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Abstract

Plagiarism is of great concern in diverse fields of human endeavour, including the basic medical sciences, especially with many trained undergraduates after degree completion venturing into academics where they need to publish. The purpose of the study was to examine the relationship between plagiarism awareness level and plagiarism practices engagement level by basic medical sciences undergraduates including determining types of and reasons for plagiarism. The study covered all 316 basic medical sciences undergraduates in five academic departments of a foremost private institution in South-West Nigeria. The study adopted a survey research design. Data were collected through a structured questionnaire. A total population sampling technique was used to examine the respondents based on inclusion criteria (faculty and academic level) and exclusion criteria (inability to provide informed consent and incomplete questionnaire filling). This technique was employed because the target group was manageable and had well-defined characteristics. In all, 296 usable copies of the questionnaire were found worthy of being analysed. Descriptive and inferential statistics were used for data analysis. Descriptive statistics such as frequency count, percentage, mean and standard deviation scores were employed. Inferential statistics – Spearman's rank correlation was also adopted. This technique was used because the study phenomena were ordinal levels of measurement and not normally distributed. The study's result showed that the students know about all the listed plagiarism types and they mostly cited the pressure to turn in written assignments/works, followed by timely access to information to meet deadlines and then the deadline to turn in group work as reasons for plagiarism. Further findings revealed evidence of a statistically significant, moderate strength monotonic and negative correlation between plagiarism awareness level and plagiarism practices engagement level.

Keywords: Basic medical sciences undergraduate students, Plagiarism, Plagiarism awareness level, Plagiarism practices engagement, Plagiarism types

Introduction

There have been many definitions of plagiarism with most of them acceding that it is on the grounds of the wrong use of other people's words and ideas (Selemani et al., 2018). In line with the European Network for Academic Integrity [ENAI] (2022), plagiarism is 'The use of ideas, content, or structures without appropriately acknowledging the source in a setting where originality is expected, leading to unfair advantage.' In addition, the World Association of Medical Editors [WAME] (2023) describes plagiarism as the use of others' published and unpublished ideas or words (or other intellectual property) without attribution or permission while presenting them as new and original rather than derived from an existing source - the intention and outcome of plagiarism misinform the reader regarding the plagiariser's contributions. Ellis et al. (2018, p. 1) also consider plagiarism as the practice of "presenting someone else's words and/or ideas as your own without appropriate attribution." The desire for academic improvement and progression by individuals compels them to take shortcuts and deceivingly receive credit (Varghese & Jacob, 2015). Students in the attempt to obtain an unethical advantage in

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their academic undertakings meant for assessment get involved in academic dishonesty or misconduct (Tee & Curtis, 2018). The aforementioned definitions show that plagiarism is a critical academic drawback depicting students' information illiteracy and damaging the extent to which any student can learn in the course of study.

Plagiarism is of great concern in diverse fields of human endeavour (Mukasa et al., 2023), including the basic medical sciences (Ismail, 2018; Lynch et al., 2017), especially with many trained undergraduates after degree completion venturing into academics where they need to publish. It is one of the three prominent breaches in academics and research, followed by fabrication and falsification (Varghese & Jacob, 2015). The occurrence of plagiarism is on the increase, particularly with the invention of the Internet making information effortlessly available and accessible without many physical hindrances allowing students and researchers access to various documents the world over (Levine & Pazdernik, 2018; Üney, 2023). In agreement, many contemporary authors have expressed that the upsurge in the cases of plagiarism in universities is alarming, especially with advancements in technology [including mobile electronic devices] plus the Internet (Dawson, 2020; Kay et al., 2022; Khan et al., 2021; Lynch et al., 2022; Tee & Curtis, 2018). Various reports have corroborated the preceding statements in Australia (Belot 2016), India (Shakeel et al., 2021) and UK (Marsh, 2017) and Africa – South Africa (Griffiths, 2017; Ramoshaba & Cloete, 2019; Verhoef & Coetser., 2021) and in Nigeria (Nordling, 2018; Nwosu & Chukwuere, 2020).

According to Dhammi and Haq (2016), there are various forms of plagiarism encompassing: (1) cyber plagiarism – the copying or downloading partly or in totality articles or research papers and ideas from the Internet and not giving proper attribution (Jawad, 2013; Omonijo et al., 2017); (2) image plagiarism – the use of image or video without receiving proper permission or providing appropriate citation; (3) mosaic plagiarism – this is when each word is not copied, however, ones words are mixed with the ideas and opinions of another (Jawad, 2013) – in a spasmodic manner; (4) paraphrasing – this is rewriting any part/paragraph of an original manuscript in one's word, despite being a restatement, the manuscript must be referenced; (5) self-plagiarism - this refers to the practice of authors using portions of their previous writings on the same topic in another of their publications, without specifically citing it formally in quotes (WAME, 2023) – it could vary from augmented publication, duplicate (redundant), segmented publication to text-recycling types; and verbatim plagiarism – this is when an author submits exactly someone else's words in his/her own name without due acknowledgement.

Several studies have drawn attention to some fundamental factors being determinants of students plagiarising and listing factors such as academic pressures, competition, fear of failure, inadequate ideas, lack of confidence, lack of policy intervention, limited skills, social and inadequate language skills and time constraints (Abbasi et al., 2020; Cleary, 2017; Farahian et al., 2020; Hopp & Speil, 2021; Husain et al., 2017; Jereb et al., 2017; Memon & Mavrinac, 2020; Moss et al., 2017). However, as observed from existing studies, a major factor affecting plagiarism among students is an unclear understanding of what it is and how it can be avoided pointing to a lack of knowledge that could also be termed scanty awareness (Abbasi et al., 2020; Bašić et al., 2018; Elshafei & Jahangir, 2020; Howard & Davies, 2009; Memon et al., 2019; Murtaza et al., 2013; Power, 2009). Awareness involves knowledge about an object or event (Reinhardt et al., 2015). To a large extent, awareness is expected to influence an individual's reasoning and exploitation of any academic object. Considering aforesaid studies, perhaps supported by Orim et al (2013) who investigated Nigerian engineering students at home and abroad where findings showed that most plagiarism cases happened due to a lack of awareness. Can we say that: (1) is this also the case for basic medical sciences undergraduates? (2) is there any relationship between plagiarism awareness (independent variable) and engagement in plagiarism (dependent variable)? These, alongside other factors, need to be researched because of their dearth in academic literature.

We hypothesised that the respondents plagiarise due to their being unaware of the various issues about plagiarism and that unawareness extends the act of plagiarism perhaps leading to increased engagement in plagiarism practices. In light of the research gap identified, we formulated five research questions to help answer the research problem as follows:

1. What are the plagiarism types known to basic medical sciences undergraduates of Adeleke University?
2. What is the plagiarism awareness level of basic medical sciences undergraduates of Adeleke University?
3. What are the reasons for plagiarism by basic medical sciences undergraduates of Adeleke University?
4. What is the level of engagement in plagiarism practices by basic medical sciences undergraduates of Adeleke University?
5. What is the correlation between plagiarism awareness level and plagiarism practices engagement level by basic medical sciences undergraduates of Adeleke University?

Literature Review

In a survey carried out by Habib et al. (2021) on dental students, the students had good knowledge and awareness of the importance of violations of professionalism relating to academic honesty and that professional errors regarding academic honesty should not be ignored. This is a demonstration that students appreciate a supportive academic environment. Hence, an academic environment that promotes professional development is associated with high academic integrity. Juyal et al. (2015) emphasised that scientists as authors are people of ethical standards and must be aware that any form of academic dishonesty including plagiarism can tarnish their image severely. However, they observed that the production of original analysis and interpretation of research are harder with the easy availability of information online. Hence, the ease of copy-paste plagiarism and inappropriate reuse of sources bordering on digitalisation does not help science. In support of the preceding claims, a Nigerian study by Babalola (2012) focusing mostly on medical undergraduates demonstrated that the abundance and ease of accessing information materials from the Internet are responsible for low plagiarism understanding and the disposition to unintentional plagiarism. Similarly, Jereb et al. (2018) found that German and Slovene higher education institution students of different disciplines equally indicated the ease of use of ICTs and the Web as the topmost cause for plagiarising. These findings suggest that the ongoing revolution in the availability of academic electronic information online such as open access if not properly managed may not assist students in achieving quality in assignments and research. Consequently, students must be continuously taught and trained to appreciate the long-term effect of plagiarism on themselves in terms of self-development and society at large.

Babalola (2012), in his study covering undergraduates of different disciplines and levels, revealed the reasons for plagiarism to be the need to pass with good grades, the inability to cite internet sources correctly and the least was the inability to search the library for materials. Idiegbeyan-Ose et al. (2016), however, mentioned the pressure to meet deadlines and inadequate writing skills as reasons for plagiarism. The indulgence in plagiarism could be due to ignorance, oversight, and deficient training in ethical scientific writing (Juyal et al., 2015). In another study, Singh and Guram (2014) highlighted that increased plagiarism is associated with pressure to publish and the lack of essence of writing in English. Jereb et al. (2018) also cited that for German students, pressure (relating to faculty, family, fear of failure, job, money, peers, and stress) and a sense of satisfaction with one's work were the two uppermost factors affecting plagiarism. However, they refuted that plagiarism was not associated with teaching factors. In a USA study, Yu et al. (2016) uncovered concerning higher education undergraduates as regards academic misconduct (cheating) that lack of self-control was positively associated with student academic cheating. Students with a career focus were also more likely to be engaged in academic misconduct, whereas students with a non-career focus were less likely to do so. The study also found that the student's perception of the cheating environment was positively associated with academic misconduct. These studies show that there are underlying factors that must be tackled for plagiarism engagement practices to be prevented among students.

Issrani et al. (2021) in their survey of medical students discovered that with an increased percentage of knowledge (awareness) about plagiarism as students move from a lower to a higher academic level, most of them believed that they still need some guidance/lectures on plagiarism. Interestingly, in a study of nursing postgraduates, Selemani et al. (2018) found that despite a report of a conceptual understanding of plagiarism by postgraduate students, they still admitted to an indecisive position with

an equal chance of either intentionally or unintentionally committing plagiarism. This was largely ascribed to the subjective nature of pressure for good grades, laziness and poor time management, and lack of good academic writing skills. This will depend on individual commitment to academics. This implies that even with the knowledge of plagiarism by students, a negative attitude may still predispose them to plagiarising. This is supported by Alhadlaq et al. (2020) who analysed medical students attending medical ethics courses and reported that those who attended were associated with a significantly more negative attitude towards plagiarism. Fadlalmola et al. (2022) stressed that despite most students being aware of plagiarism, it remained a major predictor of clinical misbehaviour. However, a gap was noticed in the study relating to students' plagiarism knowledge that perhaps contributed to the high plagiarism occurrence.

Fadlalmola et al. (2022) in their study pinpointed that plagiarism was the most frequent academic misconduct among nursing students. This might not be unconnected to why Varghese and Jacob (2015) showed that medical students had limited knowledge of plagiarism issues. Javaeed et al. (2019) demonstrated that the majority of medical undergraduate students were not aware of the existence of plagiarism and they had mostly plagiarised the works of other people. Pais et al. (2021) also underscored that medical students' lack of awareness of plagiarism led to indulgence in its practice. Babalola (2012) found a significant and positive correlation between the perception of plagiarism and the incidence of plagiarism among undergraduates including biochemistry, nursing and public health undergraduates. This suggests that an increase in plagiarism awareness in turn increases plagiarism incidence. In a study of postgraduate students in Nigeria also comprising medical students, Idiegbeyan-Ose et al. (2016) observed that the increased level of training on plagiarism also increased students' plagiarism awareness level. They also established a significant positive relationship between awareness and perception of plagiarism. This shows that as awareness increases, understanding of plagiarism by students improves. Contrariwise, Varghese and Jacob revealed that knowledge of plagiarism was negatively correlated with plagiarism practice. Abbas et al. (2021), Habib et al. (2021), Javeed et al. (2019), and Memmon and Mavrinac (2020) demonstrated that increasing awareness will reduce incidences of plagiarism. Nikjo et al. (2021) emphasised the importance of training [workshop or virtual] on plagiarism knowledge of postgraduate nursing, midwifery and surgery students. It was uncovered that training interventions enhanced the knowledge of students regarding academic dishonesty.

In an interview conducted on bioethics students, Mukasa et al. (2023) observed that some students were not aware of plagiarism at all. The students engaged in copy-and-paste plagiarism by reproducing the texts they see in textbooks or online. Some students expressed that they received confusing messages from lecturers. However, a group in the study called 'determined students' were aware of the concept of plagiarism and made all efforts to bring their similarity index down to acceptable levels. Likewise, Curtis and Tremayne (2021) assessed students [also involving medical students] based on self-reported awareness of and engagement towards different kinds of plagiarism in surveys of four analogous categories at the same university on four circumstances separated by five years (2004, 2009, 2014, and 2019). A descending inclination in plagiarism from 2004 to 2014 was not sustained in 2019. A similar effect was also observed in the rates of awareness and engagement in the diverse kinds of plagiarism in 2019 and 2014. Hopp and Speil (2021), in an Austrian undergraduate study including medical undergraduates, maintained that respondents generally hide the verity of conceivable misbehaviour when it comes to plagiarism because of its sensitivity. With the engagement of an item-count technique, a high prevalence of plagiarism was estimated and with further placebo measurements [where the anonymity of respondents was convincingly assured], a higher plagiarism prevalence was observed in comparison with similar studies. These findings stressed the need for unrelenting efforts to detect and prevent plagiarism and to educate students about academic integrity precepts.

Javaeed et al. (2019) observed that the most common plagiarism type engaged in by medical students was copying their classmates or older students based on the ease with which they have access to their works. This malaise was attributed to a lack of institutional awareness about plagiarism, poor detection vigilance and the nonexistence of well-defined policies on plagiarism. Selemani et al. (2018) established that the prevalent forms of plagiarism admitted by medical students were lack of proper acknowledgement after paraphrasing, summarising and using quotation marks. Similarly, Fadlalmola et

al. (2022) in studying medical students also stated that paraphrasing without referencing was the most practised form while submitting others' work without acknowledgement was the least one. These studies point forward that if universities play their overseeing role in plagiarism control through education, training and policy formulation, plagiarism engagement by students could become minimal.

Method

Research Context

This study was carried out at Adeleke University, Ede, Osun State, Nigeria. In this university, funding has gone into the purchase of plagiarism software including Grammarly and EagleScan (a plagiarism checker designed by the Nigerian Universities Commission). Hence, there is a need to justify this investment. The respondents were basic medical sciences students in the five departments housed by the Faculty of Basic Medical Sciences. The institution was selected due to the factors of being a foremost private university, the university's current promotion of medical education, and limited funding and proximity to the researchers. The respondents were selected based on the inclusion criteria of having offered research methodology and ethics courses at their penultimate and final year classes as included in the curriculum [with the final-year students' projects ongoing] and having prior knowledge of some plagiarism software based on taught courses. The study's exclusion criteria included the inability to provide informed consent and incomplete questionnaire filling. The survey was carried out in the 2021/2022 academic year. A total population sampling technique was used to investigate available 361 basic medical sciences students in the Faculty of Basic Medical Sciences at Adeleke University, with all five departments in the Faculty examined (Table 1). The technique was employed because the target group had a manageable size and also a particular set of characteristics.

Research Problem and Rationale for the Study

A scoping review of the literature featuring research ethics and research integrity cases showed that over two-thirds of the cases considered concerning non-adherence to guidelines and plagiarism were from medical and health sciences (Armond et al., 2021). In addition, a systematic review by Fadlalmola et al. (2022) indicated that plagiarism is a critical predictor of clinical misconduct. Furthermore, high-profile cases from Nigerian educational institutions such as Fatunde (2019), Lawal (2019) and Nordling (2018) suggest the widespread prevalence of plagiarism among undergraduates, particularly medical sciences students whose works are expected to be original considering the sensitive nature of their profession [dealing with human lives]. Additionally, the research problem in this study stemmed from two key factors. First, one of the researchers is an editor and has observed that most of the basic medical sciences undergraduates have problems citing and referencing, quoting and paraphrasing. Second, a thorough search in major library databases revealed a dearth of literature on basic medical sciences undergraduates' plagiarism praxis in Nigeria.

Instrument Development

The study adopted a survey research design. Data were collected through a structured questionnaire. The quality of the questionnaire draft was assessed in two ways. Firstly, regarding validity, copies were given to senior academics for their expert opinions and input. Their corrections as inputs were made. Secondly, Cronbach's alpha test was employed to test the reliability of the instrument. This involved a pilot study before the main data collection. The questionnaire was pre-tested on the penultimate and final year students in the College of Health Sciences of Osun State University – a public university in Nigeria. The questionnaire was administered to 30 basic medical sciences undergraduates. This population was not part of the selected respondents. The results of pre-testing indicated the significance of the alpha value. The results ranged from .72 to .79 and overall were .72 for known plagiarism types, 0.74 for plagiarism awareness, .77 for plagiarism reasons and .79 for engagement in plagiarism practices.

Data Collection

Five postgraduate research assistants helped in the administration and collection of the questionnaire. They were trained on the different aspects of the questionnaire. The training was to enable them to guide and answer respondents' questions in the course of the questionnaire administration and collection. The instrument was administered during lectures of compulsory courses taken by the students as permission

was sought from the lecturers. However, some students submitted their copies at a later time. The collection process was challenging as repeated visits were made before total instrument collection. This led to a few of the copies of the questionnaire not being appropriately filled.

From the 316 copies of the questionnaire distributed, 302 were returned (a return rate of approximately 96%). However, 296 usable copies were found worthy of being analysed because six copies of the questionnaire were wrongly filled after assessment and they were discarded. The questionnaire comprised four sections that collected responses on demographic information, plagiarism types and reasons for plagiarism, plagiarism awareness, and engagement in plagiarism. All questions were close-ended. Responses on plagiarism types were yes and no answers. The responses on reasons for plagiarism, plagiarism awareness and engagement in plagiarism were rated based on a 4-Likert-scale of 4: Very True, 3: True, 2: Seldom True and 1: Not True, giving an overall average of 2.5.

The questionnaire was an adapted one based on a deliberate modification of questions by the researchers according to the reviewed literature, particularly studies by Mustafa (2016), Fish and Hura (2013) and Starovoytova and Namango (2016). Engagement in plagiarism was broadly categorised into purpose and nature. The purpose was connected to students engaging in plagiarism for academic and commercial reasons. Commercial reasons were associated with most students being digital natives. In the current era of social media, students plagiarise by sharing someone's social media post without obtaining their permission and not crediting them for the original content which is plagiarism. This can also include reposting images, videos, or written content without acknowledging the original creator. Some students have made some profit from these contents by commercialising them. Nature in this study had to do with materials online being protected or not - granting students easy access or not.

Data Analysis

The gathered data were collated and analysed using descriptive and inferential statistics. Descriptive statistics such as frequency count, percentage, mean and standard deviation scores were employed for research questions 1-4. Inferential statistics – Spearman's rank correlation test was used to measure research question 5. This test examined the correlation between the two phenomena - plagiarism awareness and plagiarism practices engagement. The technique was employed because the data of the measured phenomena satisfied the two assumptions that must be met. These included (1) they were measured on an ordinal scale and (2) they had a monotonic relationship after creating a scatterplot using SPSS statistics (Agresti, 2007; Bhattacherjee, 2012).

Ethical Approval

Ethical issues in this study were appropriately addressed. First, we sought and were granted permission by the Director of Adeleke University Research and Ethical Committee to conduct the study at Adeleke University. Second, respondents were informed through a consent letter before taking part in the study. To demonstrate that the respondents were satisfied with the content, they had to sign before being given a questionnaire to fill out.

Findings

Table 1 summarises the demographic information of the respondents. There were 296 respondents from the Faculty of Basic Medical Sciences. In terms of gender, though female students constituted the majority (50.7%), however, it was just a slight difference compared to the males (49.3%). This demonstrated similar data on gender indicating a good representation. The majority of the students were in the age range of 18-25 (90.2%). The nursing undergraduates constituted the highest respondents (41%) while the lowest were physiology undergraduates (5%).

Identified Plagiarism Types

The question aimed to identify the types of plagiarism known to the respondents. Four plagiarism types were provided. This was considered to be imperative in influencing the kind of plagiarism that the undergraduates could be mostly involved in. Trained assistants helped the students in case they needed to clarify any differences or similarities in the types. As shown in Table 2, most of the basic medical undergraduates showed that they knew about the four options given for the types. Above two-thirds of

the respondents demonstrated that complete plagiarism, copy and paste and word switch plagiarism types [in this order] are known to them. However, the least type was self-plagiarism (139; 47%).

Table 1. Demographic characteristics of respondents (n = 296)

Demography	Frequency	Percentage (%)
Gender		
Male	146	49.3
Female	150	50.7
Age range		
18-25	267	90.2
26-35	29	9.8
Department		
Public Health	90	30.0
Medical Laboratory Science (MLS)	51	17.0
Nursing	121	41.0
Physiology	14	5.0
Anatomy	20	7.0

Table 2. Known plagiarism types

Types of Plagiarism	Frequency - Yes	%	Frequency - No	%
Complete plagiarism	235	79.4	61	20.6
Copy and paste	216	73.0	80	27.0
Word switch	199	67.2	97	32.8
Self-plagiarism	139	47.0	157	53.0

Plagiarism Awareness Level

The question aimed to assess the levels of plagiarism awareness among the respondents. Table 3 presents the responses on the plagiarism awareness levels of basic medical undergraduates. This was demonstrated by the different methods through which these students became aware of plagiarism and the extent in terms of the 4-Likert scale that weighs truthfulness level. Most respondents agreed that they are aware of plagiarism through the current awareness service [a library service that provides current information to users] and taught courses – with the two indicators tied at 179 respondents (60.5%) [at the *Very True* level]. However, the awareness of plagiarism by the undergraduates through the current awareness service (98; 33.1%) was slightly higher than through taught courses (91; 30.7%) - at the third Likert-scale level – *True*. This was also corroborated by the mean ratings – current awareness (3.52) and taught courses (3.50). However, 173 (58.4%) of the respondents believed the Internet made them to know about plagiarism. The lowest plagiarism awareness level was getting informed through friends. The general outlook on plagiarism awareness level indicated that most basic medical undergraduates were well-informed about plagiarism. Table 3 attests to this well-informed level by three out of the four plagiarism awareness level indicators affirming to claim. In concurrence, the generally high mean ratings in Table 3 show that the plagiarism awareness levels of the basic medical undergraduates are largely high.

Table 3. Plagiarism awareness level of respondents

Awareness	VT	%	T	%	ST	%	NT	%	M
SD									
Through current awareness service	179	60.5	98	33.1	13	4.4	6	2	3.52
0.679									
Through the Internet	173	58.4	95	32.1	28	9.5	-	-	3.49
0.680									
Through taught courses	179	60.5	91	30.7	26	8.8	-	-	3.50
0.674									
I got informed through my friends	81	27.4	108	36.5	91	30.7	16	5.4	2.86
0.664									

*4: Very True, 3: True, 2: Seldom True and 1: Not True

Reasons for Plagiarism

The respondents were further requested to indicate the reasons why they engaged in plagiarism, particularly the identified plagiarism types, with seven choices to choose from. Table 4 provides a

summary of the results. Most respondents (195; 65.9%) cited the pressure to turn in written assignments/works. This was followed by timely access to information to meet deadlines (172; 58.1%) and then a deadline to turn in group work (137; 46.3%). The least number of basic medical undergraduates (90; 30.4%) indicated preventing medical errors in their writing as a reason for plagiarism. The aforementioned results are also supported by the mean ratings as observed in Table 4. Further, as observed from Table 4 and in agreement with the generally high mean ratings, the respondents must have plagiarised for all the listed reasons in the questionnaire.

Table 4. Reasons for plagiarising

Reason for Plagiarising ***SD***	**VT**	**%**	**T**	**%**	**ST**	**%**	**NT**	**%**	**M**
I plagiarise because of:									
For making my writings most satisfactory and simplified *0.745*	134	45.3	43	14.5	28	9.5	91	30.7	3.36
Pressure to turn in written assignments/ work *0.750*	195	65.9	81	27.4	10	3.4	10	3.4	3.74
Inadequate writing skills *0.764*	99	33.4	129	43.6	50	16.9	18	6.1	3.05
For timely access to information to meet deadlines *0.759*	172	58.1	34	11.5	14	4.7	76	25.7	3.72
Lack of knowledge on what constitutes plagiarism *0.752*	112	37.8	111	37.5	49	16.6	24	8.1	3.20
To prevent medical errors in my writing *0.769*	90	30.4	32	10.8	31	10.5	143	48.3	3.04
Deadlines to turn in group work *0.765*	137	46.3	138	46.6	13	4.4	8	2.7	3.56

Engagement in Plagiarism Practices

This question sought to establish the engagement of the basic medical undergraduates in plagiarism practices, that is, students undertaking or attempting the act of plagiarism. As revealed in Table 5, the engagement of the respondents in plagiarism practices as designed in the questionnaire is viewed from a general perspective and also from two other different perspectives – purpose and nature. By and large, the respondents engaged in plagiarism practices for educational purposes as indicated by 179 (60.5%) of the respondents.

Table 5. Engagement in plagiarism practices

Engagement in plagiarism practices ***SD***	**VT**	**%**	**T**	**%**	**ST**	**%**	**NT**	**%**	**M**
Purpose									
I engage in plagiarism practices for educational purposes *1.219*	179	60.5	109	36.8	2	0.7	6	2.0	3.56
I engage in plagiarism practices because of commercial purposes *1.230*	147	49.7	71	24	27	9.1	51	17.2	3.06
Nature									
Involved in plagiarism practices because copied work is not protected *1.254*	117	39.5	69	23.3	24	8.1	86	29.1	2.73
Involved in plagiarism practices because copied work is protected *1.220*	59	19.9	32	10.8	32	10.8	173	58.4	1.92

Based on purpose, engagement in the practice of plagiarism was also for educational purposes while in terms of nature, more than one-third (117; 39.5%) of the respondents indicated engaging in plagiarism

practices because they felt the copied work was not protected. The mean ratings of the individual indicators of the plagiarism practices engagement construct attest to the Likert-scale results of the respondents undertaking plagiarism for the first three indicators listed in Table 5. However, the mean rating of involvement in plagiarism because of protected work was the lowest (1.92) – indicating that the lack of access to protected works reduced plagiarism practices. However, at a general level, the engagement of the students in plagiarism practices was high judging from the indicators (purpose and nature) and their sub-indicators.

Plagiarism Awareness Level and Plagiarism Practices Engagement Level

As revealed in Table 6, there is evidence of a statistically significant bivariate correlation between plagiarism awareness level and plagiarism practices engagement level *(p=0.000< 0.05)*. In addition, there exists a moderate strength monotonic correlation between the two phenomena under study [rho = -.515, which is between Spearman's correlation coefficient of between -.04 and -.06] (Sarwono, 2018). Also, the negative sign of Spearman's correlation coefficient implies a negative correlation denoting a correlation between the two phenomena that travel in different directions. This means that as the plagiarism awareness level goes up, the plagiarism practices engagement goes down, and vice versa.

Table 6. Spearman's rank correlation analysis - correlation between plagiarism awareness level and plagiarism practices engagement level

			Plagiarism awareness level	Engagement in plagiarism practices
Spearman's rho	Plagiarism awareness level	Correlation coefficient	1.000	-.515
	Sig. (2-tailed)	.000		
	N	296	296	
	Engagement in plagiarism practices	Correlation coefficient	-.515	1.000
	Sig. (2-tailed)	.000		
		N	296	296

Independent variable: Plagiarism awareness level
Dependent variable: Engagement in plagiarism practices
Significant at ≤0.05

Conclusion

Demographically, this study shows a very slight difference between male and female basic medical science undergraduate students in terms of the number – males show less than a 1.5% difference from females. This indicates a lack of gender bias and fair gender representation in the study. However, the age range of 18-25 shows what is obtainable in Nigeria as most undergraduates fall in this age range. In addition, the tilting of the larger population of students in descending numbers regarding discipline in the order of Nursing, Public Health, Medical Laboratory Science, Anatomy and Physiology is a reflection of the dwindling employment opportunities in Nigeria in the lower disciplines, that is, Anatomy and Physiology. Students will like to study the first three disciplines as they are found locally lucrative and also provide a greater chance of getting employed abroad, particularly in the UK and the US. This can make the students plagiarise as they desire to get high grades to be considered brilliant students (Babalola, 2012).

The students demonstrate that they know about the plagiarism types listed in the questionnaire. Out of the four plagiarism types listed, self-plagiarism was the least identified as indicated by almost half of the respondents (47%). This is an indication of a positive disposition regarding students being theoretically knowledgeable about what plagiarism types are. This is not surprising as the study reveals this in Table 3 where the students confirm that they are aware of plagiarism through taught courses, current awareness services and the Internet. This study is in line with Fadlalmola et al. (2022) and Issrani et al. (2021) who indicated that students in their study were aware of plagiarism, particularly with Issrani et al. (2021) mentioning that students' progress in academic level is correlated with plagiarism awareness. The study further concurs with Selemani et al. (2018) and Fadlalmola et al. (2022) who showed that students have an issue with paraphrasing. This could not have occurred if they had no prior knowledge of plagiarism. The recognition by students of the plagiarism types is a good sign as this

awareness is most likely to reduce plagiarism practices since it is an academic deviant behaviour that must be reduced by all means possible among students.

Similarly, the plagiarism awareness level of basic medical sciences undergraduate students is encouraging. Generally, the Likert-scale values and the mean ratings of plagiarism awareness level indicators are high. This finding to a great extent largely agrees with Juyal et al. (2015) and Habib et al. (2021), and partially concurs with Mukasa et al. (2023). This affirms the positive influence of current awareness services, university-taught courses, student interaction with friends [who are most likely fellow students] and the Internet. Nevertheless, the studies of Babalola (2012), Varghese and Jacob (2015), Javaeed et al. (2019) and Pais et al. (2021) are not in line with the current study. They all claimed that students had little or no understanding, knowledge or awareness of plagiarism as these words were used interchangeably in these studies. Since the indicators of plagiarism awareness level in the current study are achievable individual and institutional factors, there should be conscious individual and institutional efforts towards encouraging their continued enhancement as they will help in plagiarism reduction among students. This could indicate medical students' admiration of a pragmatic academic setting and their willingness to get engrossed with a positive institutional plagiarism-control drive to exhibit academic integrity characteristics (Habib et al., 2021). This further pushes the fundamentals of academic integrity as a central component of higher education that sustains the standing of the university and the worth of students' qualifications (Holden et al., 2021).

The reasons why the respondents plagiarise are indications of possible concern to score better grades, time mismanagement, deficient and not-well-directed library system and lacklustre approach of lecturers to supervised teaching and mentoring [possibly during practical sessions]. The indicators ticked by the respondents ranging from pressure to turn in written assignments/works, timely access to information to meet deadlines, and the deadline to turn in group work demonstrate this worry. These findings are corroborated by Singh and Guram (2014) and Jereb et al. (2018) citing academic pressure and Selemani et al. (2018) who mentioned inadequate management of time and pressure of getting good grades as reasons for plagiarising. Further support for students' basis for anxiety, which should be a clarion call to the lecturers for augmenting their teaching and practical skills, is the respondents' low indication of not plagiarising because of averting medical errors in writing. Medical students, because they are professionals and dealing with human lives should be concerned about their writing – they will not want to copy and propagate unproven medical information because both professionals and non-professionals would want to read and apply the possible written medical facts and principles. The outcome of the present study may not be unconnected with medical undergraduate students who mix up the writing pattern in university and high school that is associated with teacher's laxity in academic writing, communication and mentoring (Mukasa et al., 2023). This restates that training interventions must be put in place for continued detection and prevention of plagiarism among students by concerned authorities and classroom and practical instructions for students on plagiarism (Curtis & Tremayne, 2021; Nikjo et al., 2021).

Generally, this study shows that the engagement of the students in plagiarism practices is high judging from the indicators (purpose and nature) and their sub-indicators. This comes after the students demonstrate knowledge about what plagiarism types are and also have a high level of plagiarism awareness. It is hardly surprising to get this result as the respondents are undergraduates. Then again, most studies support this assertion (Alhadlaq et al., 2020; Hopp & Speil, 2021; Javaeed et al., 2019; Fadlalmola et al., 2022; Pais et al., 2021). Alhadlaq et al. (2020), Hopp and Speil (2021), Javaeed et al. (2019) and Pais et al. (2021) stated that the majority of medical undergraduates in their studies displayed a high level of plagiarism involvement. Fadlalmola et al. (2022) accentuated that the most recurrent academic misbehaviour among nursing students was plagiarism. The present study also indicates a significant correlation between the plagiarism awareness level and plagiarism practices engagement level of the respondents (Table 6). Further, the present study's result agrees with Varghese and Jacob (2015) who showed that plagiarism practice decreased as plagiarism knowledge increased.

The outcome of our study may be attributed to institutional differences, indicators for the measure of our variables, the instrument used in the study and the self-reported responses of the researched students

that are common in surveys. The strength of the current study is its institutional focus on the students of the Faculty of Basic Medical Sciences and the fact that the questionnaire was piloted in a related college situated in a public institution. However, the limitations of this study make the findings to be approached with caution. They include (1) being a single institution study, there is the likelihood that this survey may not accurately represent the population of Nigerian basic medical sciences undergraduates and (2) self-report bias - responses are gathered based on respondents' self-report. This can lead to memory limitation, response bias and social desirability bringing about inaccurate responses from the respondents. The interaction between students' plagiarism awareness level and plagiarism practices engagement level is rather a complex subject about student plagiarism, especially employing a survey. The approach of triangulation – the use of other instruments [such as an interview guide and focus group discussion], multiple datasets [studying several institutions] and theories could further contribute to the study and add new dimensions to the study regarding unique findings. Future studies could examine the study of many universities on the topic and the assessment of lecturers' knowledge and implementation of the outcome of plagiarism software in teaching and project supervision of basic medical sciences students.

The indication of a statistically significant, moderate strength monotonic and negative correlation between plagiarism awareness level and plagiarism practices engagement level means that as the plagiarism awareness level goes up, the plagiarism practices engagement goes down, and vice versa. Though the phenomenon of plagiarism awareness level has a moderate correlation with plagiarism practices engagement level, but remains a statistically significant factor that is large enough to unlikely have occurred based on the target group of 296 basic medical sciences undergraduates if there is no correlation in the population. If African research, especially that of the most populous black nation - Nigeria - is to be recognised in terms of its originality, plagiarism must be consciously reduced among the students as they are future researchers. Plagiarism is a subject that takes high precedence in academics, particularly in health or medical sciences that train their students and researchers to value life. Consequently, based on the findings of the study, we recommend:

1. Increased education, instruction, training and workshop attendance should be offered to the respondents and the lecturers to raise their plagiarism awareness and also know the possible consequences of plagiarising academic literature and research. This can further help reduce the level of plagiarism engagement.
2. Since basic medical sciences undergraduates still engage in plagiarism practices, the development of institutional academic integrity policies including pedagogical academic integrity policies is of the utmost importance to control the occurrence of academic dishonesty, especially plagiarism in this case and other academic vices (Holden et al., 2021). This can raise awareness and reduce students' engagement in plagiarism. Additionally, there should be the incorporation of punitive measures for recurring offenders.
3. Librarians and the library should also assist in reducing the act of plagiarism. They are involved in teaching library orientation and instruction courses and most software used in text-matching are located in the main institutional library. Hence, as students are newly enrolled and registered by the library, they should be taught everything that plagiarism represents – its positive outcomes and negative consequences.
4. Lecturers should make it a point of duty that every class assignment should have a proper in-text citation and referencing standard. By this, students are most likely to develop the tendency of appropriate citation which would drive down the probability of plagiarism.
5. Enhanced regulated courses related to awareness, engagement and control of plagiarism and academic integrity should be put in place.

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