Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Research Ethics Knowledge, Attitudes, and Practices Among Clinical Nurses and Associated Factors: A Multiregional Cross-Sectional Study

Jiehui Yang
Zhejiang Chinese Medical University
Xiaoqin Ma
17718006449@163.com
Zhejiang Chinese Medical University

Research Article

Keywords: nursing, clinical nurses, research ethics, knowledge-attitude-practice

Posted Date: September 28th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10535582/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Objective

To assess the current status of knowledge, attitudes, and practices (KAP) related to research ethics among clinical nurses and to identify associated factors, thereby providing evidence for targeted strategies to strengthen research ethics competence in nursing practice.

Methods

A cross-sectional survey was conducted from May to June 2026 among 1,616 clinical nurses from multiple provinces in China. Data were collected using a general information questionnaire and a Clinical Nurses' Research Ethics Knowledge-Attitude-Practice Questionnaire. Descriptive statistics and univariate analyses were performed to explore influencing factors.

Results

The scoring rates for research ethics knowledge, attitudes, and practices were 88.88%, 88.34%, and 88.64%, respectively, indicating generally favorable levels. Higher educational attainment was significantly associated with higher knowledge, attitude, and practice scores (all $P < 0.01$). Participation in academic conferences was also associated with higher scores across all three dimensions ($P = 0.004$, $P < 0.001$, and $P = 0.002$, respectively). Publication experience was associated with higher attitude and practice scores ($P = 0.035$ and $P = 0.047$, respectively), whereas the difference in knowledge scores was not statistically significant ($P = 0.087$). Years of work experience were not significantly associated with any KAP dimension (all $P > 0.05$). Relatively lower scoring items involved recognition of vulnerable populations, regular ethics learning and sharing, and proposing departmental improvements in research ethics capacity

Conclusion

Clinical nurses demonstrated generally high levels of research ethics KAP, but gaps remain in vulnerable participant protection and proactive ethics-related behaviors. Educational background and research engagement appear to be important determinants of research ethics competence. Systematic, stratified ethics training and greater opportunities for research participation are warranted to promote ethically robust nursing research.

Introduction

Research ethics refers to the moral principles and behavioral norms that researchers should follow in scientific research activities. Its core objectives are to protect participants' rights and interests, ensure research authenticity, and maintain social trust (Doody & Noonan, 2016; Katz, 1996). Internationally recognized research ethics principles mainly originate from the Declaration of Helsinki and the Nuremberg Code(Katz, 1996). The World Medical Association revised the Declaration of Helsinki in 2013, clearly stating that medical research involving human subjects must give priority to participants' health and rights, must be approved by an ethics review committee, and must obtain informed consent("World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects," 2013).

The four principles of biomedical ethics proposed by Beauchamp and Childress - respect for autonomy, beneficence, non-maleficence, and justice - provide an important framework for ethical decision-making in health-related research (Beauchamp, 2003). These principles are not limited to physician-led research but are equally relevant to nursing research. Because nursing studies frequently involve hospitalized patients, older adults, individuals with chronic conditions, and other potentially vulnerable groups, rigorous adherence to ethical standards is particularly important (J. et al., 2025).

In China, the development of nursing as a first-level discipline, the expansion of evidence-based nursing, and the strengthening of nursing research capacity have substantially increased the involvement of clinical nurses in scientific research (Zhou, 2023) Clinical nurses now participate not only in bedside care but also in protocol development, data collection, manuscript preparation, dissemination, and implementation of research findings. Previous studies have indicated a gradual improvement in nurses' research competence, accompanied by an overall increase in nursing-related publications (Cheng et al., 2023).

In the continuously evolving healthcare field, nursing research can directly or indirectly guide nursing practice. Research on nursing practice has become the foundation for promoting patient care, improving patient outcomes, and advancing global professional development(Berthelsen & Hølge-Hazelton, 2017; Curtis et al., 2017). However, as research activity expands, ethical risks may also increase. Examples include incomplete or inaccurate data, plagiarism, inadequate informed consent procedures, and insufficient protection of participant privacy (Pan et al., 2025). Such problems compromise research quality and may also threaten patient safety and public confidence in nursing science.

As participants in nursing research, clinical nurses' cognition, attitudes, and practical behaviors regarding research ethics determine the quality of nursing research and also affect patient experience and treatment outcomes(Yang et al., 2016). Understanding and cultivating clinical nurses' research ethics competency is crucial for enhancing nurses' professional identity, promoting standardized nursing research ethics, and advancing the development of nursing science.

In China, discussion of nursing research ethics remains relatively underdeveloped, partly because nursing historically evolved as a secondary discipline(Cheng et al., 2019). Existing studies have tended to examine a single aspect of ethical knowledge, attitudes, or behaviors. Few studies have evaluated research ethics competence among clinical nurses using an integrated KAP framework. Accordingly, this study aimed to investigate the current status of research ethics KAP among clinical nurses and to identify associated factors. The findings may provide evidence for designing targeted ethics education and management strategies in clinical nursing settings.

1 Methods

1.1 Study Design and Participants

A multiregional cross-sectional survey was conducted from May to June 2026. Convenience sampling was used to recruit 1,616 clinical nurses from hospitals in multiple provinces, China. Eligible participants were clinical nurses working in the participating hospitals who voluntarily agreed to complete the questionnaire.

1.2 Instruments

1.2.1 General Information Questionnaire

The general information questionnaire collected demographic and professional characteristics, including age, sex, marital status, educational level, years of work experience, hospital grade, professional title, employment status, department, project participation experience, publication experience, and participation in academic conferences.

1.2.2 Clinical Nurses' Research Ethics Knowledge-Attitude-Practice Questionnaire

The Clinical Nurses' Research Ethics Knowledge-Attitude-Practice Questionnaire was developed by Zhao Lei in 2025(Zhao et al., 2025). It was designed to assess the overall level of clinical nurses' knowledge mastery, learning willingness, and practical behaviors regarding research ethics. The questionnaire included 11 items in the knowledge dimension, 9 items in the belief dimension, and 8 items in the behavior dimension.A five-point Likert scale was used for scoring, ranging from "not important" to "very important," with scores of 1–5 assigned respectively. Higher scores indicated more positive performance in research ethics knowledge, beliefs, and behaviors among nurses. The Cronbach's α coefficient of the instrument was 0.967, indicating good internal consistency reliability, and the split-half reliability was 0.848, indicating good internal consistency.

1.3 Data Collection

The questionnaire was administered online through the Wenjuanxing platform and distributed via WeChat. The research team first contacted nursing managers at participating hospitals, explained the study purpose, significance, and survey procedures, and invited them to assist with recruitment. Coordinators were then designated to organize questionnaire distribution among eligible nurses. Participation was voluntary, and electronic informed consent was obtained before questionnaire completion.

To enhance data authenticity and reduce duplicate responses, all questionnaire items were set as mandatory and each IP address was limited to one submission. The questionnaire did not collect names, employee numbers, or other directly identifiable information, and nursing managers were unable to access individual responses. During data collection, the research team monitored response progress and communicated with coordinators to ensure an adequate sample size. After data collection, two researchers independently screened the responses and excluded questionnaires with logical inconsistencies or patterned answers.

1.4 Statistical Analysis

Data were entered and checked using Microsoft Excel, and statistical analyses were performed using SPSS version 27.0. Categorical variables are presented as frequencies and percentages. Continuous variables are presented as mean ± standard deviation. The scoring rate was calculated as mean score divided by the maximum possible score multiplied by 100%. Independent-samples t tests were used for univariate comparisons. All statistical tests were two-sided, and $P < 0.05$ was considered statistically significant.

2 Results

2.1 General Characteristics

A total of 1,616 clinical nurses were included in the analysis. Most participants were female (96.0%), had a bachelor's degree or above (86.7%), worked in Grade 3 hospitals (60.6%), and had more than 10 years of work experience (61.9%). In terms of research-related experience, 28.1% had participated in research projects, 40.3% had publication experience, and 45.0% had attended academic conferences (Table 1).

Table 1
General Information of the Research Subjects (n = 1616)

Item		n	Scoring rate/%
Genders	Male	64	4
	Female	1552	96
Age (year)	20–30	492	30.4
	30–40	720	44.6
	40–50	338	20.9
	> 50	66	4.1
Degrees	Below bachelor's degree	215	12.3
	Bachelor's degree or above	1401	86.7
Professional title	Nurse	250	15.5
	Staff Nurse	458	28.3
	Charge Nurse	706	43.7
	Associate Chief Nurse or Chief Nurse	202	12.5
Grade of hospital	Grade 3 hospital	979	60.6
	Grade 2 hospital	637	39.4
Project participation experience	Yes	454	28.1
	No	1162	71.9
Publication experience	Yes	652	40.3
	No	964	59.7
Participated in academic conferences	Yes	728	45
	No	888	55
Employment method	Labor Dispatching	110	6.8
	Contract Worker	548	33.9
	Career establishment staff	958	59.3
Work experience	≤ 10 years	615	38.1
	> 10 years	1001	61.9
Department	Internal Medicine	610	37.7
	Surgery	316	19.6
	ICU	90	5.6
	Emergency Medicine	84	5.2
	Operating room	56	3.5
	Pediatrics	62	3.8
	Gynaecology	43	2.7
	Obstetrical department	34	2.1
	Other	321	19.9

Table 1 **General Information of the Research Subjects (n = 1616)**

2.2 Scores of Knowledge, Attitudes, and Practices of Clinical Nurses

2.2.1 Overall Scores by Dimension

The mean scores and scoring rates for each dimension of research ethics KAP are shown in Table 2. The scoring rates for knowledge, attitudes, and practices were 88.88%, 88.34%, and 88.64%, respectively, suggesting an overall high level of research ethics KAP among clinical nurses.

Table 2
Scores of each dimension

Dimension	Score, mean ± SD	Scoring rate, %
Knowledge	48.88 ± 6.96	88.88
Attitude	35.35 ± 5.56	88.34
Behavior	39.83 ± 5.85	88.64

Table 2 **Scores of each dimension**

2.2.2 Knowledge of Research Ethics

Clinical nurses achieved relatively high scores for most knowledge items, all of which exceeded 85% except for the item concerning the scope of vulnerable populations (84.60%). The highest scoring items included obtaining written informed consent from guardians or legal representatives for participants unable to make decisions and the requirement that research protocols be approved by an ethics committee (both 90.40%) (Table 3).

Table 3
Mastery of research ethics knowledge among clinical nurses

Item	Scoring rate, %
Basic principles of nursing ethics	90.80%
Protection of patients' personal interests	90.20%
Protection of patients' right to informed consent	89.00%
Most fundamental principle of nursing ethics	87.00%
Obtaining written informed consent from guardians or agents for participants unable to make decisions	90.40%
Scope of vulnerable populations	84.60%
Ultimate purpose of ethics review application	89.20%
All life science and medical research involving humans requires ethics review	89.80%
Research protocols must be approved by the ethics committee	90.40%
Scope of academic misconduct	90.00%
Authorship issues for publications and patents	86.20%

Table 3 **Mastery of research ethics knowledge among clinical nurses**

2.2.3 Attitudes Toward Research Ethics

Participants showed generally positive attitudes toward research ethics (Table 4). The item with the highest scoring rate was the perceived importance of nursing research ethics (89.40%). The two relatively lower scoring items were the belief that nursing staff should actively acquire research ethics knowledge (87.80%) and actively seek solutions to research ethics problems encountered in practice (88.00%).

Table 4
Attitudes toward research ethics among clinical nurses

Item	Scoring rate, %
Importance of nursing research ethics	89.40%
Correlation between nurses' research ethics cognition and research quality	88.80%
Research ethics knowledge helps coordinate nurse–patient relationships	88.20%
Research ethics knowledge helps nurses address ethical problems in work	88.40%
Nurses need to master certain research ethics knowledge	88.20%
Hospitals should provide opportunities to learn research ethics	88.20%
Nursing staff should actively acquire research ethics knowledge	87.80%
Nursing staff should actively seek solutions to research ethics problems	88.00%

Table 4 **Attitudes toward research ethics among clinical nurses**

2.2.4 Research Ethics Practices

Research ethics practices were generally favorable but showed room for improvement (Table 5). The two highest scoring items were always paying attention to protecting patient privacy and starting procedures only after obtaining informed consent (both 92.00%). The two lowest scoring items were regularly

learning and sharing new research ethics knowledge with colleagues (85.40%) and providing suggestions for improving departmental ethics capacity (85.00%).

Table 5
Research ethics behaviors among clinical nurses

Item	Scoring rate, %
Departments/hospitals emphasize learning clinical research ethics	87.80%
Providing full information on risks and benefits during clinical notification	87.40%
Always paying attention to protecting patient privacy	92.00%
Starting procedures after obtaining informed consent	92.00%
Learning research ethics through various channels	88.80%
Pointing out colleagues' ethical violations	88.60%
Seeking expert help when encountering ethics issues	89.40%
Regularly learning and sharing new research ethics knowledge	85.40%
Providing suggestions for improving departmental ethics capacity	85.00%

Table 5 **Research ethics behaviors among clinical nurses**

2.3 Associated Factors of Research Ethics KAP

Univariate analysis showed that nurses with a bachelor's degree or above had significantly higher knowledge, attitude, and practice scores than those with lower educational attainment (all $P < 0.01$). Participation in academic conferences was also associated with significantly higher scores across all three dimensions ($P = 0.004$, $P < 0.001$, and $P = 0.002$, respectively). Publication experience was associated with higher attitude and practice scores ($P = 0.035$ and $P = 0.047$, respectively), but the difference in knowledge scores did not reach statistical significance ($P = 0.087$). Years of work experience were not significantly associated with knowledge, attitude, or practice scores (all $P > 0.05$) (Table 6).

Table 6
Univariate analysis of factors associated with research ethics KAP scores

Group	Knowledge			Attitude			Behavior		
	Score, mean ± SD	t	p	Score, mean ± SD	t	p	Score	t	p
Below bachelor's degree	46.75 ± 6.33	-4.855	< 0.001	33.88 ± 5.37	-4.183	< 0.001	38.83 ± 5.59	-2.687	0.007
Bachelor's degree or above	49.21 ± 6.99			35.58 ± 5.56			39.98 ± 5.86		
Work experience ≤ 10 years	48.50 ± 7.19	-1.697	0.09	35.26 ± 5.60	-0.507	0.613	39.65 ± 6.04	-0.96	0.337
Work experience > 10 years	49.11 ± 6.8			35.40 ± 5.56			39.94 ± 5.73		
Had publication experience	49.23 ± 6.49	1.714	0.087	35.69 ± 5.08	2.11	0.035	40.17 ± 5.42	1.987	0.047
No publication experience	48.64 ± 7.25			35.12 ± 5.86			39.6 ± 6.12		
Had participated in academic conferences	49.43 ± 6.56	2.897	0.004	35.88 ± 5.098	3.544	< 0.001	40.32 ± 5.51	3.123	0.002
No had participated in academic conferences	48.43 ± 7.24			34.91 ± 5.89			39.42 ± 6.09		

Table 6 **Univariate analysis of factors associated with research ethics KAP scores**

Note

KAP = knowledge, attitudes, and practices. Values are presented as mean ± SD. P values were calculated using independent-samples t tests.

3 Discussion

3.1 Overall research ethics competence among clinical nurses: strengths and remaining gaps

Clinical nurses demonstrated generally high levels of research ethics knowledge, attitudes, and practices, with all scoring rates exceeding 88%. This finding may reflect the increasing emphasis on research governance, ethics review systems, and evidence-based nursing in Chinese healthcare institutions, which has enhanced nurses' awareness of ethical responsibilities(Karjalainen et al., 2019). Similar findings have been reported in previous studies, indicating that nurses generally hold positive attitudes toward research ethics despite variations in knowledge and practical competence(Zhang et al., 2024). Despite the overall favorable results, several gaps warrant attention. The lowest knowledge score concerned the scope of vulnerable populations, suggesting that some nurses may have insufficient understanding of participant vulnerability beyond conventional categories. In the practice dimension, regular learning and sharing of new research ethics knowledge and providing suggestions for departmental improvement scored relatively low. These findings indicate that nurses may be more familiar with complying with established ethical requirements than with proactively promoting ethical practice, peer learning, and organizational improvement. Therefore, research ethics education should move beyond rule-based compliance and place greater emphasis on ethical reasoning, vulnerable participant protection, and continuous professional learning.

3.2 Educational level and research engagement as key determinants

Clinical nurses with higher educational attainment demonstrated significantly better research ethics knowledge, attitudes, and practices than those with lower educational levels. This finding is consistent with previous evidence indicating that nurses with higher educational attainment generally demonstrate greater research ethics literacy and stronger research competence(Jin et al., 2024). This association may be explained by the fact that higher education provides more comprehensive training in research methodology, evidence-based practice, and bioethics, enabling nurses to identify and appropriately manage ethical issues encountered during research activities(Melnyk et al., 2014).

Research engagement was also closely related to research ethics competence. Participation in academic conferences was associated with higher knowledge, attitude, and practice scores, while publication experience was associated with higher attitude and practice scores. These findings suggest that research ethics competence is not acquired solely through classroom-based learning but is reinforced through direct exposure to the research process. Participation in research dissemination and publication may increase familiarity with ethics review procedures, informed consent requirements, participant protection, data management, and authorship norms. Similar observations have been reported in studies of research integrity and ethics cognition among health professionals(Lu et al., 2023; Wei et al., 2024).

Taken together, these findings indicate that healthcare institutions should provide clinical nurses with more opportunities to participate in research projects, academic conferences, and manuscript development. Stratified educational programs should also be designed according to nurses' educational backgrounds and research experience. Such approaches may help transform ethical knowledge into practical competence and cultivate a more robust research ethics culture in clinical nursing settings.

3.3 Clinical Experience Alone May Not Ensure Research Ethics Competence

In contrast to educational level and research engagement, years of work experience were not significantly associated with research ethics knowledge, attitudes, or practices. This finding suggests that longer clinical service alone may not be sufficient to improve research ethics competence. Similar findings have been reported in previous studies, which indicated that education, ethics training, and research participation may exert a stronger influence on research ethics literacy than seniority alone(Li, 2017).

A possible explanation is that routine clinical practice primarily strengthens clinical skills, professional judgment, and patient care experience, whereas research ethics competence requires specialized knowledge of research governance, ethics committee review, informed consent, participant vulnerability, privacy protection, data integrity, and publication ethics (Bowrey & Thompson, 2014). Without structured ethics education or meaningful involvement in research activities, these competencies may not develop automatically through accumulated clinical experience.

These results highlight the need to integrate research ethics education into continuing professional development for nurses at all career stages. Nursing managers should not assume that senior nurses necessarily possess stronger research ethics competence. Instead, regular ethics training, case discussions, research mentoring, and interdisciplinary ethics consultation should be made accessible to both junior and senior clinical nurses.

3.4 Practical Implications for Nursing Management and Research Governance

The findings of this study have several practical implications. First, research ethics training should be embedded in continuing nursing education and should focus on areas with relatively lower scores, particularly the identification and protection of vulnerable participants, proactive learning behaviors, and departmental ethics capacity building. Training methods should include case-based learning, scenario simulation, reflective discussion, and analysis of real-world research ethics dilemmas, rather than relying solely on didactic lectures.

Second, hospitals should strengthen organizational support for ethical nursing research. Ethics committees and nursing research management departments should provide accessible guidance on protocol design, informed consent, data protection, adverse event reporting, authorship, and academic integrity. Establishing departmental ethics liaisons or research mentors may help nurses translate ethical knowledge into standardized research behaviors.

Third, research engagement should be used as an important pathway for ethics capacity building. Hospitals can encourage nurses to participate in research projects, academic meetings, evidence-based practice programs, and manuscript preparation under appropriate supervision. At the policy level, incorporating research ethics competence into professional development, research training, and competency assessment may help improve the quality and integrity of nursing research.

4 Limitations

This study has certain limitations. First, convenience sampling was used, and the sample sources had regional limitations; therefore, the representativeness of the results needs further verification. Second, self-reported questionnaires were used, which may introduce social desirability bias. Third, this was a cross-sectional study, which can only analyze correlations between variables and cannot infer causal relationships. In addition, potential influencing factors such as organizational research ethics climate and ethics training were not included. Future studies may adopt multicenter random sampling and longitudinal designs to further verify the findings.

5 Conclusion

This study showed that the overall level of research ethics knowledge, attitudes, and practices among clinical nurses was relatively high; however, deficiencies still existed in the protection of vulnerable participants, proactive learning, and ethical supervision. Educational level and research participation experience were important factors influencing research ethics knowledge, attitudes, and practices, whereas years of work experience had no significant effect.These findings suggest that systematic research ethics training should be strengthened, clinical nurses should be encouraged to participate in research practice, and the transformation of research ethics cognition into standardized behaviors should be promoted, thereby improving nursing research quality and protecting participants' rights.

6 Implications for Practice

The results of this study have important implications for nursing management and research practice. First, nursing managers should incorporate research ethics education into continuing education systems, with emphasis on informed consent, protection of vulnerable participants, and academic integrity. Second, hospitals should improve research ethics management systems, strengthen the guiding role of ethics committees, and create a positive research ethics climate. Third, clinical nurses should be encouraged to participate in research projects and academic exchanges to improve ethical literacy through research practice. Finally, stratified training strategies based on educational level and research experience are recommended to promote the overall improvement of research ethics knowledge, attitudes, and practices among clinical nurses.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Zhejiang Chinese Medical University (Approval number: KL20260612-12). All participants provided signed informed consent.

Consent for publication

Not applicable.

Competing interests

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article.

Declarations of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used ChatGPT by OpenAI to improve the readability and language of the manuscript. After using this tool, the author(s) carefully reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

Funding

This study did not receive any external funding.

Author Contribution

J Y.: Conceptualization, methodology, formal analysis, investigation, writing - original draft, writing - review & editing, Data collection

X M: Conceptualization, methodology, investigation, supervision, project administration, writing - review & editing

Acknowledgements

None.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to institutional privacy policies and ethical considerations regarding participant confidentiality but are available from the corresponding author on reasonable request subject to data sharing agreement.

References

1. Beauchamp TL. Methods and principles in biomedical ethics. J Med Ethics. 2003;29(5):269–74. https://doi.org/10.1136/jme.29.5.269.
2. Berthelsen CB, Hølge-Hazelton B. Nursing research culture' in the context of clinical nursing practice: addressing a conceptual problem. J Adv Nurs. 2017;73(5):1066–74. https://doi.org/10.1111/jan.13229.
3. Bowrey S, Thompson JP. Nursing research: ethics, consent and good practice. Nurs Times. 2014;110(1–3):20–3.
4. Cheng J, Chen Q, Cao Y. (2019). Research progress and prospect of nursing research ethics at home and abroad. *Chinese Nursing Research*, *33*(10), 1734–1738. https://link.cnki.net/urlid/14.1272.R.20190603.1026.042
5. Cheng M, Lu Y, Li J. Visualization analysis of research ability of Chinese nursing staff based on CiteSpace. Chin Gen Pract Nurs. 2023;21(19):2603–8. https://kns.cnki.net/kcms2/article/abstract?v=iMwhGHIyCLZ3z6nFjhYLoisIQmbcUMeHJpEl0hGgUsgS8ng.1QUj8Uy_A2j_MTAL6p_Bb0bzGhbFbr_WDJVTFoBEN3BL-iddYethTKnddm9yEoZrZqaasZ4eSiu3RdLaZuRQx8NsBonodi0M5ttXb_-bLpg01I5GiD15IThxrutcY6y5WUiGVQ5y-iUfOPqJ0&uniplatform=NZKPT&language=CHS.
6. Curtis K, Fry M, Shaban RZ, Considine J. Translating research findings to clinical nursing practice. J Clin Nurs. 2017;26(5–6):862–72. https://doi.org/10.1111/jocn.13586.
7. Doody O, Noonan M. Nursing research ethics, guidance and application in practice. Br J Nurs. 2016;25(14):803–7. https://doi.org/10.12968/bjon.2016.25.14.803.
8. J., D., XB., L., & Y., Y. (2025). Current situation of interventional nursing research in China based on Chinese Clinical Trial Registry. *Journal of Clinical Medicine in Practice*, *29*(12), 125–129. https://link.cnki.net/urlid/32.1697.r.20250626.0859.002
9. Jin Y, Wei J, Zhang J, Luo S, Yuan L, Zou X, Liu D. A study on the knowledge, attitude, and practice of research integrity among medical professionals in Ningxia, China. BMC Med Educ. 2024;24(1):1355. https://doi.org/10.1186/s12909-024-06380-4.
10. Karjalainen H, Halkoaho A, Pietilä AM, Bendel S, Keränen T. Intensive care nurses' perceptions of various ethics concerns affecting clinical research. Scand J Caring Sci. 2019;33(2):371–9. https://doi.org/10.1111/scs.12632.
11. Katz J. The Nuremberg Code and the Nuremberg Trial. A reappraisal. JAMA. 1996;276(20):1662–6.
12. Li Y. J. (2017). *Research on influencing factors and countermeasures ofscientific research ethics cognition and implementationamong nursing staff* [▨▨, Shanxi Medical University]. https://kns.cnki.net/kcms2/article/abstract?v=W-y7fKBVJCxqo2tvvzmUAelcsvlW9_GvkiatvlAd_0hsr6qGvcJ55t5sBMuwwqNtIh5UbKMg9l-L2OaBJBZnzrp4Zhkr1R8N8UaXVWEOCIoDpOQDllw85oFZbj3YGJynyNqwjABR2M1RckSlKhGEnRSo5f2pbTOJe9XykdgZXwL8r1wRGx9AgqH3fCbjFOjJ&un
13. Lu Y, Ding P, Chen Y, Shen L. Investigation and Analysis on the Cognition of Scientific Research Integrity of Oral Medicine Researchers. Health Vocat Educ. 2023;41(17):127–30. https://doi.org/10.20037/j.issn.1671-1246.2023.17.40.
14. Melnyk BM, Gallagher-Ford L, Long LE, Fineout-Overholt E. The establishment of evidence-based practice competencies for practicing registered nurses and advanced practice nurses in real-world clinical settings: proficiencies to improve healthcare quality, reliability, patient outcomes, and costs. Worldviews Evid Based Nurs. 2014;11(1):5–15. https://doi.org/10.1111/wvn.12021.
15. Pan J, Li M, Li X, Liu X, Liu Y. (2025). Research progress on clinical nurses' knowledge of research ethics. *Journal of Nursing Science*, *40*(15), 113–117. https://kns.cnki.net/kcms2/article/abstract?v=iMwhGHIyCLZ359bSE4sv5lUgN8dgLJM2vLAJACkWN4xLQBTJbvz_DQh0gcgV87vLh45aJdW48l35g8bZrmLK34yqOqxYHmbtmCu2k8qMdFkyOzEMK8kfLobKeH8OGB4jNQf_jdyg&uniplatform=NZKPT&language=CHS
16. Wei Z, Huang Y, Liu Q. Investigation of the current status of research ethics in traditional Chinese medicine hospitals in Chongqing. Mod Med Health. 2024;40(13):2326–31. https://kns.cnki.net/kcms2/article/abstract?v=iB5Z0i9DW_z7.J01YwHHNbBljchdffcyNov2Ww5bfHdqUFQP0_SuEqbnzgIKaceRceW8QaIXZPprY0j3Q3Ljp8802S78dvBxxdK0JL1vGl2MzYLXBEMC_73k6Dazp04heM-1oOeTVofT2PR8jvLrDz-lhWfGMrCO7DYoxHsZFgbWdlZXjol9oT-BubJNbhgsA&uniplatform=NZKPT&language=CHS.
17. World Medical Association Declaration of Helsinki. JAMA. 2013;310(20):2191–4. https://doi.org/10.1001/jama.2013.281053. : ethical principles for medical research involving human subjects.
18. Yang H, Qu H, Wang Q, Wang F, Du M. The thoughts and countermeasures of improving scientific research capacity of nurses in SWOT perspective. J Nurs Adm. 2016;16(07):510–1. https://kns.cnki.net/kcms2/article/abstract?v=iMwhGHIyCLZhSeUsBI6VzoH. rFlJ-k32BkbMcLkP5146alt-yF3QhyFI6Bg_fQIghKiXjkIi8UtiruAtvLxpkv&uniplatform=NZKPT&language=CHS.47IN3lFyLPNCh8ZUuVhOq4_tFlOGUvJOk6D2_x6sDyAilLKGFLEtBp_Rtaojp4efc_OY503rAvM-QaJ-1Q3EWTHEQjwLQsB57Qnxmgd.
19. Zhang N, Cheng Q, Lu W, Luo T, Zhang Z, Jiang S, Qin H, Zhu L. Current status and influencing factors of nurses' knowledge and attitudes towards clinical research ethical in China: a province-wide cross-sectional survey. BMC Nurs. 2024;23(1):671. https://doi.org/10.1186/s12912-024-02332-x.
20. Zhao L, Wu C, Hao X, Zhang Y. Development and validation of the Knowledge, Attitude, and Practice Questionnaire on research ethics among clinical nurses. Chin J Med Res Manage. 2025;38(3):246–51. https://doi.org/10.3760/cma.j.cn113565-20250112-00008.
21. Zhou L. S. (2023). The Situation and Prospect of Nursing Discipline Development. *Military Nursing*, *40*(01), 1–4. https://kns.cnki.net/kcms2/article/abstract?v=iMwhGHIyCLa5uBl8DirqGelHRityM_rvlR4HINAzr1Rfga7VCGajOOdN0vADZXU0SyDG7UFTwbAXXV4ms-3wHzxAdIoF8dGMzJXxqh-BAiIlBSpFGs96N5x17E1znM5GVq2GLOl1EXi8l_gmxPBsHEB0VZpOTmg2KKDu9c3Vaqczkehk_CVlQM5WbxNUniMb&uniplatform=NZKPT&language=CHS

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- OKTable.docx