

**Exploring the attitudes of medical faculty members and students in Pakistan towards plagiarism: a cross sectional survey**

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**Declaration:**

Presented as Poster presentation by AW at the 3rd Annual conference of association for excellence in medical education conference (AEME 2014), 7th -9th March 2014, University of health sciences, Lahore.

Objective: The objective of this survey was to explore the attitudes towards plagiarism of faculty members

and medical students in Pakistan ~~towards plagiarism~~. Methods: The attitudes toward plagiarism questionnaire (ATPQ) was modified and distributed among 550 medical

students and 130 faculty members in 07 medical colleges of Lahore and Rawalpindi.

Response rate was 93.~~45~~% and 73.~~05~~% respectively. ~~129 forms were discarded. Data was~~ The questionnaire was validated.

~~entered in the SPSS v.20 and descriptive statistics were analyzed.~~ Results: There were

421 medical students (female n=218) and 95 faculty members with a mean age of 20.93  $\pm$  1.4 and 34.5  $\pm$

8.9 years respectively. ~~Most of the students were females (218) and 3rd year MBBS~~

~~students (192). Only a few~~ One fifth of the students (19,7%) were trained in medical writing (19.7%), research ethics

(25.2%) or were currently involved in medical writing (17.6%). Most of the faculty members were demonstrators (66) or assistant professors (20) with work experience between 1-10 years. Most of them had trained in medical writing (68), research ethics (64) and were currently involved in medical writing (64). Most of the respondents did not consider that they worked in a plagiarism free environment and reported that selfplagiarism should not be punishable in the same way as plagiarism. Opinion regarding if the young researchers just learning the skills of medical writing should receive milder

punishment for plagiarism was divided. Conclusions: The general attitudes of Pakistani

medical faculty members and medical students as assessed by ATPQ were negative and it was considered an unethical practice by most. We propose training in medical writing and

research ethics as part of the under and post graduate medical curriculum. ~~Steps should~~

~~be taken to raise awareness about this menace in Pakista~~

**Komentar [B1]:** Begin with the validation of questionnaire, state the reliability (one sentence).

**Komentar [B2]:** Average attitude for faculty members and students has to be stated, also if there is a difference. Then the association of training and attitude. T

**Oblikovano:** Istaknuto

## Introduction

Plagiarism is defined as "the deliberate or reckless use of someone else's thoughts, words or ideas as one's own, without clear attribution of their source" (Mason, 2009). It is a serious offense in academia and a major ethical concern in biomedical writing which received a lot of global attention. There has been an increase in the number of manuscripts published on plagiarism in the last one decade but most of the work is from the developed nations of the world where research training at undergraduate level is usually imparted. In comparison, the research output of research from developing countries like Pakistan is too low and it is a need to promote research education and training.

Plagiarism has been documented and reported mainly from the developed countries with a better research environment, training and use of plagiarism detection software. With advancement in plagiarism detection software, an ever increasing number of plagiarized papers are being recognized even before publishing and retractions are avoided. Employing plagiarism detection software and manual verification, Bazdaric et al. reported the prevalence of plagiarized manuscripts to be 11% (85/754) among manuscripts submitted to Croatian Medical Journal during 2009-2010 (Bazdaric et al., 2012). A study published in 2013 on 2,047 cases of retracted papers from PubMed indexed journals, reported an encouraging trend in recognition and retraction of plagiarized articles (Steen, Casadevall & Fang, 2013). While, these statistics are encouraging but most of the times it cannot prevent the damage that has already been done to science if these articles have already been cited. Retraction Watch is a blog which brings plagiarized works into limelight in the scientific community. Retraction Watch further mentions a **dismaying** number of research articles based on fake data, image manipulation, self-plagiarism, fake peer reviews and disputed authorships that are being retracted frequently from Journals of repute (Marcus & Oransky, 2014). Sadly, this misconduct not only involves novice researchers, doctorate and post doc scholars from middle

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income countries but also western scientists and institutes enjoying international fame and prestige. number of scientists committing plagiarism also face criminal charges in court of law, lose faculty positions, federal grants supporting their work and even travel grants for conference presentations.

Although prevalence of plagiarism has not been reported for the low resource countries but it can be argued that it might be more prevalent in countries like Pakistan due to a general lack of information regarding plagiarism among medical students and faculty members (Shirazi, Jafarey & Moazam, 2010).

However, the probability of intentional plagiarism both in the faculty and students cannot be ignored. This opinion is reinforced by Ajzen's theory of planned behavior which assumes that human beings are rational and a preceding intention entailing attitudes, subjective norms and perceived behavioral control, is necessary to perform a specific behavior (Ajzen, 1991).

A number of studies conducted in: Croatia (Mavrinac et al., 2010), Romania (Badea-Voiculescu, 2013), Pakistan (Shirazi, Jafarey & Moazam, 2010), Croatia (Mavrinac et al., 2010), Norway (Hofmann, Myhr & Holm, 2013) and Iran (Ghajarzadeh et al., 2012; Ghajarzadeh et al., 2013) have reported a high prevalence of positive attitude among both students and faculty members towards plagiarism. Mavrinac et al constructed a standardized Attitudes towards Plagiarism Questionnaire (ATPQ) to explore knowledge and attitudes towards plagiarism. The original ATPQ has 29 items assessing positive, negative and subjective attitudes towards plagiarism (Mavrinac et al., 2010). This questionnaire has been extensively used and validated in Croatia (Mavrinac et al., 2010), and then extensively used in other countries, for example India (Gomez, Nagesh & Sujatha, 2014), Iran (Ghajarzadeh et al., 2012) and Romania (Badea-Voiculescu, 2013).

**Komentar [KB3]:** you should add something like the prevalence of plagiarism is very hard to measure but the investigations of attitudes can also give us an insight in this phenomena... then write about the attitude...

**Oblikovano:** Ne Istaknuto

**Komentar [B4]:** this sentence belongs to discussion

**Oblikovano:** Ne Istaknuto

**Oblikovano:** Ne Istaknuto

**Komentar [B5]:** You have to describe why have you choos the ATP questionnaire. Perhaps: because it is based on Ajzen theory, meet the requirements of our study, previously validated, used in different researches about plagiarism and research integrity. Used the sentences from the methodology section that I have marked to describe the questionnaire.

In ~~her~~ Ghiaso survey on academic dishonesty in Pakistani medical students, Ghias et al.

Oblikovano: Ne Istaknuto

reported a high prevalence of medical students who were involved in copying verbatim from internet or published sources, senior peers, class mates with or without their consent, fabricating data to show desirable results, forge professors' signatures and fake health certificates to justify absence and other such behaviors (Ghias et al., 2014). Similarly,

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Poorolajal et al. reported an overall prevalence of plagiarism commission as 38% in an Iranian University and this trend decreased by 13% with one unit increase in knowledge of plagiarism (Poorolajal et al., 2012). Similarly in India, high prevalence of plagiarism was attributed to pressure to publish, lack of facilities and funding in private institutions (Singh & Guram, 2014).

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**Komentar [B6]:** These are investigations of plagiarism and reasons why students plagiarize. Maybe you should write more about reasons

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This calls for serious educational reforms and implementation of strict policies regarding plagiarism not only in University curriculum but also in lower grades.

**Komentar [B7]:** to discussion

This study was designed with two aims: 1) To explore the attitudes of medical students and faculty towards plagiarism using attitudes towards plagiarism questionnaire (ATPQ). 2) To study the association between formal training in research ethics, medical writing and attitudes towards plagiarism.

### ~~Methodology~~ **Material and methods:**

A cross sectional survey was designed and conducted in three private and four public medical colleges in Lahore and Rawalpindi (August 2013- January 2014). Permission was obtained from the Institutional review board of CMH Lahore Medical College.

### Questionnaire

To collect data, we used a questionnaire divided in ~~The data form had~~ three sections. First section documented demographics, second had questions on participants' interest and formal training in research methodology, research ethics and involvement in medical writing. The third section consisted of ~~m~~Modified version of ATPQ ~~(25 items)~~. ~~ATPQ) designed by Martina Mavrinac and colleagues~~ (Mavrinac et al., 2010). ~~The questionnaire~~ -was used with permission and modified for our study population. ~~It~~ was not translated from the original English ~~version~~, as English is the language of instruction in all medical schools in Pakistan.

. Keeping in view the feedback received from faculty and students during the pilot survey, 4 items were removed thus, adapting the scale to Pakistani culture and academic environment.

It was further modified ~~from five-point~~ to a three-point Likert type scale ~~to facilitate the respondents~~; agree (coded as 3), neutral (coded as 2) and disagree (coded as 1). ~~Factorial analysis was performed to confirm the factor structure of the modified questionnaire.~~

### Participants

Convenient sampling technique was employed. Sample size was calculated at 95% confidence level and 5% confidence interval. Questionnaires were distributed among 550 medical students and 130 faculty members in 07 public and private medical colleges of Lahore and Rawalpindi to ensure a good and diverse response. All participants read and signed informed consent forms, which were returned with each completed questionnaire. Forms were personally distributed and collected by two of the authors (AM, AW). Response rate was 93.45 % and 73.05% for medical students and faculty members respectively. Ninety three forms were discarded (Incomplete or missing data, duplicate entries etc.).

## Data Analysis

Data was analyzed by SPSS v 20. To confirm the factor structure of the questionnaire principal axis factoring analysis was used. The reliability of the questionnaire was calculated using Cronbach's alpha.

Descriptive and inferential statistical test were employed to analyze the data. Independent sample T-test was run to analyze associations between formal training in research ethics, medical writing (yes/no) and scores on ATPQ (continuous variables). Chi Square goodness-of-fit statistics was run to analyze association between score ranges of ATPQ and respondent group (faculty/student). One way ANOVA was run between scores on ATPQ and job designation, experience and education level of faculty members.

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## **Results:**

### Characteristics of respondents:

Characteristics of respondents and their training in medical writing are given in Table 1.

There were 421 medical students and 95 faculty members. Most of the students were females 218 (51.8%) and 3<sup>rd</sup> year MBBS students 192 (45.6%). Among the faculty members, most of participants were demonstrators 66 (69.4%) followed by Assistant Professor 20 (21.1%), Associate Professor 6 (6.3%), Professor 3 (3.2%). Most of them had a highest qualification of MBBS/MD 46 (48.4%). Twenty six (27.4%) had done their Masters while, 19 (20%) had attained fellowship. Only 15 (15.8%) had an education from abroad.

~~Characteristics of respondents and their training in medical writing are given in Table 1.~~

### Questionnaire validation:

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Principal axis factor analysis was run to confirm the factor structure of the Pakistani version of the ATPQ attitude toward plagiarism questionnaire. However, unlike Croatian version of

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ATPQ, the three factor structure was not confirmed. In present study, one factor structure was determined by the Scree-test (Figure 1), interpretability criteria and the reliability of the factor calculated with Cronbach alpha ( = 0.73). The obtained factor represents an overall attitude towards plagiarism consisting of positive attitudes, negative attitude and subjective norms. Table 2 presents the factor structure of the Attitudes towards Plagiarism questionnaire with factor loadings. Items 11, 12, 13 are not included in the final factor structure and analyses because of low factor loading ( $<0,10$ ). The one factor structure explained

~~51.3%~~10,93% of variance in the questionnaire and average Inter-Item Correlation was .112.

Total scores were obtained by summing all the statements. The mean score was divided into 3 ranges by 2 cut offs at 33.33%, 66.66% of scores on ATPQ. Thus, scores on modified ATPQ were divided into three categories; low ( $< 42$ ), moderate (43-47) and high ( $> 48$ ). According to this scale, increasing score represents a positive leaning towards plagiarism.

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### Association-Attitudes towards plagiarism of ATPQ scores with independent variables:

~~Independent sample T-test revealed that those m~~Medical students who had been formally trained in medical writing were associated with low scores on ATPQ (Mean difference= 2.03,  $P < 0,05$ ). Whereas, students who were trained in research ethics ( $P > .05$ ) or were currently writing a research paper ( $P > .05$ ) did not differ on scores of ATPQ than their counterparts.

**Komentar [B8]:** is there a difference between average attitude of medical students and faculty members? Begin this section with the comment of this section that information.

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**Komentar [B9]:** please insert mean values of both groups

**Oblikovano:** Ne Istaknuto

**Komentar [B10]:** insert the exact p value in all manuscript

**Komentar [B11]:** insert the exact p value

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**Komentar [B12]:** write this after you correct the table 3.

Frequency distribution of medical students and faculty members between score ranges is presented in table 3. Overall, the attitude was low in 213 respondents, moderate in xx and high in xx. According to Chi Square goodness-of-fit statistics, statistically higher percentage of faculty members had ATPQ scored in moderate or higher ranges than medical students ( $P < 0,001$ ). And a higher percentage of students had ATPQ scores in lower range than the faculty members ( $P < 0,001$ ).

**Komentar [B13]:** this result has to be commented in discussion

Pearson Chi-Square revealed that Faculty with foreign qualifications had better formal training in research ethics ( $p < 0.05$ ). According to it, all of the faculty member who were educated abroad ( $n=15$ , 100%) had received formal education in research ethics than their counter parts. ~~Only~~ More than half (49(61.2%)) of faculty members educated in Pakistan had a formal education in research ethics.

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Komentar [B14]:

Komentar [B15]: exact value from the table and N in brackets

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~~According to One Way ANOVA~~, no statistically significant difference was found between mean scores on ATPQ scores and job designation ( $P = 0.734$ ), experience levels ( $P = 0.21$ ) and education level ( $P = 0.07$ ). ~~Independent sample T test revealed There was~~ no significant association difference between ATPQ scores and training in research ethics ( $P = 0.87$ ), medical writing ( $P = 0.17$ ) and current involvement in medical writing. ( $P = 0.99$ ).

Komentar [B16]: P on three decimals please

Oblikovano: Ne Istaknuto

Komentar [B17]: See comment 11

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Oblikovano: Ne Istaknuto

Oblikovano: Ne Istaknuto

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~~Table 4, 5 and 6 give response percentage of faculty member and students on positive, negative and subjective subscales. Table 4 (supplementary file) gives response percentage of faculty members and students on modified ATPQ.~~

**Discussion:**

~~According to our analysis, a~~ Very high percentage of respondents had high scores on ATPQ which represents their approval of plagiarism. The present study includes respondents from 4 public and 3 private medical colleges of Pakistan..

Lower scores on ATPQ in medical students were associated with training in medical writing whereas ATPQ scores were not significantly associated with formal education in research ethics or current involvement in medical writing. ~~Principle-f~~Factor analysis revealed ~~an~~ one factor structure ~~representing-called~~ attitude towards plagiarism with 22 statements and ~~good~~ reliability ~~an acceptable Cronbach's alpha value of 0.73~~. This version of ATPQ ~~has shown is~~ valid and reliable for ~~use on~~ Pakistani population.

~~Plagiarism has been committed even by many senior faculty members and world renowned scientists as well as students and young researchers (Marcus & Oransky).~~ Shirazi et al. have attributed lack of training in research methodology and referencing techniques among Pakistani students and faculty rather than malice as a cause of plagiarism in most cases (Shirazi, Jafarey & Moazam, 2010). Shashok et al. also discussed that many cases of plagiarism are unintentional and arise from lack of knowledge of citation practices, pressure to increase publication output, inability to write and communicate ideas in English which may lead to copy-pasting to improve use of language in the manuscript (pers comm. Shashok, 2011).

Formal training in research methodology, medical and publication ethics at the undergraduate level is generally lacking in Pakistan. Even the faculty members are not clear about the definition, types and implications of plagiarism and unethical practices in medical writing and research (pers comm. Rathore & Farooq, 2014). The mandatory training workshops of the college and physicians and surgeons, Pakistan for the trainees and supervisors do not adequately address plagiarism and other unethical practices in medical research and writing.

**Komentar [B18]:** How much? Half of them had low attitude, half moderate and half

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**Komentar [B19]:** Comment your results within the known framework. Did you expected that your respondents will approve plagiarism?

**Komentar [B20]:**

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Although a lot of studies specifically on plagiarism have been published abroad but in Pakistan, research on this specific subject is lacking. This study was conducted on a relatively large sample of medical students and faculty in seven private and public medical colleges.

**Komentar [B21]:** This belongs to the introduction, a good reason why to investigate

~~A very low percentage of students~~ Only about one quarter of students in our sample were formally trained in medical writing and research ethics. These findings are consistent with those of Shirazi et al. who have attributed lack of knowledge of proper referencing and citing as a cause of plagiarism in medical students (Shirazi, Jafarey & Moazam, 2010). In contrast to students, most of the faculty members had received formal training and education in research ethics and medical writing. This was probably due to involvement of the faculty in the continuing medical education, self-directed learning and the recent revision of faculty promotion rules by the PMDC which mandates the faculty members to write a certain number of articles for promotions. The medical students who had been trained in medical writing or were currently involved in medical writing had a low tendency towards plagiarism.

~~In our study, X~~ year of study did not affect attitudes towards plagiarism in medical students. These findings favor our hypothesis that formal education of medical students would decrease the prevalence of plagiarism ~~in our society~~. However, the evidence of efficacy of educational interventions on attitude towards plagiarism is rather confusing. A case study discussing plagiarism by adult learners online found no significant association between the incidence of plagiarism and cheating and educational interventions on policies related to academic honesty (Jocoy & Dibiase, 2006). **However**, imparting information related to policies on academic honesty immediately before examinations lowered the incidence of cheating behaviors (~~k~~Kerkvliet & Sigmund, 1999). Similarly, Anderson et al. reported no significant association between attending formal courses on research ethics and academic dishonesty (Anderson et al., 2007). However, it should be noted that results of these studies

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were from developed countries, therefore, these results might not be applicable in Pakistan where cultural and academic environment is very different.

Most of our sample of faculty members (69.4%), comprised of less experienced demonstrators in medical colleges who did not have postgraduate degrees or fellowships yet, highlighting the need of continuing medical education programs and interventions on research ethics and medical writing. Ghajarzadeh et al. reported similar trends in ATPQ scores of Iranian faculty members (Ghajarzadeh et al., 2012). These arguments are in consonance with Shirazi et al., where less than 30% of the faculty members had correct knowledge of copy right rules, referencing and use of quotation marks (Shirazi, Jafarey & Moazam, 2010).

Most of the students disagreed with the statement that they worked in a plagiarism free environment. Such high ðperceivedð prevalence of plagiarism among medical students might be rooted in the learning styles of most Pakistani students who unlike Western institutions are more involved in rote and teacher-centered learning (Introna et al., 2003). Many students tend to copy verbatim from learning resources or othersðwork mainly due to insufficient language proficiency (Vessal & Habibzadeh, 2007).- However, this behavior can be discouraged by increasing the awareness and use of plagiarism detection software in both faculty and students. As confirmed in our study, a high percentage of students resort to cheating behavior because they havenð been caught yet. This trend was also reported by another study, which reported a very low awareness about existence of plagiarism detection software in Pakistani university students (Ramzan et al., 2012).

~~Plagiarism is a serious misconduct that had recently diseased our medical fraternity.~~ It is essential to understand ~~its plagiarisms~~ etiology to ~~completely eradicate it from our society~~decrease it. In a recent study, majority of the respondents; both medical students and faculty confessed to having plagiarized at least once in their life (Shirazi, Jafarey & Moazam, 2010). This supports our findings where only 24.2% of the medical faculty and 20.4% of

medical students agreed that they worked in a plagiarism free environment. The causes of this evil practice in Pakistani medical faculty are many folds. PMDC has laid down strict criteria of qualification, teaching experience and research experience for promotion in academic ranks. Promotion of an assistant professor to rank of associate professor and to professor requires at least 3 and 5 publications respectively in PMDC indexed journals (PMDC, 2011). A majority of the faculty members and students agreed that approaching deadlines gave them a right to plagiarize. Thus, approaching deadlines (pressure to publish) and promotions in academia has led to a focus on quantity rather than quality of research products.

**Komentar [B22]:** ??? in your study?

A majority of the medical students opinionated that young researchers should receive milder punishment but medical faculty had a mixed opinion on it. Participants may have differed in opinion keeping different causes of plagiarism in context. ~~Most of the respondents agreed that it is necessary to discuss ethical dilemmas in academic writing.~~ A majority of the respondents agreed that they are tempted to plagiarize because everyone else is doing it. Therefore, the identities of the plagiarists should be brought to light. This is will set an example for the academic community and keep plagiarism in check.

**Komentar [B23]:** This is not clear. Why is this connected with the previous passage?

To ensure a thriving research environment in Pakistan, a thorough analysis of its etiology is required. .

**Komentar [B24]:** Yes, this stands alone. Either you better explain or delete it

Proper policies should be devised by the stakeholders and training modules on research and medical writing should be introduced in medical curriculum. Higher Education Commission, Pakistan (HEC), Pakistan Medical and Dental Council, Pakistan (PMDC) and College of Physicians and Surgeons, Pakistan (CPSP) should facilitate the medical Colleges and universities to train and establish ethics review committees and intuitional review boards. The medical colleges should invest in buying plagiarism detection software and make them available to their students, trainees and faculty members. Even if the institute doesn't

subscribe to a paid plagiarism detection software there are many free alternatives available (Rathore & Farooq, 2014). Workshops, seminars, invited lectures should be arranged specifically to address this issue. Dedicated modules on research methodology, analytical and referencing techniques should be integrated in undergraduate medical curriculum to further develop the research environment in Pakistan. This calls for a revision of undergraduate and post graduate curriculum and faculty training with an emphasis in teaching the current best practices and ethics of medical research and writing.

#### Limitations:

The cross-sectional design of this study limits inferences about causality and temporality. Use of self-administered questionnaires may lead to information bias. The present study is based on an adequate sample size but it was collected using convenience sampling approach. Therefore, its results cannot be generalized to whole Pakistani population or medical students or faculty members.

#### **Conclusion~~s~~:**

The general attitudes of Pakistani medical faculty members and medical students as assessed by ATPQ were ~~disapproving plagiarismnegative and as~~ it was considered an unethical practice by most. There is a lack of training in biomedical ethics and good practices in medical writing. We propose training in medical writing and research ethics as part of the under and post graduate medical curriculum. Faculty should keep itself updated about the latest policies regarding plagiarism inside the country and abroad. Steps should be taken by PMDC, CPSP and HEC to raise awareness about this menace in Pakistan.

#### **Acknowledgement:**

**Komentar [B25]:** This is opposite to the beginning of this section öVery high percentage of respondents had high scores on ATPQ which represents their approval of plagiarismö

The authors thank Sana Gulraiz; student at Services Institute of Medical Sciences, Lahore and Bilal Gujjar; student at Sheikh Khalifa Bin Zayed Al Nahyan Medical and Dental College, Lahore, for their help in collecting data for this project.

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Table 1: Demographic characteristics of medical students and faculty members (n= 516)

Variables		Medical Students	Faculty Members
Gender	Male	203 (48.2%)	43 (45.3%)
	Female	218 (51.8%)	52 (54.7%)
Male		203 (48.2%)	43 (45.3%)
Female		218 (51.8%)	52 (54.7%)
Median age (min-max)		21 (17-28)	32 (23-61)
Training in Medical writing		83 (19.7%)	68 (71.6%)
Training in research ethics		106 (25.2%)	64 (67.4%)
Currently writing an article		74 (17.6%)	64 (67.4%)
Mean score and SD on ATPQ		43.21 (7.1)	48.4 (5.9)

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**TABLE 2. Factor structure of the Attitudes Towards Plagiarism questionnaire with factor loadings**

Statements	Factor loading
1. Since plagiarism is taking other people's words rather than tangible assets; it should NOT be considered as a serious offence.	-0,39
2. It is justified to use previous descriptions of a method, because the method itself remains the same.	-0,23
3. Self-plagiarism is not punishable because it is not harmful (one cannot steal from oneself).	-0,39
4. Plagiarized parts of a paper may be ignored if the paper is of great scientific value.	-0,36
5. Self-plagiarism should not be punishable in the same way as plagiarism is.	-0.13
6. Young researchers who are just learning the ropes should receive milder punishment for plagiarism.	-0.19
7. I could not write a scientific paper without plagiarizing.	-0.40
8. Short deadlines give me the right to plagiarize a bit.	-0.48
9. It is justified to use one's own previously published work without providing citation in order to complete the current work.	-0.39
10. Authors say they do NOT plagiarize, when in fact they do.	-0.20

11. <i>*Plagiarists do not belong in the scientific community.</i>	0,09
12. <i>*The names of the authors who plagiarize should be disclosed to the scientific community</i>	0,01
13. <i>*In times of moral and ethical decline, it is important to discuss issues like plagiarism and self-plagiarism.</i>	0,02
14. A plagiarized paper does no harm to science.	-0,37
15. Sometimes one cannot avoid using other people's words without citing the source, because there are only so many ways to describe something	-0,30
16. If a colleague of mine allows me to copy from her/his paper, I'm NOT doing anything bad, because I have his/her permission.	-0,31
17. Those who say they never plagiarized are lying.	-0,37
18. Sometimes I'm tempted to plagiarize, because everyone else is doing it (students, researchers, physicians).	-0,32
19. I keep plagiarizing because I haven't been caught yet	-0,23
20. I work (study) in a plagiarism-free environment.	-0,16
21. Plagiarism is not a big deal.	-0,52
22. Sometimes I copy a sentence or two just to become inspired for further writing.	-0,41
23. I don't feel guilty for copying verbatim a sentence or two from my previous papers.	-0,32
24. Plagiarism is justified if I currently have more important obligations or tasks to do.	-0,52

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25. Sometimes, it is necessary to plagiarize.

-0.51

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\*Items 11, 12, 13 are not included in the final factor structure, because of to low (<0,10) factor loading

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Table 3: Frequency distribution of medical students and faculty members in score ranges of ATPQ (  $\chi^2$  value = 32.4, P < .001)

Respondent	$\chi^2$ value (P- value)	Low (< 42.0)	Moderate (43-47)	High (> 48)
Medical Student	26.5 (P< .001)	190 (45.1%)	112 (26.6%)	119 (28.3%)
Faculty member	19.3 (P< .001)	14 (14.7%)	32 (33.7%)	49 (51.6%)
Statistics	$P = \frac{\chi^2}{df}$			

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Table 4: Attitudes towards plagiarism of Responses (%) of medical students and faculty members regarding positive attitudes

<u>Statements regarding positive attitudes</u> <u>Statements of the ATPQ</u>	Opinion	<u>Frequency of responses</u> <u>Students</u> <u>Faculty</u>	
		Students	Faculty
Sometimes one cannot avoid using other people's words without citing the source, because there are only so many ways to describe something.	Agree	53.0%	57.8%
	Disagree	27.3%	32.2%
	Neutral	19.7%	10.0%
It is justified to use previous descriptions of a method, because the method itself remains the same.	Agree	51%	52.2%
	Disagree	23.3%	32.2%
	Neutral	25.7%	15.6%
Self-plagiarism is not punishable because it is not harmful (one cannot steal from oneself).	Agree	64.4%	38.9%
	Disagree	21.6%	42.2%
	Neutral	14.0%	18.9%
Plagiarized parts of a paper may be ignored if the paper is of great scientific value.	Agree	32.8%	30.4%
	Disagree	52.5%	53.9%
	Neutral	14.7%	15.7%
Self-plagiarism should not be punishable in the same way as plagiarism is	Agree	66.1%	47.8%
	Disagree	20.4%	34.4%
	Neutral	13.5%	17.8%
Young researchers who are just learning the ropes should receive milder punishment for plagiarism.	Agree	48.0%	42.2%
	Disagree	36.8%	46.7%
	Neutral	15.2%	11.1%
I could not write a scientific paper without plagiarizing.	Agree	25.4%	22.2%
	Disagree	58.9%	70.0%
	Neutral	15.7%	7.8%
Short deadlines give me the right to plagiarize a bit.	Agree	33.7%	25.6%
	Disagree	49.7%	62.2%
	Neutral	16.6%	12.2%
It is justified to use one's own previously published work without providing citation in order to complete the current work.	Agree	42.7%	27.8%
	Disagree	37.3%	61.1%
	Neutral	20.0%	11.1%
If a colleague of mine allows me to copy from her/his paper, I am NOT doing anything bad, because I have his/her permission.	Agree	49.4%	28.9%
	Disagree	35.4%	56.7%
	Neutral	15.2%	14.4%

Table 5: Responses (%) of medical students and faculty regarding negative attitudes

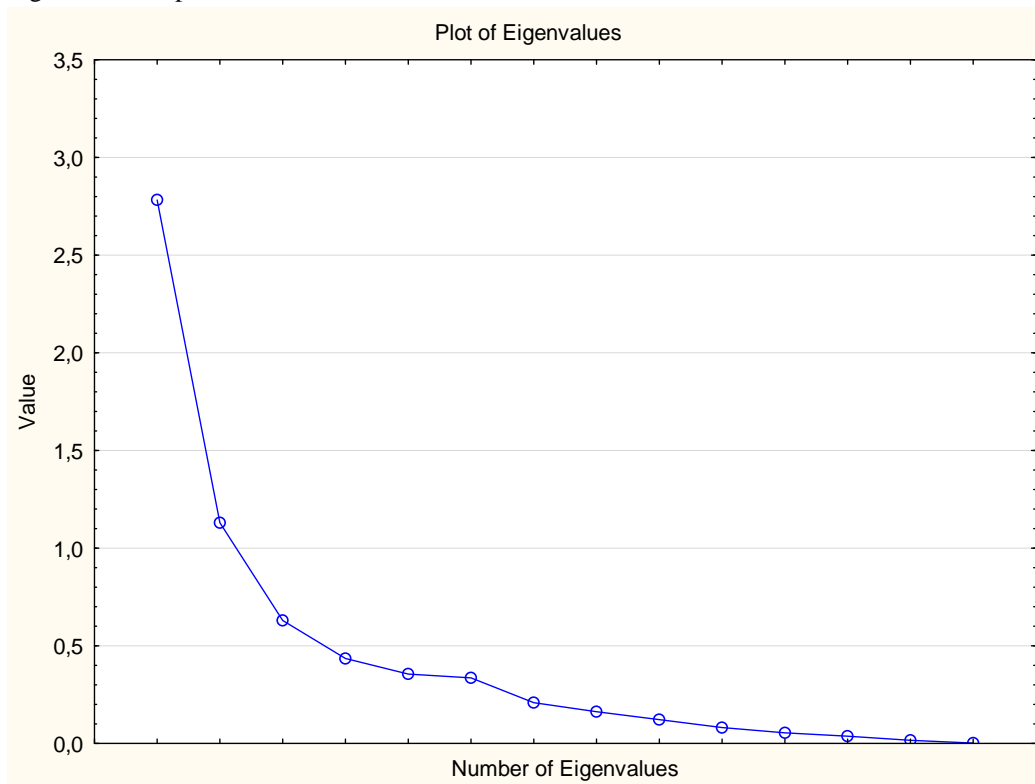
Statements regarding negative attitudes	Opinion	Student	Faculty
Plagiarists do not belong in the scientific community.	Agree	38.7%	40.0%
	Disagree	40.2%	42.2%
	Neutral	21.1%	17.8%
The names of the authors who plagiarize should be disclosed to the scientific community	Agree	55.3%	58.9%
	Disagree	29.0%	27.8%
	Neutral	15.7%	13.3%
In times of moral and ethical decline, it is important to discuss issues like plagiarism and self plagiarism.	Agree	77.4%	87.8%
	Disagree	13.3%	12.2%
	Neutral	9.3%	0.0%
A plagiarized paper does no harm science	Agree	33.0%	24.4%
	Disagree	49.4%	68.9%
	Neutral	17.6%	6.7%
Since plagiarism is taking other people's words rather than tangible assets; it should NOT be considered as a serious offense.	Agree	17.1%	11.1%
	Disagree	72.0%	78.9%
	Neutral	10.9%	10%



**Table 6: Responses (%) of medical students and faculty regarding subjective attitudes**

Statements regarding subjective attitudes	Opinion	Students	Faculty
Authors say they do NOT plagiarize, when in fact they do	Agree	56.5%	72.3%
	Disagree	22.6%	14.4%
	Neutral	20.9%	13.3%
Those who say they have never plagiarized are lying.	Agree	48.0%	54.4%
	Disagree	28.0%	27.8%
	Neutral	24.0%	17.8%
Sometimes I'm tempted to plagiarize, because everyone else is doing it (students, researchers, physicians).	Agree	43.4%	37.8%
	Disagree	41.6%	48.9%
	Neutral	15.0%	13.3%
I keep plagiarizing because I haven't been caught yet.	Agree	17.3%	10.0%
	Disagree	71.1%	75.6%
	Neutral	11.6%	14.4%
I work (study) in a plagiarism-free environment.	Agree	20.4%	24.4%
	Disagree	66.8%	61.2%
	Neutral	12.8%	14.4%
Plagiarism is not a big deal.	Agree	20.2%	13.3%
	Disagree	67.2%	75.6%
	Neutral	12.6%	11.1%
Sometimes I copy a sentence or two just to become inspired for further writing.	Agree	51.3%	48.9%
	Disagree	35.9%	41.1%
	Neutral	12.8%	10.0%
I don't feel guilty for copying verbatim a sentence or two from my previous papers.	Agree	46.8%	36.7%
	Disagree	39.9%	52.2%
	Neutral	13.3%	11.1%
Plagiarism is justified if I currently have more important obligations or tasks to do.	Agree	25.9%	17.8%
	Disagree	59.8%	74.4%
	Neutral	14.3%	7.8%
Sometimes, it is necessary to plagiarize.	Agree	36.8%	31.1%
	Disagree	45.4%	52.2%
	Neutral	17.8%	16.7%

Figure 1. Scree plot for the obtained one factor structure



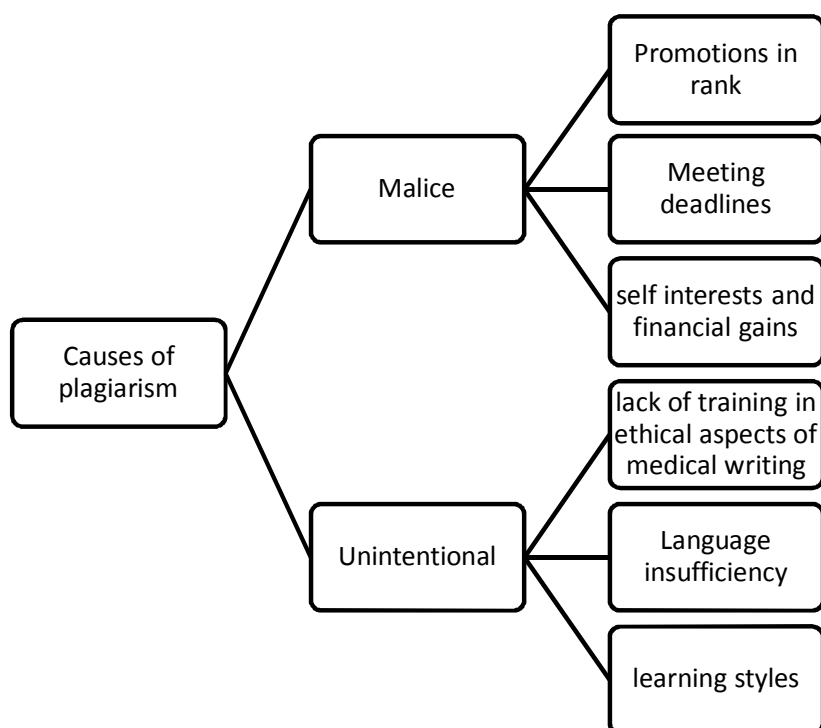


Figure 2: Possible causes of plagiarism

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