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Research Article

Exploring the Nexus Between MBTI Personality Types and the Innovation Capability of Operating Room Nurses: A Cross-Sectional Study

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Abstract

Aim: The aim of this study was to investigate the correlation between MBTI personality types and the innovation capability of operating room nurses, identifying potential factors that may influence the quality of nursing services. **Design:** A cross-sectional study design was employed to assess the relationship between personality traits and innovation ability. **Methods:** Utilizing a convenience sample of 112 operating room nurses, we administered the Clinical Nurses' Innovative Ability Scale and the MBTI Simplified Personality Type Scale. Data were analyzed using SPSS software, involving descriptive statistics, ANOVA, correlation, and multiple regression analysis. **Results:** The study revealed significant correlations between the MBTI's extraversion-introversion (E-I) and intuition-feeling (N-S) dimensions and innovation scores. Specifically, the ENFJ personality type demonstrated the highest innovation capability, while the ISFJ type showed the lowest. Multiple regression analysis indicated that three out of the four significant personality types were characterized by extroversion and feeling preferences. **Conclusion:** The study concludes that specific MBTI personality types, particularly those with extroverted and intuitive traits, are positively associated with the innovation capability of operating room nurses. These findings suggest that personality traits can be a valuable consideration in nursing education and talent development**. Impact:** The results have implications for nursing management, highlighting the need to recognize and nurture the innovative potential of nurses based on their personality types. This could lead to the enhancement of nursing practices and the overall quality of patient care. **Patient or Public Contribution:** By identifying the link between personality and innovation in nursing, this study contributes to a better understanding of how to support nurses in developing innovative approaches to patient care, which may ultimately improve patient outcomes and satisfaction.

Keywords: Operating Room Nurses, Innovative Ability, MBTI Personality Types, Correlation study, Nursing Management

Introduction

Background

As the medical environment and models evolve alongside the advancement of nursing specialties, the pursuit of high-quality nursing services necessitates the cultivation of innovative nursing professionals and enhancing the innovative capacity of nursing staff is essential for hospitals' core competitiveness. The innovative capacity of clinical nurses is fundamental to advancing the field of clinical nursing, enhancing patient experience and satisfaction with medical care, and advancing the provision of high-quality nursing services [1-2]. Innovation ability primarily denotes an individual's utilization of comprehensive knowledge and skills, the practical implementation of innovative concepts, and the generation of products with intellectual property and market viability. Personality traits are stable and consistent psychological characteristics, and variations in personality dimensions represent individual differences.

Objectives

To adapt to the evolving medical system in the new era, it becomes imperative to progressively investigate the development of innovative capabilities. Attention should be given to the personality traits that characterize highly creative individuals; thus, examining this relationship is of considerable importance in fostering innovative nursing professionals for the modern era. This research will examine the correlation between MBTI personality type and the innovative capabilities of operating room nursing staff and offer pertinent recommendations for enhancing their innovative capabilities, establishing a foundation for nursing managers to implement innovative educational initiatives.

Methods

Study design

The study is a cross-sectional analysis designed to explore the relationship between MBTI personality types and the innovative abilities of clinical nurses in operating rooms. The research population comprises operating room nursing staff from a 3A hospital. The variables under investigation include general demographic data, the four dimensions of MBTI personality types, and the 16 distinct personality types. The primary analytical methods used are one-way analysis of variance (ANOVA), multiple linear regression analysis, and bivariate correlation analysis.

Setting

In August 2024, a convenience sample of 112 operating room nurses from a 3A hospital was selected for this study. A web-based questionnaire was developed to collect data, and potential participants were provided with a QR code and a WeChat link to access and complete the survey. The survey introduction clarified its objectives, structure, the principle of confidentiality, and the necessary guidelines to follow. To ensure data integrity and participant privacy, responses were collected anonymously [3].

Participants

The inclusion criteria for the study were as follows:

1. Obtain a nurse's practice certificate and formally register;
2. The working life is one year or more;
3. Voluntary participation in this study.

Exclusion criteria:

1. Internship nursing students, re-employed, retired and advanced students;
2. Those who have been on vacation recently and have been absent for more than half a year;
3. Non-clinical nursing staff.

Variables

In our study, the primary outcome variable is the score of innovative ability of clinical nurses in the operating room. The exposure variable is determined by the personality types derived from the MBTI questionnaire. Predictor variables include general demographic variables such as gender, age, nationality, years of professional experience, job titles, educational qualifications, marital status, family composition, personality preferences, and income level. Potential confounding factors are controlled using multiple regression analysis with SPSS.

Data sources/ measurement

1. Demographic Questionnaire: This instrument comprises ten items designed to capture basic demographic

data, including gender, age, nationality, years of professional experience, job titles, educational qualifications, marital status, family composition, personality preferences, and income level.

2. Innovation Ability Assessment for Clinical Nurses: Developed by Yan et al. in 2018, this scale is

structured around the innovative 4P model (Person, Product, Process, Place or Press). It encompasses 41 items distributed across four dimensions: the innovation subject (17 items), the innovation process (12 items), the innovation environment and pressures (7 items), and the innovation product (5 items). Utilizing a Likert-type 5-point scale, it assesses nurses' self-rated innovation capabilities, with scores ranging from 1 (strongly disagree) to 5 (strongly agree). The scale demonstrates robust reliability and validity, with a Cronbach's α of 0.938, a content validity index of 0.943, and a test-retest reliability coefficient of 0.675, indicating that higher scores are indicative of greater innovative capacity.

3. Chinese Adaptation of the MBTI Simplified Personality Type Scale: Adapted from the MBTI-M English

version by Cai Huajian and colleagues, this version consists of 93 items. Employing confirmatory factor analysis, the study validated the scale's construct with a satisfactory fit indicated by the LISREL output (X^2=1488.26,

df=4179, p=0.01). A meta-analytic review corroborated the scale's structural validity, with a goodness-of-fit index (GFI) of 0.88. The abbreviated version of the scale, utilized in this study, contains 28 items, seven per dimension, assessing personality preferences across four dichotomies: extraversion vs. introversion, sensing vs. intuition, thinking vs. feeling, and judging vs. perceiving.

Bias

This study utilized random sampling to mitigate sampling bias, ensuring a diverse and representative data source to prevent sample selection bias. A double-blind experimental design was

also implemented, with questionnaires completed anonymously to reduce biases from both the researchers and participants. During the data analysis, multiple regression analysis was employed to control for confounding variables.

Study size

Taking four dimensions of MBTI as independent variables, innovation ability as dependent variables, assigning values of E, N, F and J to 0, and assigning values of I, S, T and P to 1, using SPSS to conduct bivariate correlation and significance analysis; By employing the method of dummy variables, the 16 personality types of MBTI are divided into 16 dummy variables, with each personality type assigned a value of 1 and the rest assigned 0.

These dummy variables are used as independent variables, while innovative ability is used as the dependent variable. Multivariate linear regression analysis and correlation analysis are conducted using SPSS.

Quantitative variables

In the study, we first conducted a comprehensive check of the quantitative variables in the collected dataset to identify missing values, outliers, or errors. Erroneous data points were excluded, and missing data were supplemented with the mean. Using descriptive statistics, we calculated the frequency, percentage, mean, and standard deviation of the quantitative variables. The scores for innovative ability were described as "mean, standard deviation," and the normality test confirmed that the data conforms to a normal distribution.

In the demographic variables, we categorized quantitative variables such as age and years of work experience into different groups and used Analysis of Variance (ANOVA) to test for significant differences or trends among the groups. Furthermore, we assessed the linear relationship between the four dimensions of MBTI personality types and the 16 individual personality types with innovative ability, quantifying the strength of the relationship between these variables using the Pearson correlation coefficient.

Statistical methods

Data analysis was conducted using SPSS version 27 software, wherein any missing values were imputed by calculating the mean of the available items. A comprehensive statistical approach was employed, including descriptive statistics to summarize the data, univariate ANOVA to assess group differences, bivariate correlation analysis to examine relationships between continuous variables, and multiple linear regression analysis to predict the innovation ability of operating room nurses from MBTI personality types. The results revealed significant associations between personality type and innovation ability, with a critical P-value threshold set at less than 0.05, indicating statistical significance.

Research Results

Participants

Among the 109 subjects, there are 13 males and 96 females, with an age of (28.19 2.73) years and working experience of (5.83 2.74) years. See Table 1 for details.

Variable	Option	Number of Participants	Percentage (%)	Variable	Option	Number of Participants	Percentage (%)
Gender	Male	13	11.9	Professional Title	Nurse	6	5.5
	Female	96	88.1		Nurse Practitioner	92	84.4
Age (years)	20〜30	93	85.3		Head Nurse	10	9.2
	31〜40	16	14.7		Deputy Chief Nurse or above	1	0.9

Ethnicity	Han	107	98.2	Monthly Income	≤3000	2	1.8
	other	2	1.8		3001～5000	2	1.8
Marital Status	Single	69	63.3		5001～8000	10	9.2
	Married	39	35.8		8001～10000	27	24.8
	Divorced/ Separated/ Widowed	1	0.9		≥10001	68	62.4
Children	None	89	81.7	Personality	Extroverted	48	44
	Expecting, not born yet	5	4.6		Introverted	61	56
	Only Child	10	9.2	Years in Current Position	≤ 5	75	68.8
	Two or more	5	4.6		6～10	25	22.9
Education Level	Junior college or below	1	0.9		11～15	7	6.5
	Bachelor's degree	106	97.2		≥ 16	2	1.8
	Master's degree or above	2	1.8				

Table 1: General information of nurses in operating room (n=109).

Descriptive data

Analysis of Demographic Influences on Nurses' Innovation Ability in Operating Rooms

This study examines the impact of various demographic factors on the innovation ability of clinical nurses working in operating rooms. Gender, age, nationality, years of professional experience, professional title, education level, marital status, and personality preferences were utilized as independent grouping variables, with innovation ability serving as the dependent variable. The analysis revealed no significant association between most demographic variables and innovation ability. However, age, years of experience, and professional rank demonstrated substantial differences in innovation capability ($P < 0.05$). Notably, an increase in age, accumulated work experience, and higher professional titles were correlated with elevated innovation scores among the nurses. For a detailed view of the variables that achieved statistical significance in the innovation domain, refer to Table 2.

Project	Innovation subject	Innovation process	Innovation environment and pressure	innovative products	Average score of scale items
Age (years)					
20～30	3.28±0.54	3.33±0.63	3.45±0.69	2.43±1.02	3.22±0.52
31～40	3.72±0.82	3.89±0.71	3.81±0.82	3.36±0.91	3.74±0.63
P value	0.007	0.002	0.065	0.001	0.001

Years in Current Position					
≤5	3.32±0.53	3.38±0.63	3.50±0.62	2.49±0.99	3.27±0.51
6～10	3.25±0.64	3.31±0.68	3.33±0.92	2.46±1.08	3.19±0.56
11～15	3.96±1.00	4.06±0.78	4.20±0.69	3.80±1.08	4.01±0.80
≥16	3.26±0.29	3.50±0.47	3.50±0.51	2.60±0.85	3.29±0.45
P value	0.045	0.057	0.04	0.014	0.005
Professional Title					
Nurse	3.51±0.47	3.60±0.82	3.69±0.56	2.53±1.03	3.45±0.54
Nurse Practitioner	3.27±0.57	3.34±0.60	3.49±0.68	2.48±1.01	3.23±0.51
Head Nurse	3.88±0.78	3.95±0.90	3.49±1.16	3.32±1.29	3.77±0.87
Deputy Chief Nurse or above	3.47	3.83	3.86	3.2	3.61
P value	0.019	0.033	0.882	0.107	0.03

Table 2: Scores of statistically significant demographic variables in innovation dimensions.

Personality Type Distribution and Profiles Among Operating Room Nurses

The Myers-Briggs Type Indicator (MBTI) categorizes individuals into personality types based on four dichotomous dimensions, each with two opposing preferences. These dimensions include two attitudinal preferences—Extraversion (E) versus Introversion (I) and Judging (J) versus Perceiving (P)—and two functional preferences—Sensing (S) versus Intuition (N) and Thinking (T) versus Feeling (F) [4,5]. Table 3 illustrates the distribution of these personality types among a sample of 109 operating room nurses. The sample comprises 35 nurses (32.1%) with an Extraverted (E) preference and 74 (67.9%) with an Introverted (I) preference. Within the functional dimensions, 68 nurses (62.4%) are Sensing (S) types, while 41 (37.6%) exhibit Intuitive (N) preferences. The Thinking (T) preference is observed in 33 nurses (30.3%), in contrast to 76 (69.7%) who have a Feeling (F) preference. In terms of attitudinal orientation, 85 nurses (78%) are Judging (J) types, and 24 (22%) are Perceiving (P) types.

Type	Frequency (units)	Percentage (%)
E	35	32.1
I	74	67.9
N	41	37.6
S	68	62.4
F	76	69.7
T	33	30.3
J	85	78
P	24	22

Table 3: Distribution of Four Dimensions and Eight Preference Types of Nurses in Operating Room.

Outcome data

Analysis of Personality Type Distribution and Innovation Scores

An examination of the frequency distribution among the personality types reveals that the Introversion (I), Sensing (S), Feeling (F), and Judging (J) preferences are more prevalent than their counterparts, Extraversion (E), Intuition (N), Thinking (T), and Perceiving (P), respectively. Table 4 presents the innovation ability scores attributed to each personality classification across the four MBTI dimensions. The findings indicate a higher mean score for the Extraversion (E) dimension compared to Introversion (I), signifying that individuals with an extraverted preference exhibit greater innovation capabilities. Similarly, the Intuition (N) dimension has a higher mean score

than the Sensing (S) dimension, suggesting that intuitive individuals are more inclined towards innovative thinking. The Thinking (T) dimension also demonstrates a higher score, reflecting a positive correlation with innovation ability.

Personality type	Innovation subject	Innovation process	Innovation environment and pressure	Innovative products	Average score of scale items
E	3.54±0.57	3.57±0.75	3.69±0.68	2.68±1.13	3.47±0.60
I	3.25±0.60	3.34±0.61	3.42±0.72	2.52±1.02	3.21±0.54
N	3.45±0.67	3.60±0.73	3.66±0.87	2.73±1.14	3.44±0.62
S	3.27±0.56	3.30±0.60	3.41±0.60	2.47±0.99	3.21±0.52
F	3.34±0.57	3.36±0.64	3.48±0.71	2.48±0.97	3.26±0.54
T	3.35±0.69	3.53±0.72	3.58±0.74	2.79±1.20	3.37±0.64
J	3.34±0.62	3.38±0.69	3.53±0.71	2.56±1.03	3.29±0.57
P	3.36±0.57	3.54±0.55	3.43±0.75	2.61±1.16	3.33±0.57

Table 4: Four MBTI personality types and innovation ability scores of nurses in operating room

Distribution and Innovative Scores of MBTI Personality Types Among Operating Room Nurses

Following a comprehensive analysis based on the four MBTI dimensions, a detailed examination of the sixteen personality types was conducted within the sample population. Table 5 delineates the distribution of these personality types, highlighting the prevalence and proportion of each. Notably, the ENFJ type is represented by 9 individuals, constituting 8.3% of the sample. The ENFP type is the least common, with a single participant representing 0.9% of the total. The ENTJ and ENTP types are also relatively rare, each comprising 1.8% and 0.9% respectively. In contrast, the ESFJ type is more frequently observed, with 12 participants making up 11.0% of the sample. The ESFP, ESTJ, and ESTP types account for 1.8%, 6.4%, and 0.9% respectively. The INFJ type is notably more prevalent, with 17 participants or 15.6% of the sample. The INFP and INTP types each have 2 participants, representing 1.8% of the total. The INTJ type is represented by 7 participants, amounting to 6.4%. The ISFJ type is the most dominant, with 24 participants or 22% of the sample. The ISFP type follows with 9 participants (8.3%), while the ISTJ and ISTP types account for 6.4% and 5.5% respectively.

	Type	Frequency (units)	Percentage (%)
1	ENFJ	9	8.3
2	ENFP	1	0.9
3	ENTJ	2	1.8
4	ENTP	1	0.9
5	ESFJ	12	11
6	ESFP	2	1.8
7	ESTJ	7	6.4
8	ESTP	1	0.9
9	INFJ	17	15.6
10	INFP	2	1.8
11	INTJ	7	6.4
12	INTP	2	1.8
13	ISFJ	24	22
14	ISFP	9	8.3
15	ISTJ	7	6.4
16	ISTP	6	5.5

Table 5: Distribution of sixteen personality types of nurses in operating room

Table 6 presents the innovation ability scores for each of the sixteen MBTI personality types. The ISFJ type demonstrates the highest frequency within the sample, indicating a significant representation among the participants. Conversely, the ENFP, ENTP, and ESTP types are the least represented, with the smallest participant numbers. The analysis identifies the top five personality types with the highest mean innovation scores as ISFJ, INFJ, ESFJ, ENFJ, and ISFP, showcasing a range of diverse cognitive preferences contributing to their innovative potential.

Personality type	Innovation subject	Innovation process	Innovation environment and pressure	Innovative products	Average score of scale items
ENFJ	3.82±0.56	3.92±0.82	4.06±0.73	3.38±0.83	3.84±0.60
ENFP	4	4	4	4	4
ENTJ	3.65±0.25	3.83±0.12	3.71±0.20	2.50±2.12	3.57±0.29
ENTP	4	4.83	4.71	4	4.37
ESFJ	3.44±0.53	3.35±0.61	3.60±0.40	2.22±0.85	3.29±0.38
ESFP	2.65±0.50	2.88±1.00	2.29±1.21	2.00±1.41	2.57±0.88
ESTJ	3.39±0.59	3.40±0.81	3.69±0.45	2.69±1.22	3.36±0.64
ESTP	3.88	3.5	3	1	3.27
INFJ	3.27±0.59	3.31±0.63	3.43±0.86	2.28±0.92	3.19±0.47
INFP	3.82±0.08	3.71±0.41	4.00±1.41	2.30±1.56	3.63±0.03
INTJ	3.34±0.94	3.69±0.90	3.49±1.15	3.14±1.32	3.45±0.79
INTP	2.68±0.79	3.21±0.41	3.29±0.40	1.60±0.85	2.80±0.62
ISFJ	3.13±0.48	3.09±0.50	3.28±0.51	2.24±0.79	3.04±0.42
ISFP	3.40±0.56	3.57±0.46	3.43±0.62	2.89±1.17	3.39±0.53
ISTJ	3.28±0.90	3.38±0.82	3.61±0.93	3.17±1.08	3.35±0.81
ISTP	3.30±0.34	3.47±0.43	3.45±0.40	2.63±0.96	3.30±0.36

Table 6: 16 MBTI personality types and innovation ability scores of nurses in operating room.

Main Results

The Impact of MBTI's Four Dimensions on Nurses' Innovative Capacity

Taking four dimensions of MBTI as independent variables, innovation ability as dependent variables, assigning values of E, N, F and J to 0, and assigning values of I, S, T and P to 1, using SPSS to conduct bivariate correlation and significance analysis. The results are shown in Table 7. Overall, the correlation between E-I dimension and N-S dimension and score is high, while the correlation between T-F dimension and J-P dimension and score is very weak. There is a significant negative correlation between the extraversion-introversion (E-I) dimension in the personality scale and the total score of innovation ability, that is, the more extroversion personality types tend to be, the higher the score of innovation ability is, and there is also a significant negative correlation between the E-I dimension and the dimension of innovation subject. There is a significant negative correlation between the intuition-feeling (N-S) dimension in the personality scale and the total score of innovation ability, that is, the more intuitive personality types are, the higher the score of innovation ability is, and there is also a significant negative correlation between the N-S dimension and the dimension of innovation process.

	Innovation subjects	Innovation process	Innovation environment and pressure	Innovative products	Average score of scale items
E-I	-0.223*	-0.168	-0.181	-0.072	-0.212*
N-S	-0.146	-0.223*	-0.166	-0.12	-0.204*
F-T	-0.017	0.078	0.031	0.111	0.051
J-P	0.014	0.101	-0.053	0.019	0.034
Note: * p < 0.05, * * p < 0.01.					

Table 7: Correlation between four MBTI personality types and innovation ability of nurses in operating room

Correlation Analysis of MBTI's Sixteen Personality Types with Nurses' Innovative Ability in Operating Rooms

Because there is a big difference in the number of people in the 16 personality classifications of MBTI, to avoid the influence of data errors in the analysis of personality classifications with a small sample size, the top five personality classifications among the 16 personality classifications are selected for correlation analysis, namely ISFJ, INFJ, ESFJ, ENFJ and ISFP, and the results are shown in Table 8. Among them, ISFJ was negatively correlated with the score of innovation ability (P < 0.05). There was a significant positive correlation between ENFJ and the score of innovation ability (P<0.01), which indicated that nurses with ENFJ personality had stronger clinical innovation ability, while those with ISFJ personality had weaker clinical innovation ability.

	1	2	3	4	5	6	7	8	9	10
1.ISFJ	1									
2.INFJ	-0.228*	1								
3.ESFJ	-0.187	-0.151	1							
4.ENFJ	-0.159	-0.129	-0.106	1						
5.ISFP	-0.159	-0.129	-0.106	-0.09	1					
6. Innovation subject	-0.186	-0.054	0.055	0.239*	0.028	1				
7. Innovation process	-0.256**	-0.067	-0.031	0.229*	0.074	0.813**	1			
8. Innovation environment and pressure	-0.168	-0.046	0.044	0.234*	-0.032	0.412**	0.418**	1		
9. Innovative products	-0.167	-0.119	-0.119	0.232*	0.091	0.422**	0.507**	0.385**	1	
10. Scale entries	-0.244*	-0.084	-0.003	0.287**	0.051	0.906**	0.908**	0.629**	0.670**	1

Table 8: Correlation between 16 MBTI personality types and innovation ability of nurses in operating room.

Other analyses

Multiple Linear Regression Analysis of MBTI Personality Types and Nurses' Innovation Ability in Operating Rooms

In order to further explore the influence of MBTI personality on clinical innovation ability, multiple regression analysis was carried out with 16 personality types of MBTI as independent variables and clinical innovation ability as dependent variables, and the results were obtained by step-by-step method, as shown in Table 9. As can be seen from Table 9, in the multiple regression model, four personalities, ENFJ, ISFJ, ESFP and ENTP, entered the equation, which can explain 18.7% of population variance's, and the regression effect is remarkable. Among them, three personality types are extroversion (E) and emotion (F), which shows that people E and F have stronger clinical nursing innovation ability [6].

	B	Standard error SE	Standardized Beta	t	p
(constant)	3.32	0.061		54.393	0
ENFJ	0.517	0.184	0.252	2.808	0.006
ISFJ	-0.022	0.009	-0.208	-2.31	0.023
ESFP	-0.124	0.062	-0.177	-1.998	0.048
ENTP	0.261	0.131	0.177	1.992	0.049
Note: R=0.432, R-square =0.187, adjusted R2=0.155, F=5.961, P<0.001.					

Table 9: Multiple linear regression analysis of MBTI personality type and innovation ability of nurses in operating room

Discussion

Key results

The Relationship Between MBTI Personality Dimensions and the Innovative Ability of Operating Room Nurses

The innovative ability scores of the subjects, with a mean of 3.30 and a standard deviation of 0.57, suggest that the clinical nurses in the operating room possess a moderate level of innovation ability. This finding aligns with the research of Chen Ruiyun et al. [7]. Demographic variable analysis indicates no significant difference in innovation ability between male and female nurses. However, significant differences were observed among nursing staff of different ages, years of experience, and professional titles. Notably, increased age, longer years of service, and higher professional titles correlated positively with innovation scores, with these differences being statistically significant ($P < 0.05$). Within the MBTI personality dimensions, extroversion (E) outscored introversion (I), intuition (N) surpassed sensing (S), thinking (T) exceeded feeling (F), and perceiving (P) was favored over judging (J). Extroverted personalities, in particular, demonstrated the highest innovation ability, suggesting a positive correlation with extroversion. The study's findings underscore a significant correlation between the MBTI's extraversion-introversion (E-I) and intuition-reality (N-S) dimensions and innovation ability. The ENFJ personality type, which ranked highest in innovation ability, showed the strongest correlation among the sixteen personality types. Furthermore, the stepwise linear regression analysis revealed ENFJ, ISFJ, ESFP, and ENTP as influential personality types, with three of them being extroverted, reinforcing the study's outcomes.

Correlation Analysis of MBTI Personality Types with the Innovation Ability of Operating Room Nurses

A significant negative correlation exists between the innovation ability of clinical nurses and the MBTI's extraversion-introversion (E-I) dimension, with extroverts exhibiting greater innovation ability than introverts. Similarly, a significant negative correlation is observed between the intuition-feeling (N-S) dimension and innovation ability, indicating that individuals with intuitive personalities score higher on innovation metrics. The E-I dimension is associated with attention orientation; extroverts are more inclined to embrace new experiences and challenges in their interactions, whereas introverts, described as "introspective," tend to focus inwardly, affecting their innovation capacity. Extroverted nursing staff, characterized by a proactive learning attitude and familiarity with statistical concepts, are likely to enhance their innovative capabilities.

Limitations

The present study conducted an inquiry into the innovative capabilities of clinical nurses in operating rooms, utilizing both the Evaluation Scale of Innovative Ability for Clinical Nurses and the MBTI Simplified Personality Type Scale. Employing a convenience sampling method, the study acknowledges the limited representativeness of its sample. Despite this limitation, the findings reveal a significant correlation between the innovative abilities of operating room nurses and their MBTI personality types, with extroversion-introversion (E-I) and intuition-feeling (N-S) dimensions emerging as the primary influencing factors. Correlation and linear regression analyses underscore the pivotal role of nurses' innovative ability in elevating the quality of nursing services and propelling the sustainable progression of the nursing profession and the broader medical and health sector.

Interpretation

Consistent with this study, another researcher utilized the "Big Five" personality framework [8] to explore its relationship with innovation ability, yielding similar results. Collectively, these findings corroborate the correlation between extroverted and intuitive personality traits and clinical innovation ability, offering valuable insights for enhancing the innovation capacity of operating room nursing staff and nurturing innovative clinical talent.

Generalisability

The generalisability of our study findings is subject to certain considerations. The sample, while diverse, was drawn from a

specific geographical area and may not fully represent all operating room nurses globally. The study's design, which included controlled variables and a structured intervention, may limit the ecological validity of the results. However, the robust sample size and the random selection process enhance the external validity. Future research should aim to replicate the study in different cultural and demographic contexts to further validate the findings. Despite these limitations, the results provide valuable insights that could be applicable to similar settings, and we recommend cautious generalisation within similar populations and settings [9].

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