

Attitudes toward Plagiarism: The Case of Undergraduate Health Sciences Students at the University of Pretoria

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Abstract

The primary aim of the study on which this article is based was to investigate undergraduate health sciences students' perceptions, attitudes to and awareness of plagiarism at the University of Pretoria in South Africa. The sample comprised 696 students from the School of Medicine and School of Healthcare Sciences in the Faculty of Health Sciences. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 25. Analytical tools included frequencies, custom tables, independent t-tests and one-way analysis of variance. Exploratory factor analysis and reliability analysis were used to assess construct validity and internal consistency of the instrument tool respectively. Findings revealed that overall, the sample group of students seem to be generally aware of the University's plagiarism policy and what it entails. However, it became evident that there is still a fairly significant percentage of students whose responses suggest a lack of understanding and awareness of plagiarism. Findings further revealed statistically significant differences in attitudes to plagiarism and awareness of it among the six programmes and across the levels of study. The paper advocates that plagiarism policies should be clearly written and communicated to ensure that students have consistent understandings of how plagiarism is defined, its purpose, due process and specific consequences.

Keywords: health sciences, perceptions, plagiarism policy, Turnitin, undergraduate students

Introduction

Plagiarism is a problem that plagues higher education institutions worldwide. The problem has been exacerbated by easily accessible online information on a variety of electronic platforms. Students are deemed to have poor understandings of plagiarism and the various ways in which plagiarism finds expression (Marshall & Garry 2005). Plagiarism is also prevalent in South African higher education and occurs at all qualification levels in various academic undertakings by students such as assignments, dissertations and other projects (Mammen & Meyiwa 2013).

In an article that appeared in *TimesLive*, Govender (2014) reported that over 1,400 students at major higher education institutions in South Africa were found guilty of academic dishonesty in 2014. The University of South Africa penalised 519 students by barring them from studying at that institution for three years as a consequence of cheating during exams or plagiarising (Govender 2014). The article further reported that figures provided by other universities indicate that 535 students were found guilty of cheating or plagiarising at North-West University, 153 at the University of Johannesburg, 66 at the Nelson Mandela Metropolitan University, 35 at Stellenbosch University, 31 at the University of the Witwatersrand, 27 at the University of the Western Cape, and 24 at the University of Cape Town (Govender 2014). These figures suggest that academic dishonesty is widespread within the South African higher education sector. In fact, Govender (2014) reported that some of the universities approached seemed to have been afraid of tainting their image by releasing these figures.

Plagiarism is considered so serious that an academic at the University of Johannesburg describes it as a ‘cancer’ that is proliferating in our higher education institutions (Friedman 2015). According to a student judicial officer at the University of Pretoria, one of the justifications given by students found guilty of academic dishonesty was that they did not have time to properly engage with the material as they had enrolled for too many modules (Friedman 2015). In a study of graduation reports by undergraduate students at two universities in Vietnam, Tran, Huynh and Ngunyen (2018) found that plagiarism was detected in 91.7% of the graduation reports at one university which does not use Turnitin and in 61.7% of the reports at another university that also does not use the software. These findings reveal that plagiarism is also a serious problem among undergraduate students beyond the borders of South Africa.

It has become increasingly simple to plagiarise others' work due to the availability of information that is freely accessible on various electronic platforms. Plagiarism is a form of intellectual dishonesty that includes copying someone's work without citation, failure to use quotation marks where required, omissions and carelessness in compiling the reference list and using others' figures, tables or illustrations without securing permission to do so (Gibelman, Gelman & Fast 1999).

According to the University of Pretoria's (2010: 3) Plagiarism Prevention Policy, plagiarism is:

... the presentation of someone else's work, words, images, ideas, opinions, discoveries, artwork, music, recordings or computer-generated work (including circuitry, computer programs or software, websites, the Internet or other electronic resources) whether published or not, as one's own work, without properly acknowledging the source, with or without the source's permission.

The policy further states that it is not a requirement that a person must have intended to deceive or to plagiarise for plagiarism to occur. At the University, it is simply assumed that where certain plagiarised elements are found in a text, the author intended them to be there, and that where paraphrasing is the issue, the author intended this as a disguise for more obvious plagiarism, such as unattributed verbatim copying.

In view of the aforementioned prevalence of plagiarism in higher education institutions, this study investigated undergraduate health sciences students' perceptions, attitudes to and awareness of plagiarism at the University of Pretoria. The research objectives were:

- (i) to establish the undergraduate health sciences students' perceptions, attitudes and awareness towards plagiarism;
- (ii) to investigate whether statistically significant differences exist between males and females regarding undergraduate health students' perceptions, attitudes to and awareness of plagiarism;
- (iii) to determine whether a statistically significant difference exists across programmes regarding undergraduate health students' perceptions, attitudes to and awareness of plagiarism; and

- (iv) to explore whether undergraduate health sciences students' perceptions, attitudes to and awareness of plagiarism differs across levels of study.

Literature Review

Formal recognition of plagiarism dates back to the mid-18th century (Goldgar 2001) and is a complex issue that is central to academic and literary culture (Green 2002). The issue has become one of the central academic problems in higher education, globally. According to Etter, Cramer and Finn (2006), there has been a sharp increase in the number of students in higher education institutions who use online material without citing the source. A study by Jones, Reid and Bartlett (2005: 8) revealed that just over 36% of 171 students surveyed indicated that they failed to cite references used. In the same study it also emerged that approximately 20% of students confessed to cutting and pasting information from the internet without citing the source. This is corroborated in the study by Scanlon and Neumann (2002) in which 24% of 698 students self-reported cutting and pasting without acknowledging the source. In a different study by Selwyn (2008), 59% of 1,222 students admitted to copying a few sentences from the internet into their assignments, 30% self-reported copying a few paragraphs and 4% copied entire assignments from an online source.

Causes of Plagiarism

Research on plagiarism has not only investigated the prevalence of plagiarism among university students, but has also explored the reasons for its occurrence (Mwamwenda 2006; Park 2003; Teferra 2001; Millerville University 2005; Cummings *et al.* 2002). Some of the reasons for the increasing prevalence of plagiarism are students' lack of familiarity with rules governing quoting; paraphrasing; citing and referencing; too much work and a lack of time to properly engage with academic material; easier access to information through the internet; and students thought that lecturers might not detect that plagiarism has occurred (Mwamwenda 2006).

Many instances of plagiarism by undergraduate students seem to be unintentional; they result from students' failure to conform to proper protocols

for academic referencing and lack of acknowledgement of their sources' ideas largely because students are unaware of what constitutes plagiarism (Elander, Pittam, Lusher, Fox & Payne 2009). Unintentional plagiarism could occur due to students' failure to see themselves as authors who should make an important contribution as well as a lack of critical engagement with the sources (Abari, Akbari & Graves 2006).

To expand on the above, unintentional plagiarism is partly predated by lack of awareness and knowledge of plagiarism. Indeed, some studies pointed out that students' lack of awareness of and uncertainties regarding what constitutes plagiarism could itself be a precursor to plagiarism (Eret & Gokmenoglu 2010; Murtaza, Zafar, Bashir & Hussain 2013; Pupovac Bilic-Zulle, Mavrinac & Petroveckii 2010; Marshall & Garry 2005; Sentleng & King 2012). Conversely, intentional plagiarism occurs when a student knowingly uses another person's ideas as his or her own. This also includes cutting and pasting an essay or article from the internet, or, part of an essay or article, using online sources without acknowledging the author or fabricating a quotation or a source (Sentleng & King 2012).

Plagiarism in South African Higher Education

In 2005 it was reported in the media that several students at the University of Cape Town, the University of Pretoria and Stellenbosch University had failed their courses, been suspended or even been expelled for failing to acknowledge original sources in their work (Russouw 2005). At the University of Pretoria, 80% of 150 undergraduate students interviewed for a study on plagiarism admitted that they regularly copied their assignments straight from the Internet. Most of these students attributed their plagiarism tendencies to academic laziness, poor time management and a lack of research skills (Russouw 2005).

In another study which investigated plagiarism among students at the former University of Transkei (now called Walter Sisulu University) plagiarism was found to be clearly common among students (Mwamwenda & Monyooe 2000). This was corroborated by Ellery's (2008) study which investigated plagiarism amongst first-year students at the University of KwaZulu-Natal and found that although students had plagiarised in an essay assignment, there was little deliberate intention to deceive. Instead students appeared to have poor understanding of correct referencing techniques and the

establishment of authorial voice. These shortcomings seemed to emanate from students' lack of proper engagement with plagiarism and referencing. Ellery (2008) advises that universities should view the acquisition of norms, values, attitudes, beliefs and practices that help curb plagiarism as an important and iterative process, particularly in a multilingual and multicultural society such as South Africa.

Research by Sentleng and King (2012) which investigated the awareness and causes of plagiarism among undergraduate first, second and third year students of the departments of Chemistry and Mathematical Technology within the Faculty of Applied Science at a South African university of technology found evidence of both intentional and unintentional plagiarism. Some of the reasons for intentional plagiarism were that students wanted to obtain better marks, make up for poor time management and because they thought everybody else was doing it. Unintentional plagiarism occurred due to students' poor writing skills, inadequate understanding of referencing skills, poor understanding of assignments and lack of awareness and understanding of the concept of plagiarism (Sentleng & King 2012).

Plagiarism Awareness and Perceptions

An evaluation of students' perceptions and behaviour towards plagiarism in 35 Pakistani universities revealed that most of the students were not aware of policies on plagiarism at their universities, while only a few students were aware of these policies and the penalties for plagiarism (Murtaza *et al.* 2013). Students in the Pakistani universities did not view plagiarism as a serious enough offence to warrant any penalties. In concurrence, one third of students surveyed in Pupovac *et al.*'s (2010) study felt that they were entitled to plagiarise to a certain extent as they were still in the early stages of the academic writing process. Furthermore, half of the students in the latter study (Pupovac *et al.* 2010) did not consider self-plagiarism to be harmful nor to warrant any punishment. Although students in a study by Marshall and Garry (2005) understood the more obvious forms of plagiarism, such as copying others' work without acknowledgment, they were uncertain about how they should reference correctly. Despite lack of awareness and understanding of plagiarism, Cilliers (2017) found that very few universities had included information ethics in their curriculum.

Theories Pertaining to Plagiarism

Research on plagiarism and other forms of academic dishonesty seems to be largely atheoretical (Finchilescu & Cooper 2018). However, some of the factors central to this study such as attitudes and perceptions resonate with the elements of relevant theories. A theory of planned behaviour (TPB) postulates that an individual's intention to engage in a particular behaviour is contingent on their attitude to that behaviour, their perception of the social norms pertaining to the behaviour and how they perceive their capacity to perform the behaviour. It is this intention that may eventually drive the individual to perform the behaviour (Fishbein & Ajzen 2010). The extent to which intentions predict behaviour is partly dependent on factors outside the individual's control, i.e. the strength of the relationship between intention and behaviour is moderated by actual control over the behaviour (Ajzen 2011). Therefore, a lack of actual control over one's behaviour will likely reduce the predictive validity of one's intentions.

Various researchers have successfully applied TPB to plagiarism with considerable success (Pulker 2012; Stone, Jawahar & Kisamore 2010; Beck & Ajzen 1991). Overall, the main components of TPB (i.e. attitudes, subjective norms and perceived behavioural control) were helpful in predicting intention to plagiarise, although the relative importance of the individual components differed from one study to another (Finchilescu & Cooper 2018).

Plagiarism at the University of Pretoria

Various researchers have investigated the prevalence and perceptions of plagiarism in the South African higher education sector in various disciplines (Finchilescu & Cooper 2018; Mwamwenda & Monyooe 2000; Mwamwenda 2006; Sentleng & King 2012; Cilliers 2017). However, there is a paucity of research that has been undertaken on plagiarism among health sciences students in South African universities, particularly in the following programmes: Medicine, Radiography, Physiotherapy, Occupational Therapy, Human Nutrition and Nursing.

This study therefore aimed to bridge this gap by investigating students' perceptions, attitudes to and awareness of plagiarism at the University of Pretoria in South Africa. This should serve as baseline research that sets the stage for further research on the actual prevalence of plagiarism among health

sciences students in the aforementioned programmes at various South African universities.

The aim of the study from which this article derives, was to investigate undergraduate health sciences students' perceptions of, attitudes to and awareness of plagiarism at the University of Pretoria.

Research Methodology

A descriptive design and a causal comparative quantitative research design were both used for the research method. Descriptive research attempts to provide answers to what is happening rather than why is it happening (Greenfield 2002). A causal comparative research design aims to compare two or more groups with the intent to understand differences which may exist between the groups (Pallant 2010).

The population consisted of students in the School of Medicine and School of Healthcare Sciences in the Faculty of Health Sciences at the University of Pretoria. A stratified sampling method was used to select groups of students as the study was aimed at focusing on mainly first, second and third year students in Medicine and Health Care Sciences. The School of Healthcare Sciences comprises the following departments: Radiography, Human Nutrition, Occupational Therapy, Nursing and Physiotherapy. The study included students from the School of Medicine and all the departments in the School of Healthcare Sciences; the total population at the time of study was 1561. According to Israel's (1992) sample size table, for a population size of just over 1 500, the sample size should be based on a confidence level of 95%. In this study, a sample size of 696 students was obtained.

The researcher distributed a structured questionnaire to students in the Schools of Medicine and Healthcare Sciences. Arrangements were made with each of the departments to allow the researcher a few minutes to distribute questionnaires manually in a lecture room, either at the beginning of a lecture or just after the lecture. Students were allocated a few minutes to complete the questionnaires, after which completed questionnaires were collected. After collecting completed questionnaires from the participants, data were analysed using the Statistical Package for Social Sciences (SPSS). This software (SPSS), which has been in existence since the 1960s, appears to be the most widely used quantitative data analysis software for social sciences (Bryman 2001).

Statistical techniques used to analyse the data were frequencies, custom tables, independent t-tests and one-way ANOVA. In order to measure the validity and reliability of the instrument tool, exploratory factor analysis and reliability analysis were respectively used.

Validity and Reliability

Table 1 below presents the results of Kaiser-Meyer Olkin's measure of sampling adequacy and Bartlett's Test of Sphericity.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of Sphericity	Approx. Chi-Square	2132.763
	df	91
	Sig.	.000

It is evident from Table 1, that the Kaiser-Meyer Olkin measure of sampling adequacy is 0.830, indicating that the data set was appropriate for factor analysis (Tabachnick & Fidell 2013). The Bartlett's Test of Sphericity was also significant, thus, $p\text{-value} = 0.000 < 0.05$ level of significance (Bartlett 1954) thereby confirming the Kaiser-Meyer Olkin measure of sampling adequacy's results.

Table 2 provides an exploratory factor analysis and reliability analysis results.

Table 2: Exploratory factor analysis and reliability analysis

Factor (s)	Factor Loadings	Eigen-values	Variance Explained (%)	Cronbach's Alpha Coefficient
Factor 1: Plagiarism Awareness (PA)				
PA3-I am aware of the University's policy regarding plagiarism.	0.796			

PA5-I am aware of the penalties which may be incurred if I plagiarise.	0.730	3.778	26.988	0.752
PA4-I have seen the University's policy document on plagiarism.	0.706			
PA1-I understand what plagiarism entails.	0.650			
PA2-My lecturers have explained what plagiarism entails.	0.632			
Factor 2: Plagiarism Attitudes (PAT)		1.949	13.921	0.713
PAT2-We should only cite published work. It is not necessary to cite unpublished work.	0.722			
PAT1-Plagiarism should only be checked in theses and dissertations and not assignments.	0.722			
PAT5-One should not be penalised using other people's e-mail and cell phone text messages.	0.641			
PAT6-It is not necessary for each assignment to be accompanied by a Declaration of Originality.	0.617			
PAT4-First-year students should not be penalised for committing plagiarism.	0.615			
Factor 3: Plagiarism Perceptions (PP)		1.335	9.533	0.686
PP9-I am guilty of plagiarism if I copy something from another author's work (e.g. a book, an article or a website) without acknowledging the source and pass it off as my own.	0.806			
PP4-If I paraphrase someone else's work, I still need to credit the source.	0.672			
PP10-If it is unclear whether an idea in your paper really came from you, or whether you got it from somewhere else and just changed it a little, you should always cite your source.	0.613			
PP11-Images and websites are not serious enough to be cited.	0.546			
Total variance explained			50.442	

Exploratory factor analysis by principal components analysis was performed in order to establish construct validity. Table 2 reveals that 3 factors were extracted in the analysis using Kaiser's eigenvalue of greater than 1 criterion (Kaiser 1970). The three factors were called plagiarism awareness, plagiarism attitudes and plagiarism perceptions. These three factors contributed a total variance of 50.442%, less than the 60% threshold value commonly used in the field of social sciences (Hair, Anderson, Tatham & Black 1998). Plagiarism awareness accounted for 26.988%, while plagiarism attitudes contributed 13.921% and plagiarism perceptions explained 9.533%. It is also shown in Table 2 that all factor loadings are above the threshold value of 0.5, indicating that they are of utmost significance to the factors to which they are loading (Hair *et al.* 1998). Twelve items were deleted due to the fact that some did not measure what they were intended to measure and some had factor loadings below 0.5.

An internal consistency analysis was performed in order to assess the reliability aspect of the plagiarism instrument. The ability of the instrument to provide consistent results in repeated uses is referred to as reliability (Gatewood & Field 1990). Reliability analysis carried out on all extracted three factors demonstrated that the Cronbach's alpha coefficient for plagiarism awareness is 0.752, 0.713 for plagiarism attitudes and 0.686 for plagiarism perception.

Two Cronbach's alpha coefficient values are above the recommended minimum acceptable value of 0.7 (Nunnally 1978) while the other one is very close to 0.7, indicating that the scales are reliable.

Results

Figure 1 provides a graphic representation of the distribution of respondents by gender. The statistics indicate that the percentage of female respondents was higher than that of their male counterparts: females (79.6%) and males (20.4%).

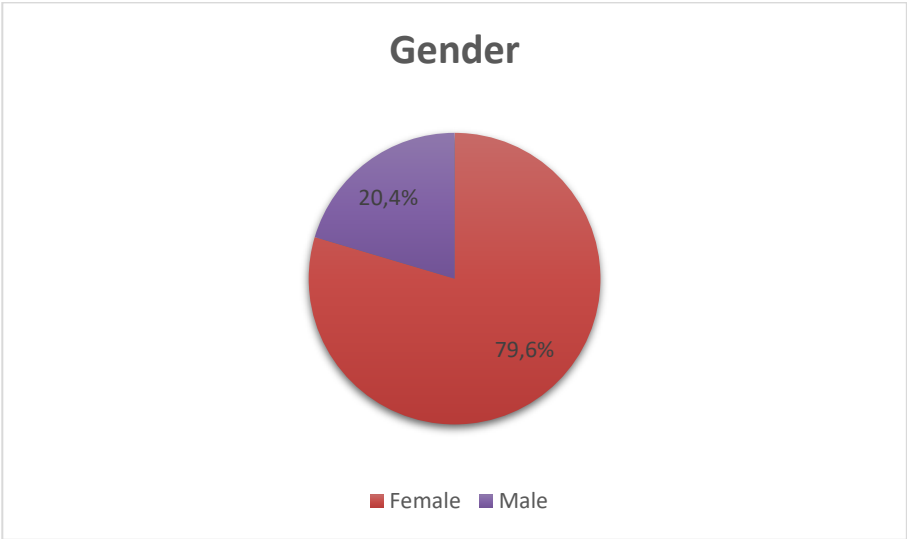


Figure 1: Distribution of Respondents by Gender

Figure 2 presents programmes in the Faculty of Health Sciences. Almost half of the respondents (49.1%) were studying Medicine.

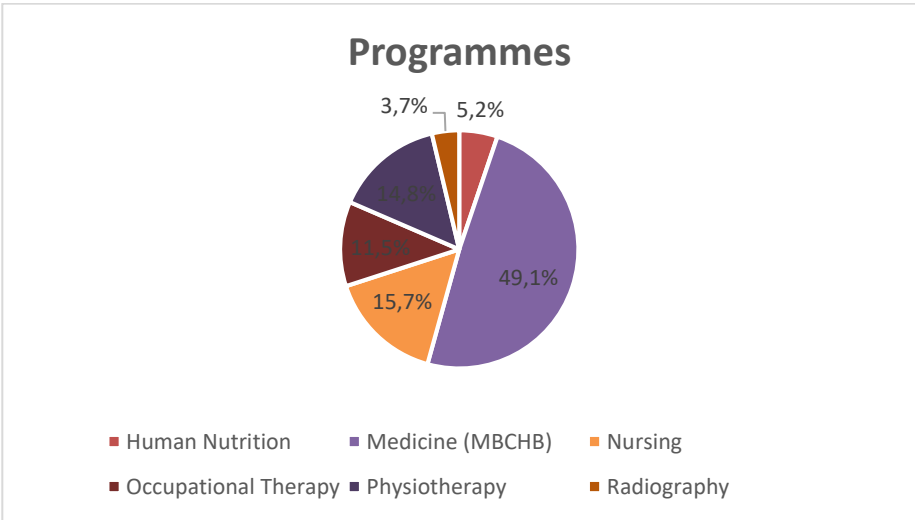


Figure 2: Distribution of Respondents by Programmes

Figure 3 shows a number of students and years of study. Results indicate that (48.7%) of the students were in third year, (44.1%) in second year and (7.2%) in first year.

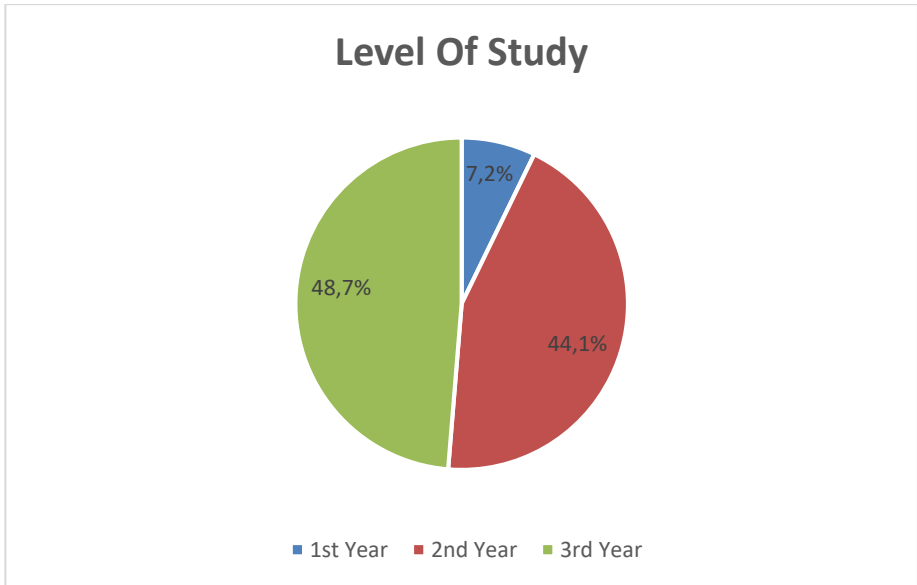


Figure 3: Distribution of Respondents by Level of Study

Data in Table 3 indicate that a majority of the students were aware of plagiarism and the University of Pretoria's plagiarism policy; 82.6% of the participants indicated that lecturers had explained to them what plagiarism entails and 88.5% were aware of the University's policy on plagiarism.

Table 3: Plagiarism Awareness

		Strongly Disagree	Disagree	Agree	Strongly Agree
PA1. I understand what plagiarism entails.	Count	5	10	331	350
	Row N %	0.7%	1.4%	47.6%	50.3%

PA2. My lecturers have explained what plagiarism entails.	Count	23	98	334	241
	Row N %	3.3%	14.1%	48.0%	34.6%
PA3.I am aware of the University's policy regarding plagiarism.	Count	9	71	291	325
	Row N %	1.3%	10.2%	41.8%	46.7%
PA4.I have seen the University's policy document on plagiarism	Count	67	201	205	223
	Row N %	9.6%	28.9%	29.5%	32.0%
PA5.I am aware of the penalties which may be incurred if I plagiarise.	Count	25	110	290	271
	Row N %	3.6%	15.8%	41.7%	38.9%

However, it is a matter of concern that 38.5% of respondents had not seen the University's policy on plagiarism and 19.4% were not aware of the penalties which might be incurred if they plagiarise.

Table 4: Plagiarism Perceptions

		Strongly Disagree	Disagree	Agree	Strongly Agree
PP1Plagiarism occurs when one intentionally avoids acknowledging sources used. If failure to cite sources was unintentional, it is not plagiarism.	Count	228	288	111	69
	Row N %	32.8%	41.4%	15.9%	9.9%
PP2Using only another person's idea and not the actual words can constitute plagiarism.	Count	60	159	326	151
	Row N %	8.6%	22.8%	46.8%	21.7%
PP3Students who commit plagiarism will only be given credit for the plagiarised work if they prove that they plagiarised unintentionally.	Count	246	310	116	24
	Row N %	35.3%	44.5%	16.7%	3.4%
PP4.If I paraphrase someone else's work, I still need to credit the source.	Count	10	24	225	437
	Row N %	1.4%	3.4%	32.3%	62.8%
PP5To avoid plagiarism, I need to hand in my own and original work.	Count	15	58	184	439
	Row N %	2.2%	8.3%	26.4%	63.1%
PP6In extreme cases plagiarism penalties could result in expulsion or failure to graduate at all.	Count	10	18	204	464
	Row N %	1.4%	2.6%	29.3%	66.7%
PP7Changing a few words of the original sentences does not make your writing a legitimate paraphrase. You must change both the words and the sentence structure of the original, without changing the content.	Count	26	63	374	233
	Row N %	3.7%	9.1%	53.7%	33.5%
PP8Only undergraduate students are exempt from plagiarism penalties as they are still in the process of learning referencing techniques.	Count	313	269	88	26
	Row N %	45.0%	38.6%	12.6%	3.7%

PP9.I am guilty of plagiarism if I copy something from another author's work (e.g. a book, an article or a website) without acknowledging the source and pass it off as my own.	Count	15	13	134	534
	Row N %	2.2%	1.9%	19.3%	76.7%
PP10.If it is unclear whether an idea in your paper really came from you, or whether you got it from somewhere else and just changed it a little, you should always cite your source.	Count	7	33	326	330
	Row N %	1.0%	4.7%	46.8%	47.4%
PP11. Images and websites are not serious enough to be cited.	Count	402	241	36	17
	Row N %	57.8%	34.6%	5.2%	2.4%
PP12.Changing the words of an original source substantially is sufficient to prevent plagiarism.	Count	149	275	221	51
	Row N %	21.4%	39.5%	31.8%	7.3%
PP13.If I use my own previous work I don't need to acknowledge the source.	Count	153	247	192	104
	Row N %	22.0%	35.5%	27.6%	14.9%
PP14.If I use my own words when writing about information I found in a book, I do not have to cite the source.	Count	282	286	87	41
	Row N %	40.5%	41.1%	12.5%	5.9%

With regard to plagiarism perceptions, Table 4 reveals that 668 (96%) of the study participants agreed that they would be guilty of plagiarism if they copied from another author's work without acknowledging the source and passed it off as their own. The results in the table further indicate that 95.1% of participants agreed that one still needs to credit the source when paraphrasing someone's work. There were 656 (94.2%) participants who indicated that even if it is unclear whether an idea in one's work really came from them, or whether they obtained it from somewhere else and just changed it a little, one should always cite their source. Ninety-two point four percent (92.4%) of participants regarded images and websites as serious enough to be cited.

The table also reveals that 39.1% of the students believed that substantially changing the words of an original source is sufficient to prevent plagiarism. Approximately one third (31.4%) of the students indicated that merely using another person's idea and not the actual words, does not constitute plagiarism. Furthermore, over a quarter (25.8%) of the students felt that plagiarism occurs when there is an intention on the part of the offender and that if failure to cite sources was unintentional, it is not plagiarism. Concomitantly, 20.1% of the participants indicated that students who commit plagiarism will be given credit for the plagiarised work only if they prove that they plagiarised unintentionally.

Table 5 provides statistical results on plagiarism attitudes.

Table 5: Plagiarism Attitudes

		Strongly Disagree	Disagree	Agree	Strongly Agree
PAT1Plagiarism should only be checked in theses and dissertations and not assignments.	Count	346	291	45	14
	Row N %	49.7%	41.8%	6.5%	2.0%
PAT2We should only cite published work. It is not necessary to cite unpublished work.	Count	229	322	112	33
	Row N %	32.9%	46.3%	16.1%	4.7%
PAT3Each student should indicate precisely and accurately when they have used information provided by someone else, i.e. referencing must be done in accordance with a recognised system.	Count	7	18	262	409
	Row N %	1.0%	2.6%	37.6%	58.8%
PAT4First-year students should not be penalised for committing plagiarism.	Count	233	306	124	33
	Row N %	33.5%	44.0%	17.8%	4.7%
PAT5One should not be penalised using other people's e-mail and cell phone text messages.	Count	156	332	177	31
	Row N %	22.4%	47.7%	25.4%	4.5%
PAT6It is not necessary for each assignment to be accompanied by a Declaration of Originality	Count	218	293	151	34
	Row N %	31.3%	42.1%	21.7%	4.9%
PAT7It is unfair to single out a few students for plagiarising because many students plagiarise.	Count	159	225	205	107
	Row N %	22.8%	32.3%	29.5%	15.4%

Table 5 shows that 91.5% of the respondents indicated that plagiarism should be checked not just in theses and dissertations, but in assignments too. Although the majority of the participants stated that both published and unpublished works should be cited, 145 (20.8%) participants indicated that it was not necessary to cite unpublished work. The table further records that 157 (22.5%) students did not think that first year students should be penalised for committing plagiarism. Furthermore, 29.9% of the students felt that one should not be penalised for using others' e-mail and mobile phone text messages. Moreover, 26.6% of the respondents indicated that it was not necessary for each assignment to be accompanied by a declaration of originality. It was interesting to find that almost half of the students (44.9%) were of the opinion that, since many students engaged in plagiarising, it was unfair to punish a few students for the offence.

Table 6 displays the independent t-test results on plagiarism awareness, attitudes and perceptions by gender.

Table 6: Independent t-test Results on Plagiarism Awareness, Attitudes and Perceptions by Gender

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Plagiarism Awareness	Equal variances assumed	1.040	.308	-.235	694	.814	-.01227	.05221	-.11479	.09024
	Equal variances not assumed			-.225	207.185	.823	-.01227	.05466	-.12003	.09548
Plagiarism Attitudes	Equal variances assumed	1.394	.238	-1.950	694	.052	-.10040	.05149	-.20149	.00070
	Equal variances not assumed			-1.785	197.833	.076	-.10040	.05625	-.21132	.01053
Plagiarism Perceptions	Equal variances assumed	2.917	.088	-.759	694	.448	-.02354	.03100	-.08440	.03733
	Equal variances not assumed			-.682	194.014	.496	-.02354	.03453	-.09163	.04456

An independent samples t-test was conducted to investigate if statistically significant differences exist regarding undergraduate health students' perceptions, attitudes to and awareness of plagiarism between males and females. Results in Table 6 indicate no statistically significant difference between males ($M = 3.20$, $SD = 0.59$) and females ($M = 3.19$, $SD = 0.55$); t

(694) = -0.235, $p = 0.814$ on plagiarism awareness. In addition, there was no statistically significant difference between males ($M = 2.00$, $SD = 0.61$) and females ($M = 1.90$, $SD = 0.53$); $t(694) = -1.950$, $p = 0.052$ on plagiarism attitudes. Finally, there was no statistically significant difference between males ($M = 3.07$, $SD = 0.38$) and females ($M = 3.05$, $SD = 0.32$); $t(694) = -0.759$, $p = 0.448$ on plagiarism perceptions.

Table 7: One-way ANOVA Results on Plagiarism Awareness, Attitudes and Perceptions according to Programmes

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Plagiarism Awareness	Between groups	8.696	5	1.739	5.850	.000
	Within groups	205.157	690	.297		
	Total	213.854	695			
Plagiarism Attitudes	Between groups	6.376	5	1.275	4.340	.001
	Within groups	202.741	690	.294		
	Total	209.117	695			
Plagiarism Perceptions	Between groups	.819	5	.164	1.514	.183
	Within groups	74.634	690	.108		
	Total	75.452	695			

A one-way analysis of variance was performed to determine if a statistically significant difference exists across programmes on undergraduate health students' perceptions, attitudes to and awareness of plagiarism. It is evident from Table 7 that there was a statistically significant difference at the $p < 0.05$ level of significance on plagiarism awareness among the six programmes: $F(5, 690) = 5.850$, $p = 0.000$. Post hoc tests using Tukey's HSD indicate that statistically significant differences in plagiarism awareness exist between the following programmes, as may be seen in Table 8, below:

Table 8: Post hoc Tests on Plagiarism Awareness by Programmes

Programmes	p-value
Human Nutrition (M = 3.36, SD = 0.50) & Occupational Therapy (M = 3.00, SD = 0.53)	0.011
Human Nutrition (M = 3.36, SD = 0.50) & Physiotherapy (M = 3.02, SD = 0.55)	0.016
Medicine (M = 3.25, SD = 0.56) & Occupational Therapy (M = 3.00, SD = 0.53)	0.002
Medicine (M = 3.25, SD = 0.56) & Physiotherapy (M = 3.02, SD = 0.55)	0.002
Nursing (M = 3.23, SD = 0.52) & Occupational Therapy (M = 3.00, SD = 0.53)	0.045

Table 7 also indicates that there was a statistically significant difference at the $p < 0.05$ level of significance on plagiarism attitudes among the six programmes: $F(5, 690) = 4.340$, $p = 0.001$. Post hoc tests using Tukey's HSD indicate that statistically significant differences in plagiarism attitudes exist between the following programmes, as recorded in Table 9, below:

Table 9: Post hoc Tests on Plagiarism Attitudes by Programmes

Programmes	p-value
Human Nutrition (M = 1.73, SD = 0.44) & Physiotherapy (M = 2.09, SD = 0.47)	0.009
Medicine (M = 1.90, SD = 0.59) & Physiotherapy (M = 2.09, SD = 0.47)	0.024
Nursing (M = 1.83, SD = 0.53) & Physiotherapy (M = 2.09, SD = 0.47)	0.008

It is apparent from Table 7 that there was no statistically significant difference at the $p < 0.05$ level of significance on plagiarism perceptions among the six programmes: $F(5, 690) = 1.514$, $p = 0.183$.

Table 10, below, presents the results of one –way ANOVA on plagiarism awareness, attitudes and perceptions by level of study.

Table 10: One-way ANOVA Results on Plagiarism Awareness, Attitudes and Perceptions by Level of Study

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Plagiarism_ Awareness	Between Groups	1.940	2	.970	3.172	.043
	Within Groups	211.914	693	.306		
	Total	213.854	695			
Plagiarism_ Attitudes	Between Groups	2.858	2	1.429	4.802	.008
	Within Groups	206.259	693	.298		
	Total	209.117	695			
Plagiarism_ Perceptions	Between Groups	.064	2	.032	.293	.746
	Within Groups	75.389	693	.109		
	Total	75.452	695			

An ANOVA was also conducted to explore whether the said perceptions, attitudes and awareness of undergraduate health sciences students differ across levels of study. As may be seen from Table 10, there was a statistically significant difference at the $p < 0.05$ significance level on plagiarism awareness among the three levels of study: $F(2, 693) = 3.172$, $p = 0.043$. Post hoc tests using Tukey HSD indicate that statistically significant differences in plagiarism awareness exist between first year students ($M = 3.03$, $SD = 0.50$) and third year students ($M = 3.23$, $SD = 0.58$); $p = 0.046$. Table 10 also presents statistically significant differences at the $p < 0.05$ level of significance on plagiarism attitudes among the three levels of study: $F(2, 693) = 4.802$, $p = 0.008$. Post hoc tests using Tukey HSD indicate that statistically significant differences in plagiarism attitudes exist between first year students ($M = 2.06$, $SD = 0.57$) and third year students ($M = 1.86$, $SD = 0.58$); $p = 0.043$ as well. However, there was no statistically significant difference at the

$p < 0.05$ level of significance on plagiarism perceptions among the three levels of study: $F(2, 693) = 0.293$, $p = 0.746$.

Discussion of Data

The findings of this study supported previous studies (Ryan, Bonanno, Krass, Scouller & Smith 2009; Sentleng & King 2012) which found that the majority of undergraduate students were aware of plagiarism and their university's plagiarism policy. Ryan *et al.* (2009) also found that a significantly lower proportion of students had actually seen what was covered in the policy. This is further corroborated by Gullifer and Tyson's (2014) study which revealed that only half (50%) of students at Charles Sturt University (CSU) in Australia had read the CSU Academic misconduct policy. There was therefore no association between being aware of the existence of the plagiarism policy and actually reading it.

There were no notable differences between males and females about their awareness, perceptions and attitudes of plagiarism. This finding is corroborated by Yardley, Rodriguez, Bates and Nelson (2009) who found no statistically significant difference between undergraduate males and female students in terms of academic cheating. There were, however, significant differences across the six qualification groups. For example there were significant differences in plagiarism awareness between students studying Human Nutrition and Occupational Therapy, Medicine and Physiotherapy as well as Nursing and Occupational Therapy. Data also showed significant differences in plagiarism attitudes between students enrolled for Human Nutrition and Physiotherapy, Medicine and Physiotherapy, as well as Nursing and Physiotherapy.

Findings further revealed statistical differences in awareness and attitude across levels of study. For example, statistically significant differences in plagiarism awareness were found between first year students and third year students. There were also statistically significant differences in plagiarism attitudes observed between first year and third year students. These findings are supported by Ford and Hughes (2012) who also found statistical differences amongst students across different levels of study and study programmes in a school of dentistry. As mentioned earlier, TPB posits that one's intention to engage in a particular behaviour depends on one's attitude to that behaviour

(Finchilescu & Cooper 2018). Accordingly, the differences in attitudes concerning plagiarism amongst students in different study programmes and levels of study in the Faculty of Health Sciences at the University of Pretoria could be a warning sign indicating intentions among some students to plagiarise. As Fishbein and Ajzen (2010) caution, this intention may eventually lead to the actual execution of plagiarism behaviour by students.

These differences could be indicative of a potentially serious issue regarding academic integrity among health sciences students. The University may need to review and improve its mechanisms for creating awareness about plagiarism by providing clear guidelines and training to address the awareness and attitude differential across the different qualification groups in the faculty. This would ensure that students acquire enough research skill to avoid the need to plagiarise while pursuing their studies.

Conclusions and Recommendations

As discussed, overall, the students seem to be generally aware of the University's plagiarism policy and what it entails. It is, however, evident that there is still a fairly significant percentage of students whose responses suggest a lack of understanding and awareness of plagiarism. Notwithstanding that the students' perceptions of plagiarism were generally correct, there were a few misperceptions that are cause for concern. For example, more than a third of the students (39.1%) believed that substantially changing the words of an original source is sufficient to prevent plagiarism and just less than a third (31.4%) felt that merely using another person's ideas rather than their actual words cannot constitute plagiarism. The attitudes of the students towards plagiarism were mostly positive, although it was somewhat worrisome to note that almost half of the respondents (44.9%) indicated that it was unfair to punish students who commit plagiarism as many students do get away with plagiarism.

The results of plagiarism awareness, attitudes and perceptions by gender indicated that there is no statistically significant difference between males and females. Although there was no statistically significant difference regarding plagiarism perceptions among the six programmes, there were statistically significant differences found concerning plagiarism attitudes and awareness among the six programmes.

A one-way analysis of variance revealed a statistically significant difference on plagiarism awareness and attitudes amongst the three levels of study. There was, however, no statistically significant difference on plagiarism perceptions among the three levels of study.

While the students in the main showed awareness, had correct perceptions and positive attitudes regarding plagiarism, the statistically significant differences across the six groups and the three levels of study regarding plagiarism attitudes and awareness indicate possible discrepancies in the manner in which the University appraises its students of plagiarism.

The University therefore needs to bring about immediate improvements in plagiarism awareness so as to limit plagiarism and improve effectiveness in plagiarism policies and procedures developed and implemented. The current plagiarism awareness efforts at the University need to be enhanced to provide more clarity to the students from the time they begin their academic studies. As Gullifer and Tyson (2010) observe, students who did not plagiarise reported greater understanding of university policy than those who cheated. Specific recommendations that arise from the above conclusions to the benefit of the University and students, include the following:

- Plagiarism policies should be clearly written to ensure that students clearly understand how plagiarism is defined, its purpose, due process and specific consequences. For example, the definition of plagiarism may include statements which specify that paraphrasing without acknowledging the source or citing correctly without changing the wording and sentence structure of the original source may also be considered as plagiarism.
- The faculty should ensure that there is no discrepancy in the understanding and awareness of plagiarism among students in different qualification groups and levels of study by communicating clear and consistent messages on plagiarism across the entire faculty.
- Students should be encouraged to always attach a Turnitin report whenever they submit their assignments or research work. Training and access to Turnitin would be provided by the University's library services. As students become aware of how Turnitin works, the

knowledge that their assignments will always be reviewed by the software may make them less inclined to plagiarise.

- Students should be taught and given opportunities to practise academic writing and paraphrasing. For example, assignments designed to allow students to practice paraphrasing could be used by lecturers and tutors to teach students correct techniques of paraphrasing and academic writing, thereby improving students' understanding and knowledge of plagiarism. Further research on plagiarism should be conducted at health sciences faculties in other South African Universities. The research should even be expanded to include not only undergraduate but postgraduate students as well.

Although Turnitin can play a vital role in curbing the occurrence of plagiarism by detecting possible plagiarism or discouraging potential transgressions, it should not be the focal point in a campaign against plagiarism. Instead, higher education institutions should focus their efforts on educating students about what plagiarism entails and how it can be avoided (Ocholla & Ocholla 2016). Wiebe (2006) supports this view by adding that it is the role of librarians to be advocates of plagiarism awareness and educate students on why plagiarism is wrong and how it can be avoided. Ignorance and lack of education are antithetical to academic integrity and librarians, lecturers and other members of the university community, including those in marketing and communications, are able to play a pivotal role in educating students about information literacy. Plagiarism should be discussed more openly and regularly within higher education institutions (Singh & Remenyi 2016).

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