SORIGINAL ARTICLE

Assessment of knowledge, attitude, and practice towards research ethics among medical faculty and postgraduate residents of the government medical college in Uttarakhand

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CITATION

Garhwal K, Bartwal J, Rawat CMS, Nautiyal N. Assessment of knowledge, attitude, and practice towards research ethics among medical faculty and postgraduate residents of the government medical college in Uttarakhand. Indian J Comm Health. 2025;37(3):401-407. https://doi.org/10.47203/IJCH.2025.v37i03.008

ARTICLE CYCLE

Received: 16/04/2025; Accepted: 28/06/2025; Published: 30/06/2025

ABSTRACT

Background: Research ethics fundamentally describe the guidelines followed by a researcher while working on the research. This study assesses the knowledge, attitude, and practices towards research ethics among medical faculty and postgraduate residents. **Methods:** 105 medical faculty and postgraduate students participated in a cross-sectional study at a government medical college in Uttarakhand using convenience sampling. A semi-structured questionnaire was used to gather data, which included demographics, knowledge, attitudes, and practices related to research ethics. Participants were approached department-wise and provided a Google Form link. Statistical analysis was conducted using SPSS version 20, with $p < 0.05$ considered significant. **Results:** Of the 105 participants, 66.6% were ≤30 years old, 53.3% were female, and 64.8% were postgraduate residents. While 68.6% were currently involved in research, 64.8% had no prior publications. Knowledge of research ethics varied significantly by rank, with faculty and senior residents demonstrating stronger ethical stances than junior residents, particularly regarding citation practices and method reuse. Significant differences were found in views on self-plagiarism, plagiarism severity, and its justification. Reported plagiarism practices included 2.9% using others' work without citation and 4.8% misappropriating ideas. **Conclusion:** Our study reveals gaps in research ethics awareness, especially among junior residents. While most participants were engaged in research, many lacked prior publication experience. Ethical knowledge varied by rank, with faculty and senior residents demonstrating stronger adherence. Misconceptions about self-plagiarism and plagiarism severity were common, highlighting the need for targeted ethics training.

KEYWORDS

Publication Ethics, Plagiarism, Research, Scientific Misconduct

INTRODUCTION

"The application of moral principles and professional codes of behaviour to the gathering, examination, reporting, and publication of data concerning study participants—particularly the active acceptance of the subjects' rights to confidentiality, privacy, and informed consent"—is known as research ethics. (1)

It is seen as a grave transgression of scientific ethics and academic integrity, undermining the credibility of research and eroding trust in scholarly work. (2,3) In medical research, plagiarism is particularly concerning as it compromises the reliability of findings that may influence clinical practice and patient care. (4)

Medical faculty and postgraduate residents play a crucial role in advancing research and upholding ethical standards. However, studies have shown varying levels of awareness, beliefs and behaviours

around research ethics among medical professionals. (2,5)

Factors such as limited training in ethical guidelines, pressure to publish, and accessibility to online resources contribute to unethical practices like plagiarism. (3,4) This study aims to understand aspects essential for designing targeted interventions such as workshops at institutional level to promote ethical research practices. By identifying gaps in awareness and adherence to ethical standards, this study seeks to contribute to develop a culture of academic integrity and improve the quality of medical research.

Aim & Objective(s)

To study the knowledge, attitude and practice of research ethics among medical faculty and post graduate medical residents.

To assess the difference between knowledge, attitude and practice of medical faculty and post graduate residents.

MATERIAL & METHODS

Study type: Observational.

Study design: A cross-sectional study.

Study population: All medical teachers and post graduate students of Government Medical College in state of Uttarakhand.

Inclusion criteria: All medical teachers and post graduate students of Government Medical College in state of Uttarakhand who consented.

Study duration: July 2023 to January 2024.

Sample size: 105

Sampling technique: Convenience sampling

Data collection: With the proper authorisation from the department head, the medical faculty and post graduate residents were met department-by-department. Participants were given a thorough explanation of the study, and those who agreed to take part were shared a link to the google form containing the questionnaire which mentioned the consent before questions section. Email and other details which can disclose one's identity were not included in the questionnaire. Explicit confidentiality assurance was insured in the informed consent. There were in total 193 teachers and post graduate residents in medical college. All of them were approached twice during the study period with a gap of one week. Study Participants who were willing to take part in the study were included thereof.

Ethical clearance: Before the initiation of the study, Institutional Ethics Committee approval was obtained.

Study instrument: It comprised of 4 sections:

(1) Basic demographic information; (2) Knowledge level regarding plagiarism and ethics (3) Attitudes regarding plagiarism (4) Plagiarism practice. Self-developed questionnaire was used for knowledge and practice. Its internal validity was checked. It took no more than 15 minutes to complete the interview, 20 PG residents participated in a preliminary study of the questionnaire, that were not part of the study. The Attitudes Towards Plagiarism Questionnaire (ATPQ) developed by Mavrinac et al (6) was used. It consists of 29 questions that assess three different aspects: (3) "subjective" or personal norms (items 20–29); (2) "negative" or critical attitudes (items 13–19); and (1) "positive" or permissive attitudes (items 1–12). A high negative attitude score shows that the participant is against plagiarism (positive), whereas a high permissive attitude score shows that the participant allows oneself to plagiarise (negative). A high score for subjective norms indicates that the individual merely tolerates plagiarism since they are aware of its frequency (unfavourable). It has a reliability score of >0.70. Data was entered into Excel 2021. Statistical analysis was conducted using SPSS version 20. The chi square test was used, with $p < 0.05$ being regarded as significant. Fisher's exact test was applied for cells having value less than 5 in chi square test results and only values which were statistically significant were included in the study. Cronbach alpha for our study questionnaire was 0.73.

Pilot study: After conducting a pilot study on 20 participants, its internal validity was checked. Cronbach alpha for questions related to the knowledge and practice were 0.71 and 0.74 respectively and all the questions were included in the study.

RESULTS

Since 105 people took part in the study, the response rate was 54.4%. The majority 70 (66.7%) were aged ≤30 years. The sample was predominantly young, with 70 participants (66.7%) aged 30 years or younger and 35 participants (33.3%) above 30 years. Gender distribution showed a slight female majority at 56 participants (53.3%) compared to 49 male participants (46.7%). Professionally, junior residents dominated the sample with 68 participants (64.8%), while senior residents and faculty combined represented 37 participants (35.2%). Publication experience was limited, as 68 participants (64.8%) had no prior publications while 37 participants (35.2%) had at least one previous publication. Despite limited publication experience, the majority of participants were actively engaged in research, with 72 individuals (68.6%) currently involved in research

activities compared to 33 participants (31.4%) who were not.

A significant proportion of junior residents 26 (38.2%) agreed that avoiding the use of other people's words without citation is sometimes impossible due to limited ways of describing concepts. In contrast, only 6 (16.2%) of faculty/SRs shared this view, with a majority 20 (54.1%) strongly disagreeing ($\chi2=46.20$, p=0.000). A similar pattern was observed in the justification of using previous descriptions of methods, with 32 (47.1%) of JRs agreeing compared to 10 (27.0%) of faculty/SRs ($\chi2=29.75$, p=0.000).

Regarding self-plagiarism, 24 (35.3%) of JRs agreed that it is not punishable since one cannot steal from oneself, whereas only 7 (18.9%) of faculty/SRs held the same opinion. Faculty/SRs were more likely to disagree or strongly disagree 15 and 12 (40.5% and 32.4%, respectively), and it has statistically significant value ($\chi2=25.40$, p=0.000). When asked if a paper's plagiarized portions could be ignored if it had substantial scientific value, faculty/SRs showed a higher proportion of strong disagreement 16 (43.2%) than JRs 12 (17.6%), ($\chi2=19.40$, p=0.001).

JRs were more receptive to the idea that self-plagiarism shouldn't carry the same penalties as plagiarism, with 31 (45.6%) agreeing, compared to only 9 (24.3%) of faculty/SRs ($\chi2=16.30$, p=0.002). Similarly, JRs were more likely to believe that plagiarism should be punished less severely for junior researchers with 37 (54.4%) strongly disagreeing with this leniency compared to 19 (51.4%) of faculty/SRs ($\chi2=16.30$, p=0.003).

On the issue of language barriers justifying plagiarism, 47 (69.1%) of JRs strongly disagreed, as did 26 (70.3%) of faculty/SRs ($\chi2=9.41$, p=0.024). Likewise, translating parts of a foreign-language paper when uncertain about what to write was strongly opposed by both groups, with 25 (67.6%) of JRs and 24 (64.9%) of faculty/SRs expressing strong disagreement. 19 (51.4%) of faculty/SRs strongly disagreed that copying a colleague's work with permission was acceptable, while JRs showed more division, with 21 (30.9%) neither agreeing nor disagreeing and 16 (23.5%) strongly disagreeing ($\chi2=14.77$, p=0.002). A significant proportion of both groups held negative attitudes toward plagiarism. Among faculty/SRs, 14 (37.8%), agreed that the scientific community should not tolerate plagiarists whereas 35 (51.5%) of JRs shared this belief ($\chi2=15.25$, p=0.004). Similarly, the disclosure of plagiarists' names to the scientific community was supported by 37 (54.4%) of JRs and 13 (35.1%) of faculty/SRs ($\chi2=12.08$, p=0.017).

The impact of plagiarism on investigative spirit was acknowledged by 19 (51.4%) of faculty/SRs and 21 (30.9%) of JRs ($\chi2=22.58$, p=0.000). However, opinions on whether plagiarism should be considered a serious offense differed. While 17 (45.9%) of faculty/SRs disagreed with leniency toward plagiarism, 32 (47.1%) of JRs agreed that stealing physical things is more serious than plagiarism ($\chi2=14.10$, p=0.007).

A notable proportion of respondents admitted to occasional minor plagiarism for inspiration. Among faculty/SRs, 12 (32.4%) agreed that copying a sentence or two helped with further writing, while 25 (36.8%) of JRs held the same view. However, a larger proportion of JRs 30 (44.1%) disagreed with this behaviour compared to 15 (40.5%) of faculty/SRs ($\chi2=10.38$, p=0.002).

Finally, the necessity of plagiarism was rejected by most participants, with 23 (62.2%) of faculty/SRs and 37 (54.4%) of JRs disagreeing with the statement that plagiarism is sometimes necessary ($\chi2=12.15$, p=0.007). A small percentage 3 (2.9%) of participants admitted to using another person's work without proper citation, and 5 (4.8%) acknowledged using someone else's idea as their own.

Table 1: Attitude towards plagiarism among study participants (N=105)

Attitudinal factors	Score categories	N (%)	Mean ± Standard Deviation	Median
Positive Attitude	Low (12-28)	14 (13.3)	33.71 ± 6.41	34.0
	Moderate (29-45)	80 (76.2)		
	High (46-60)	11 (10.5)		
Negative Attitude	Low (7-16)	06 (5.7)	20.81 ± 3.85	21.0
	Moderate (17-26)	90 (85.7)		
	High (27-35)	09 (8.6)		
Subjective Norms	Low (10-23)	21 (20)	25.27 ± 4.10	25.0
	Moderate (24-37)	74 (70.5)		
	High (38-50)	10 (9.5)		

Figure 1: Knowledge about research ethics and plagiarism among the study participants (multiple response)

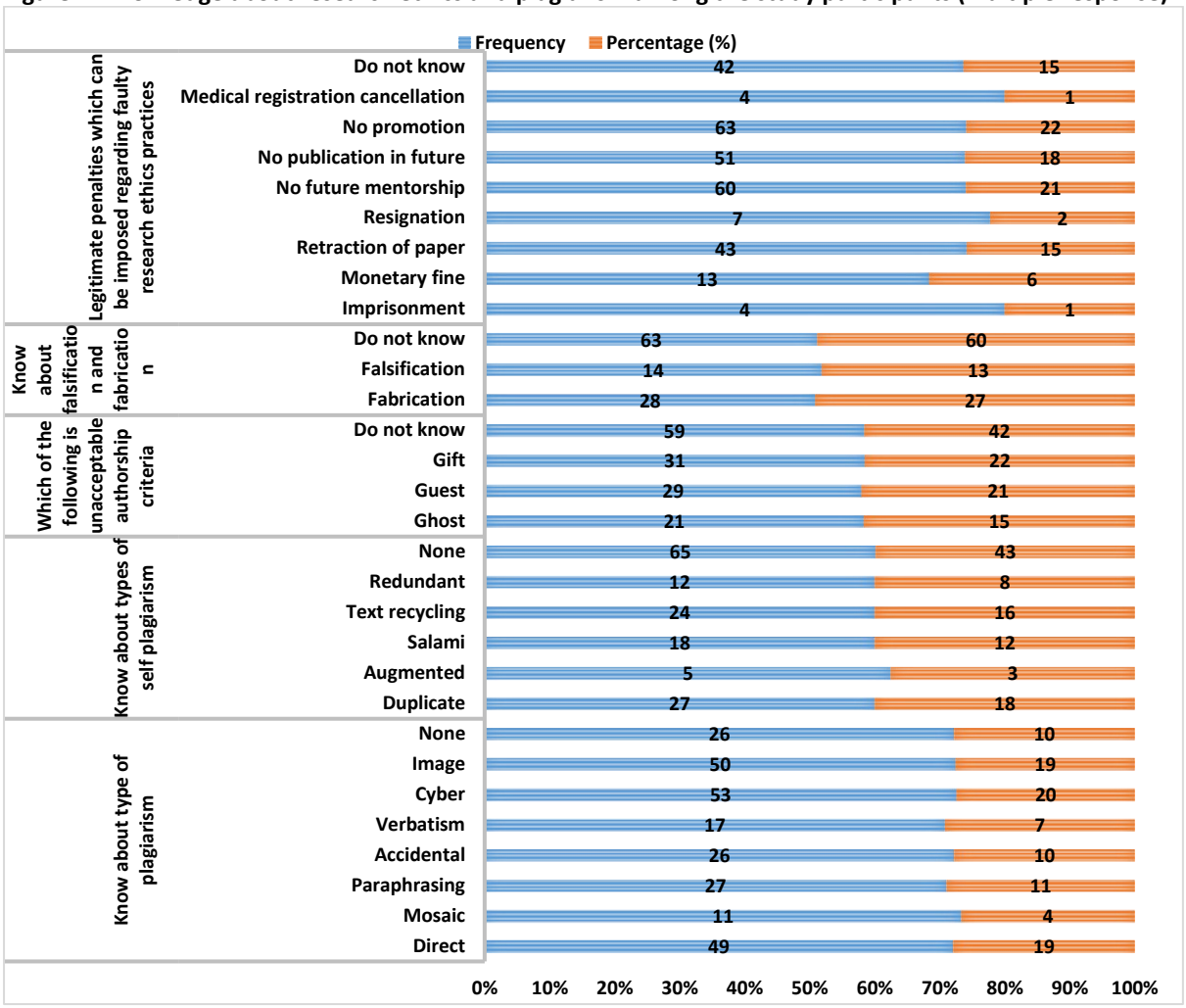
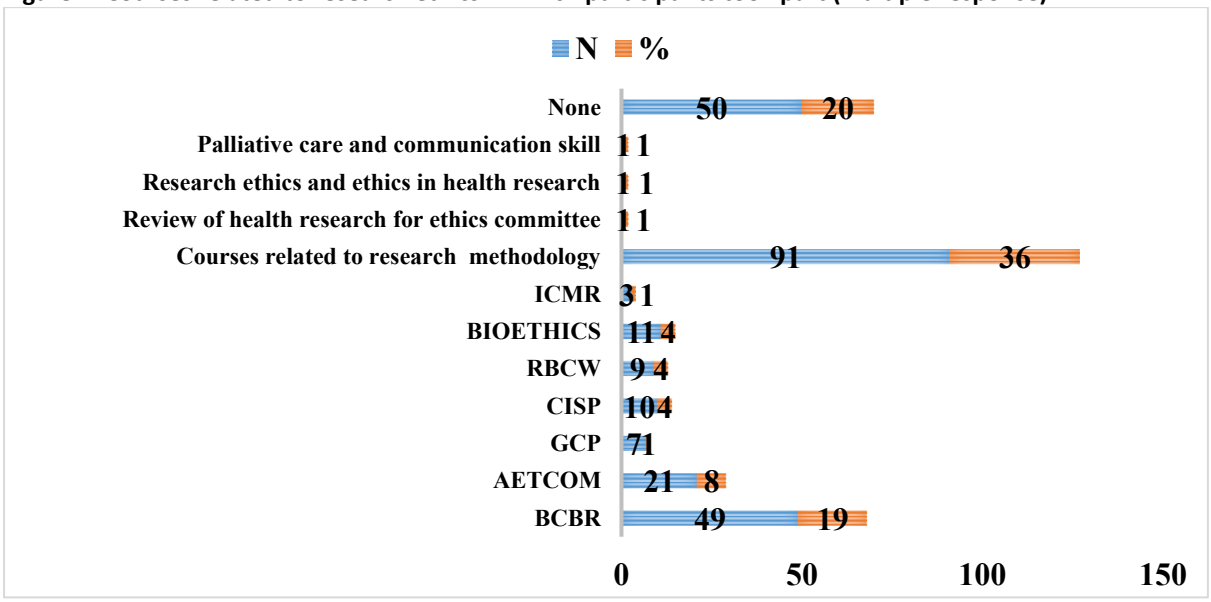


Figure 2: Courses related to research ethics in which participants took part (multiple response)



(ICMR:Indian Council of Medical Research ; BIOETHICS: Biomedical Ethics; RBCW: Revised Basic Course Workshop ; CISP: Curriculum Implementation Support Program GCP: Good Clinical Practice ; AETCOM: Attitude, Ethics and Communication Modules ; BCBR: Basic Course in Biomedical Reseach)

Figure 3: Ethical principles about which participants were aware of (multiple responses)

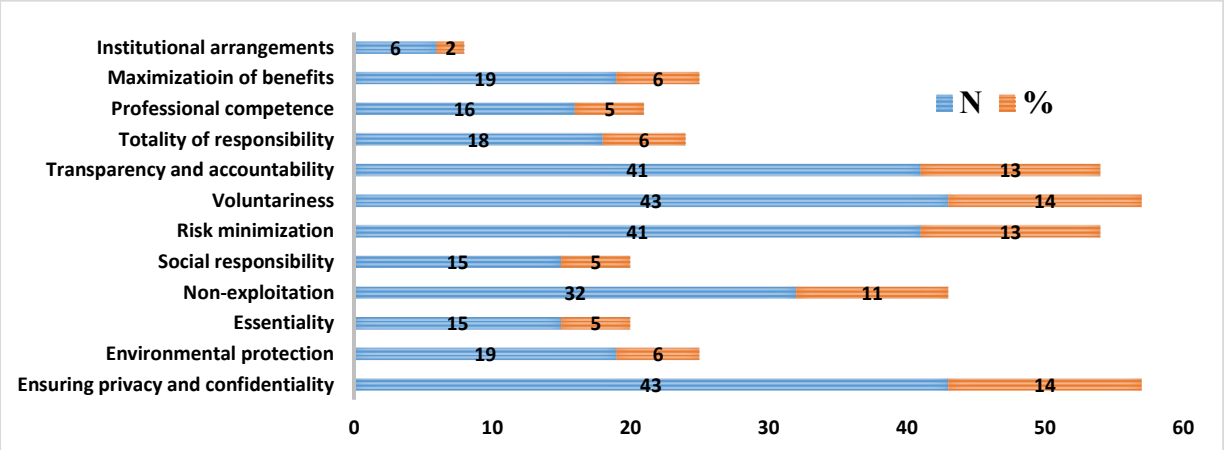
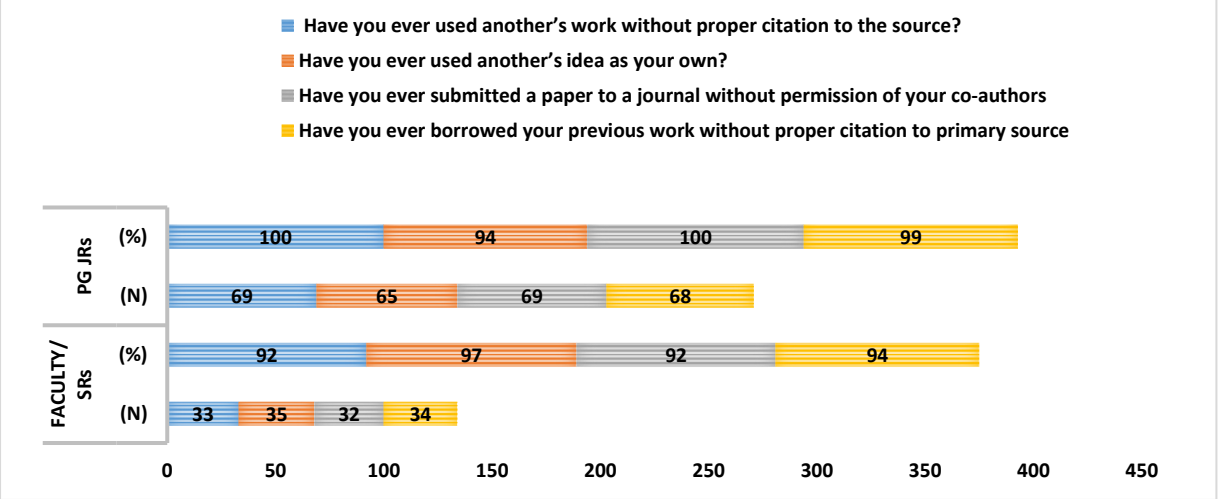


Figure 4: Extent of practice of plagiarism among the study participants



DISCUSSION

Our findings reveal significant differences between junior residents and senior residents/faculty members regarding their perceptions of plagiarism and ethical research practices.

The involvement in various ethics courses demonstrates the institutional commitment to ethics education. These findings resonate with the work of Raj et al (2021), who conducted a multicentric study among post-graduate resident doctors and junior medical faculty in India. Their research highlighted the variable exposure to ethics training across different medical institutions, which is reflected in our participants' diverse course participation patterns. (7) The structured approach to ethics education through these various programs aligns with recommendations by Zimba et al (2021) for systematic plagiarism detection and prevention training. (15)

The knowledge gaps identified in this study align with broader concerns about plagiarism awareness in medical research, as highlighted by Dhammi et al (2016) who stressed the importance of understanding what constitutes plagiarism and implementing preventive measures. (2)

The findings regarding participants' understanding of plagiarism definitions are particularly significant when viewed against Ahmed et al (2020) comprehensive analysis of the true meaning of plagiarism. Their work underscores that many individuals in academic medicine may have superficial understanding of plagiarism, which could explain the knowledge deficits observed in our study population. (3) Masic et al (2014) further contextualized this issue by demonstrating how inadequate knowledge about plagiarism contributes to its prevalence in scientific research and publications. (4)

The patterns observed in our study align with findings from Rathore et al (2015), who explored attitudes of medical faculty members and students in Pakistan. Their research demonstrated that awareness of ethical principles is often incomplete and fragmented, requiring systematic educational interventions. (8) This is further supported by Phyo

et al (2023), whose study in Myanmar revealed similar gaps in ethical principles awareness. (13)

The study found that 54.1% of senior residents/faculty strongly disagreed with the notion that using others' words without citation is unavoidable, compared to only 2.9% of junior residents who strongly disagreed. This trend mirrors findings from a cross-sectional multicentric study in India, where junior doctors demonstrated permissive attitudes toward plagiarism due to inadequate training and awareness. (7) Similarly, research from Pakistan revealed that formal training in medical writing significantly reduced approval of plagiarism among students. (8) Acceptance of reusing method descriptions was higher among junior residents i.e., 47.1% compared to 27% senior residents/faculty, with a statistically significant association. This aligns with findings from Saudi Arabia, where medical students who attended ethics courses showed more negative attitudes toward plagiarism. (9) Lack of exposure to ethical guidelines likely contributes to junior residents' leniency toward such practices. According to 63.2% of JRs in the study, plagiarism cannot be disregarded, but only 38% of JRs agreed with that finding in another survey done by Kirthi PB et al. (10) This might be due to difference in inclination towards importance of plagiarism in the study population. Junior residents were evenly split on whether self-plagiarism is punishable (35.3% agreed, 35.3% disagreed), while 40.5% of senior faculty disagreed. Research conducted in India indicates that self-plagiarism is often misunderstood due to limited knowledge about publication ethics among early-career researchers. (7,11) This suggests a need for clearer definitions and guidelines on self-plagiarism. In our study, on all three attitudinal criteria, the majority of participants had category scores belonging to moderate level, indicating cautious responses. It is in coherence with similar research done by Kattimani S, et al. (12)

According to our survey, 30.9% of JRs and 51.4% of Faculty/SRs think that plagiarism erodes one's capacity for inquiry. Phyo EM et al in their research observed that 96.1% of participants thought plagiarism undermines the spirit of inquiry, ought to be reported and taught more about plagiarism, even though some people did not believe it to be dangerous or a serious offense. (13) This finding could be because faculty have spent more time in academia leading them to have better understanding of plagiarism. Junior residents were more likely to agree that plagiarism is not serious because it involves words rather than tangible assets 47.1%, compared to senior faculty 13.5%. Similar attitudes were observed in studies from Pakistan and Saudi Arabia, where students lacked awareness of intellectual property norms but showed improved attitudes after ethics training. (8,9)

The self-reported rates of plagiarism in this study are relatively low, consistent with findings from other studies that suggest researchers often underreport unethical behaviours due to fear of repercussions or lack of awareness about what constitutes plagiarism. For instance, Shankar SV et al highlighted that many researchers, particularly early-career professionals, may not fully understand the ethical boundaries of plagiarism, leading to unintentional misconduct. It also emphasized the importance of training programs to educate researchers about the ethical guidelines governing scientific writing.(14) Similarly, a study by World Association of Medical Editors (WAME) emphasized that unintentional plagiarism is often a result of poor academic writing skills or ignorance rather than deliberate intent.(15) Cole et al in their research found that many medical residents were unaware that copying text or ideas without citation is considered plagiarism, underscoring the need for education on research ethics. (16) The low rates of self-reported plagiarism may also reflect a lack of awareness about what constitutes unethical practices. The belief that plagiarism might be necessary was more prevalent among junior residents 20.6% than senior faculty 13.5%. Studies across India, Saudi Arabia and Western Balkans suggest that the "publish or perish" culture pressures early-career researchers into unethical practices due to insufficient support in academic writing**.** (7,9,17)

CONCLUSION

The report emphasizes how urgently improved instruction and training on plagiarism and research ethics are needed, especially among junior residents. Addressing these gaps through workshops and targeted training can foster a culture of academic integrity within healthcare institutions.

RECOMMENDATION

To address the identified gaps, it is imperative to integrate formal training on research ethics and plagiarism into medical education curricula. Early exposure to these topics can cultivate a culture of academic integrity and ethical research practices. Additionally, institutions should implement policies that promote adherence to ethical standards and provide resources to support researchers in maintaining integrity in their work.

LIMITATION OF THE STUDY

As this study was conducted on limited number of participants and only at one medical college, it could not give a broader perspective into the real extent of plagiarism.

RELEVANCE OF THE STUDY

Our study emphasizes that plagiarism is a very common issue faced by researchers joining newly in the field. Attitude towards plagiarism is the stepping stone for plagiarism practice which needs to be worked upon.

AUTHORS CONTRIBUTION

All authors have contributed equally.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

ACKNOWLEDGEMENT

The authors would like to express their gratitude to every institute member who took part in the study.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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