❖ RESEARCH PAPER ❖

Nurse–physician collaboration impacts job satisfaction and turnover among nurses: A hospital-based cross-sectional study in Beijing

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This study aims to explore the impact of physician–nurse collaboration on nurse job satisfaction and turnover in a dental hospital. Physician–nurse collaboration is important for the stability of the entire nursing team. Few studies have shown the impact on job satisfaction and turnover among nurses working in Chinese dental hospitals. This was a prospective, cross-sectional study and investigated nurses from a tertiary dental hospital in Beijing using convenience non-randomized sampling. A structured questionnaire was used to collect data, which included general information, the Index of Work Satisfaction, the Nurse–Physician Collaboration Scale and the Turnover Intention Scale. The scores of physician–nurse collaboration correlated positively with those for job satisfaction and negatively with the stated likelihood of turnover intention. Physician–nurse collaboration scores positively predicted job satisfaction and negatively predicted the likelihood of quitting the current job. In conclusion, improving the level of physician–nurse collaboration is helpful to enhance job satisfaction and reduce turnover among nurses in a dental hospital.

Key words: interprofessional collaboration, nurse, physician, satisfaction, turnover intention.

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INTRODUCTION

Nurse–physician collaboration is defined as an interpersonal and interprofessional relationship in which nurses and physicians share work-related goals and responsibilities for

outcomes.[1,2] Open communication, respect for different perspectives, equal decision-making capacity and responsibility for problem-solving and patient care management are the hallmarks of successful collaboration.[1,3] In China, historically, interactions between physicians and nurses were hierarchical, similar to this phenomenon worldwide.[4–6] Negative attitudes, hostile and destructive behaviours persist among health-care teams, especially between the physicians and nurses.[6] Studies have reported that poor physician–nurse cooperation could result in job dissatisfaction, a lack of autonomy, higher possibility of intention to leave and poor health.[4,7–11] A study found that in the past 2 years, nurse job satisfaction reduced while the turnover rate increased,[12] which greatly influenced the stability of the nursing team.

As global health providers have begun to pay attention to nurse–physician collaboration, Chinese medical systems have tried to follow the same trend. Currently, directed by the concept of 'medical-care integration' of the National Health and Family Planning Commission of the People's Republic of China (NHFPC), hospital managers are trying to find effective ways to reconcile the contributions of both parties during collaboration.[13] Nurse–physician collaboration requires recognizing a common purpose and the mutual responsibilities and duties required to deliver effective, safe, high-quality and efficient care.[14]

To our knowledge, most studies about physician–nurse collaboration have focused on general hospitals in China,[6] and many of them have surveyed attitudes rather than behaviours. Few studies have been conducted to explore nurse–physician cooperation in specialized hospitals, for example, dental hospitals. Physicians in dental hospitals are more inclined to view nurses as dental assistants, who actually do not need much nursing skill. Nurses working in dental hospitals usually find themselves trapped in a 'double-identity' as a registered nurse and a dental assistant, which are two independent professions in most Western countries. Nurses often feel frustrated and exhausted because they do not have enough dental knowledge and skills to fulfil the job, and their work only occasionally entails conventional nursing, such as providing first aid, monitoring vital signs and delivering injections or infusions. Physicians' views of the nurses' situation probably creates tension between the two groups; this experience may have powerful negative effects on nurses' turnover and job satisfaction and finally influence the stability of the entire nursing team.

In view of limited research, our study aimed at evaluating the status of nurse–physician collaboration and its impact on job satisfaction and intention to leave among nurses working in a major dental hospital.

METHODS
Design

This was a prospective, cross-sectional study.

Setting and participants

This study sampled nurses of a major dental hospital in Beijing. Directed by the NHFPC, it is currently the largest international medical institution offering oral outpatient medical service in the world. It includes 545 medical chairs, 157 beds, 15 clinical departments, 7 medical departments and 5 subordinate medical units. All nurses working in these units between December 2014 to February 2015 were invited to participate provided they met the following inclusion criteria: registered nurses who had worked for at least 1 year in the hospital and had completed the relevant training and passed the exams; nurses who worked in units where physicians and nurses were required to collaborate, such as the Endodontics, Prosthodontics and Periodontics Departments. All these departments used the 'four-handed' technique (defined as chairside assistant mixing dental materials, exchanging instruments or providing oral evacuation during dental procedures) and therefore required close physician–nurse collaboration.

Structured questionnaires were printed and distributed to included departments, and eligible nurses were invited to complete these self-administered questionnaires during their weekly meetings. Only fully completed questionnaires were defined as valid data. All participants were ensured anonymity, as findings were reported as aggregate data only.

In total, 592 of the 804 nurses were surveyed; 212 nurses were employed in departments that did not involve physician–nurse collaboration and were therefore excluded. In total, 572 (96.6%) nurses returned questionnaires, of which 545 (95.3%) were complete and valid.

Measuring instruments

The questionnaire consisted of items involving nurses' demographic data, including gender, age, nursing rank, highest nursing education, marital status and years of working experience. The Nurse–Physician Collaboration Scale (NPCS), the Index of Work Satisfaction (IWS) and the Turnover Intention Scale (TIS) were included.

Physician–nurse collaboration was assessed by the NPCS, which was developed by Rei Ushiro.[15] It measures three parameters: 'sharing of patient information', 'joint participation in the cure/care decision-making process' and 'cooperativeness'. The items used 5-point Likert responses reverse scaled for frequency ('always' as 1, 'usually' as 2, 'sometimes' as 3, 'rarely' as 4, and 'never' as 5). Higher scores indicated higher levels of collaboration; total and mean scores of each parameter were calculated. The NPCS was translated into Chinese by Chen *et al.*[16] resulting in a 21 item Chinese version after factor analysis, with Cronbach's α scores of 0.946 (nurses) and 0.947 (physicians); the *r* values of the test-retest reliability correlation were all 0.63 or above. The Chinese version of NPCS was demonstrated as suitable for measuring nurse–physician collaborative activity in a Chinese medical context.

The IWS was developed by Stamps *et al.*[17] and used to measure the work satisfaction of nurses. This study used Part B of the IWS in the Chinese version translated by Wu *et al.*[18]; Cronbach's α value was 0.920, and *r* values of the test-retest reliability correlations were 0.840, 0.818, 0.813, 0.801, 0.851 and 0.821 for each of the six parameters (pay, autonomy, task requirement, organizational policy, interaction and professional status). IWS's items used 5-point Likert response scales (scoring 'strongly disagree' as 1, 'partly disagree' as 2, 'not sure' as 3, 'partly agree' as 4 and 'strongly agree' as 5); higher scores represented greater satisfaction. Total and mean scores of each parameter were calculated.

The six-item TIS developed by Michaels *et al.*[19] was used to measure nurses' intention to leave. Items were scored using 4-point Likert reverse-scored responses (scoring 'always' as 4, 'often' as 3, 'occasionally' as 2 and 'never' as 1); higher scores indicated stronger turnover intention. Items 1 and 6 combined as turnover intention I, indicating probability of resignation; items 2 and 3 combined as turnover intention II, indicating motivation to search for other jobs; items 4 and 5 combined as turnover intention III, indicating probability of obtaining a new job; the higher the scores, the stronger the intention. The Chinese version of the scale was translated by Lee[20] producing Cronbach's α 0.920 and content validity 67.67%.

Statistical analysis

SPSS version 17.0 (Chicago, IL, USA) was used to perform the statistical analysis. Descriptive statistics including percentages, frequencies and tables were used to measure nurses' demographic data, the NPCS, the IWS and the TIS. Pearson correlation analysis was used to analyse relationships between scores for the NPCS, IWS and TIS. In order to explore correlations among the NPCS, IWS and TIS, multiple linear stepwise regression analysis was used with the NPCS as an independent variable and the IWS and TIS as dependent variables. All *P*-values < 0.05 were regarded as statistically significant.

Ethical considerations

The study proposal was approved by the Biomedical Institutional Review Board, School and Hospital of Dental, Peking University. The survey was strictly anonymous to protect nurses' privacy and participants' supplied informed consent.

RESULTS

Participant characteristics are set out in Table 1.

NPCS, IWS and TIS scores

Average scores of the three parameters of the NPCS were, in descending order, sharing of patient information, cooperativeness and joint participation in cure/care decision-making processes. The six parameters of the IWS mean scores ranked in descending order were interaction, autonomy, task requirement, professional status, organizational policy and pay. The three parameters of the mean scores of the TIS, ranked in descending order, were turnover intention III, I and II: probability of obtaining a new job; probability of resignation; and motivation to search for other jobs (Table 2).

Relationships between the NPCS, IWS and TIS

Pearson correlation analysis was used to examine relationships between NPCS and IWS and NPCS and TIS. We found that NPCS scores showed significant positive correlation with IWS total scores and scores of each of the parameters (*P*-value < 0.001) and showed a negative correlation with TIS and turnover I and II (*P*-value < 0.001, Table 3). The multiple linear stepwise regression analysis showed that NPCS positively predicted IWS total score, task requirement, interaction and turnover intention I (*P*-value range from < 0.001 to 0.014, Table 4).

Table 1 Participant profile (N = 545)

	N (%)
Gender	
Female	541 (99.3)
Male	4 (0.7)
Age (years)	
19–29	394 (72.3)
30–39	107 (19.6)
≥40	44 (8.1)
Level of education	
Secondary vocational school	46 (8.5)
3-year college	282 (51.9)
Bachelor diploma	211 (38.9)
Master degree	6 (1.1)
Rank	
Registered nurse	450 (82.6)
Primary nurse	41 (7.5)
Group leader nurse	42 (7.7)
Head nurse	12 (2.2)
Years of hospital-based experience	
1–5	271 (49.7)
6–9	153 (28.0)
≥10	121 (22.2)

DISCUSSION
Nurses' work satisfaction and turnover intention need to be improved

In our findings, there was a gradation in parameters of work satisfaction running from highest to lowest for mutual cooperation, autonomy, job tasks, occupational status, organizational decisions and income. This result was in accordance with other studies[6]: interactive cooperation scored highest and rated 75.06% but needed further improvement. Income was the lowest-scoring parameter and rated only 44.03%, which was similar to other studies.[6,21,22] Compared with the other hospital departments or other professionals, nurses' current income was relatively lower, and findings indicated that the nurses in the dental hospital were not satisfied with the current income distribution system.

The turnover intention total score was relatively high at 24 points. Current hospital managers focus on the shortage of nurses resulting from nurses leaving their positions. Because of the shortage of nurses in developed countries, workforce losses in China in recent years have been serious, further worsening the nursing shortages. In addition to the lack of nursing human resource, nursing shortage is also thought to have caused a series of further negative impacts. For example, long-term hospital investment has not favoured clinical nurses. Short-term lack of nursing

Table 2 Nurses' scores for NPCS, IWS and TIS ($\bar{x}\pm$SD)

Parameters	Full score	Total score	Mean score	Rank
NPCS	105	86.46 ± 14.52	4.11 ± 0.69	—
Sharing of patient information	40	34.15 ± 5.14	4.26 ± 0.64	1
Joint participation in the cure/care decision-making process	50	39.74 ± 8.12	3.97 ± 0.80	3
Cooperativeness	15	12.52 ± 2.43	4.16 ± 0.82	2
IWS	220	136.08 ± 14.88	3.09 ± 0.34	—
Pay	30	13.21 ± 3.93	2.20 ± 0.65	6
Autonomy	40	26.33 ± 4.27	3.29 ± 0.53	2
Task requirement	30	18.54 ± 2.57	3.09 ± 0.43	3
Organizational policy	35	20.94 ± 3.85	2.99 ± 0.55	5
Interaction	50	37.53 ± 5.69	3.75 ± 0.57	1
Professional status	35	21.25 ± 3.67	3.04 ± 0.52	4
TIS	24	20.31 ± 3.67	3.39 ± 0.61	—
I	8	6.35 ± 1.52	3.17 ± 0.76	2
II	8	6.20 ± 1.61	3.10 ± 0.80	3
III	8	7.74 ± 1.22	3.87 ± 0.61	1

IWS, Index of Work Satisfaction; NPCS, Nurse–Physician Collaboration Scale; TIS, Turnover Intention Scale.

Table 3 Pearson correlation analysis of total scores of NPCS with IWS and TIS

	r-value	*P*-value
IWS total score	0.528	< 0.001
Pay	0.572	< 0.001
Autonomy	0.487	< 0.001
Task requirement	0.677	< 0.001
Organizational policy	0.628	< 0.001
Interaction	0.597	< 0.001
Professional status	0.634	< 0.001
TIS	−0.620	< 0.001
I	−0.678	< 0.001
II	−0.500	< 0.001
III	−0.026	0.569

IWS, Index of Work Satisfaction; NPCS, Nurse–Physician Collaboration Scale; TIS, Turnover Intention Scale.

manpower has caused instability among on-the-job nurses, with lower job satisfaction and diminished work efficiency. Hiring other registered nurses to supplement existing staff affected nursing work conditions: training newly hired nurses required expenditure in terms of time, manpower, material and financial resources, with the medical institutions shouldering additional economic burden. Nurses on-the-job had to work overtime resulting in work overload, because of the lack of nursing manpower.[18,23] Altogether, this resulted in decreased patient satisfaction.

In China, tremendous changes have occurred since the reform and opening-up policy, which have improved people's living standards. The public's view of oral health has also changed, with increased attention. The number of dental clinics or hospitals has grown rapidly in proportion to the size of the public demand, requiring additional skilled dental professionals. However, the nurses' role in Chinese dental hospitals is different to that in general hospitals. These nurses usually work as clinical dental assistants, primarily with the physician (dentist) using four-handed dentistry techniques, or providing an extra pair of hands as needed throughout the clinical areas of the practice (as circulating assistant, working in seating and dismissing patients and preparing and caring for instruments and treatment rooms), referred to as six-handed dentistry.[24] In China, however, 'dental assistant' is not included in the skilled occupation lists in medicine because the education system does not provide a relevant training programme. Most nurses working in dental hospitals have little dental education background before they begin their career. They must be a registered nurse initially but in order to deliver clinical collaboration, they are expected to undergo continuing educational programmes designed by the hospitals from the beginning. Systematic and standardized training programmes need to be improved because of poor learning outcomes.[21]

The results in our study were not promising. Nurses working in this dental hospital reported low levels of job satisfaction and high turnover intention, suggesting a high risk of departure. This situation was not conducive to the stability of nursing teams, underscoring the need to improve overall job satisfaction among nurses and warranting the attention of relevant nursing managers for this.

Improvement of nurse–physician cooperation to potentially improve job satisfaction and decrease the turnover intention

The results showed that nurses' NPCS score required improvement. The parameter 'sharing of patient information'

Table 4 Multiple linear stepwise regression analysis; prediction of IWS and TIS by NPCS scores

Variable	B-value	*SE*	*β*-value	*t*-value	*P*-value
Constant[†]	1.569	0.283	—	5.534	< 0.001
IWS total score[†]	0.383	0.133	0.194	2.871	0.004
Task requirement[†]	0.218	0.089	0.156	2.455	0.014
Interaction[†]	0.183	0.068	0.136	2.697	0.007
Constant[‡]	4.903	0.131	—	37.535	< 0.001
TIS I[‡]	−0.246	0.040	0.129	−6.209	< 0.001

[†]Model formula 1: $F = 27.941$, $P < 0.001$; $R = 0.406$, $R^2 = 0.165$. [‡]Model formula 2: $F = 28.551$, $P < 0.001$; $R = 0.475$, $R^2 = 0.275$.

IWS, Index of Work Satisfaction; NPCS, Nurse–Physician Collaboration Scale; TIS, Turnover Intention Scale.

scored the highest suggesting that cooperation ranked highest for patient information exchange between nurses and physicians in the hospital. 'Joint participation in the cure/care decision-making process' scored lowest, probably because of the dental assistant role played by registered nurses, which requires a different educational background or educational input. Physicians have been reported as thinking that nurses do not possess adequate professional dental knowledge and skills, and that therefore, the therapeutic role was 'the business of physician', limiting communication between the two parties in terms of decision-making.

We found in this study that physician–nurse relationships correlated positively with job satisfaction, namely, higher nurse–physician cooperation was associated with higher job satisfaction. It correlated negatively with turnover intention, with higher degrees of nurse–physician cooperation relating to greater stability of the nursing team. Simultaneously, it positively affected job satisfaction and its two parameters and negatively predicted the likelihood of leaving the current job (turnover intention I). The foregoing analysis suggests the need for measures to improve nurses' job satisfaction and hence their desire to remain employed. Improvement of physician–nurse collaboration can potentially contribute to increase job satisfaction and decrease likelihood of departure.

Healthcare managers should recognize the factors underlying physician–nurse collaboration and implement effective measures to improve this. Effective communication between the two parties is essential to develop harmonious working relationships.[1] Most of the nurses in the dental hospital worked in the outpatient department cooperating with the physician via 'four-handed technique', with a more direct route to communicate with physicians than nurses working in comprehensive hospitals or medical–surgical wards.[25–27] Trust and respect are important in the development of nurse–physician relationships,[27,28] and other factors such as understanding professional roles, task prioritizing and unequal power also affect collaboration behaviours between the groups.[27] Current strategies with potential to enhance physician–nurse collaboration include inter-professional educational programmes and interdisciplinary ward rounds.[26,29,30] Managers should implement proactive efforts to create a healthy, harmonious and autonomous professional working ambience.

Limitations

This study was based on data collected in one major dental hospital in Beijing, suggesting possible sampling bias. It may not be representative of the dental nursing population in China or of nurses working in other provinces. Nevertheless, our study surveyed the largest international dental institution in the world, comprising the largest dental nursing population in China.

CONCLUSION

Cooperation is defined as a team of people working for a common goal.[31] Nurses and physicians are important professionals in the health-care system. Our findings suggested that physician–nurse collaboration, job satisfaction and turnover were not optimal among Chinese dental hospital nurses. Policymakers and managers in the medical and educational system should emphasize collaboration between nurses and physicians in the dental area, for example, organizing cooperative training of nursing and medical personnel to share work experience as well as designing collaborative curricula for nursing and medical students to strengthen team work. In addition, relevant educational departments should emphasize design of improved professional dental nursing education and on-the-job training system, to meet nurses' clinical needs in dentistry and to promote overall nursing care quality, job satisfaction and reduced turnover in dental hospitals.

By improving the level of nurse–physician cooperation, increasing job satisfaction, reducing turnover and laying the foundation for a stable nursing team, dental hospitals will benefit in terms of retaining talent in the face of the fierce competition of the global labour market.

CONFLICT OF INTEREST

None of the authors has a conflict of interest with respect to the authorship and/or publication of this article.

ETHICAL APPROVAL

The research project was approved by the Biomedical Institutional Review Board, School and Hospital of Stomatology, Peking University.

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