Examining the Relationships Between Confirmation Bias, Self-Determination and Clinical Decision-Making in Hospital Nurses

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Article

Examining the Relationships Between Confirmation Bias, Self-Determination and Clinical Decision-Making in Hospital Nurses

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Abstract: Background/Objectives: Healthcare environments are rapidly evolving with advanced medical technologies, digital innovation, and accelerated medical informatization. In this context, nurses' accurate clinical judgment and decision-making have become increasingly important, particularly as cognitive biases can affect their critical thinking and self-determination. This study aimed to analyze the relationships between confirmation bias, self-determination, and critical thinking among hospital nurses, and to examine how confirmation bias influences clinical decision-making in nursing practice. **Methods**: This descriptive correlational study was conducted with 124 nurses from hospitals with more than 500 beds. Data were collected using structured questionnaires, including the Confirmation Bias Proneness Scale, General Motivation Scale, and Critical Thinking Disposition Scale. Data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient, and multiple regression analysis. **Results**: The mean scores were 3.42±0.68 for confirmation bias, 4.86±0.92 for self-determination, and 3.78±0.54 for critical thinking. Confirmation bias showed significant negative correlations with self-determination ($r=-.425$, $p<.001$) and critical thinking ($r=-.468$, $p<.001$). Multiple regression analysis revealed that confirmation bias had significant negative effects on both self-determination ($\beta=-.385$, $p<.001$) and critical thinking ($\beta=-.442$, $p<.001$). Age, clinical experience, and education level showed significant positive effects on both variables. **Conclusions**: The findings indicate that confirmation bias significantly impairs nurses' self-determination and critical thinking abilities, with its impact being stronger than in other professions. These results suggest the need for systematic educational programs to help nurses recognize and overcome confirmation bias, particularly for those with less clinical experience. Furthermore, organizational efforts are needed to promote evidence-based practice and objective decision-making in clinical settings.

Keywords: confirmation bias; self-determination; critical thinking; clinical decision-making; nursing; cognitive bias; evidence-based practice; clinical judgment; patient safety; healthcare

1. Introduction

The healthcare environment is rapidly evolving due to advances in cutting-edge medical technology, digital innovation, and accelerated medical informatization. The complexity of patient conditions and diversity of medical services increasingly emphasize the importance of accurate clinical judgment and decision-making for nurses [1]. Within these changes, nurses must provide optimal care through critical thinking based on objective evidence [2]. However, due to human cognitive characteristics, various forms of bias exist in all decision-making processes [3]. Confirmation bias, in particular, is a cognitive tendency to selectively accept information that supports existing beliefs or experiences while ignoring or undervaluing other information. It has been identified as a major factor hindering nurses' critical thinking and self-determination in clinical settings [4]. In clinical practice, confirmation bias can manifest in various forms, such as nurses fixating excessively on initial judgments about specific symptoms without considering other possibilities, or adhering only to existing nursing practices while refusing to accept new evidence-

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based practices [5]. Studies show that approximately 73% of nurses tend to rely excessively on their own experiences or colleagues' opinions rather than objective evidence in uncertain situations, suggesting that such confirmation bias may impair nurses' critical thinking abilities [6,7]. Critical thinking refers to the ability to make rational judgments based on objective evidence without being swayed by emotions or prejudices [8]. However, confirmation bias may prevent nurses from objectively evaluating new clinical evidence or accurately assessing changes in patient conditions [9].

Furthermore, this confirmation bias affects nurses' self-determination, which is the ability to make independent judgments and decisions. When confirmation bias leads nurses to make decisions based on existing biased beliefs rather than objective information, it becomes a serious issue that can ultimately threaten patient safety and deteriorate the quality of nursing care [6,7]. Despite these concerns, there is insufficient research systematically analyzing the impact of nurses' confirmation bias on critical thinking and self-determination. Therefore, this study aims to analyze the degree of confirmation bias among clinical nurses and its effects on critical thinking abilities and self-determination, ultimately proposing measures to reduce confirmation bias and enhance critical thinking and self-determination

2. Materials and Methods

2.1. Research Design

This study is a descriptive correlational research investigation aimed at examining the impact of confirmation bias on self-determination and critical thinking among clinical nurses.

2.2. Study Participants

The study participants were nurses with at least one year of clinical experience working in general hospitals with 500 or more beds. The sample size was calculated using G*power 3.1.9. For multiple regression analysis, with a significance level of 0.05, power of 0.8, medium effect size of 0.15, and 8 independent variables (gender, age, clinical experience, work department, education level, confirmation bias, self-determination, and critical thinking), the required sample size was 109 participants. Considering a dropout rate of 10-20%, questionnaires were distributed to 131 participants. The specific inclusion criteria for study participants were: registered nurses with at least one year of clinical experience working in general hospitals with 500 or more beds, direct involvement in patient care as staff nurses, and voluntary agreement to participate after understanding the purpose of the study.

2.3. Data Collection

Data collection was conducted from May 26, 2023, to June 26, 2023. After obtaining approval from the nursing department heads of participating institutions, participants were recruited through head nurses of each ward. Data was collected through an online survey using structured questionnaires. Before beginning the survey, participants were provided with explanations regarding the research necessity, purpose, and data collection methods, and the survey proceeded only after obtaining informed consent. The survey took approximately 10-15 minutes per person to complete, and participants were provided with the researcher's contact information for any inquiries regarding the survey content. The collected data was coded to ensure participant anonymity, and out of 131 total surveys, 124 were included in the final analysis after excluding insufficient or inappropriate responses.

 doi:10.20944/preprints202504.0579.v1

2.4. Research Instruments

2.4.1. Confirmation Bias

Confirmation bias was measured using the Confirmation Bias Proneness Scale, originally developed by Rassin [10] and translated into Korean by Choi and Heo [11]. The instrument consists of 10 items rated on a 5-point Likert scale, with higher scores indicating stronger confirmation bias tendencies. The original instrument demonstrated a Cronbach's α of .66, while in the current study, it was .70.

2.4.2. Self-Determination

Self-determination was assessed using the General Motivation Scale, modified by Pelletier et al. [12]. The scale consists of 18 items rated on a 7-point scale, measuring six subscales: intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. The original scale showed a Cronbach's α of .80, and in the present study, it was .91.

2.4.3. Critical Thinking

Critical thinking was measured using an instrument developed by Yoon [13]. This 27-item scale uses a 5-point Likert format and comprises seven subscales: intellectual enthusiasm/curiosity, prudence, confidence, systematicity, intellectual fairness, healthy skepticism, and objectivity. Higher scores indicate stronger critical thinking dispositions. The original instrument's Cronbach's α was .85, and in this study, it was .81.

2.5. Data Analysis

The collected data were analyzed using SPSS version 27.0 as follows:

1. Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated for demographic characteristics, while means and standard deviations were computed for confirmation bias, self-determination, and critical thinking scores.
2. Differences in confirmation bias, self-determination, and critical thinking according to participants' demographic characteristics were analyzed using independent t-tests and one-way ANOVA, with Scheffé's test for post-hoc comparisons.
3. Relationships among confirmation bias, self-determination, and critical thinking were examined using Pearson's correlation coefficients.
4. Multiple regression analysis was performed to determine the influence of confirmation bias on self-determination and critical thinking.

3. Results

3.1. Characteristics of Participants

The demographic characteristics of the participants are presented in Table 1. The majority of participants (45.2%, n=56) were aged 25-29 years, and 89.5% (n=111) were female. Regarding clinical experience, 35.5% (n=44) had 3-5 years of experience. In terms of education, 75.8% (n=94) held bachelor's degrees. With respect to work placement, 48.4% (n=60) were assigned to general wards, and 83.9% (n=104) held staff nurse positions.

 doi:10.20944/preprints202504.0579.v1

Table 1. General Characteristics (N=124).

Characteristics	Categories	N	%	M ±SD
Age (year)	25-29	56	45.2	
	30-34	35	28.2	
	35-39	19	15.3	
	≥40	14	11.3	
Gender	Female	111	89.5	
	Male	13	112.9	
Clinical experience (years)	1-2	16	35.5	
	3-5	44	30.6	
	6-10	38	21.0	
	≥11	26		
Education level	Diploma	19	15.3	
	Bachelor	94	75.8	
	≥Master	11	8.9	
Working unit	General ward	60	48.4	
	ICU	25	20.2	
	ER	16	12.9	
	OR	13	10.5	
	OPD	10.8.0		
Position	Staff nurse	104	83.9	
	Charge nurse	20	16.1	
Confirmation bias				3.42± 0.68
Self-determination				4.86± 0.92
Critical thinking				3.78± 0.54

3.2. Levels of Confirmation Bias, Self-determination, and Critical Thinking

The levels of confirmation bias, self-determination, and critical thinking among participants are presented in Table 1. The mean confirmation bias score was 3.42 ± 0.68 (out of 5 points), self-determination was 4.86 ± 0.92 (out of 7 points), and critical thinking was 3.78 ± 0.54 (out of 5 points).

3.3. Differences in Confirmation Bias, Self-Determination, and Critical Thinking According to Demographic Characteristics

The analysis of differences in confirmation bias, self-determination, and critical thinking according to demographic characteristics is presented in Table 2. Age-related differences showed that nurses aged 40 and above demonstrated significantly lower confirmation bias (F=3.86, p=.011), and higher self-determination (F=4.24, p=.007) and critical thinking (F=5.12, p=.002) compared to those aged 25-29 years. Regarding clinical experience, nurses with 11 or more years of experience showed

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lower confirmation bias (F=3.25, p=.024), and higher self-determination (F=3.86, p=.011) and critical thinking (F=4.13, p=.008) compared to those with 1-2 years of experience. Education level analysis revealed that nurses with master's degrees or higher demonstrated lower confirmation bias (F=3.12, p=.028), and higher

Table 2. Correlations among Confirmation Bias, Self-determination, and Critical Thinking (N=124).

Variables	Confirmation bias	Self-determination	Critical thinking
Confirmation bias	1		
Self-determination	-.425***	1	
Critical thinking	-.468***	.512***	1

*p<.05, **p<.01, ***p<.001.

3.4. Effect of Confirmation Bias on Self-determination and Critical Thinking

The results of the multiple regression analysis to determine the impact of confirmation bias on self-determination and critical thinking are shown in Table 3. The variance inflation factor (VIF) for multicollinearity among the independent variables ranged from 1.15-2.24, which is below 10, and the Durbin-Watson value ranged from 1.86-2.05, which is close to 2, confirming the absence of autocorrelation. Self-determination was statistically significant (F=15.845, p<.001), with an explanatory power of 32.4%. Confirmation bias (β=-.385, p<.001) had a significant negative effect on self-determination, while age (β=.186, p=.009), clinical experience (β=.165, p=.019), and education (β=.162, p=.020) had significant positive effects. Critical thinking (38.5% explanatory power) was significant (F=19.674, p<.001). Confirmation bias (β=-.442, p<.001) had a strong negative effect on critical thinking, while age (β=.212, p=.002), clinical experience (β=.186, p=.002), and education (β=.168, p=.005) had significant positive effects. The higher the confirmation bias, the lower the nurses' self-determination and critical thinking, while the higher the age, clinical experience, and education level, the higher the self-determination and critical thinking. The negative impact of confirmation bias on critical thinking suggests that preconceived notions and stereotypes can interfere with objective and rational clinical judgment.

Table 3. Effects of Confirmation Bias on Self-determination and Critical Thinking (N=124).

	Variables	B	SE	β	t	*p*	Adjusted R^2	F(*p*)
Self-determination	(Constant)	6.842	0.325		21.052	<.001	.324	15.845 (<.001)
	Confirmation Bias	-0.468	0.086	-.385	-5.442	<.001		
	Age	0.245	0.092	.186	2.663	.009		
	Clinical experience	0.186	0.078	.165	2.385	.019		
	Education level	0.224	0.095	.162	2.358	.020		
Critical Thinking	(Constant)	4.856	0.186		26.108	<.001	.385	19.674 (<.001)
	Confirmation Bias	-0.325	0.048	-.442	-6.771	<.001		
	Age	0.168	0.052	.212	3.231	.002		
	Clinical experience	0.142	0.045	.186	3.156	.002		
	Education level	0.156	0.054	.168	.168	.005		

 doi:10.20944/preprints202504.0579.v1

Table 4. Differences in Confirmation Bias, Self-determination, and Critical Thinking According to General Characteristics (N=124).

	Variables	B	SE	β	t	*p*	Adjusted R^2	F(*p*)
Self-determination	(Constant)	6.842	0.325		21.052	<.001	.324	15.845 (<.001)
	Confirmation Bias	-0.468	0.086	-.385	-5.442	<.001		
	Age	0.245	0.092	.186	2.663	.009		
	Clinical experience	0.186	0.078	.165	2.385	.019		
	Education level	0.224	0.095	.162	2.358	.020		
Critical Thinking	(Constant)	4.856	0.186		26.108	<.001	.385	19.674 (<.001)
	Confirmation Bias	-0.325	0.048	-.442	-6.771	<.001		
	Age	0.168	0.052	.212	3.231	.002		
	Clinical experience	0.142	0.045	.186	3.156	.002		
	Education level	0.156	0.054	.168	.168	.005		

Table 5. Differences in Confirmation Bias, Self-determination, and Critical Thinking According to General Characteristics (N=124).

		Confirmation bias		Self-determination		Critical thinking	
		M±SD	t/F(*p*)	M±SD	t/F(*p*)	M±SD	t/F(*p*)
Age(year)	25-29 a	3.58±0.72	3.86(.011*) a>c,d	4.62±0.88	4.24(.007**)	3.65±0.52	5.12(.002**)
	30-34 b	3.45±0.65		4.85±0.95		3.78±0.55	
	35-39 c	3.32±0.64		5.12±0.86		3.92±0.48	
	≥40 d	3.12±0.58		5.24±0.82		4.05±0.45	
Gender	Female	3.44±0.69	0.86(.394)	4.88±0.93	0.65(.520)	3.76±0.54	-0.92(.357)
	Male	3.38±0.65		4.82±0.90		3.82±0.52	
Clinical experience (year)	1-2	3.62±0.70	3.25(.024*)	4.58±0.90	3.86(.011*)	3.62±0.51	4.13(.008**)
	3-5	3.51±0.69		4.75±0.88		3.71±0.53	
	6-10	3.35±0.65		4.95±0.94		3.85±0.52	
	≥11	3.20±0.60		5.16±0.86		3.94±0.48	
Education level	Diploma	3.55±0.71	3.12(.028*)	4.65±0.91	3.57(.015*)	3.68±0.53	3.86(.011*)
	Bachelor	3.41±0.67		4.88±0.93		3.79±0.54	
	≥Master	3.25±0.62		5.12±0.85		3.95±0.49	
Working unit	General ward	3.45±0.69	0.25(.912)	4.82±0.94	0.36(.840)	3.75±0.55	0.25(.912)
	ICU	3.38±0.66		4.95±0.90		3.82±0.52	
	ER	3.42±0.68		4.88±0.92		3.80±0.53	
	OR	3.40±0.67		4.85±0.91		3.78±0.54	
	OPD	3.44±0.68		4.80±0.93		3.76±0.54	
Position	Staff nurse	3.48±0.70	2.86(.005**)	4.75±0.92		3.72±0.53	

 doi:10.20944/preprints202504.0579.v1

	Charge nurse	3.25±0.62	5.15±0.88	-3.25(.002**)	3.95±0.50	-3.12(.`002**)

*p<.05, **p<.01.

4. Discussion

The confirmation bias of the subjects in this study was higher than that found in a study of airline flight attendants [14], but this may be due to the fact that both occupations tend to rely on existing experience and knowledge due to the nature of the job to make frequent decisions that are directly related to life and death [15]. In addition, it is difficult to try new changes in a hierarchical medical organizational culture, which may increase confirmation bias [16]. Self-determination had a mean score of 4.86 out of 7, and in medical education, self-determination is part of identity and respect [17]. This is because self-determination has a direct impact on patient outcomes and safety through independent judgment and decision-making in complex clinical situations, and nurses with high self-determination are able to make sound clinical judgments as professionals. Critical thinking had a mean score of 3.78 out of 5, which is similar to previous studies that have shown that critical thinking in ICU nurses can influence the risk of medication errors [18]. In a healthcare setting where medical errors can have devastating consequences, nurses' critical thinking skills can be an important safeguard to ensure patient life and safety.

In terms of age, clinical experience, and educational level, older age and more clinical experience were associated with decreased confirmation bias and increased self-determination and critical thinking. This was consistent with previous studies showing that increasing age and clinical experience improves the ability to reflect on clinical situations objectively and critically on clinical judgment [19], and that expertise accumulated through diverse clinical experience reduces cognitive biases and promotes objective decision-making based on evidence [20]. In particular, rich clinical experience has been shown to have a positive effect on overcoming confirmation bias by enhancing the ability to analyze multifaceted situations and evaluate objective evidence [21]. Similar results were found in a study of Korean nurses [22] and doctors [23], suggesting that the accumulation of experience has a positive effect on overcoming cognitive biases in healthcare workers.

Education level has been shown to influence critical thinking and objective judgment, with higher levels of education associated with higher order thinking skills [24]. When analyzed by position, charge nurses were found to have lower confirmation bias and higher self-determination and critical thinking than general nurses. This is consistent with Rouwette and Franco's [25] finding that increased responsibility and authority within an organization leads to more objective and deliberate decision-making, and that professionals in leadership positions are better able to overcome cognitive biases.

In this study, the differences in confirmation bias, self-determination, and critical thinking by department of work were not statistically significant. This shows that the complexity and diversity of the modern healthcare environment requires nurses in all departments to exercise sound clinical judgment and decision-making, and advances in medical technology and the increasing complexity of patient care now require nurses in all departments to have high levels of critical thinking skills [26,27]. In this study, confirmation bias was significantly negatively correlated with self-determination and critical thinking, and self-determination and critical thinking were significantly positively correlated. Chen et al. [28] found that nurses' self-reflection was positively related to critical thinking, and Zuriguel-Perez et al. [29] found that nurses' high professional autonomy positively influenced their propensity for critical thinking. This reflects the findings of this study that self-determination and critical thinking were positively related. Therefore, to improve nurses' critical thinking skills, educational interventions that reduce confirmation bias and promote self-determination are needed. Specific educational strategies to overcome biased thinking while enhancing self-directed learning and critical reflection are needed, especially in new nurse curricula. In this study, the effects of confirmation bias on self-determination and critical thinking were all

 doi:10.20944/preprints202504.0579.v1

statistically significant. Confirmation bias had a significant negative effect on self-determination and critical thinking. This is consistent with previous studies that confirmation bias can impede autonomous decision-making and critical thinking. Suzuki and Yamamoto [30] concluded that nurses' stereotypes and confirmation bias can impair clinical decision-making, and that improving existing mindsets through critical reflection programs is effective in improving critical thinking. Age, clinical experience, and education were associated with higher levels of self-determination and critical thinking. Nurses who are experienced managers or nurses with more clinical experience show higher levels of critical thinking than nurses with less experience [28,29]. These findings suggest that educational interventions that reduce confirmation bias are needed to improve nurses' self-determination and critical thinking, especially the development of systematic educational programs for nurses according to their career paths and ongoing education to support their professional development according to their various clinical experiences.

5. Conclusions

This study analyzed the impact of confirmation bias on self-determination and critical thinking in clinical nurses and found that higher levels of confirmation bias were associated with lower levels of self-determination and critical thinking, and that confirmation bias decreased with age, clinical experience, and education. This suggests that nurses' confirmation bias is a major issue that negatively affects self-determination and critical thinking in nursing practice, which is directly related to patients' lives. Based on these findings, we make the following recommendations. First, nursing curricula should include systematic training programs to recognize and overcome confirmation bias. This should be particularly tailored for new nurses with little clinical experience. Second, an organizational culture that reinforces evidence-based practice and encourages decision-making based on objective evidence should be created. Third, ongoing professional development programs should be provided to enhance nurses' self-determination and critical thinking. This study is limited by the fact that it was conducted in a cross-sectional survey, which limits the ability to clearly establish causal relationships between variables, and by the fact that the self-report survey cannot completely eliminate the subjectivity of responses. Therefore, subsequent studies should include nurses from various sizes of healthcare organizations, use a longitudinal study design to clarify the causal relationship between variables, and apply various research methods such as observational and experimental studies to verify the actual effects of confirmation bias more objectively. Despite these limitations, this study is significant in that it empirically verified the relationship between confirmation bias, self-determination, and critical thinking in nurses and comprehensively analyzed the factors that influence these variables. The results of this study can be used as a basis for developing educational programs and improving practice environments to enhance nurses' clinical decision-making skills.

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Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy and confidentiality concerns as they contain information that could compromise research participant privacy.

Conflicts of Interest: The authors declare no conflicts of interest

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