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Correlates of Work Engagement among Medical-Surgical Nurses in Selected Hospitals in Shandong, China: Basis for Theoretical Development

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Abstract: Because of nurse-researchers bringing theories of organizational behavior to the field of nursing, they have become more increasingly involved in research. As frontline healthcare workers, nurses are critical to the development of the entire healthcare industry. Nurses' work engagement and related influencing factors are conducive to improving the quality of care and promoting the development of nurses' physical and mental health. This study was conducted to determine the current status of medical-surgical nurses' work engagement and to explore the influence of psychological capital, and organizational justice on their work engagement. It provided a theoretical basis for the management and education of medical-surgical nurses.

Keywords: Work Engagement; Psychological Capital; Organizational Justice.

1. Introduction

With the occurrence of new roles to fulfill in their job, nurses have been met with increasing demands in the healthcare industry [2]. The high turnover rate of nurses and the shortage of nurses are well-known and clichéd issues. Nurses act as a bridge for the entire hospital, and nurses must not only carry out physicians' orders correctly, but also provide patient care and health promotion. The nature of nursing, with its high level of responsibility, irregular hours, and high risk, the average nurse turnover rate from 2017-2021 was 5.15% with a fluctuating increase in nurse turnover [3]. Woo et al. [4] conducted a systematic review of 113 studies, which included nearly 50 countries and more than 40,000 nurses around the world, and showed that 11. 23% of nurses had low levels of work engagement, which affects about one-tenth of the nursing population. Zhang et al. [5] surveyed nurses in 311 cities in China and found that 50% of nurses had low levels of work engagement and 93.5% had low levels of personal fulfillment. From the available surveys, it is clear that nurses in China need to improve their level of work engagement. [1]

Work engagement is a work-related, highly activated state that can effectively improve the competitiveness of hospitals [6]. As professionals, the level of nurses' work engagement directly affects the presentation of nurses' nursing behaviors, nurses' career development, and patient satisfaction [7]. Medical-surgical nurses are required to care for a large number of patients and more types of diseases, which contributes to higher work pressure and low levels of motivation and engagement [8]. As medical-surgical nurses are professionals in the medical field, the utilization of quality nursing resources is closely related to their work commitment. How to improve the work engagement of medical-surgical nurses is a topic worthy of study.

Studies have found that the higher nurses' levels of psychological capital and sense of organizational justice, the higher their levels of work engagement [9-10]. Psychological capital activates healthy psychological energy in individual [11] and allows employees to maintain their enthusiasm for their work so that they can respond positively to the difficulties they encounter and is an important individual resource for work engagement. Research has found that nurses' psychological capital is closely related to work stress, professional identity, and work engagement levels [12-13]. Understanding the current state of nurses' psychological capital and implementing targeted psychological capital interventions can help reduce the workload and increase the commitment of nurses, which has a profound impact on the overall development of the nursing profession. Organizational justice refers to employees' perceptions of the organization's social responsibility [14] and is one of the organizational resources. When nurses identify with and accept the fairness system of the hospital, they will feel respected and satisfied, and thus actively engage in their work. Unfair treatment can dampen nurses' motivation and creativity and even cause them to leave the organization. The fairer the employees feel about the organization, the higher the employees' work engagement [15]. Wan et al. [16] found that a fair and equitable organizational environment with more work and equal pay for equal work is conducive to increasing nurses' work engagement. It was found that most of the studies on the sense of organizational fairness were conducted on corporate employees, with little focus on nurses.

In recent years, many correlation studies have been conducted at home and abroad on the work engagement of employees. However, there are few studies on the correlation between psychological capital and sense of organizational justice and work engagement of medical-surgical nurses. This study took medical-surgical nurses in a tertiary hospital as the research object, examined the work engagement of the two variables of psychological capital and organizational justice, analyzed the relationship between psychological capital, organizational justice and work engagement, and proposed corresponding measures and countermeasures to improve the level of work engagement of medical-surgical nurses.

2. Objects and Methods

2.1. Subjects

This study understood the current status of work engagement among medical-surgical nurses and explored its relation to their organizational justice and psychological capital. Following the determination of medical-surgical nurses' work engagement status and its relation to their organizational justice and psychological capital, it attempted to provide a responsive theoretical basis for the management and training of medical-surgical nurses.

2.2. Methods

2.2.1. Sample Size and Sampling

A convenience sampling method was used in selecting particular medical-surgical nurses from several tertiary hospitals in China. According to the average of sample size estimation, the sample size of descriptive research is five (5) to 10 times the number of variables (Li & Liu, 2012). The study designed five (5) variables for the measurement of general capital, including three (3) dimensions for the Job Involvement Scale, four (4) dimensions for the Psychological Capital Scale, and four (4) dimensions for the Organizational Justice Scale. Considering the validity and completeness of the collected questionnaires, the final sample size will not be fewer than 192, plus 20% of the sample size.

2.2.2. Inclusion and Exclusion Criteria

Inclusion criteria

In order to be eligible to participate in this study, target participants must fulfill the following qualifications:

1. Clinically active and have a valid professional nursing license;
2. At least 12 months worth of clinical experience in the medical-surgical field; and
3. Turn in a duly-signed Informed Consent Form to signify voluntary participation

Exclusion criteria

Those who initially qualify may be barred from participating if they fall under any of the following categorical descriptors:

1. Interns and student-nurses; and
2. Nurses not working in the unit at the time of the survey such as those on vacation or study leave.

2.2.3. Research Instruments

1) General Information Questionnaire

A questionnaire which will be self-administered for the purposes of the study, this will include seven items which are on the participants' gender, age, education, marital status, and years of experience.

2) Work Engagement Scale

This is a 17-item standardized workload scale which is currently the most widely accepted and used Work Engagement Scale. It assessed vigor (1-6), dedication (7-11), and absorption (12-17) (Schaufeli et al., 2002). Each item was paired with a seven-point Likert scale wherein zero (0) is 'never'; one (1) is 'almost never'; two (2) is 'rarely'; three (3) is 'sometimes'; four (4) is 'often'; five (5) is 'very often'; and six (6) is 'always', with higher scores representing higher levels of nurse work engagement. A total mean score of less than or equal to (≤ 2) is low work engagement; a total mean score of two to four (2-4) is medium work engagement; and a total mean score of greater than or equal to four (≥4) is high work engagement. The overall Cronbach Alpha Value of the scale was 0.916, and the Cronbach Alpha Values for the vigor, dedication, and absorption subscales were 0.865, 0.752, and 0.780 respectively. These indicate that all scales were highly reliable and recommended for use [17-18].

3) Psychological Capital Scale

The scale developed by Luthans et al. [19] was divided into four dimensions: self-efficacy, hope, resilience, and optimism. Each dimension contained six (6) items, for a total of 24 items. Each item was scored on a six-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores represented higher levels of psychological capital. Reverse scoring should be used for Items 13, 20, and 23. The psychological capital scale was categorized into four dimensions, the Cronbach's Alpha coefficient of self-sufficient was 0.785, the Cronbach's Alpha coefficient of hopeful was 0.779, the Cronbach's Alpha of resilient was 0.707, the optimistic Cronbach's Alpha was 0.710 and the Cronbach's Alpha coefficient of the scale as a whole was 0.918. The psychological capital scale used in this study has good reliability.

4) Organizational Justice Scale

The Organizational Justice Scale [20] consisted of 20 items, divided into distributive fairness, procedural fairness, interpersonal fairness, and information fairness. The items were scored on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher total scores indicate higher levels of perceived organizational fairness among nurses. In general, a total mean score of less than three (<3) was considered low, three to four (3-4) was moderate, and greater than (>4) was high. The organizational justice scale was divided into four dimensions. Cronbach's Alpha coefficient of distributive justice was 0.778, that of procedural justice was 0.818, Cronbach's Alpha for interpersonal justice was 0.769, and Cronbach's Alpha for informational justice was 0.762. Cronbach's Alpha coefficient for the whole questionnaire was 0.900. The organizational justice scale adopted in this study had good reliability.

2.2.4. Specific Procedures

A pre-survey of selected medical-surgical nurses who met the criteria was conducted prior to the actual distribution of the questionnaire. The researcher made preliminary estimates of response time and invalid questionnaires. For the formal survey, the researcher used a paper and pencil questionnaire as an investigator. Inclusion and exclusion criteria were strictly followed to select the study population. The significance of the study, the process, the method of completing the questionnaire and the precautions were explained to the study participants with their informed consent and confidentiality. Invalid questionnaires were excluded by the researcher based on the length of the answer and logical errors. Verification of the status of each questionnaire and data entry were done by two persons to ensure the accuracy of the data.

2.2.5. Statistical Analysis of Data

The Statistical Package for the Social Sciences version 25 (SPSS 25.0) was used to analyze the data in this study. Demographic information was expressed as frequencies and percentiles. The Shapiro-Wilk test was used in determining the normality of the data. Organizational justice and work participation conformed to a normal distribution and were expressed as mean and standard deviation. Psychological capital was skewed, with median and interquartile range used. The parametric tool Pearson R was used to determine the correlation between the study variables (i.e., organizational

justice and work engagement among medical-surgical nurses). The researcher used Spearman rho to determine the correlation between the study variables (i.e., psychological capital and work engagement of medical-surgical nurses). To identify the contribution of the organizational justice and psychological capital on work engagement, hierarchical multiple regression analyses were performed after testing normality, linearity, and homoscedasticity.

3. Ethical Considerations

The researcher was securing the approval of the Ethics Review Committee (ERC) of the Angeles University Foundation (AUF) before proceeding with data collection. The AUF-ERC assessed a study for its compliance with ethical standards and protection of the rights and welfare of human research subjects.

4. Results

4.1. Descriptive Analysis of General Demographic Information

A total of 313 questionnaires were distributed, with 273 valid questionnaires and a recovery rate of 87.2%. Out of the 273 nurses, the majority of them were female (95.6%) and their age range was 21-46 years with a mean age of (28.05±5.05) years. 57.5% of the nurses studied had a bachelor's degree and the least number of nurses had a postgraduate degree (7%). Majority of the nurses were unmarried (65.2%) status. The number of years of nursing experience ranged from 1-25 years with a mean of (5.78±4.60) years. Nurses with 1-4 years and 5-10 years of experience constituted 49.8% and 34.1% respectively.

Table 1. Demographically variable frequency distribution of the studied nurses (n = 273).

Variables	N	%
Gender		
Male	12	4.4
Female	261	95.6
Age (years)		
21-25	86	31.5
26-30	129	47.3
31-46	58	21.2
Education		
High diploma (technical institute graduates)	97	35.5
Bachelor degree (college graduates)	157	57.5
Master degree	19	7.0
Marital status		
Single	178	65.2
Married	95	34.8
Years of experience		
1-4 years	136	49.8
5-10 years	93	34.1
11-15 years	34	12.5
>15 years	10	3.7

4.2. Study the Scores of Variables

4.2.1. Work Engagement Score

The total work engagement of medical-surgical nurses was (62.32 ±11.31) points, and all items were (3.67±0.67) points. Among all dimensions, the absorption dimension had the highest score (3.79±0.66), followed by the vigor dimension (3.44±0.87), and the dedication dimension had the lowest score (3.79±0.67).

Table 2. Total score for work engagement and scores for each item (n=273)

Variables	Min	Max	Total Mean (SD)	Item Mean (SD)	Num of questions
work engagement	36	95	62.32 (11.31)	3.67 (0.67)	17
vigor	2	36	20.65 (5.19)	3.44 (0.87)	6
dedication	10	30	18.97 (3.36)	3.79 (0.67)	5
absorption	13	36	22.71 (3.98)	3.79 (0.66)	6

4.2.2. Organizational Justice Score

The total score of organizational justice of medical-surgical nurses was (70.56±8.62), and the scores of all items were (3.53±0.43). In comparison of the average scores of all dimensions, the Interpersonal justice dimension receives the highest score (3.63±0.49). The Distributive justice dimension had the lowest score, both of which were (3.47±0.58) points.

Table 3. Organizational justice scores among the studied nurses (n=273).

Variables	Min	Max	Total Mean (SD)	Item Mean (SD)	Num of questions
Organizational justice	49	92	70.56 (8.62)	3.53 (0.43)	20
Distributive justice	10	19	13.87 (2.31)	3.47 (0.58)	4
Procedural justice	14	33	24.76 (3.64)	3.54 (0.52)	7
Interpersonal justice	8	20	14.26 (2.23)	3.63 (0.49)	4
Informational justice	11	24	17.67 (2.53)	3.61 (0.44)	5

4.2.3. Psychological Capital Score

Because psychological capital scores did not satisfy normal distribution, median and interquartile range were used for statistics. The median psychological capital score of medical and surgical nurses was 102, and the upper and lower interquartile distances were 93 and 106, respectively. Among the dimensions of psychological capital, the highest median score is hopeful and resilient, and the other two dimensions have the same score.

Table 4. Psychological capital scores among the studied nurses (n=273).

Variables	Median	P25	P75	Min	Max
Psychological capital	102	93	106	47	131
self-sufficient	25	22	27	11	33
hopeful	26	23	27	11	34
resilient	26	24	27	11	33
optimistic	25	23	27	10	32

4.3. Correlation Analysis

4.3.1. Correlation Analysis of Organizational Justice and Work Engagement

The results showed that all dimensions of organizational justice were positively correlated with all dimensions of job involvement ($P < 0.01$).

Table 5. Analysis of the correlation between organizational justice and work engagement.

Variables	work engagement	vigor	dedication	absorption
Organizational justice	.625**	.511**	.590**	.611**
Distributive justice	.488**	.396**	.459**	.483**
Procedural justice	.525**	.435**	.486**	.514**
Interpersonal justice	.493**	.396**	.474**	.484**
Informational justice	.494**	.405**	.476**	.474**

** Correlation is significant at the 0.01 level (2-tailed).

4.3.2. Correlation Analysis of Psychological Capital and Work Engagement

The results showed that each dimension of psychological capital was positively correlated with each dimension of work engagement ($P < 0.01$).

Table 6. Analysis of the correlation between psychological capital and work engagement

Variables	work engagement	vigor	dedication	absorption
Psychological capital	.528**	.445**	.517**	.488**
self-sufficient	.520**	.475**	.476**	.459**
hopeful	.403**	.315**	.423**	.385**
resilient	.447**	.381**	.423**	.420**
optimistic	.447**	.352**	.462**	.430**

** Correlation is significant at the 0.01 level (2-tailed).

4.3.3. Multiple Linear Regression Analysis of Influencing Factors of Work Engagement.

Table 7. Multiple linear regression analysis of influencing factors of work engagement

	Unstandardized Coefficients		Standardized Coefficients	t	P	Collinearity Statistics
	B	Std. Error	Beta			VIF
(Constant)	-10.352	5.266		-1.966	0.050	
self-sufficient	1.057	0.232	0.317	4.552	0	2.425
distributive justice	0.96	0.268	0.196	3.588	0	1.498
procedural justice	0.459	0.192	0.148	2.389	0.018	1.92
Interpersonal justice	1.055	0.309	0.208	3.416	0.001	1.857
R Square	0.473					
Adjusted R Square	0.457					
F	F=29.603, P=0.000					
D-W	2.108					

Multiple linear regression analysis was conducted with the sub-dimensions of psychological capital and organizational justice as independent variables and work engagement as dependent variables. The results showed that there were statistical differences in the effects of self-efficacy on work engagement ($b=1.057$, $t=4.552$, $P < 0.001$), distribution justice on work engagement ($b=0.96$, $t= 3.588$, $P < 0.001$), and procedural justice on work engagement ($b=0.459$, $P < 0.001$). $t=2.389$, $P=0.018$), the effect of interpersonal justice on work engagement was statistically significant ($b=1.055$, $t=3.416$, $P=0.001$).

5. Discussion

5.1. Analysis of Baseline Data of the Study Population

A total of 273 medical-surgical nurses from three grade 3A hospitals in Shandong Province were surveyed in this study. The results of the study showed that the proportion of male medical-surgical nurses was very low. Due to the advantages of male nurses in terms of physical strength and emergency response, male nurses are more preferred in the choice of employment departments in favor of emergency, operating theatre and custodial units [21]. The age structure of the nurses in the studied hospitals showed a trend towards younger nurses, which is consistent with the studies of Zou and Pu [22], Teng [23] and may be related to the high turnover rate of nurses in recent years as a result of increased recruitment of new nurses for the expansion of hospitals and heavy workloads in tertiary care hospitals.

Most of the nurses surveyed in this study were highly educated, probably due to the fact that the subjects of this study were from a tertiary care hospital, which requires highly educated and qualified nurses to cope with all kinds of emergencies. In addition, the booming development of higher nursing education in China, the gradual improvement of the training system for nursing-related specialties [24], and the increasing requirements of hospitals for the academic level of nursing personnel have prompted nurses to continuously improve their academic qualifications through continuing education to cope with the medical recruitment environment [25]. The proportion of nursing graduates is low, indicating that there is still much room for improvement in nursing higher education. In terms of years of working experience, the majority of the study participants had less than 10 years, which is consistent with the Ma et al. [26] study. Overall, tertiary hospital nurses, the majority of whom were Overall, nurses in tertiary hospitals, with a majority of females [27], lower age [26] and higher education [28].

5.2. Work Engagement, Organizational Justice, and Psychological Capital Status of Medical-Surgical Nurses.

5.2.1. Work Engagement Status of Medical-Surgical Nurses

The results of this study showed that the total work engagement score of medical-surgical nurses this was lower than that of surveys conducted by national scholars [29] and lower than the level of work engagement of clinical nurses in developed countries [30-31], suggesting that there is a large room for improvement for the surveyed nurses. This study suggests that nursing managers in our country should strengthen scientific management and maximize the enthusiasm of the limited nursing manpower to devote themselves to their work in order to improve the efficiency and quality of their work. However, the results of this study are slightly higher than the survey of nurses' work engagement conducted by Yu et al. [32], indicating that the work engagement of medical-surgical nurses is at an above-average level. In this study, the scores of all dimensions of work engagement from high to low are absorption, vigor, and dedication. The highest scores for absorption indicate that medical-surgical nurses often devote themselves to their work

and find it difficult to get away from it. This may be because medical-surgical nurses have heavy workloads and must maintain high levels of concentration to avoid making mistakes. Nurses must avoid causing harm and distress to patients and families through communication problems, which in turn requires a high level of concentration. Vigor refers to a nurse who is energetic and willing to put more time and effort into her work. Dedication is working without expecting anything in return and feeling the satisfaction and pride that comes with it. Dedication scores the lowest, which is inconsistent with previous studies [33]. The lowest dedication score may be due to the fact that patients in tertiary care hospitals are in acute, critical, and serious condition, and nurses need to face heavy clinical work and pressure every day without understanding from patients and support from leaders. In an increasingly stressful nursing environment with increased nurse-patient conflict, busy and significant tasks, medical-surgical nurses have high levels of negativity and empathic exhaustion [34]. In summary, hospital administrators, in the configuration of nursing staff should be based on the nursing position, work tasks, workload and the required level of business skills and other reasonable configuration, in order to promote the work of nurses into the state, to ensure the quality of nursing services.

5.2.2. Status Quo of Organizational Justice of Medical-Surgical Nurses

There is no constant model of organizational justice score in the country, this researcher used a median score of 3 as the cut-off point, higher than 3 is considered as a high level of organizational justice and lower than 3 is considered as a low level of organizational justice. The sense of organizational justice of the subjects in this study was at a medium level, which is consistent with Yu's [35] study. Nurses are required to perform various tasks such as therapeutic services, psychological services, and patient awareness and education, which makes nurses very busy and even unable to leave work on time every day. However, the salary level of nurses is not proportional to their contribution, and nurses develop a sense of unfair distribution. When the hospital's salary and resources are unfairly distributed, nurses become dissatisfied and resistant, which affects their work commitment. Distributive justice received the lowest score, which is consistent with the study of Liu [36] and Wu [37] and the study of Yang et al. [38]. Distributive justice is the dimension with the lowest perceived justice among nurses, which indicates that tertiary hospitals do not involve nurses enough and managers do not communicate information to nurses in a timely manner in the process of making decisions related to nurses, salary distribution and other important issues, and do not provide adequate explanations and justifications for the results of decisions related to nurses. Higher interpersonal justice and informational justice scores are consistent with the study by Yang et al. [39]. Higher interpersonal justice scores indicate that nurse leaders are able to respect and empathize with their subordinates, and treat them with sincerity and courtesy. Informational justice indicates that leaders are able to communicate information and explain the results of decisions in a timely manner. Every patient's recovery requires communication and collaboration between healthcare providers and nurses. Nurses not only have to provide services to patients according to medical advice, but also have to provide a full range of services to patients, including primary care, psychological care and health education, which results in a relatively heavy workload and high work pressure for nurses. At the same time, compared with other medical positions such as doctors, nurses' income is relatively low and their social status is low [40], which creates an imbalance in pay and benefits and a sense of disrespect, resulting in feelings of injustice. In order to perform their duties effectively and improve the quality of care, nurse managers need to ensure that the decision-making system is transparent and rational.

5.2.3. Psychological Capital Status of Medical-Surgical Nurses.

The score of psychological capital of medical-surgical nurses was in the middle level. Hope has the highest score, which is consistent with the study of Zhao et al. [41], and inconsistent with the study of Chen Yuchan [42] and Chang et al. [43], which has the highest self-efficacy score. The reason may be that there are more nurses in the study with a low age, and most young nurses are full of energy. Full of confidence and hope for career development. The high resilience score indicates that the nurses in the study have strong anti-pressure ability and can cope with emergency events firmly. The lowest score of optimism indicates that nurses often view difficulties in work with negative emotions and lack vitality and adaptability. The improvement of nurses' psychological capital can effectively regulate their own behavior and work cognition by influencing nurses' self-cognition [44]. Nurses with a higher level of psychological capital will plan and manage their career more effectively and have the confidence to explore problems [45]. Nursing managers should pay attention to the cultivation and promotion of nurses' psychological quality.

5.3. Correlation Analysis of Work Engagement, Organizational Justice and Psychological Capital of Medical-Surgical Nurses.

5.3.1. Correlation Analysis between Organizational Justice and Work Engagement

Organizational justice is positively correlated with all dimensions of work engagement, which is consistent with the studies of Wang et al. [46] and Du et al. [47]. Organizational justice is an individual's subjective perception of fairness, which can explain employees' behavior. When the nurse's efforts are rewarded, the nurse's sense of fairness will be satisfied, and the nurse will show a good state of work involvement. On the contrary, when the efforts of nurses are not rewarded correspondingly, the enthusiasm of nurses will be discouraged, resulting in more lazy behaviors and inefficient behaviors, and the level of work commitment of nurses will be reduced. The sense of organizational justice is an important resource that can have an important role in influencing individuals and collectives. A good sense of organizational justice facilitates work engagement by improving the quality of work, enhancing psychological well-being, and promoting organizational and civic behaviors, among others [48]. This study also found that among the four dimensions of sense of organizational fairness, procedural fairness has the strongest correlation with work engagement. Procedural fairness responds to the fact that nursing managers take into account the opinions of their subordinates when making decisions, so that employees feel that the allocation and appraisal process is fair and transparent [49]. The higher the perceived sense of procedural justice of nurses, the more active nurses are in the organizational management process,

the more correct nurses' cognition of the profession, and the higher the subjective social status of nurses [47]. Therefore, managers should fully consider subordinates' opinions and accept subordinates' supervision when making and implementing decisions, ensure that the decision-making process is transparent and open, and provide nurses with opportunities to participate in the decision-making process.

5.3.2. Correlation Line Study between Psychological Capital and Work Engagement.

This study shows that the total score of psychological capital and its dimensions are positively correlated with the total score and dimensions of work engagement of medical-surgical nurses, which is consistent with the studies of He et al. [50], Sha [51] and Yang [52]. The higher the psychological capital of nurses, the higher the level of work engagement and work motivation, which is consistent with previous studies [53]. This study also found that among the four dimensions, self-efficacy had the strongest correlation with work engagement, suggesting that the stronger the nurses' beliefs about achieving their goals, the more they were able to combat work stress and the higher their level of work engagement. Nurses with greater self-efficacy demonstrated more skillful interventions at the onset of a crisis [54]. In the context of hospital care, most people focus on the physical and mental state of the patient and ignore the mental state of the nurse. Nurses also crave external understanding and support and have higher professional aspirations. Nurses' potential for self-efficacy, hope, resilience, and optimism are conducive to higher levels of work engagement. Nursing managers should emphasize the positive role of psychological capital as a positive factor in nurses' work engagement so that nurses can maintain positive professional values and sustained enthusiasm for work.

5.3.3. Multifactorial Analysis of Influences on Nurses' Work Engagement.

This study shows that self-efficacy, distributive justice, procedural justice, and interpersonal justice, when significant predictors of work engagement, together explain 45.7% of the total variance in work engagement.

Self-efficacy in psychological capital becomes an important factor in the work engagement of medical-surgical nurses. Chen and Zheng [55] showed that nurses with higher self-efficacy have clearer and more objective self-perceptions and positive self-direction. Nurses with high self-efficacy are able to face difficulties and emergencies at work with a positive and optimistic attitude and have enough confidence to try to solve problems[56]. This study shows that the nurses studied were more likely to be satisfied with their jobs and hopeful about the future of their nursing careers. Therefore, hospital administrators should not only focus on professional competence, but also on the psychological state of nurses.

Distributive justice, procedural justice, and interpersonal justice in terms of organizational justice have become important factors in the work engagement of medical-surgical nurses, indicating that clinical nurses care a lot about fairness. Nursing work pressure, heavy load, treatment overall low and other reasons have an impact on the nurses' sense of organizational justice [57]. When the nurse's contribution is rewarded accordingly and his or her sense of fairness is satisfied, he or she will be put into work in a better state. When the nurses' sense of fairness is not satisfied, then they will have negative emotions and even resistance. Zhang and Wang [58] showed that when nurses perceive fairness in the distribution of outcomes, they rarely take time off from work, have a stronger willingness to work, and have higher work engagement. The higher employees' sense of procedural justice, the higher their sense of psychological security and the higher their work engagement [59]. Employees with a low sense of procedural justice are more concerned about the fairness of managers' decisions than the work itself. A high sense of interpersonal fairness indicates that nurses work in a harmonious, equal, and democratic environment and that managers do not oppress nurses. When managers give enough affirmation and respect to nurses' own abilities and value, it can effectively enhance nurses' loyalty to the organization and sense of organizational commitment, thus stimulating higher productivity. Nursing managers should focus on nurses' sense of organizational justice by, first, establishing a scientific salary distribution system and developing clear organizational procedures to motivate nurses to work. Second, they should ensure that the promotion and decision-making system is democratic and transparent. Finally, nurse managers should communicate with nurses, respect them, and understand their needs.

5.4. Theoretical Basis to Improve Work Engagement

1) Assessing the level of medical-surgical nurses' work engagement

This study found that the work engagement of medical-surgical nurses is at a moderate level and there is still much room for improvement. Therefore, managers should make it a priority to assess and improve the level of medical-surgical nurses' work engagement. The level of nurses' work engagement can be improved by increasing their dedication behavior through rational resource allocation and appropriate salary for the position.

2) Providing organizational resources to improve sense of organizational justice

This study confirms the positive effect of the sense of organizational justice on nurses' work engagement, but the sense of distributive justice of nurses is obviously low, at present. One of the important measures to improve the distribution policy and personnel system is to implement job management and realize job matching. First of all, improve the performance appraisal system, performance and income linked. Develop a scientific and reasonable scheduling system, and managers should appropriately reduce the workload of nurses. Secondly, managers should make decisions openly and transparently, and fully listen to reasonable opinions. Encourage nurses to make decisions on their own. Thirdly, managers should strengthen communication with nurses, respect and trust nurses, and give nurses enough care. Managers should take the initiative to listen to nurses' opinions and suggestions and understand nurses' needs. Finally, managers should provide nurses with education and training opportunities, encourage nurses to improve themselves in many ways, and fully meet nurses' career development needs.

3) Developing personal resources and improving psychological capital

This study supports that psychological capital affects nurses' work engagement. Managers should pay attention to developing nurses' psychological capital. First of all, managers should develop nurses step by step with patience and care, and formulate a reasonable training programme for nurses, i.e., set up appropriate goals for each nurse, so that nurses can have confidence and grow slowly. Managers

cannot help nurses grow by pulling them up and put too much pressure on them. Secondly, nursing managers should encourage, guide and help nurses. Timely find out the nurse's confusion and help the nurse to recover to a good state. Thirdly, they should reward nurses with progress and excellence to enhance the nurses' sense of acquisition in their heart. Finally, encourage nurses to find multiple solutions and alternatives to problems. Communicate more with colleagues.

6. Conclusion

This study investigated the work engagement of medical-surgical nurses using a questionnaire and found that they had a moderate level of work engagement with a large room for improvement, suggesting that managers should focus on the work engagement of medical-surgical nurses. It was found that the higher the nurses' sense of organizational justice, the higher the level of psychological capital and the higher the level of work engagement. Self-efficacy, distributive justice, procedural justice and interpersonal justice were significant predictors of nurses' work engagement, suggesting that managers can focus on these aspects to improve nurses' work engagement.

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