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A Survey on Research Ethics Cognition and Influencing Factors among Primary-Care Medical Staff in Shanghai from the Perspective of Regional Medical Alliance

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Abstract: *Objective*: To understand the knowledge and attitudes of primary-care medical staff toward research ethics and research ethics committees (RECs), analyze influencing factors, and thereby improve ethical awareness and decision-making capacity among researchers in primary-care institutions. *Methods*: A cross-sectional survey was conducted using convenience sampling among researchers from a tertiary hospital and its affiliated medical alliance units in Jinshan District, Shanghai. *Results*: Only 45.76% of participants were familiar with the operational guidelines and ethical principles for reviewing biomedical research involving human subjects. Although 83.47% considered RECs helpful, 65.68% knew that their hospital had an REC, but only 37.29% fully understood its functions. Meanwhile, 47.04% believed that REC review slows research progress, and 41.52% thought it acceptable to fabricate some data or alter study structures if no harm is caused to patients. *Conclusion*: It is recommended that research ethics education be prioritized in medical ethics curricula through revised syllabi or teaching methods; a culture of research integrity should be fostered; and regional ethics collaboration and training platforms led by tertiary hospitals within the medical alliance should be vigorously promoted.

Keywords: Regional medical alliance; Primary-care medical institutions; Research ethics; Research ethics committee; Cognition

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1. Introduction

With the rapid development of medical research, exploration of various disease fields and innovation in medical technology are changing rapidly. The National Health Commission has clearly stated that by 2025, community health service centers must meet capability standards or recommended standards, ensuring

universal access to basic medical services. Community medical construction is an important part of China's urban primary healthcare system [1].

As urban primary healthcare institutions, community hospitals undertake preventive care, health education, and basic medical services [2]. With the advancement of the national hierarchical diagnosis and treatment system and family doctor contract services, along with the high-quality development of primary care, community hospitals have gradually attached importance to grassroots research to enhance service capacity. Studies show that research training, postgraduate degrees, and senior professional titles in the past five years are major factors influencing higher research output among community general practitioners in Shanghai [3]. However, as research activities deepen in primary hospitals and ethical committee structures are often lacking, issues such as integrity lapses and academic misconduct have emerged, seriously harming hospital reputation [4]. The Measures for Ethical Review of Life Science and Medical Research Involving Humans(2023) first proposed that "institutions without an ethics committee or unable to meet review needs may entrust regional ethics review committees to conduct ethical reviews" [5]. In October 2023, the Ministry of Science and Technology and ten other departments issued the Interim Measures for Science and Technology Ethics Review, which mentioned "exploring the establishment of professional and regional science and technology ethics review centers" [6]. Beijing's Implementation Opinions on Strengthening Science and Technology Ethics Governance (Trial)(2024) explicitly stated that "regional ethics committees are responsible for training and consultation in this field and undertake ethics review of scientific activities for innovative entities within the region that have not established ethics committees or have insufficient review capacity" [7]. Shanghai's Ethical Review Standards for Life Science and Medical Research Involving Humans (DB31-T899-2025) defined regional ethics committees and explicitly required that "if an institutional ethics review committee is unable to perform its duties, it shall entrust in writing an ethics review committee of not lower level or a regional ethics review committee to conduct the review" [8]. Thus, the demand for ethical oversight at primary institutions is receiving increasing attention from national and local authorities. The degree of ethics cognition among medical and research staff at primary hospitals greatly influences their attitudes and behaviors toward participating in ethics review.

This study investigates the knowledge and attitudes of medical staff at primary institutions within a medical alliance toward research ethics and RECs, analyses influencing factors, and proposes countermeasures to improve ethical awareness and decision-making capacity among researchers in the district's primary institutions.

2. Subjects and methods

2.1. Study subjects

Medical researchers meeting inclusion criteria were selected.

2.1.1. Inclusion criteria

(1) In-service doctors, technicians, nurses, and postgraduate students in the hospital;
(2) Had research experience during school or work;
(3) Had experience in writing and submitting research papers;
(4) Provided informed consent and volunteered.

2.1.2. Exclusion criteria

(1) Interns or trainees;

(2) Unable to attend research ethics training on time.

2.2. Methods

A cross-sectional survey was conducted using convenience sampling among medical researchers from one tertiary hospital and four medical alliance units in a district of Shanghai from July to November 2024. The questionnaire was distributed via Wenjuanxing through WeChat links or QR codes to research leaders of each community hospital, who organized staff to complete it. The platform allowed real-time monitoring and collection of responses, ensured data completeness, and provided export functions. Data encryption and anonymous collection protected personal information, enhancing authenticity and reliability [9]. The questionnaire included an informed consent section at the beginning; participants could proceed only after consenting. The survey was returned anonymously, with no identifiable information.

2.3. Questionnaire design

A self-designed "knowledge-attitude-practice" questionnaire was developed using literature review and expert consultation. Three medical ethics experts supervised and revised the content to finalize the version. The questionnaire covered knowledge (ethical principles, REC functions), attitudes (acceptance of REC, recognition of ethical practice), and practice. It comprised six parts: Part I–demographics (age, gender, specialty, title, years of work, hospital level, previous ethics training, experience in human-related research, and publication record). Parts II and III asked about knowledge of research ethics and RECs (21 items, answered with "yes", "no", "I don't know", or "I'm not sure"). Parts IV and V addressed attitudes toward research ethics and RECs (22 items on a 5-point Likert scale from "strongly agree" = 5 to"strongly disagree" = 1). The final part contained four case scenarios testing ethical knowledge (specific items are shown in **Table 4**).

2.4. Statistical analysis

Data were exported to Excel and analyzed using SPSS 27.0. Descriptive statistics were performed. In descriptive analysis, "don't know" and "uncertain" were combined into "uncertain"; "strongly disagree" and "disagree" into "disagree"; "agree" and "strongly agree" into "agree". Frequencies and percentages were used for categorical variables. The Kruskal-Wallis test(non-parametric) assessed correlations between knowledge/attitudes and REC-related factors; $p \leq 0.05$ was considered significant.

3. Results

3.1 Basic characteristics

A total of 236 valid questionnaires were returned, and the data were analyzed with SPSS 27.0(detailed analysis is shown in **Table 1**). Among participants,36.44%were male and 63.56%female, showing a higher proportion of females. In terms of age distribution, the majority (66.1%) were aged 33 years and above. Most participants came from community health centers (37.71%) and the tertiary hospital (38.56%). Regarding professional titles, intermediate titles accounted for the highest proportion (58.05%), with other levels evenly distributed. Over five years of work experience comprised 86.44%; 147(62.29%) had previously attended ethics-related courses or training; only 94(39.83%) had conducted or participated in human-related research; and 99(41.95%) had published human-related research papers.

Table 1. Demographic characteristics (N = 236)

Characteristic	Category	N(236)	P (%)
Age (years)	18~23	2	0.85
	24~27	20	8.47
	28~32	58	24.58
	33~40	78	33.05
	>40	78	33.05
Gender	Male	86	36.44
	Female	150	63.56
Hospital Level	Community Health Service Center	89	37.71
	Public Secondary Hospital	56	23.73
	Community Health Service Center	89	37.71
	Public Tertiary Hospital	91	38.56
Medical Specialty	General Practice	54	22.88
	Internal Medicine	34	14.41
	Surgery	32	13.56
	Pharmacy	21	8.9
	Nursing	45	19.07
Professional Title	Junior	59	25
	Intermediate	137	58.05
	Associate Senior	31	13.14
	Senior	9	3.81
Years of Work	1	11	4.66
	2	7	2.97
	3	4	1.69
	4	10	4.24
	5-10	73	30.93
	>10	131	55.51
Participated in research ethics-related courses/ training?	Yes	147	62.29
	No	89	37.71
Led/Participated in life science/medical research involving human subjects?	Yes	94	39.83
	No	142	60.17
Published research papers involving human subjects?	Yes	99	41.95
	No	137	58.05

3.2. Knowledge of research ethics and RECs

When asked about awareness of Chinese research ethics laws and regulations, 64.83% of participants had taken medical research ethics courses during university; 58.47% and 54.66% had attended ethics lectures and courses in research ethics or bioethics, respectively. 78.81% knew about relevant laws and regulations. However, only 45.76% and 41.1% were familiar with China's operational guidelines for biomedical research ethics review and ethical principles for life sciences, respectively. Most (82.2%) agreed that human-subject research requires REC review, but 25% thought only clinical trials need it, 25.42% believed funded projects are exempt, and 26.27% thought retrospective studies should be exempt.

Regarding RECs, 83.47% considered RECs helpful; 65.68% knew their hospital had an REC; but only 37.29% fully understood its functions. For scientific review, 66.53% knew of the existence of a science committee, and 78.81% believed that research projects need scientific review before ethics review. Some participants felt that the presence of a science committee made REC review unnecessary.

3.3. Attitudes toward research ethics and RECs

Table 2 shows participants' attitudes toward research ethics. The majority (93.22%) believed that research ethics courses should be compulsory for medical students; 94.07% thought all researchers should receive ethics training; 93.22% agreed that informed consent must be obtained when research involves more than minimal risk. Despite legal requirements, 45.77% thought that during clinical research, patients should not be told of potential risks for fear of refusal; 41.9% believed using discarded patient blood samples for research does not require informing or obtaining consent; 41.52% thought data fabrication is acceptable if no harm occurs; 44.06% believed that if blood samples are collected for clinical tests, researchers can use leftover samples without informed consent; similarly, 41.96% thought using discarded clinical laboratory blood samples does not require consent. However, 95.34% agreed that measures should be taken to prevent accidental data leakage.

Table 2. Attitudes of primary medical researchers towards research ethics

Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Medical research ethics should be taught as a compulsory module for postgraduate studies.	130 (55.08%)	90 (38.14%)	14 (5.93%)	1 (0.42%)	1 (0.42%)
Medical research ethics should be taught as a compulsory module for undergraduate studies.	121 (51.27%)	99 (41.95%)	15 (6.36%)	0 (0%)	1 (0.42%)
All researchers should receive training in research ethics.	125 (52.97%)	97 (41.1%)	12 (5.08%)	1 (0.42%)	1 (0.42%)
More emphasis should be placed on research ethics when conducting research involving human subjects.	135 (57.2%)	87 (36.86%)	11 (4.66%)	2 (0.85%)	1 (0.42%)
When the risk of life science research involving human subjects exceeds minimal risk, we must obtain informed consent from each patient.	123 (52.12%)	97 (41.1%)	12 (5.08%)	3 (1.27%)	1 (0.42%)
When obtaining data from research subjects, measures should be taken to prevent accidental data leakage.	139 (58.9%)	86 (36.44%)	9 (3.81%)	2 (0.85%)	0 (0%)

Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
During clinical research, patients should not be informed of potential risks; otherwise, they might not agree to participate.	47 (19.92%)	61 (25.85%)	11 (4.66%)	45 (19.07%)	72 (30.51%)
As long as no harm is caused to patients, some data or results can be appropriately fabricated to improve research results.	38 (16.1%)	60 (25.42%)	9 (3.81%)	44 (18.64%)	85 (36.02%)
If researchers do not comply with ethical guidelines, it will be difficult to publish articles/research reports.	103 (43.64%)	106 (44.92%)	20 (8.47%)	2 (0.85%)	5 (2.12%)
If blood samples are collected for clinical laboratory tests and researchers wish to use part of the blood for research, there is no need to obtain informed consent from patients regarding the research.	41 (17.37%)	63 (26.69%)	14 (5.93%)	55 (23.31%)	63 (26.69%)
During clinical research, potential risks need not be disclosed to patients to prevent them from refusing to participate.	38 (16.1%)	60 (25.42%)	11 (4.66%)	47 (19.92%)	80 (33.9%)
If researchers want to use discarded blood samples from the hospital laboratory for scientific research, it is not necessary to obtain patient informed consent.	40 (16.95%)	59 (25%)	24 (10.17%)	51 (21.61%)	62 (26.27%)

For attitudes toward RECs (**Table 3**), 94.92% agreed that every university or research institution needs an REC for human-related research; 91.53% agreed that human research should first be reviewed by an REC before scientific committee review. However, 45.76%thought ethics review applies only to international collaborative studies, and 47.04% believed REC review delays research and increases difficulty.

Table 3. Attitudes of primary medical researchers towards the research ethics committee

Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Every university or research institution needs a research/ethics committee to conduct ethical reviews for research involving human subjects.	120 (50.85%)	104 (44.07%)	11 (4.66%)	1 (0.42%)	0 (0%)
Research involving human subjects must be reviewed by a research ethics committee.	129 (54.66%)	96 (40.68%)	10 (4.24%)	1 (0.42%)	0 (0%)
Research involving human subjects must first be reviewed by a research ethics committee, and then by a scientific committee.	117 (49.58%)	99 (41.95%)	14 (5.93%)	4 (1.69%)	2 (0.85%)
Ethical review enhances the credibility of research.	115 (48.73%)	104 (44.07%)	14 (5.93%)	2 (0.85%)	1 (0.42%)
Ethical review only applies to international cooperative research and projects.	43 (18.22%)	65 (27.54%)	33 (13.98%)	60 (25.42%)	35 (14.83%)
Because there is a scientific review committee, there is no need for an ethics committee to review research.	40 (16.95%)	53 (22.46%)	24 (10.17%)	73 (30.93%)	46 (19.49%)
Review by the research ethics committee will delay the initiation of research projects and make researchers' work more difficult.	42 (17.8%)	69 (29.24%)	43 (18.22%)	53 (22.46%)	29 (12.29%)

Item	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Members of the research ethics committee should receive regular training in research ethics.	112 (47.46%)	100 (42.37%)	18 (7.63%)	6 (2.54%)	0 (0%)
Members of the research ethics committee should at least be professors with high authority in universities / or have associate senior or senior professional titles in hospitals.	82 (34.75%)	98 (41.53%)	40 (16.95%)	13 (5.51%)	3 (1.27%)
To ensure the accuracy of decisions made by medical research ethics committees, it is necessary for them to receive regular supervision from higher-level institutions.	110 (46.61%)	104 (44.07%)	14 (5.93%)	8 (3.39%)	0 (0%)

3.4. Case scenario analysis

In the final part (**Table 4**), participants answered four case scenarios that tested knowledge of clinical research ethics, covering: informed consent with description of risks and benefits, research involving vulnerable children, patient privacy protection, and retrospective use of stored clinical samples. The correct rates were: 69.49% for the informed consent scenario, 77.97% for vulnerable children, 94.49% for privacy protection, and 77.54% for retrospective sample use. Almost all participants (94.49%) demonstrated strong awareness of privacy protection, but over 30% were unclear about the informed consent description.

Table 4. Responses to case scenarios on clinical research ethics based on research ethics knowledge

Ethical content involved	Case scenario	Correct rate
Informed Consent Form Describing Risks and Benefits	Case 1: 60 patients from our dental clinic participated in a study comparing the effect of immediate alveolar ridge preservation (i.e., filling the socket with biological material and covering with a barrier membrane immediately after extraction to reduce alveolar bone resorption) versus traditional extraction methods on shortening the prosthetic rehabilitation cycle. However, alveolar ridge preservation also has drawbacks, such as leading to gingival recession of adjacent teeth, loss of interdental papillae, and reduction of buccal keratinized gingiva. Oral consent was obtained from patients without fully describing the risks and benefits. Which of the following best describes the obligation of informed consent?	164 (69.49%)
Research Involving Vulnerable Groups (Children)	Case 2: 100 children aged 6–12, regardless of gender, were randomly selected from our ophthalmology clinic. The examined children were randomly divided into two groups: one group used monofocal glasses with matching prescriptions, and the other used 4L comprehensive therapy. The final evaluation assessed the clinical efficacy and safety of the 4L therapy. Which method of informing and obtaining consent for the children is appropriate?	184 (77.97%)
Patient Privacy Protection	Case 3: 120 patients participated in a clinical study comparing the efficacy of two different drugs for treating gout with hyperuricemia. Which of the following statements about this study is correct?	223 (94.49%)
Retrospective Study Using Samples Collected and Stored During Clinical Treatment	Case 4: 50 patients from the Gastroenterology outpatient clinic were diagnosed with gastric cancer. After obtaining patient consent during clinical diagnosis and treatment, gastroscopic biopsies were performed to confirm the clinical diagnosis. One month later, the department planned a study on gastric cancer requiring the use of all patient hospitalization information, including all previously obtained biopsies from the patients. Which of the following statements about this study is correct?	183 (77.54%)

3.5. Correlation between knowledge and attitudes

As shown in **Table 5**, participants familiar with biomedical research ethics review principles scored higher on REC recognition ($p < 0.05$) and had stronger ethical attitudes than those uncertain ($p < 0.05$). Those who had

taken research ethics or bioethics courses showed stronger attitudes toward both research ethics and RECs ($p < 0.05$), and they considered RECs more beneficial than those without such courses ($p < 0.05$). Although these participants generally supported the necessity of RECs ($p < 0.05$), those who believed RECs apply only to academic settings scored higher ($p < 0.05$), and they also more often thought retrospective studies should be exempt ($p < 0.05$).

Table 5. Correlation between primary medical researchers' knowledge of and attitudes towards research ethics and the REC

Question	Research Ethics		Research Ethics Committee	
	Median (IQR)	*p*	Median (IQR)	*p*
1. To your knowledge, are there laws or regulations in China regarding the oversight of research ethics?		0.176		0.067
Yes	3.58 (3.25–4.35)		2.92 (2.67–3.19)	
No	3.50 (3.08–4.02)		2.79 (2.73–3.17)	
Uncertain	3.50 (3.08–4.00)		2.75 (2.52–3.00)	
2. Are you familiar with the principles of ethical review for biomedical research involving human subjects?		0.002		< 0.001
Yes	4.00 (3.33–4.96)		3.00 (2.75–3.70)	
No	3.42 (3.17–4.00)		2.92 (2.58–3.00)	
Uncertain	3.29 (3.17–4.00)		2.75 (2.50–3.00)	
No vs. Uncertain		1		0.662
No vs. Yes		0.156		0.000
Uncertain vs. Yes		0.006		0.085
3. Did you have courses related to research ethics for medical students during university?		< 0.001		0.050
Yes	3.67 (3.25–4.58)		2.92 (2.67–3.46)	
No	3.33 (3.13–4.00)		2.75 (2.46–3.00)	
Uncertain	3.54 (3.00–4.00)		2.88 (2.58–3.00)	
No vs. Uncertain		1		
No vs. Yes		0.002		
Uncertain vs. Yes		0.046		
4. Do you know China's "Operational Guidelines for Ethical Review of Biomedical Research Involving Human Subjects"?		< 0.001		< 0.001
Yes	3.92 (3.33–4.98)		3.00 (2.75–3.73)	
No	3.33 (3.17–4.04)		2.83 (2.63–3.00)	
Uncertain	3.33 (3.08–4.00)		2.75 (2.50–3.00)	
No vs. Uncertain		1		0.361
No vs. Yes		0.011		0.175
Uncertain vs. Yes		0.000		0.000
5. Have you participated in seminars/lectures on research ethics?		0.003		0.003
Yes	3.00 (2.73–3.35)		3.37 (3.25–4.58)	
No	2.75 (2.50–3.00)		3.33 (3.08–4.00)	
Uncertain	2.96 (2.69–3.00)		3.92 (3.10–4.00)	

Question	Research Ethics		Research Ethics Committee	
	Median (IQR)	*p*	Median (IQR)	*p*
No vs. Uncertain		0.719		0.321
No vs. Yes		0.002		0.002
Uncertain vs. Yes		0.578		1.000
6. Have you taken courses in research ethics or bioethics?		< 0.001		< 0.001
Yes	3.00 (2.75–3.50)		3.75 (3.33–4.63)	
No	2.75 (2.50–3.00)		3.25 (3.08–4.00)	
Uncertain	2.92 (2.67–3.00)		3.92 (3.08–4.00)	
No vs. Uncertain		0.292		0.481
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.198		0.001
7. Are you familiar with the ethical guidelines for life science research involving human subjects?		0.053		<0.001
Yes	3.00 (2.75–3.75)		4.00 (3.33–5.00)	
No	2.75 (2.50–3.00)		3.33 (3.17–4.00)	
Uncertain	2.75 (2.58–3.00)		3.33 (3.17–4.00)	
No vs. Uncertain		1		1
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.003
8. Are you familiar with China's "Good Clinical Practice for Drugs" and "Good Clinical Practice for Medical Devices"?		0.021		< 0.001
Yes	4.00 (3.33–5.00)		3.00 (2.75–3.75)	
No	3.25 (3.08–3.96)		2.75 (2.50–3.00)	
Uncertain	3.33 (3.17–4.00)		2.75 (2.58–3.00)	
No vs. Uncertain		0.812		1
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.001
9. Research involving human subjects must be reviewed by an ethics committee?		0.633		0.669
Yes	3.58 (3.25–4.33)		2.83 (2.67–3.17)	
No	4.00 (3.17–4.00)		2.92 (2.25–3.00)	
Uncertain	3.92 (3.00–4.00)		3.00 (2.67–3.00)	
10. Only clinical trials need to be reviewed by an ethics committee?		< 0.001		< 0.001
Yes	4.33 (3.83–5.00)		3.00 (2.83–3.75)	
No	3.33 (3.17–4.00)		2.75 (2.58–3.00)	
Uncertain	3.50 (3.00–4.00)		3.00 (2.67–3.00)	
No vs. Uncertain		1.000		0.815
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.010
11. Approved research projects do not need ethics committee review because they have already been approved by relevant institutions?		< 0.001		< 0.001
Yes	4.46 (3.88–5.00)		3.17 (3.00–3.75)	

Question	Research Ethics		Research Ethics Committee	
	Median (IQR)	*p*	Median (IQR)	*p*
No	3.33 (3.17–4.00)		2.75 (2.58–3.00)	
Uncertain	3.42 (3.00–4.00)		2.83 (2.52–3.00)	
No vs. Uncertain		1.000		1.000
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.000
12. Does the research ethics committee only apply to academic environments?		< 0.001		< 0.001
Yes	4.75 (4.00–5.00)		3.75 (3.00–3.75)	
No	3.33 (3.23–4.00)		2.75 (2.58–3.00)	
Uncertain	3.25 (3.00–4.00)		2.75 (2.50–3.00)	
No vs. Uncertain		0.303		1
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.000
13. Should retrospective studies be exempt from ethics committee review?		< 0.001		< 0.001
Yes	4.33 (3.67–5.00)		3.25 (3.00–3.75)	
No	3.33 (3.25–4.00)		2.75 (2.58–3.00)	
Uncertain	3.25 (3.00–4.00)		2.75 (2.50–3.00)	
No vs. Uncertain		0.271		1
No vs. Yes		0.000		0.000
Uncertain vs. Yes		0.000		0.000

4. Discussion

This study reveals a "high knowledge, weak practice" pattern among primary-care researchers. While overall knowledge and attitudes appear positive–with 64.83%having taken ethics courses, 58.47% attending seminars, and 54.66% taking bioethics courses–only 41.1% were familiar with ethical principles for life sciences, and 45.76% knew the national guidelines. This indicates that beyond general medical ethics, medical schools need to strengthen and disseminate research ethics education as a compulsory component for all students. Curriculum revision and teaching method adjustments can deepen understanding of principles, rules, and details. For example, an educational workshop in Jordan recommended incorporating REC functions and review processes into medical student teaching [10].

4.1. Knowledge of research ethics and RECs

Our participants achieved high correct rates for privacy protection (94.49%) and over 75% for vulnerable group consent and biospecimen use–thanks to China's standardization efforts since 2018, with successive regulations on ethics review and informed consent for biomedical research, biospecimens, and data [11,12]. Although 82.2% agreed human research needs REC review and 83.47% considered RECs helpful, only 37.29% fully understood REC functions. In Lebanon, 90%of physicians found RECs helpful but nearly 40%were unaware of their functions; in Myanmar, only 47.1% of postgraduates fully understood REC functions [13,14]. Medical researchers should be familiar with ethical principles and REC review processes to better incorporate them from project conception and application stages.

4.2. Attitudes toward research ethics

About 44.06% of participants believed that blood samples collected for clinical tests can be used for research without patient consent, and 41.95% held the same view for discarded laboratory blood samples. Similar results appeared in Myanmar, where 20%thought it acceptable to use clinically collected samples without specific consent [14]. However, Chinese regulations specify conditions for waiving informed consent. The 2016 Measures for Ethical Review of Biomedical Research Involving Humans and the 2023 Guidelines for the Construction of Clinical Research Ethics Review Committees allowed waiver in certain circumstances, but the 2023 joint measures simplified review by removing some waiver conditions and adding four categories exempt from ethics review, aiming to enhance individual autonomy and privacy protection [15–17].

Currently, China has not issued detailed rules for waiver of informed consent, and operational standards vary. Some institutions allow waiver for research on stored biospecimens if participants had previously signed broad consent forms (e.g., for medical data and residual sample use) but still require REC approval [18]. Thus, more detailed guidance and training on the appropriate application of informed consent and its waiver are essential.

Regarding misconduct, although 88.56% believed that non-compliance with ethical norms makes publication difficult, 41.52% thought it acceptable to fabricate some data if no harm occurs. A Myanmar study found 32.8% accepted data modification to improve results [14]. Therefore, research misconduct among primary-care researchers warrants further scrutiny. Upholding research integrity is fundamental; its absence hinders scientific innovation and damages scholarly reputation [19].

4.3. Attitudes toward research ethics committees

RECs are responsible for reviewing both scientific and ethical aspects of research projects [20]. However, 47.04% of our participants believed ethics review delays research and increases difficulties–similar to findings in Myanmar and Iran [14,21]. To correct this misconception, RECs should operate transparently and accountably, and provide more frequent and detailed training so researchers understand the necessity of RECs.

Our study showed that attitudes toward research ethics and RECs were significantly correlated with knowledge of ethical principles. Those more familiar with ethics demonstrated stronger support. Therefore, incorporating ethical education during university and on-the-job training will help researchers balance ethical practice and principles, enabling them to resolve ethical dilemmas in future clinical research.

Moreover, 37.71% of participants came from community health centers and 23.73%from secondary hospitals; only 65.68% indicated that their institution had an REC. Yet, serious cognitive biases remained regarding retrospective research and use of discarded samples. This indicates that while tertiary hospitals' research resources have been disseminated, the supporting ethical oversight and integrity education have not truly taken root at the grassroots level.

5. Conclusion

This assessment of primary-care medical researchers' cognition and attitudes reveals major cognitive gaps and systemic weaknesses in ethical practice. Based on the results and discussion, we propose three strategies to enhance the ethical level and research integrity of primary medical research in China:

First, build a systematic ethics education mechanism to internalize ethical norms. The current cognitive

deficiencies highlight a systematic shortfall in education. Medical schools and institutions should strengthen the structured development of research ethics curricula, not only incorporating core content but also extending ethics education throughout the entire career. Using case-based teaching, scenario simulations, and reflective discussions, both students and practicing researchers can deeply understand domestic regulations such as the Measures for Ethical Review of Life Science and Medical Research Involving Humans as well as international principles like the Declaration of Helsinki, thereby transforming ethical requirements from external constraints into internal research habits [5].

Second, foster a cultural ecology that respects research integrity as the foundation for effective ethics implementation. A culture of research integrity should be cultivated to enhance awareness and commitment among medical researchers, ensuring truthfulness, standardization, and transparency from study design to data collection and publication. This strengthens the credibility of scientific research, provides a reliable basis for ethical review of risk-benefit assessments, and fundamentally protects subjects' rights and public interests. At the same time, it provides a truthful and reliable foundation for the scientific evaluation of risks and benefits in ethical review, fundamentally safeguarding subjects' rights and public interests.

Third, innovate regional collaborative ethics governance models to standardize ethics review. To overcome uneven ethical review capacities at the grassroots, active exploration of new collaborative models based on the medical alliance is recommended. With the leading tertiary hospital at the core, a regional medical alliance ethics collaboration and training platform should be established to implement homogeneous management of review standards, operating procedures, and decision-making criteria, as encouraged by recent policies [5,6,8]. The platform can offer immersive scenario-based training focusing on proper informed consent acquisition, privacy and confidentiality, and standardized ethics review processes, translating abstract legal requirements into clear, actionable guidance for front-line researchers, thus elevating overall regional ethics governance.

In summary, improving grassroots medical research ethics requires a systematic effort integrating education, culture, and institutional coordination. Future research should evaluate the implementation effects of these interventions to continuously optimize ethical governance pathways suited to the Chinese context.

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