



Nursing Students Perceptions About the Quality of Teaching of a Pharmacist Pharmacologist and a Nurse Pharmacologist at the University for Development Studies

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Abstract: Background: Since the quality of Pharmacological knowledge of nursing students depend on the expertise of the Pharmacology instructors, they must possess an in-depth knowledge of Pharmacology and excellent teaching skill in order to teach effectively. Our study was designed to assess and compare the quality of teaching pharmacology between a Pharmacist Pharmacologist and the Nurse Pharmacologist. Materials and methods: The study was conducted using a comparative, cross-sectional design. A questionnaire was administered to 95 nursing students who were asked to assess the teaching performance of a nurse Pharmacologist and a Pharmacist Pharmacologist based on 4 pre-defined performance indicators. Data was processed using Excel 2010 Version. Results. 80 (84.22%) of the study population had interest in Pharmacology while 15 (15.78%) were not interested. 68 (71.57%) of the nursing students preferred the Nurse Pharmacologist and 27 (28.43%) preferred the Pharmacist Pharmacologist. Conclusions: The Nurse Pharmacologist was a more competent Lecturer than the Pharmacist Pharmacologist from the nursing student's perspective. The Nursing students preferred being taught Pharmacology by the Nurse Pharmacologist rather than the Pharmacist Pharmacologist.

Keywords: Performance, Nurse Pharmacologist, Pharmacist Pharmacologist, Nursing Pharmacology

1. Introduction

The Nursing profession is a healthcare related profession which main focus is on providing bedside direct patient care through clinical assessment and medication administration and management. Nurses are important members of a multidisciplinary healthcare team who perform a vital role in the patient care process and are very actively involved in the Pharmacological management of patients. Therefore, nurses must possess adequate knowledge and competencies regarding the Pharmacological in order to deliver safe and effective drug therapies to all patients [1] This core mandate of practicing nurses makes it academically prudent to ensure that all nursing students receive adequate knowledge and skills in both basic and clinical Pharmacology during their

training. Pharmacology is a branch of the Pharmaceutical sciences that is concerned with the study of drugs and how they interact with living systems through biochemical processes [2]. Several studies conducted to determine the interest, depth of knowledge, skills and quality of teaching nursing Pharmacology, have demonstrated that graduating Nurses are very limited in their knowledge of the basic principles of Pharmacology [3-15]. Learning Nursing Pharmacology involves more than memorizing concepts, it requires a thorough understanding of mechanisms of actions, side effects and nursing considerations regarding medication administration [3]. A Nursing Pharmacology course must therefore be designed in such a manner that nursing students can understand the Pharmacodynamics and Pharmacokinetics of medications and develop the necessary knowledge and skills to administer medications safely and effectively to

patients with a variety of health conditions [4] Because the Pharmacological knowledge and skills of the nursing students depend greatly on the ability of the Pharmacology instructor to teach effectively, Nursing Pharmacology instructors must also possess the necessary academic and Professional qualifications, in depth knowledge about the principles of Pharmacology and excellent teaching skills; and must implement innovative strategies to promote student learning, achievement of learning objectives and lifelong learning principles [5] The School of Allied Health Sciences (SAHS) offers a four (4) year Nursing program leading to the degree of Bachelor of Nursing Sciences. For the past ten (10) years, Pharmacology courses for the nursing program at SAHS were taught by a Pharmacist with a Doctor of Philosophy (Ph. D.) in Clinical Pharmacology. During the 2018/2019 academic year, management at SAHS made a decision to replace the Pharmacist Pharmacologist with a Nurse Pharmacologist with a Master degree in Pharmacology due to interdepartmental disagreements. So far, to the best knowledge of the authors, the performances of Pharmacology instructors at the School of Allied Health Sciences (SAHS) of the University for Development Studies (UDS) have not been studied. This study was designed to assess and compare the performances of the Pharmacist Pharmacologist and the Nurse Pharmacologist in teaching nursing Pharmacology, and the Nursing student's preference for a Pharmacology Lecturer based on pre-defined Quality of teaching indicators.

2. Inclusion Criteria and Exclusion Criteria

Only Nursing students from level 200 were included in the study. Nursing students from Levels 100 and 400 were excluded from the study because Pharmacology lessons are not taught at these levels of the nursing program at the School of Allied Health Science of the University for Development studies. Students from Level 300 were also excluded because they were only taught by the nurse Pharmacologist and not the

Pharmacist Pharmacologist so could not fairly assess the performance of the Pharmacist Pharmacologist.

3. Materials and Methods

The study was conducted using a cross-sectional, comparative, descriptive and mixed qualitative and quantitative study design. A total of ninety-five (95) level 200 nursing students who had the opportunity to be taught Pharmacology by a Pharmacist Pharmacologist during the first trimester and by a nurse Pharmacologist during the second trimester of the 2018/2019 academic year were sampled purposively to participate in the study. All study participants gave their written informed consent to participate in the study and were assured of the highest confidentiality of their responses. A research assistant from the School of education was co-opted to administer the questionnaire. A structured questionnaire was designed for the nursing students to assess performances of the Pharmacist Pharmacologist and the nurse Pharmacologist based on four (4) pre-defined performance criteria namely: Content knowledge competence, Content deliver competence, Quality of assessments and examinations questions and professionalism. For each quality indicator, students were asked to assign a grade of excellent, very good, good, fair or poor based on their perceptions about the quality of Pharmacology lessons impacted by the Pharmacist Pharmacologist and the Nurse Pharmacologist. Data analysis was performed using the SPSS Version 24.0.

4. Results

Gender and Age distribution

47 (49.47%) of the sampled nursing student's population were female and 48 (50.53%) were male. 53 (55.78%), were between the ages of 18 - 25 years; 36 (37.89%) were between the ages of 26 - 32 years and 6 (6.31%) were older than 32 years (Table 1 / Figure 1).

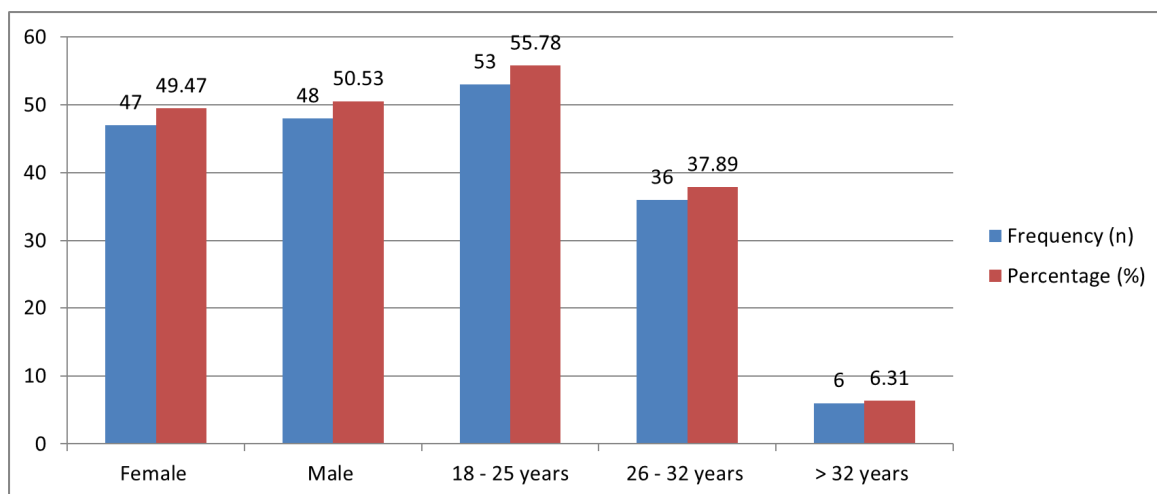


Figure 1. Gender and age distribution.

Table 1. Gender and Age distribution.

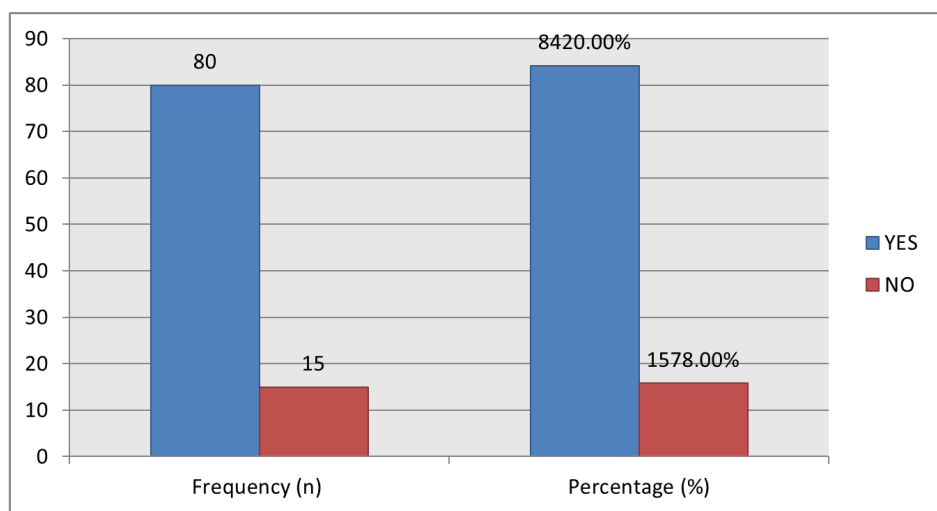
Characteristics	Frequency (n)	Percentage (%)
Female	47	49.47
Male	48	50.53
18 - 25 years	53	55.78
26 - 32 years	36	37.89
> 32 years	6	6.31

Nursing Students interest in Pharmacology (General Population)

80 (84.22%) of the sampled nursing student population have interest in Pharmacology while 15 (15.78%) are not interested (Table 2 / Figure 2).

Table 2. Nursing Students interest in Pharmacology (General Population).

Parameter	Frequency (n)	Percentage (%)
YES	80	84.21%
NO	15	15.78%

**Figure 2.** Nursing Students interest in Pharmacology (General Population).

Nursing Students interest in Pharmacology (Gender basis)

42 (44.21%) of male nursing students have interest in Pharmacology while 6 (6.31%) are not interested in the subject of Pharmacology. 38 (40%) of female nursing students have interest in Pharmacology while 9 (9.47%) are not interested at all (Table 3 / Figure 3).

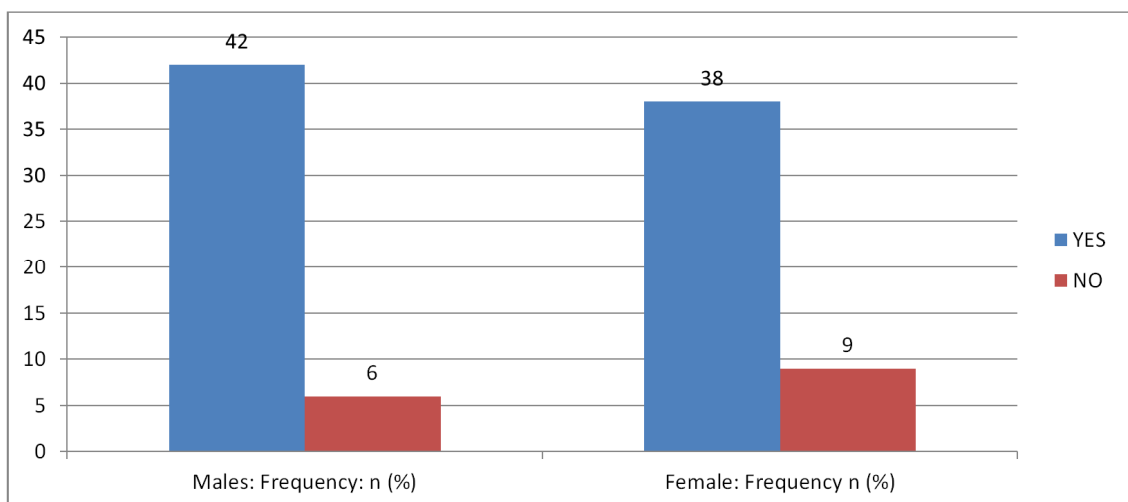
**Figure 3.** Nursing Students interest in Pharmacology (Gender basis).

Table 3. Nursing Students interest in Pharmacology (Gender basis).

Parameter	Males: Frequency: n (%)	Female: Frequency n (%)
YES	42 (44.21)	38 (40)
NO	6 (6.31)	9 (9.47)

Content competence (The Pharmacist Pharmacologist's depth of knowledge about Pharmacology)

16 (16.84%), Excellent; 34 (35.78%), very good; 37 (38.94%), good; 5 (5.26%), Fair and 3 (3.15%), Poor. (Table 4/Figure 4).

Table 4. Content competence (The Pharmacist Pharmacologist's Depth of knowledge about Pharmacology).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	16	16.84
Very Good	34	35.78
Good	37	38.94
Fair	5	5.26
Poor	3	3.15

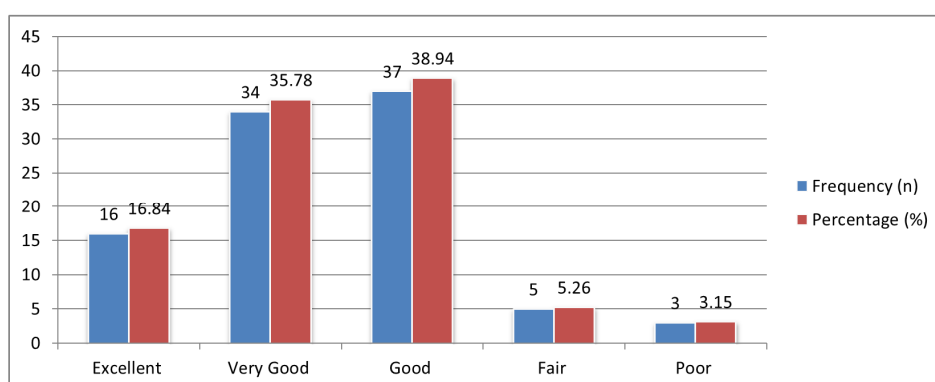


Figure 4. Content competence (The Pharmacist Pharmacologist's Depth of knowledge about Pharmacology).

Content delivery competence (The way the Pharmacist Pharmacologist explains basic concepts to Nursing students)

14 (14.73%), excellent; 25 (26.31%), very good; 44 (46.31%), good; 9 (9.47%), Fair; 3 (3.15%), Poor. (Table 5/Figure 5).

Table 5. Content delivery competence (The way Pharmacist Pharmacologist explains basic concepts to Nursing students).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	14	14.73
Very good	25	26.31
Good	44	46.31
Fair	9	9.47
Poor	3	3.15

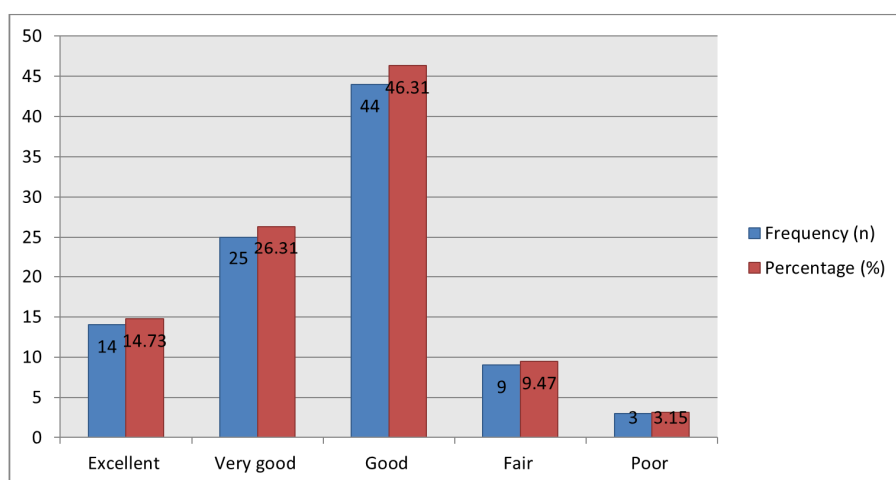


Figure 5. Content delivery competence (The way Pharmacist Pharmacologist explains basic concepts to Nursing students).

Quality of examinations modalities (Format and Clarity of examination questions set by the Pharmacist Pharmacologist)
7 (7.36%), excellent; 20 (21.05%), very good; 35 (36.84%), good; 11 (11.57%), Fair; 22 (23.15%), Poor. (Tablet 6/Figure 6).

Table 6. Quality of Examinations modalities (Format and Clarity of examination questions set by the Pharmacist Pharmacologist).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	7	7.36
Very good	20	21.05
Good	35	36.84
Fair	11	11.57
Poor	22	23.15



Figure 6. Quality of Examinations modalities (Format and Clarity of examination questions set by the Pharmacist Pharmacologist).

Professionalism of the Pharmacist Pharmacologist (Attitudes of Pharmacist Pharmacologist towards Nursing Students)
18 (18.94%), excellent; 31 (32.63%), Very good; 34 (35.78%), Good; 12 (12.63%), Fair; 0 (0%), Poor. (Table 7/Figure 7).

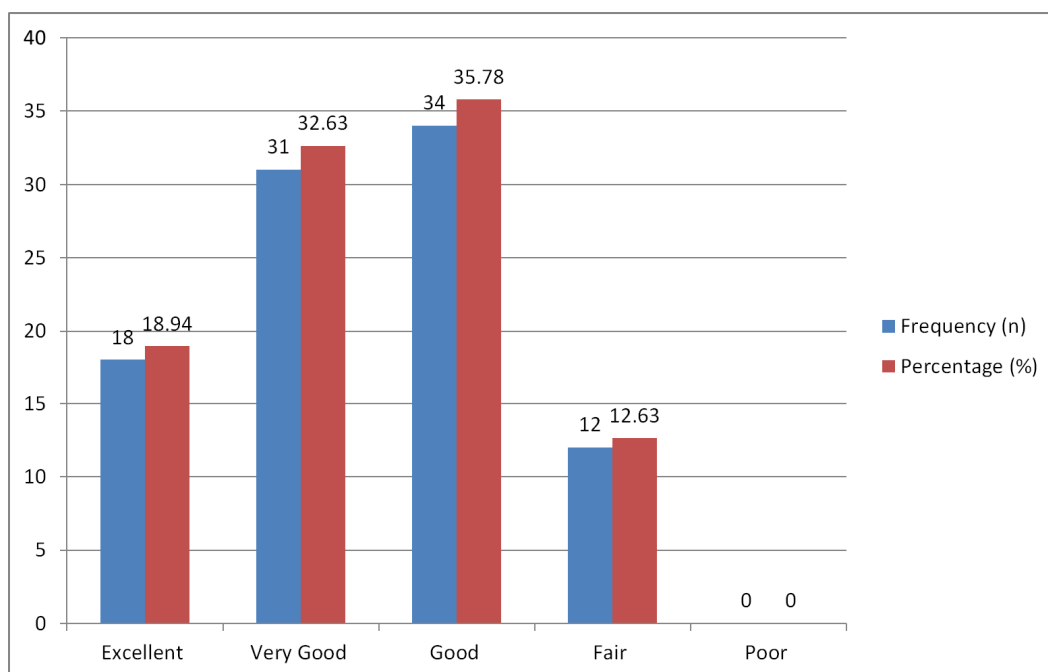


Figure 7. Professionalism of the Pharmacist Pharmacologist (Attitudes of Pharmacist Pharmacologist towards Nursing Students).

Table 7. Professionalism of the Pharmacist Pharmacologist (Attitudes of Pharmacist Pharmacologist towards Nursing Students).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	18	18.94
Very Good	31	32.63
Good	34	35.78
Fair	12	12.63
Poor	0	0

Content competence (The Nurse Pharmacologist's depth of knowledge about Pharmacology)
30 (31.57%), excellent; 39 (40.05%), very good; 19 (20.00%), good; 7 (7.36%), Fair; 0 (0%), Poor (Table 8/Figure 8).

Table 8. Content competence (The Nurse Pharmacologist's depth of knowledge about Pharmacology).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	30	31.57
Very Good	39	40.05
Good	19	20.00
Fair	7	7.36
Poor	0	0

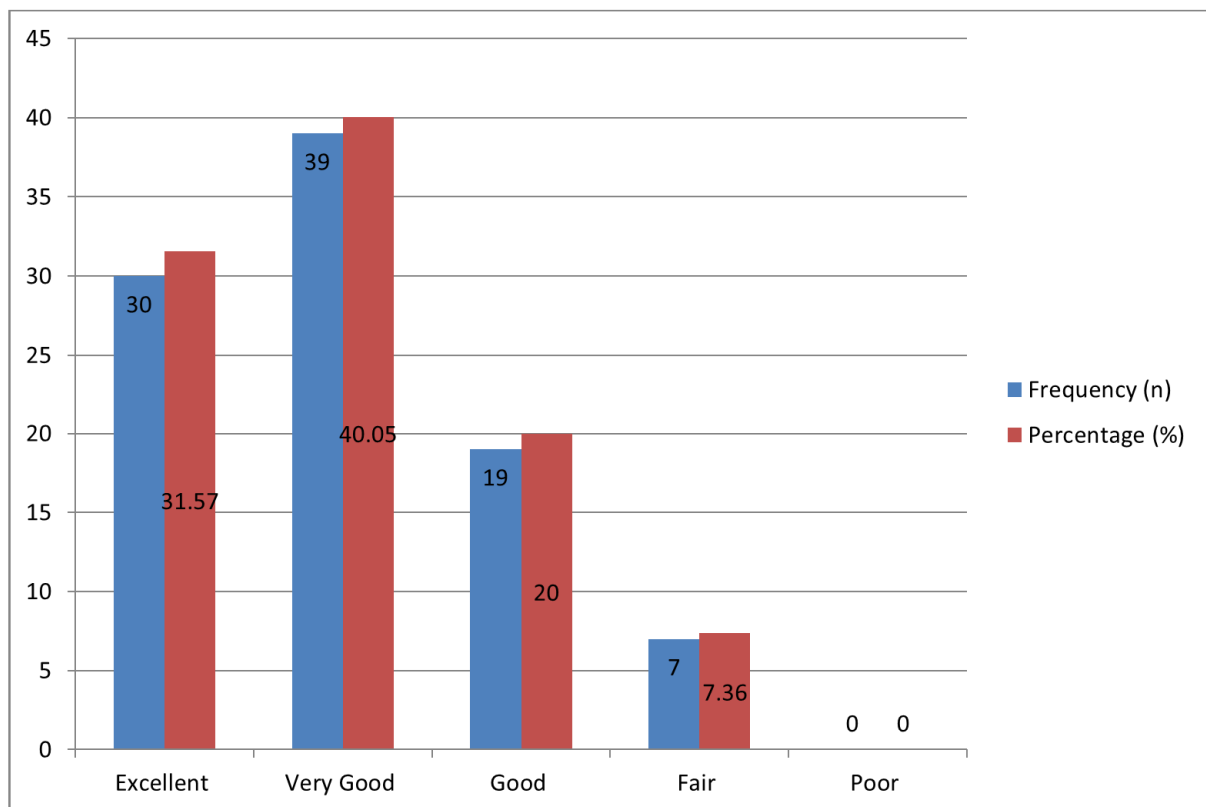


Figure 8. Content competence (The Nurse Pharmacologist's depth of knowledge about Pharmacology).

Content delivery competence (The way the Nurse Pharmacologist explains basic concepts to nursing students)
26 (27.36%), excellent; 31 (32.63%), very good; 21 (22.10%), good; 14 (14.73%), Fair, 3 (3.15%), Poor. (Table 9/Figure 9).

Table 9. Content delivery competence (The way the Nurse Pharmacologist explains basic concepts to nursing students).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	26	27.36
Very good	31	32.63
Good	21	22.10
Fair	14	14.73
Poor	3	3.15

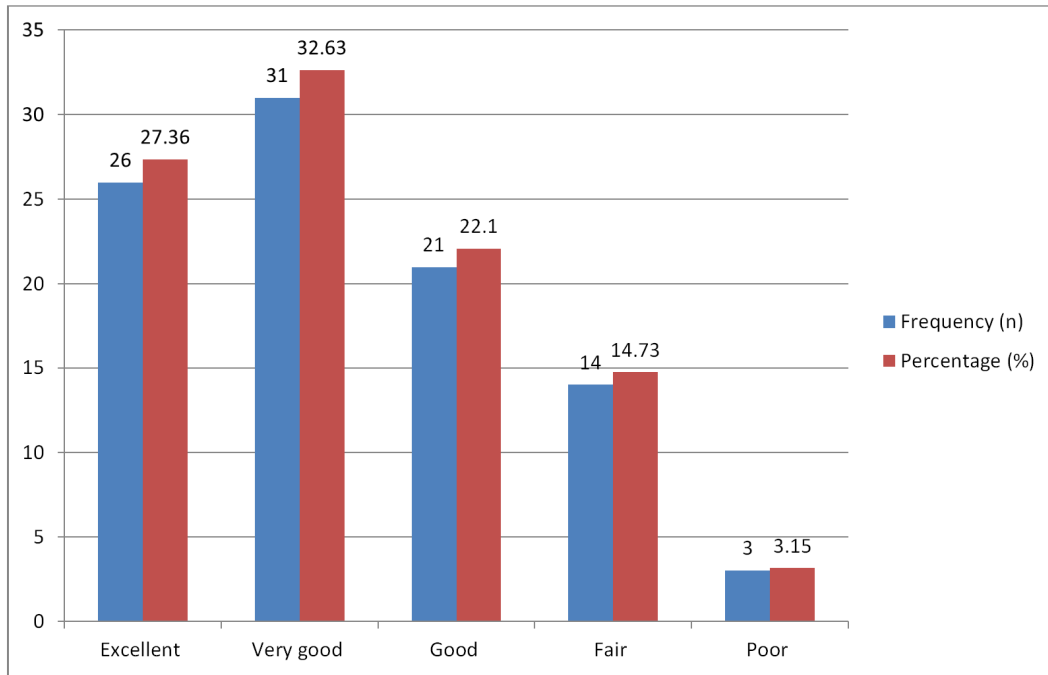


Figure 9. Content delivery competence (The way the Nurse Pharmacologist explains basic concepts to nursing students).

Examinations modalities (Format and Clarity of examinations questions set by the Nurse Pharmacologist)

10 (10.52%), excellent; 28 (29.47%), very good; 23 (24.21%), Good; 23 (24.21%), Fair; 11 (11.57%), Poor (Table 10/Figure 10).

Table 10. Examinations modalities (Format and clarity of examination questions set by the Nurse Pharmacologist).

Quality Grade	Frequency (n)	Percentage (%)
Excellent	10	10.52
Very good	28	29.47
Good	23	24.21
Fair	23	24.21
Poor	11	11.57

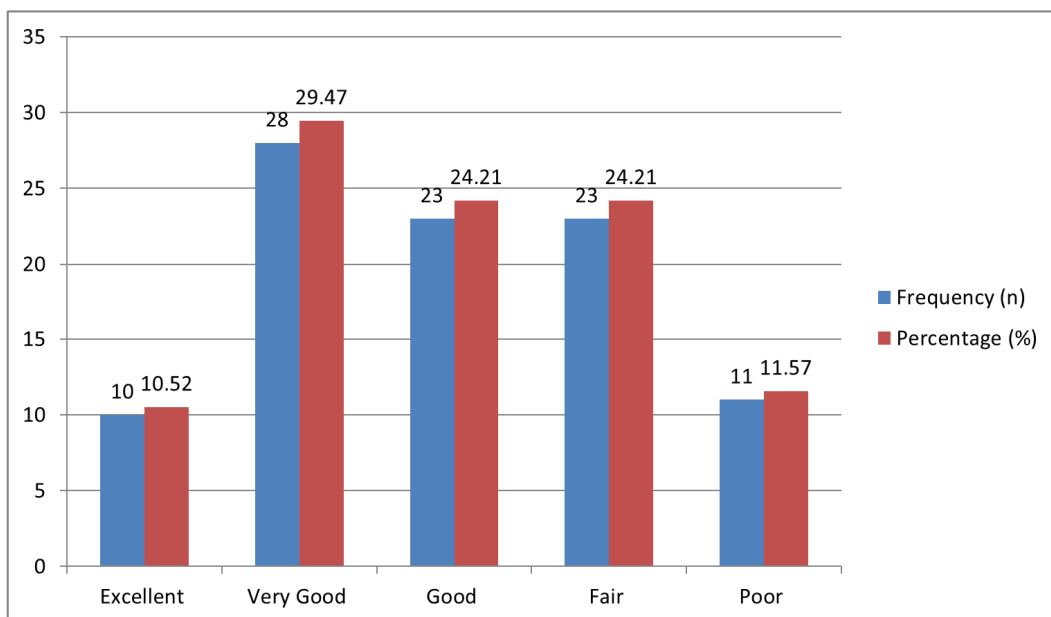


Figure 10. Examinations modalities (Format and clarity of examination questions set by the Nurse Pharmacologist).

Professionalism of the Nurse Pharmacologist (Attitude of the Nurse Pharmacologist towards nursing students)

23 (24.21%), excellent; 39 (41.05%), very good; 28 (29.47%), good; 4 (4.21%), Fair; 1 (1.05%), Poor (Table 11/Figure 11).

Table 11. Professionalism of Nurse Pharmacologist (Attitude of Nurse Pharmacologist towards Nursing Student).

Quality Grade	Frequency	Percentage
Excellent	23	24.21
Very Good	39	41.05
Good	28	29.47
Fair	4	4.21
Poor	1	1.05

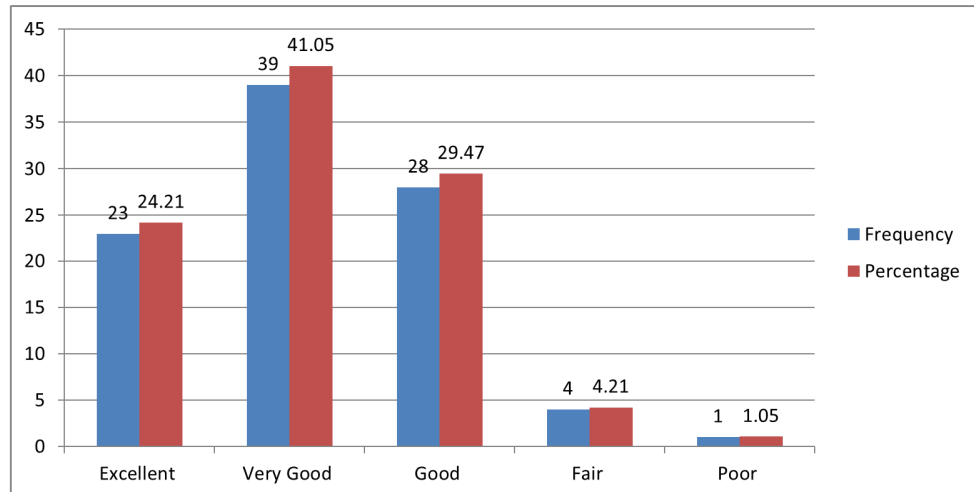


Figure 11. Professionalism of Nurse Pharmacologist (Attitude of Nurse Pharmacologist towards Nursing Student).

Nursing students preferred Pharmacology Lecturer based on the quality of teaching 27 (28.42%), Pharmacist Pharmacologist; 68 (71.57%), Nurse Pharmacologist (Table 12/Figure 12).

Table 12. Nursing Students Preferred Pharmacology Lecturer based on the quality of Teaching.

Type of Instructor	Frequency (n)	Percentage (%)
Pharmacist Pharmacologist	27	28.42
Nurse Pharmacologist	68	71.57

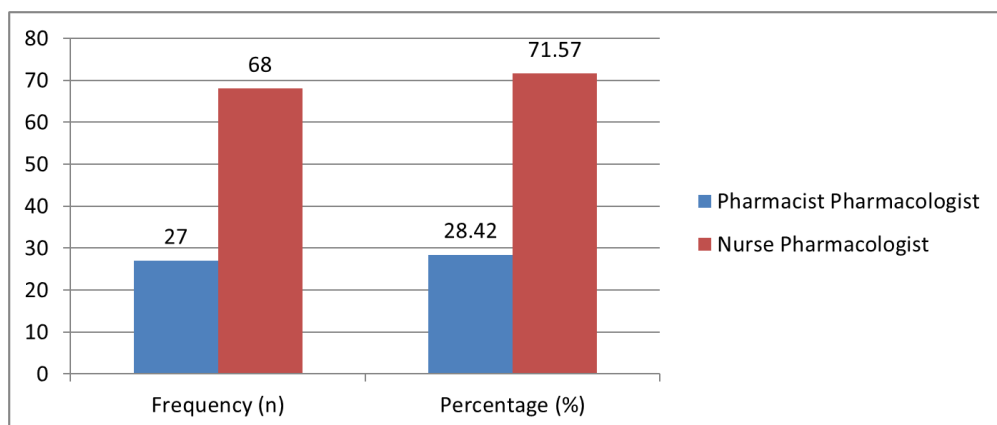


Figure 12. Nursing Students Preferred Pharmacology Lecturer based on the quality of Teaching.

5. Discussions

There was a fairly equitable gender distribution among the level 200 nursing students of the SAHS-UDS (49.73% Males versus 50.53% Females) (Table 1). This results clearly points to the fact that, the nursing profession at the SAHS-UDS can

no longer be considered a predominantly female Profession. The majority of the nursing students (84.22%) were interested in the subject of Pharmacology with more male students (44.21%) having interest versus (40%) female students expressing interest (table 2) (table 3). The 9.47% of the students who were not interested in Pharmacology attributed their lack of interest to the fact that, the

Pharmacology Lecturers employed too many technical Pharmacological Jargons that were difficult to understand. Although the Pharmacist Pharmacologist is considered as an expert in Pharmacology by his peers and possess more teaching experience Ten (10) years versus three (3) years of teaching experience for the Nurse Pharmacologist; the nursing students prefer the Nurse Pharmacologist teaching them Pharmacology than the Pharmacist Pharmacologist (71.57% for the Nurse Pharmacologist Versus 28.43% for the Pharmacist Pharmacologist) (Table 6). The two main reasons for their preference were that the Nurse Pharmacologist takes his time to explain the basic Pharmacological concepts and has the ability to relate them very deeply to the principles of bedside nursing care practice.

6. Study Limitations

The key limitation of this study was that, the authors could not design a strategy to monitor the performances of the nurses in the area of Pharmacological management of patients after graduating from school. Further research is required to investigate if there is any relationship between the quality of Pharmacological knowledge received by nursing students during training and the ability of the nurse practitioner to apply knowledge of the basic principles of Pharmacology to the daily nursing care process.

7. Conclusions

The results from this study clearly and emphatically demonstrates that; majority of the general nursing student population are interested in Pharmacology, with more males expressing interest than females. The Nurse Pharmacologist is more knowledgeable and delivers lessons more competently than the Pharmacist Pharmacologist. Ironically, the Pharmacist Pharmacologist exhibits a better professional attitude towards the nursing students than the Nurse Pharmacologist. Overall, the majority of the nursing students prefer the Nurse Pharmacologist because he is a better teacher than the Pharmacist Pharmacologist.

8. Study Implications

The findings from this study strongly implies, it is most likely that nursing students may attribute their poor performance in Pharmacology examinations or during practical field work to the inability of the Pharmacist Pharmacologist to effectively teach the subject matter.

Recommendations

- 1) Since there is currently only one (1) nurse Pharmacologist with postgraduate training, management at the SAHS should consider the possibility of establishing a fully sponsored scholarship scheme that will reward deserving Nurse educators who are interested in pursuing post graduate training in the field

of Pharmacology. This initiative will augment the teaching capacity in the area of Nursing Pharmacology.

- 2) The Department of Pharmacy of the School of Medicine and Health Science (SMHS) should reconsider their Pharmacology teaching arrangements and commitments with the SAHS. It will be very prudent in this case for them to re-focus their efforts on teaching Pharmacology for the Doctor of Pharmacy (Pharm. D.) students since this category of students are most likely to benefit from their Pharmacology teaching efforts than the nursing students.

Data availability Statement

The processed mixed qualitative/quantitative data that supports the findings and conclusions of this study are included in this manuscript. The said data is also available in the supplementary information file which was submitted together with this manuscript.

Declaration of the Source of Funding for This Research

The activities of this research were conducted using monies from the annual Book and research allowances allocated by the Government of the republic of Ghana to every lecturer within the public Universities.

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