Attitudes Toward Vital Signs Monitoring and Influencing Factors Among Clinical Nurses: A Cross-Sectional Survey Study

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Abstract

Objective: This study aimed to understand nurses' attitudes toward vital signs monitoring and to explore its influencing factors to provide a management basis for improving the quality of vital signs monitoring and enhancing nurses' ability to observe and deal with diseases and emergencies.

Methods: By convenience sampling, 1554 nurses in Guangdong Province were selected as the study population and surveyed using the attitudes toward vital signs monitoring scale (V-scale) and a self-designed influencing factors questionnaire.

Results: The mean total V-scale score of the respondents was 49.79 ± 7.82. From the 26 study factors, 13 were significant in the multiple linear regression analysis, including age, work duration, job position, ability to recognize changes in vital signs, experience of delayed off-duty because of vital signs monitoring, experience of delayed resuscitation because of untimely detection of changes in vital signs, assessment tools used, whether monitoring tools met the needs, belief that vital signs monitoring should be undertaken by junior nurses, experience of fabricating vital signs data and attitude toward it, relevant training experience, and complaints from colleagues (P<0.05).

Conclusions: The low mean score of nurses' attitudes toward vital signs monitoring was influenced by individual factors, tool support used, work climate, and management factors. Therefore, improving nurses' attitudes toward vital signs monitoring must be based on strengthening their disease observation ability, provision of easy access to monitoring tools, and collaboration to create a good organizational atmosphere.

Keywords: Vital signs monitoring; Nurse attitudes; Tool support; Organizational climate.

Vital signs monitoring is the most basic and common nursing task, an integral part of nursing assessment, and an important indicator of changes in patients' condition [1]. However, monitoring is repetitive and tedious, and the potential predictive value of vital signs is often neglected [2]. A study of the characteristics of vital signs measured in 16 wards in four hospitals in southern England revealed that [3] only 6–21% of vital signs monitoring events were completed and that most nurses did not regularly measure, record, or interpret vital signs, which is often the main reason for unrecognized changes in patients' conditions and even delays in resuscitation, ultimately leading to higher rates of unplanned intensive care unit admissions and increasing the risk of patient death [4, 5]. Nurses' attitudes are important factors that affect the quality of their work [6]. Studies [7–9] have revealed that clinical nurses find vital signs monitoring time-consuming and laborious and that nurses' knowledge of abnormal signs is inadequate and

needs to be strengthened to identify changes in patients' conditions. However, relevant studies in China are limited, and only a few studies have shown that nurses' overall attitude toward vital signs monitoring is weak [10], which is related to nurses' personal experiences; a comprehensive analysis is lacking. Thus, this study investigated the attitude of clinical nurses toward vital signs monitoring using large-sample data and explored the influencing factors to provide a reference for subsequent improvement in the quality of vital signs monitoring and the ability of nurses to recognize changes in patients' condition.

Methods
Design
A cross-sectional survey design was used and conducted with clinical nurses in Guangdong Province, China. STROBE guidelines for observational research were followed in reporting this study (Appendix 1).

Participants
Convenience and snowball sampling was used to select nurses working in Guangdong Province. With the assistance of the Guangdong Nursing Association Special Committee on Surgery, participants were included if they meet the criteria following: 1) age≥18; 2) had received the nursing qualification certificate; 3) currently worked in a department related to clinical nursing including those in an internship, advanced training, and standardized resident training; and 4) voluntarily consented to take part in the survey. The survey was conducted from March to April of 2021, and a total of 1554 nurses participated in the survey.

Measures
Attitudes toward vital signs monitoring scale (V-scale, Chinese version)
The V-scale developed by a Singaporean scholar [8] and localized in Chinese by Zheng Danping [11] was used to evaluate nurses' attitudes toward vital signs monitoring in identifying, interpreting, and reporting deterioration in patients' condition. The scale consists of 16 entries with five dimensions, including workload (four entries), operational skills (four entries), communication (two entries), key indicators (three entries), and knowledge assessment (three entries). As the entries on the scale were developed with most entries being reverse questions, the original author's scale was scored using a Likert five-point scale, strongly agree to strongly disagree, on a scale of 1 to 5. When the Chinese scale was localized the scoring was logically changed to strongly agree=5, agree=4, neutral=3, disagree=2 and strongly disagree=1. All entries were scored in reverse, except for entries 5, 8, and 9, which were positive-scoring questions. The total score ranged from 16 to 80 points, with higher scores indicating a more positive attitude of the nurse toward identifying deterioration in patients' condition during vital signs monitoring, and vice versa. Cronbach's α coefficient for the Chinese version of the overall scale was 0.761. Cronbach's α coefficient for each dimension ranged from 0.579 to 0.809, and the retest reliability was 0.778.

Self-designed questionnaire
Based on the literature and expert consultation, the questionnaire was self-designed and consisted of two parts, namely, individual nurse factors and organizational environment factors. (1) Individual nurse factors included 17 entries on a. general information (sex, age, academic qualifications, job title, work duration, unit level, department, clinical teaching (yes or no), job position, and ability to observe the condition) and on b. attitude and experience (belief that junior nurses should complete monitoring work, experience of fabricating vital signs data and attitude toward such behavior, having delayed off-duty because of monitoring work, delays because of untimely detection of changes in vital signs, praise and commendation, relevant training, and delays in resuscitation because of failure to detect changes in condition). (2) Organizational environment factors included a total of nine entries, composed of a. tool support (whether the monitoring tool meets the needs, whether the monitoring tool can automatically generate early warning signs of changes in vital signs, and whether assessment tools were applied), b. working climate (attitudes of the patients and family members toward monitoring, whether doctors attach importance to the reporting of abnormal signs, and colleagues' complaints), and c. management system (relevant incentive mechanisms and supervision systems at both the hospital and department levels). A total of 40 nurses from surgery and internal medicine departments were selected for the pre-survey in order to test the reliability of the self-designed questionnaire, and the result was included in the survey. The questionnaire had good reliability with Cronbach's α coefficient of 0.81.

Data collection and collation
The support of the Guangdong Surgical Nursing Special Committee was obtained before the survey.
We data were collected using the Questionnaire Star platform (Changsha Ranxing Information Technology Co. LTD, www.wjx.cn), and questionnaire entries were set up such that the respondents answered all of them before submission. After the survey, the results were exported from the web survey platform to Excel 2019; data were double-checked and cleaned; finally, 1554 valid data were obtained, with 100% completeness of the returned questionnaires.

Ethical consideration
The study was approved by the Ethics Committee of the General Hospital of the Southern Theater of the Chinese People's Liberation Army. The nursing managers of each hospital were contacted before the survey, and their consent was sought before fully explaining the purpose of this study, method, and requirements for filling it out to the study respondents, obtaining informed consent, and filling it out truthfully. Participants were advised of their right to

withdraw from the survey without having to provide any reason and without any consequences for withdrawal.

Data analysis

Statistical analysis was performed using the SPSS 21.0 software (IBM Corp., Armonk, NY, USA), with categorical variables described as frequencies and percentages and continuous variables as means ± standard deviations. The total score of nurses' attitudes toward vital signs monitoring was used as the dependent variable. Statistical methods such as the t-test or one-way analysis of variance (ANOVA) and multiple linear regression analysis were used to analyze the influencing factors. The t-test or ANOVA was used for the univariate analysis. Variables with $P<0.05$ in the univariate analysis were included in the multivariate analysis, and multiple linear regression analysis and stepwise regression were used to screen the variables that affect nurses' attitudes toward vital signs monitoring. A two-sided $P<0.05$ was considered a significant difference.

Results

General information

The survey population involved all individuals, mainly from various departments of tertiary hospitals, female individuals aged 26–35 years, having a bachelor's degree, nurse practitioners, responsible nurses, and nurses with <5 years of work experience (Table 1).

Table 1: General information on the survey respondents.

	Category	Number of persons	Proportion (%)
Sex	Male	46	3.0
	Female	1508	97.0
Age (years)	<25	334	21.5
	26–35	798	51.4
	36–45	334	21.5
	>46–55	88	5.6
Academic qualifications	College	439	28.3
	Bachelor	1071	68.9
	Masters and above	44	2.8
Job title	Junior (nurse)	365	23.5
	Junior (nurse practitioner)	649	41.8
	Intermediate	407	26.2
	Associate senior and above	103	6.6
	None	30	1.9
Work duration (years)	0–5	567	36.5
	6–10	395	25.4
	11–15	255	16.4
	>15	337	21.7
Unit level	Tertiary hospitals	1394	89.7
	Secondary hospital	160	10.3
Department	Internal medicine ward	314	20.2
	Surgical ward	806	51.9
	Specialist ward	137	8.8
	Care unit	63	4.1
	Outpatient and outpatient-related departments	79	5.1
	Emergency care	28	1.8
	Operating theater	20	1.3
	Others	107	6.9
Involve in clinical teaching	Yes	640	41.2
	No	914	58.8
Job position	Responsible nurse	857	55.1
	Nurse team leader	246	15.8
	Primary care nurse	87	5.6
	Office nurse	43	2.8
	Chief nursing officer	151	9.7
	Others	170	10.9
Disease observation ability	Better	426	27.4
	Normal	887	57.1
	Poor	241	15.5

Nurses' attitudes toward vital signs monitoring

The mean score of the nurses' attitudes using the V-scale was 49.79 ± 7.82, and the mean scores for each dimension are detailed in Table 2.

Table 2 Mean scores for each dimension of the nurses' attitudes toward vital signs monitoring scale.

Dimensions	Average score $\bar{X} \pm sd$
Workload	10.80 ± 3.14
Operational skills	11.93 ± 3.46
Communication	12.12 ± 1.81
Key indicator	8.29 ± 1.98
Knowledge assessment	6.66 ± 1.75
Total scale score	49.79 ± 7.82

Univariate analysis of nurses' attitudes toward vital signs monitoring
Individual factors

As shown in Table 3, of the 10 factors of general information, all factors (except education, job title, unit level, and whether or not involved in clinical teaching) were significant ($P < 0.05$). All six factors related to personal attitude and experience were significant ($P < 0.05$). Older nurses with longer work experience had better disease observation skills, zero tolerance for the fabrication of vital signs data, disagreed with the belief that junior nurses should assume monitoring duties, had good work experience and relevant training, and higher monitoring attitude scores.

Organizational environment factors

All three factors related to tool support were significant ($P<0.05$), and nurses who used tools had better attitudes toward vital signs monitoring. All factors related to work climate were significant, except for the attitudes of patients and their families. Moreover, the more the doctors and colleagues valued vital signs monitoring, the higher were the nurses' attitudes score. Of the three factors related to management, the difference in the scores on attitudes toward individual vital signs monitoring was significant and higher among nurses who were supervised at both the hospital and department level ($P<0.05$) (Table 3).

Table 3: Univariate analysis of nurses' attitudes toward individual vital signs monitoring (n=1554).

Projects				N(%)	Total score for monitoring attitude $\bar{X} \pm sd$	T/f value	P-value
Individual factors	General information	Sex	Male	46(3.0)	46.98 ± 8.10	2.48	0.013
			Female	1508(97.0)	49.88 ± 7.80		
		Age (years)	<25	334(21.5)	48.77 ± 7.56	3.15	0.02
			26–35	798(51.4)	49.83 ± 7.86		
			36–45	334(21.5)	50.58 ± 8.01		
			>46	88(5.6)	50.25 ± 7.43		
		Work duration (years)	<5	567(36.5)	49.36 ± 7.41	3.34	0.02
			6–10	395(25.4)	49.43 ± 8.39		
			11–15	255(16.4)	49.79 ± 7.93		
			>15	337(21.7)	50.95 ± 7.63		
		Job position	Office nurse	43(2.8)	47.33 ± 7.27	4.04	0.001
			Safeguarding nurse	87(5.6)	47.83 ± 8.36		
			Responsible nurse	857(55.1)	49.48 ± 7.66		
			Others	170(10.9)	50.54 ± 8.44		
			Chief nursing officer	151(9.7)	50.65 ± 7.07		
			Nurse team leader	246(15.8)	50.96 ± 8.01		
			Better	426(27.4)	50.65 ± 9.78	13.89[a]	<0.001

		Disease observation skills	Normal	887(57.1)	49.95 ± 6.93		
			Poor	241(15.5)	47.68 ± 6.56		
	Attitude and experience	Experience fabricating vital signs data	Yes	751(48.3)	48.24 ± 7.69	7.70	<0.001
			None	803(51.7)	51.24 ± 7.67		
		Attitudes toward fabricating vital signs data	Zero tolerance	623(40.1)	51.14 ± 9.18	18.03[a]	<0.001
			Intolerance	493(31.7)	49.92 ± 6.49		
			Subject to actual situation	399(25.7)	47.91 ± 6.36		
			Understandable	39(2.5)	45.87 ± 8.25		
		Belief that monitoring should be undertaken by junior nurses	Strongly agree	89(5.7)	42.64 ± 10.06	45.63[a]	<0.001
			Agree	366(23.6)	47.38 ± 7.32		
			Disagree	867(55.8)	50.59 ± 6.78		
			Totally disagree	232(14.9)	53.36 ± 8.46		
		Experience of delayed off-duty because of monitoring work	Yes	1012(65.1)	49.03 ± 7.74	5.29	<0.001
			None	542(34.9)	51.21 ± 7.77		
		Experience of delayed resuscitation because of untimely detection of changes in vital signs	Yes	316(20.3)	47.21 ± 8.02	6.66	<0.001
			None	1238(79.7)	50.45 ± 7.63		
		Relevant training experience	Yes	874(56.2)	50.28 ± 8.27	2.86	0.004
			None	680(43.8)	49.16 ± 7.16		
Organizational environmental factors	Tool support	Application of assessment tools	Not used	975(62.7)	49.38 ± 7.46	2.63	0.01
			Used	579(37.3)	50.49 ± 8.36		
		Whether the monitoring tools meet the needs	Unsatisfied	1478(95.1)	49.60 ± 7.73	4.33	<0.001
			Satisfied	76(4.9)	53.55 ± 8.58		
		Does the monitoring tool automatically generate early warning signs of changes in vital signs	Unsatisfied	1461(94.0)	49.66 ± 7.86	2.53	0.01
			Satisfied	93(6.0)	51.77 ± 6.92		

Working climate	Importance doctors placed on the reporting of abnormal physical signs	Always	552(35.5)	49.92 ± 9.32	10.56ᵃ	<0.001
		Frequently	735(47.3)	50.25 ± 7.14		
		Rarely	267(17.2)	48.25 ± 5.80		
	Complaints from colleagues	Yes	1023(65.8)	48.50 ± 7.70	9.30	<0.001
		None	531(34.2)	52.28 ± 7.44		
Management system	Supervision of departmental managers	Yes	1124(72.3)	50.29 ± 8.06	4.40	<0.001
		None	430(27.7)	48.47 ± 6.98		
	Supervision of hospital managers	Yes	973(62.6)	50.31 ± 8.26	3.53	<0.001
		None	581(37.4)	48.93 ± 6.94		

Note: a: Welch analysis of variance

Multiple linear regression analysis of nurses' attitudes toward vital signs monitoring

Nurses' total V-scale score was used as the dependent variable, and the 18 variables that were significant in the univariate analysis were used as independent variables. Multiple linear regression analysis was conducted using the entry method. Dummy variables were set for the multi-categorical variables, and the dummy variable settings are shown in Table 4. A total of 13 influencing factors were included in the regression model, and the results of the analysis are detailed in Table 5.

Table 4: Independent variables' assignment method in the multiple linear regression analysis.

Variables	Assignment notes
Sex	Male = 1; Female = 2
Age	Dummy variable set to "<25 years" as control
Work duration	Dummy variable set to "<5 years" as control
Job position	Dummy variable set to "responsible nurse" as control
Application of assessment tools	Yes = 1; No = 2
Disease observation skills	Dummy variable set to "better" as control
Experience fabricating vital signs data	Yes = 1; No = 0
Attitudes toward fabricating vital signs data	Dummy variable set to "zero intolerance" as control
monitoring should be undertaken by junior nurses	Dummy variable set to "strongly agree" as control
Experience of delayed off-duty because of monitoring work	Yes = 1; No = 0
Experience of delayed resuscitation because of untimely detection of changes in vital signs	Yes = 1; No = 0
Relevant training experience	Yes = 1; No = 0
Is the monitoring tool in demand	Not satisfied = 1; satisfied = 2
Monitoring tools automatically generate early warning signs of changes in vital signs	Not satisfied =1; satisfied = 2
Importance doctors placed on the reporting of abnormal physical signs	Dummy variable set to "always" as control
Complaints from colleagues	Yes = 1; No = 0
Supervision of departmental managers	Yes = 1; No = 0
Supervision of hospital managers	Yes = 1; No = 0

Table 5: Multiple linear regression analysis of factors influencing nurses' attitudes toward vital signs monitoring (n=1554).

Independent variable	Partial regression coefficient	Standard error	Standardized regression coefficients	T-value	*P*-value	95% CI Lower limit	95% CI Upper limit
Constants	25.945	2.676		9.697	<0.001	20.697	31.193
Age (years)							
26–35	−1.629	0.575	−0.086	−2.831	0.005	−2.757	−0.500
36–45	−1.040	0.800	−0.055	−1.299	0.194	−2.609	0.530
>46–55	−1.224	1.175	−0.036	−1.042	0.298	−3.528	1.080
Work duration (years)							
6–10	0.083	0.559	0.005	0.149	0.882	−1.013	1.179
11–15	0.774	0.699	0.037	1.107	0.268	−0.597	2.145
>15	2.334	1.017	0.123	2.295	0.022	0.339	4.330
Job position							
Nurse team leader	1.789	0.574	0.084	3.114	0.002	0.662	2.915
Primary care nurse	−1.357	0.787	-0.040	−1.725	0.085	−2.901	0.186
Office nurse	−0.995	1.090	-0.021	−0.912	0.362	−3.133	1.143
Chief nursing officer	0.806	0.743	0.031	1.086	0.278	−0.650	2.263
Others	1.366	0.599	0.055	2.279	0.023	0.190	2.541
Application of assessment tools	−0.807	0.375	-0.050	−2.152	0.032	−1.542	−0.071
Disease observation skills							
Normal	0.090	0.448	0.005	0.200	0.841	−0.788	0.968
Poor	−1.330	0.522	−0.062	−2.550	0.011	−2.353	−0.307
Experience fabricating vital signs data	1.184	0.393	0.076	3.013	0.003	0.413	1.956
Attitudes toward fabricating vital signs data							
Intolerance	−0.511	0.440	−0.030	−1.163	0.245	−1.373	0.351
Subject to actual situation	−1.446	0.498	−0.081	−2.900	0.004	−2.423	−0.468
Understandable	−2.615	1.173	−0.052	−2.230	0.026	−4.916	−0.315
Belief that vital signs should be undertaken by junior nurses							
Agree	3.967	0.848	0.215	4.679	<0.001	2.304	5.630
Disagree	7.190	0.806	0.457	8.920	<0.001	5.609	8.771
Totally disagree	10.057	0.892	0.458	11.281	<0.001	8.308	11.806
Experience of delayed off-duty because of monitoring work	1.140	0.385	0.070	2.957	0.003	0.384	1.896
Experience of delayed resuscitation because of untimely detection of changes in vital signs	1.762	0.452	0.091	3.897	0.000	0.875	2.649
Relevant training experience	−0.943	0.380	−0.060	−2.479	0.013	−1.689	−0.197
Whether the monitoring tools meet the needs	2.423	0.854	0.067	2.838	0.005	0.749	4.098
Complaints from colleagues	2.289	0.409	0.139	5.591	<0.001	1.486	3.092
Note: F-value =15.495, *P*<0.001							

Discussion

Strengthening nurses' awareness of disease observation is the basis for improving attitudes toward vital signs monitoring

One's attitude toward vital signs monitoring is an important factor in determining the implementation of monitoring behaviors. In this study, the respondents' mean score in the V-scale was 49.79 ± 7.82, which was higher than those of other small-sample studies in China [10] (40.05 ± 8.38) but lower than those of similar studies abroad [8]. Compared with the average score of 55.6 ± 7.7 for registered nurses and 54.1 ± 6.9 for assistant nurses in foreign countries, the level of attitudes toward vital signs monitoring of nurses in

China remains low level and has room for improvement. The survey showed that only 27.4% of the nurses thought they had better disease observation ability, and 20.3% of nurses failed to recognize changes in the patient's condition promptly leading to delays in resuscitation, indicating that clinical nurses' disease observation ability is weak, which should be improved. Nurses responsible for vital signs monitoring have better attitudes, especially the nurse team leader, than those not responsible (*P*<0.05). Responsible nurses need to provide overall patient care and should have a higher degree of concern for patients, mastery of their condition and implementation of care [12], and a stronger disease observation ability than those not responsible.

Meanwhile, the nurse team leader should make a comprehensive assessment of patients under his or her supervision, manage and supervise subordinate nurses, and have better attitudes toward vital signs monitoring. Compared with the findings of existing studies, the results of the present study revealed no significant differences in the scores of nurses' attitudes toward vital signs monitoring concerning general information such as age, education, job title, and unit level, and 43.8% of the nurses had not received training or continuing education programs related to vital signs monitoring other than institutional education. This suggests that the importance of vital signs monitoring is insufficient in clinical nurses of different units, education and working levels. Relevant institutional education and continuing education have certain deviations, focusing on operational training rather than on establishing critical thinking of nurses, which leads to nurses' failure to observe and manage changes in vital signs timely and effectively. Therefore, while teaching monitoring skills to nursing students, institutions should cultivate their sensitivity and thinking ability to recognize changes in vital signs. Units should provide nurses with training and assessment on topics such as vital signs monitoring and abnormal vital signs management and integrate relevant training into critical condition management, planning exercises, and regular rapid response team exercises to form an integrated and progressive cultivation model and to comprehensively strengthen nurses' ability to recognize changes in vital signs and improve their emergency response capabilities.

Providing convenient tools is an important means to enhance nurses' attitudes toward vital signs monitoring

The rational use of convenient monitoring tools is an effective way to reduce workload and alleviate human resource bottlenecks [13]. This survey found that criticality assessment tools and vital signs monitoring tools to meet demand were positive factors that influence nurses' attitudes toward vital signs monitoring. Nurses have an intense clinical workload in vital signs monitoring, in which up to 65.1% of nurses have experienced delayed off-duty because of vital signs monitoring and 65.8% complained that vital signs monitoring and data entry took too much time. However, the patient's condition dictates the frequency of vital signs observation, and the frequency of monitoring cannot be reduced just to ease the workload of nurses. Studies have shown that the application of intelligent vital signs collection equipment can reduce the time taken between monitoring and reduce the error rate by >20% [14], and these tools are reported to effectively reduce the burden of monitoring. The results of the big data analysis [15] show that abnormal vital signs rates are as high as 20% in emergency admissions and 10% in inpatients; thus, nurses should recognize changes in patients' conditions. The critical illness assessment tool helps nurses to quickly identify and differentiate the risk of deterioration of serious clinical events [16, 17].

The early warning score (EWS) is the most commonly used clinical assessment tool for critical illness. It uses readily available indicators such as vital signs to predict changes in patients' condition, and the clinical application of the guidelines has been developed under the promotion of foreign health care authorities [16]. The EWS has received increasing attention from scholars in China, but it has not been standardized [18]. In the present study, the automatic generation of early warning signs of the change in patients' conditions by monitoring tools was significant in the univariate analysis, but it was not included in the regression model, probably because integrated smart monitoring devices are not currently popular. The iterative update of devices is inevitable, and some companies have already developed monitoring instruments that combine vital signs monitoring with EWS functions, such as the Hillrom Connex® Vital Signs Monitor, which automatically generates EWS and automatically enters and uploads them while monitoring vital signs, thereby improving the efficiency of nurses' to observe patients' condition. Therefore, hospitals can promote the introduction of intelligent monitoring devices in clinical practice by integrating the functions of monitoring, evaluating, entering, and uploading vital signs to improve work efficiency and reduce the incidence of unexpected situations.

Creating a positive organizational climate is fundamental in improving nurses' attitudes toward vital signs monitoring

A positive work environment is an important influencing factor in enhancing nurses' self-efficacy, stimulating their intrinsic potential, and improving the quality of care [19, 20]. Many nurses considered vital signs monitoring as the domain of junior and less experienced nurses and believed that such a work arrangement would allow senior nurses to focus more on advanced nursing care [21], which is similar to the findings of this study. However, a study [22] revealed that junior nurses had a higher rate of having delays in vital signs monitoring than experienced nurses and required supervision from senior nurses. The UK EWS guidelines state [16] that nurses at all levels should be involved in vital signs monitoring based on patients' conditions and should work together in their respective roles to monitor patients' conditions and implement appropriate care. In addition, complaints from colleagues about work can affect nurses' work perceptions [23]. This can lead to negative emotions and lower motivation, creating a vicious cycle that affects the overall working atmosphere. Although the related attitudes of physicians, patients and families, and managers were not entered into the final regression model because of the overall low importance of vital signs monitoring in the clinic, in the era of medical and nursing integration, physicians, as important members of the team, should pay attention to nurses' reports of abnormal vital signs [21], cooperate, and deal with changes in patients' conditions on time. The cooperation and support of patients and their families, as the main recipients of nursing care, are effective

in improving the communication between nurses and patients, which can enhance nurses' self-confidence in their work. Management supervision and corresponding incentive mechanisms can improve the quality of work and stimulate nurses' subjective initiative [24] to enable nurses to implicitly regard vital signs monitoring as an important part of disease observation rather than a daily task. Moreover, the results of the study showed that nurses who have not fabricated vital signs and had zero tolerance for data fabrication had better attitudes toward vital signs monitoring. Therefore, managers should establish a workflow and incentive system related to vital signs monitoring, standardize nurses' daily vital signs monitoring behaviors and disease observation, encourage nurses to strengthen the dynamic assessment of patients' vital signs, ensure the authenticity of patients' vital signs data on each shift, reduce the number of fabricated data, and create a good organizational atmosphere through the consensus of nurses, doctors, patients, families, and management on the importance of vital signs monitoring. Thus, a good organizational atmosphere can be created and thereby improves nurses' attitudes toward vital signs monitoring and enhance the quality of monitoring.

Summary

Vital signs monitoring is a repetitive, tedious, basic, and important nursing task. The findings of this study suggest that the overall level of clinical nurses' attitudes toward vital signs monitoring is low and that monitoring is not valued by the unit or individual nurses and is related to individual differences among nurses, experience, organizational support, and work climate. However, this study has some limitations. First, convenience sampling was used, which is not random enough. Second, the self-assessment questionnaire, which is mainly based on recall, may have some reporting bias. Thus, future studies should comprehensively examine methods to improve nurses' attitudes toward vital signs monitoring based on the clues obtained to enhance nurses' ability to observe and respond to emergencies and to improve the quality of vital signs monitoring.

Conflict of interest

The authors have no conflict of interest in any institution or social group.
Please check the complete questionnaire on:
https://www.wjx.cn/vj/hWcIdZ0.aspx

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