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Analysis of the Current Situation and Influencing Factors of Touch Comfort Among Intensive Care Unit Nurses

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Objective: To investigate the current situation of the touch comfort of nurses in the intensive care unit (ICU) of Grade A tertiary hospitals and analyse its influencing factors, to provide a basis for formulating intervention programmes.

Methods: In August 2022, 343 nurses in the ICUs of eight tertiary-level hospitals in Shijiazhuang City, Hebei Province were surveyed, and the current situation of nurses' tactile comfort and the factors affecting it in the ICU were analysed using the Nurses' General Information Questionnaire, Nurses' Touch Comfort Scale, Nurses' Humanistic Qualities Self-Assessment Scale and Nursing Work Environment Scale.

Results: The mean score for the tactile comfort of ICU nurses was (5.16±1.25). Staffing, ICU nurses' family support, nursing work environment and nurses' humanistic qualities were positively correlated with ICU nurses and tactile comfort, whereas job title was negatively correlated with ICU nurses and tactile comfort.

Conclusion: The touch comfort of nurses in ICUs is good, and the physiological dimension is at the medium level. Nursing managers could take comprehensive measures to strengthen the cultivation of nurses' humanistic quality, improve the nursing working environment in the ICU, improve nurses' touch comfort and promote the improvement of nursing service.

Keywords: intensive care unit, nurses, comfort with touch, the nursing work environment, nurses' humanistic quality self-assessment scale, influencing factors

Introduction

The intensive care unit (ICU) serves as a specialised setting dedicated to the concentrated surveillance and treatment of critically ill patients, with the quality of ICU care directly influencing patient clinical outcomes. Research indicates that high-quality ICU care markedly lowers patient mortality, shortens hospital stays and decreases the incidence of complications. Interaction between nurses and patients is indispensable in the intricacies of nursing care in the ICU, and touch therapy, a method of tactile massage that treats illnesses and promotes health through manipulation, is a basic and essential method of nursing care.[1] Touch not only facilitates effective treatment and alleviates pain, thereby promoting physical comfort, but it also represents the simplest and most direct form of comfort care that nurses can provide to patients, helping to ease their tension, anxiety and depression.[2–4] Increasing nurses' comfort with touch can improve the quality of care. Comfort touch is the emotional experience of providing touch without anxiety or worry; it is a silent way of communicating care, hope, strength and humanity to critically ill patients.[5,6] The significance of touch for patients lies in its impact as a non-verbal communication method on their physiological and psychological states, such as pain relief and anxiety reduction. Although these two concepts of touch and comfort touch overlap and are intrinsically related, they fundamentally differ, with the former focusing on the subjective feelings of the nurse and the latter centring on the objective responses of the patient. Whether touch is perceived as comfortable can influence the nurse's therapeutic

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care practices, thereby affecting the quality and frequency of touch care provided to patients.[7] Moreover, the act of touching impacts nurses' sense of professional value and identity, and it can be detrimental to establishing a positive nurse–patient relationship.[8] To date, surveys on nurses' comfort with touch have been conducted among various nurse groups, including those in oncology, infectious disease and paediatric departments, as well as nursing interns. A survey of oncology nurses showed a high level of comfort with touch but indicated that some nurses still need psychological support.[9–12] However, research on ICU nurses' comfort with touch is limited, with few studies considering factors such as nurses' humanistic literacy and the nursing work environment.

Being critically ill and having limited external contact, ICU patients tend to exhibit an increased need for touching from nurses. Studies by Yekefallah et al[13] demonstrated that therapeutic touch is associated with improvements in consciousness and vital signs in adults with traumatic brain injuries, while research by Tracy et al[14] indicated that touch can reduce anxiety in mechanically ventilated adults. Enhancing nurses' comfort with touch can lead to the provision of higher quality and more considerate care for patients.

The present study aims to investigate the current status of ICU nurses' comfort with touch and analyse its influencing factors, with the aim of providing a reference for enhancing nurses' willingness to touch patients and ensuring the quality of nursing services.

Participants and Methods

Participants

This study utilised a purposive sampling method to selectively choose research participants who were able to provide a wealth of information and had specific experience and knowledge.[15] High summer temperatures lead to an increase in the number of ICU patients, and nurses work under increased stress, with seasonal factors significantly affecting touch comfort. Initially, nurses working in the ICUs of eight Grade A tertiary hospitals in Shijiazhuang City, Hebei Province during August 2022 were selected as the participants. Subsequently, all on-duty nurses meeting the inclusion criteria in each hospital's ICU were invited to participate in the survey. During the survey period, researchers explained the study's purpose and methods to potential participants, and upon obtaining consent, questionnaires were distributed to a total of 368 nurses. The inclusion criteria were as follows: (1) on-duty registered nurses working in the ICU; (2) possessing a nursing qualification certificate; (3) having undergone specialised ICU training and passed the assessment; (4) working in the ICU for 1 year or more; and (5) providing informed consent with voluntary participation in the study. The exclusion criteria were as follows: (1) nurses temporarily transferred to work in the ICU; (2) nurses undergoing training or internships in the ICU; (3) nurses with severe physical or mental illnesses unable to complete the survey; and (4) nurses refusing to participate in the study. The study was approved by the ethics committee of our hospital.

Methods

Survey Instruments

(1) Nurse Demographic Questionnaire: This questionnaire includes various aspects of the nurses' personal information, including age, gender, years of experience in the ICU, educational background, professional title, marital status, position, children status, authorised strength status and family support.

(2) Nurse Comfort with Touch Scale: Developed by Pedrazza et al,[16] with a Cronbach's alpha (α) coefficient of 0.966, this scale measures the level of comfort nurses feel when touching patients. It comprises four dimensions: physiological comfort (5 items), task-oriented contact (3 items), comforting support (5 items) and personal care (4 items), totalling 17 items. In the survey, a Likert 7-point rating scale was used, ranging from very uncomfortable (1 point) to very comfortable (7 points), with total scores ranging from 17 to 119. An average item score of <2 indicates very poor comfort, 2–2.9 indicates poor comfort, 3–4.9 indicates moderate comfort and ≥5 indicates good comfort.

(3) Nursing Work Environment Scale: Developed by Shao J et al,[17] with a Cronbach's α coefficient of 0.946, this scale includes seven dimensions: leadership and management (4 items), professional development (5 items), recognition atmosphere (3 items), nurse–physician relationship (4 items), basic guarantees (3 items), professional autonomy (4 items) and adequate staffing (3 items), totalling 26 items. In the survey, a Likert 4-point rating scale was used, ranging from

strongly disagree (1 point) to strongly agree (4 points), with total scores ranging from 26 to 104. Higher scores indicate a better work environment.

(4) Self-Assessment Scale of Nurses' Humanistic Quality: Developed by Zhang Yi et al,[18] with a Cronbach's α coefficient of 0.982, this scale includes six dimensions and 54 items, including cultural knowledge and aesthetics (11 items), interpersonal interaction (14 items), responsibility (10 items), psychology (8 items), communication (7 items) and support maintenance (4 items). The survey was conducted using a 5-point Likert scale ranging from 1 to 5 points per entry, with total scores ranging from 54 to 270. Higher scores indicate a higher humanistic quality of nurses. Nurses' humanistic quality includes the comprehensive qualities of humanistic knowledge, spirit and care demonstrated in nursing practice, including cultural knowledge and aesthetics, interpersonal interaction, sense of responsibility, psychological quality, communication skills and support maintenance abilities.

Survey Method

This study was conducted using Questionnaire Star (https://questionstar.com/), with anonymous participation based on the principle of voluntary and truthful completion. Specific procedures included organising a training meeting by the research team before the survey to clarify the purpose, methods and precautions. Trained researchers were responsible for distributing and collecting questionnaires. Before the survey commenced, the principal investigator contacted the head nurses of ICUs in various hospitals to explain the study's purpose and gain support. Researchers distributed questionnaires on-site in each ICU and addressed participants' questions.

It was ensured that sample size calculations were adapted to the ICU environment, considering the complexity of the condition and treatment, as well as ICU-specific variability and influencing factors. This ensured the accuracy and reliability of the statistical results. In terms of the sample size determination method, based on the scale with the most items (54), at least 270 questionnaires (54*5) were required.[19] Considering that this was a cross-sectional survey using linear regression analysis, the formula $n = Z^2\sigma^2/e^2$ was applied with a confidence level of 95%. This yielded Z=1.95, e=5% and σ^2 =0.25. Based on these calculations, a sample size of 300 was determined. To account for a potential 20% non-response rate, it was projected that 360 questionnaires would need to be distributed. In the actual process of the survey, 368 questionnaires were distributed, and 343 valid questionnaires were collected, resulting in an effective response rate of 93.21%.

Statistical Methods

All data were statistically analysed using SPSS 22.0 software (SPSS Inc., Chicago, IL, USA). Enumeration data were presented as counts and percentages, whereas measurement data were expressed as mean ± standard deviation. Statistical methods such as *t*-tests, one-way analysis of variance, Pearson correlation analysis and multiple linear regression analysis were employed. For categorical variables (eg professional title, authorised strength), the dummy variable method was used to include them in the multiple linear regression model. In the multiple linear regression analysis, age was included as a control variable to adjust for potential confounding effects, in addition to variables that were statistically significant in univariate analysis. A significance level of $P \leq 0.05$ was used to indicate a statistically significant difference.

Results

Current Status of Intensive Care Unit Nurses' Comfort with Touch, Nursing Work Environment and Humanistic Quality

The total score for ICU nurses' comfort with touch was 87.74±21.25, with an average item score of 5.16±1.25. The highest scores were observed in the task-oriented contact dimension, whereas the lowest scores were in the physiological comfort dimension. The total score for nurses' humanistic quality was 208.71±41.47, with an average item score of 3.87 ±0.77. The highest scores were in the communication dimension, whereas the lowest scores were in the responsibility dimension. The total score for the nursing work environment was 77.04±34.18, with an average item score of 2.96±1.31. The highest scores were in the recognition atmosphere dimension, whereas the lowest scores were in the adequate staffing dimension. See Table 1 for the detailed results.

Table 1 Comfort with Touch and Humanistic Quality Scores by Dimension (n=343)

Item	Total Score	Average Item Score
Total Comfort with Touch Scale	87.74±21.25	5.16±1.25
Physiological Comfort	24.45±7.11	4.89±1.42
Task-oriented contact	15.94±3.96	5.31±1.32
Comforting support	26.30±6.32	5.26±1.26
Personal care	20.55±5.68	5.14±1.42
Total Nurses' Humanistic Quality Scale	208.71±41.47	3.87±0.77
Cultural knowledge and aesthetics	41.75±7.97	3.80±0.72
Interpersonal interaction	55.25±11.67	3.95±0.83
Responsibility	37.82±8.85	3.78±0.89
Psychology	31.18±7.13	3.90±0.89
Communication	27.63±6.45	3.95±0.92
Support maintenance	15.61±3.72	3.90±0.93
Nursing Work Environment	77.04±34.18	2.96±1.31
Professional development	15.90±4.25	3.18±0.85
Leadership and management	12.48±3.96	3.12±0.99
Nurse-physician relationship	13.64±5.48	3.41±1.37
Recognition atmosphere	10.41±4.50	3.47±1.50
Professional autonomy	12.16±4.28	3.04±1.07
Basic guarantees	8.64±2.49	2.88±0.83
Adequate staffing	8.49±2.19	2.83±0.73

Comparison of Comfort with Touch Among Intensive Care Unit Nurses with Different Characteristics

The factors influencing the comfort with touch of nurses, including professional title, authorised strength status and family support, showed statistically significant differences ($P<0.05$), as shown in Table 2. No significant differences were observed in the comfort with touch scores among ICU nurses of different genders, ages, years of working in the ICU, marital status, educational level, position and child rearing status (all $P>0.05$).

Correlation Analysis Between Nursing Work Environment, Nurses' Humanistic Literacy and Comfort with Touch

The Pearson correlation analysis conducted on the ICU nurses' nursing work environment, humanistic literacy and comfort with touch revealed that the overall comfort with touch score and the scores across its dimensions positively correlated with all dimensions of the nursing work environment, with correlation coefficients ranging from 0.275 to 0.844 ($P<0.01$). Similarly, the overall comfort with touch score and the scores across its dimensions were positively correlated with all dimensions of nurses' humanistic literacy, with correlation coefficients of between 0.452 and 0.886 ($P<0.01$), as shown in Table 3.

Multiple Linear Regression Analysis of Intensive Care Unit Nurses' Comfort with Touch

The dependent variable was the comfort with touch scale score, and the independent variables included the nursing work environment score, nurses' humanistic literacy score and general information from the ICU nurses that showed statistical significance in the univariate analysis. These factors underwent multiple linear regression analysis. The variables entered into the regression equation included professional title, authorised strength status, family support, nursing work environment and nurses' humanistic literacy. The analysis indicated that the nursing work environment, nurses' humanistic literacy, family support and professional title (with nurses serving as the reference group for dummy

Table 2 Comfort with Touch Scores for ICU Nurses with Different Characteristics (n=343)

Item		Mean comfort With Touch Scores	Statistics	
Gender			1.104	0.271
Male	52	4.99±1.33		
Female	291	5.19±1.23		
Age group			1.205	0.308
≤25	55	5.21±1.42		
26–35	206	5.09±1.28		
36–45	74	5.25±1.06		
>45	8	5.86±0.72		
Years of service			1.472	0.222
1–2	55	5.33±1.33		
2–5	54	4.86±1.38		
5–10	126	5.22±1.16		
>10	108	5.16±1.23		
Marital status			0.554	0.575
Married	235	5.21±1.21		
Single	108	5.07±1.34		
Educational level			0.292	0.831
Junior college and below	39	5.22±1.21		
Bachelor's degree	302	5.15±1.26		
Master's degree	2	5.53±1.00		
Professional title			3.226	0.013
Nurse	29	5.60±1.24		
Nurse practitioner	135	5.31±1.29		
Nurse-in-charge	162	4.92±1.21		
Associate chief physician	15	5.49±0.95		
Chief nurse	2	5.29±0.66		
Position			1.092	0.353
General nurse	262	5.15±1.27		
Primary nurse supervisor	62	5.08±1.32		
Head nurse	19	5.50±0.57		
Child status			−0.304	0.761
No	140	5.14±1.33		
Yes	203	5.18±1.19		
Authorized strength			−2.349	0.019
No	275	5.08±1.26		
Yes	68	5.48±1.15		
Family support			−2.540	0.012
No	14	4.34±1.68		
Yes	329	5.20±1.22		

variables) were the primary factors affecting ICU nurses' comfort with touch (all $P<0.05$). Title was negatively correlated with nurses' touch comfort, a result that is contrary to the findings obtained by Huang Zhen et al.[20] The results of the multiple linear regression analysis are shown in Table 4.

Discussion

Better Comfort with Touch Among Intensive Care Unit Nurses

The results shown in Table 1 indicated that ICU nurses scored an average comfort with touch score of 87.74±21.25, with an item mean score of 5.16±1.25, suggesting a relatively high level of comfort with touch. This score is higher than the

Table 3 Correlation Analysis Between Nursing Work Environment, Nurses' Humanistic Literacy, and Comfort with Touch

	Comfort With Touch	Personal Care	Comforting Support	Task-Oriented Contact	Physiological Comfort
Support maintenance	0.886***	0.779***	0.510***	0.630***	0.624***
Communication	0.833***	0.730***	0.490***	0.664***	0.619***
Psychology	0.737***	0.624***	0.482***	0.520***	0.538***
Responsibility	0.842***	0.757***	0.519***	0.616***	0.651***
Interpersonal interaction	0.817***	0.786***	0.462***	0.621***	0.622***
Interpersonal interaction	0.819***	0.821***	0.452***	0.608***	0.628***
Adequate staffing	0.815***	0.844***	0.397***	0.619***	0.577***
Basic guarantees	0.506***	0.450***	0.575***	0.458***	0.456***
Professional autonomy	0.566***	0.480***	0.538***	0.505***	0.531***
Recognition atmosphere	0.500***	0.446***	0.504***	0.505***	0.503***
Nurse-physician relationship	0.442***	0.355***	0.533***	0.468***	0.469***
Leadership and management	0.725***	0.760***	0.275***	0.520***	0.478***
Professional development	0.663***	0.539***	0.488***	0.572***	0.609***

Note: ***$p<0.01$.

Table 4 Multiple Linear Regression Analysis on ICU Nurses' Comfort with Touch (n=343)

	Unstandardized Coefficients		Standardized Coefficients	*t*	*p*	Collinearity Diagnosis	
	B	Standard error	*Beta*			VIF	Tolerance
Constant	0.104	0.024	–	4.265	<0.000	–	–
Nursing work environment	0.016	0.000	0.481	107.865	<0.001	1.932	0.518
Nurses' humanistic literacy	0.017	0.000	0.650	155.426	<0.001	1.699	0.589
Associate chief physician and Above	−0.023	0.020	−0.005	−1.157	0.248	1.608	0.622
Nurse-in-charge	−0.042	0.013	−0.020	−3.178	0.002	3.694	0.271
Nurse practitioner	0.015	0.013	0.007	1.145	0.253	3.436	0.291
Authorized strength status	0.017	0.009	0.007	1.881	0.061	1.473	0.679
Family support	0.031	0.011	0.011	2.882	0.004	1.461	0.685
R^2	0.997						
Adjusted R^2	0.996						
F	13817.306						
D-W value	2.060						

Note: Dependent variable: Comfort with touch.

findings obtained by Qu JH et al,[6] which might be attributed to the fact that Bai Lili's study targeted general nurses, whereas this research focused on ICU nurses. The absence of family companionship for ICU patients, requiring 24-hour care solely by nurses, and the necessity of touch in most nursing care due to the job's nature, contribute to the higher comfort with touch among ICU nurses. Among the four dimensions studied, the task-oriented dimension scored the highest at 5.31±1.32, aligning with Qu JH et al's findings.[6] Task-oriented touch includes clinical procedures such as measuring vital signs, administering injections and infusions, representing the primary nursing services provided to patients. Nurses undergo rigorous training and assessment in these areas, making them less likely to experience aversion. The lowest score was in the physiological comfort dimension at 4.89±1.42, possibly because physiological comfort with touch requires nurses to empathise with patients' feelings, achieving emotional and cognitive empathy. Given that ICU patients are mostly unconscious and ICU nurses are busy, they are at risk of empathy fatigue,[21] making empathy challenging to achieve.

Factors Influencing the Comfort with Touch Among Intensive Care Unit Nurses

Professional Title, Authorised Strength and Family Support

The results of univariate analyses indicated statistically significant differences in comfort with touch among ICU nurses with different professional titles. Pairwise comparisons between nurses of different titles revealed significant differences in comfort with touch between nurses-in-charge and nurses, and between nurses-in-charge and nurse practitioners, with nurses-in-charge having a lower comfort with touch than both nurses and nurse practitioners. When professional titles were included in a multiple linear regression analysis, it was found that being a head nurse significantly negatively impacted comfort with touch. This finding contradicts the results obtained by Huang Zhen et al,[20] who argued that the comfort with touch among nurses increases with higher professional titles. The reason for this might be that head nurses in the ICU typically have over 10 years of experience, and the prolonged pressure of working in the ICU can lead to professional burnout, fatigue and negative emotions,[22] reducing their enthusiasm compared with younger nurses. Compared with deputy directors and those with higher titles, nurses-in-charge may also see less advantage in career development and prospects, leading to professional burnout. Additionally, nurses in ICUs who received a level of family support reported a higher comfort with touch than those without family support. Given the demanding nature of ICU nursing, which often requires overtime work and thus limits time for family, support and understanding from family members can alleviate concerns, enhance nurses' initiative, improve patient care and increase the willingness to provide touch care. Nurses with authorised strength reported a stronger comfort with touch compared with those without, possibly because permanent positions are perceived as more stable, encouraging a more dedicated approach to work. However, this difference was not statistically significant in the regression analysis, likely due to the large sample size difference between nurses with and without authorised strength.

Association Between Better Nursing Work Environment in Intensive Care Units and Comfort with Touch

The nursing work environment encompasses all elements that have a direct or indirect impact on the nursing system.[23,24] Research has demonstrated that a more favourable work environment strengthens nurses' willingness to provide care and improves the quality of nursing services.[25,26] The present survey showed that the nursing work environment has a significant positive impact on comfort with touch. The better the nursing work environment is, the higher the comfort with touch among nurses in ICUs. This aligns with the findings obtained by Fang Xiaoxue.[25] However, the scores for sufficient workforce and basic guarantees were low, indicating a general shortage of human resources and inadequate basic guarantees in ICUs. This is consistent with the findings obtained by Zhang Xiaojiao et al.[15] Consequently, nursing managers should address the shortage of nursing human resources and inadequate basic guarantees in local intensive care wards by establishing emergency reserves, dynamically adjusting staffing and enhancing the training of specialised intensive care nurses to alleviate the shortage of human resources. A good environment could also be achieved by improving performance policies for ICUs, increasing night shift allowances and ensuring vacation time to motivate nurses in ICUs, ensuring the quality of care and improving the level of comfort with touch.

Association Between Levels of Humanistic Literacy Among Intensive Care Unit Nurses and Levels of Comfort with Touch

Humanistic quality, spirit, care and science are integral to nurses' humanistic literacy.[27] Numerous issues in the nurse–patient relationship stem from a lack of humanistic literacy among nurses.[28] This survey found that the score for nurses' humanistic literacy was 208.71±41.47, which is above the medium level. Regression results showed that nurses' humanistic literacy significantly positively impacted comfort with touch. The higher the humanistic literacy of nurses was, the higher the comfort with touch. Research both domestically and internationally has shown that improving nurses' core competencies in humanistic care can lead to improved nursing service quality.[29,30] Consequently, nursing managers should prioritise the training of nurses' humanistic literacy skills. Based on needs assessments, a training curriculum system for nurses' humanistic literacy skills should be constructed to achieve systematic, individualised, targeted and progressive improvement of humanistic literacy among nurses in ICUs.

This study found that the nursing work environment and nurses' humanistic literacy are the main factors affecting comfort with touch among nurses in ICUs, which is generally consistent with previous research findings. Smith et al[31]

demonstrated that a favourable nursing care environment significantly enhances nurses' job satisfaction and the quality of care. Jones et al[32] found that the level of humanistic literacy among nurses is positively correlated with the quality of care they provide.

The clinical significance of this study includes: (1) providing ICU managers with specific directions to improve nurses' comfort with touch, such as improving the work environment and strengthening humanistic literacy training; (2) highlighting the potential impact of family support on the professional performance of ICU nurses, suggesting that hospitals could consider offering more family-friendly policies; and (3) providing empirical evidence for designing future interventions to improve the quality of ICU nursing.

Hospitals can develop policies to improve nurse touch satisfaction. This could include developing family leave or flexible scheduling policies, implementing flexible work schedules, providing child care services and establishing a response mechanism for family emergencies. In addition, conducting training in empathy fatigue management or emotional recovery skills to maintain good mental health and work efficiency, as well as to improve ICU nurses' job adaptability and career satisfaction, could be introduced.

This study is subject to several limitations. First, the cross-sectional study design limits the inference of causality. Second, the sample is from a single region, affecting the generalisability of the results. Third, patient factors affecting nurses' comfort with touch were not considered, and finally, the use of self-reported questionnaires may have introduced social desirability bias. Future research should consider using a prospective design, multi-centre sampling and a combination of objective assessment methods to obtain more comprehensive and reliable results.

Conclusion

The present study indicates that nurses in ICUs exhibit a generally satisfactory level of comfort with touch, albeit with the physiological dimension operating at a moderate level. This comfort is influenced by factors such as professional title, authorised strength, family support for ICU nurses, the nursing work environment and the level of humanistic literacy among nurses. Nursing managers could implement comprehensive strategies to improve the nursing work environment in ICUs, optimise workflow, adjust staffing, implement peer support programmes, improve shift flexibility, strengthen the cultivation of nurses' humanistic qualities, conduct regular training in nursing humanistic care and communication skills, and encourage nurses to participate in continuing education and professional development activities. This could also include considering nurses' career development and quality of life, providing career advancement path and career planning support, and conducting team building activities focusing on the importance of touch to enhance team cohesion and sense of belonging. Furthermore, feedback from nurses could be regularly collected to help resolve problems in a timely manner and enhance the working environment and the sense of well-being among ICU nurses, increasing their self-worth and promoting their professional identity, thereby increasing the comfort level and improving nursing quality.

Data Sharing Statement

All data generated or analyzed during this study are included in the article.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Hebei General Hospital. Informed consent was signed by all participants in this study.

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