally yet importantly, the positive and negative relationships among other components of the model can also be considered in the percentage of the variance.

The findings proved the relationship among the

components of clinical nursing productivity. These findings can help the managers and policy-making boards to understand the effects of parameters used in this model on nurses' productivity in health-care environments. For further studies, it is recommended to perform interventional researches on the parameters of the designed model and accordingly, investigate their effects on productivity.

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