ASSESSMENT OF QUALITY OF COUNSELLING GIVEN BY DISPENSERS IN THE CO-ADMINISTRATION OF ENTERIC-COATED DRUGS (MEDICATIONS) AND ANTACIDS

By

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DECLARATION

I hereby declare that this submission is my own work towards the Master of Science (MSc) in Clinical Pharmacy and that, to the best of my knowledge; it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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Signature Date

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DR. (MRS) FRANCES OWUSU-DAAKU …… …….

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(HEAD OF DEPARTMENT) Signature Date

ABSTRACT

Patient counselling forms part of the quality pharmaceutical service provision in any health care delivery system. This leads to an improvement of patients' outcome, a reduction in development of complications and adverse drug reactions.

The quality of counselling given by dispensers when dispensing enteric-coated medicines together with antacids to be used by a patient concurrently needs to be assessed since the oral administration of the two medicines at the same time would result in the premature dissolution of the enteric coating of the coated tablets leading to the absorption of the drug in the stomach, instead of the duodenum, and the patient not having the full benefit of treatment.

A descriptive cross-sectional study was carried out in ten randomly selected public hospitals in the Volta Region of Ghana within a 2-week period in May to June 2009. A total of sixty-six dispensers, who have been practising for more than 3 months, were interviewed with a questionnaire. The data collected was processed and analyzed by the use of Microsoft excel.

Of the sixty-six respondents, 21.2% were pharmacists, 36.4% and 42.4% were dispensing technicians/technologists and dispensing assistants/attendants respectively. The study showed that there was much awareness among dispensers not to administer antacids and enteric-coated medicines concurrently but the actual time interval in the administration of both oral medicines was not well known

The result obtained in this study suggests that the about half (42.4%) of the dispensers working in the public hospitals in the Volta Region had no formal training in pharmaceutical service provision and this might have affected the quality of counselling given by this category of dispensers to their clients. There is the need to improve the competence of the pharmacy staff and to augment the number of staff by training, recruiting and employing people with formal training in pharmaceutical service provision by the Ministry of Health and the Ghana Health Service in order to improve upon the quality pharmaceutical service provision to the clients.

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I am especially grateful to my colleague pharmacists for their support, words of encouragement and critical comments and suggestions which have helped in the realization of this research work.

I wish to put on record my heartfelt appreciations to my daughter, my wife and my family for their support during my course of study.

Finally my profound thanks go to all who have contributed in diverse ways to the success of this research work especially Miss Perfect Dogbey and Miss Albertina Attipoe of District Hospital, Sogakope for typing some of the scripts.

God bless you all.

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LIST OF ABBREVIATIONS

CEP	-	Continuous Education Programme
DAAs	-	Dispensing Assistants/Attendants
DTTs	-	Dispensing Technicians/Technologists
EC MED	-	Enteric Coated Medicine
GHOSPA	-	Government & Hospital Pharmacists' Association
HCl	-	Hydrochloric Acid
HRD	-	Human Resource Department
MoH	-	Ministry of Health
OPD	-	Out Patient's Department
PSGH	-	Pharmaceutical Society of Ghana

DEDICATION

This research work is dedicated to my family especially my daughter (Etornam Laura Korbuvi) and my wife (Mrs Bubune Korbuvi), whose supportive prayers have sustained and brought me this far.

CHAPTER ONE

1 INTRODUCTION

1.1 Background Information

Patient counselling has become an integral and a vital component of pharmaceutical service delivery. Counselling often involves the giving of advice and making certain that the advice is understood after listening to the patient's doubts, problems or viewpoints. A better understanding by the patient of their medicines received at the pharmacies is critical to their health recovery. Therefore, in pharmaceutical service delivery, adequate advice and counselling during dispensing of pharmaceutical products can encourage patient compliance, thereby leading to improved therapeutic efficacy and the patient's well-being.

Wrongful administration of medicines may not be beneficial to the patient. Dispensers are to be knowledgeable in their field of practice, so as to counsel the patient very well to their (patients') understanding. Hence, the dispenser should be able to analyze a prescription during the dispensing process and counsel accordingly in order to minimize drug interactions, side effects, etc. for the benefit of the patient.

Drug interaction may occur at any level of drug administration. Drugs that change the normal pH of the stomach can affect the absorption characteristics of other drugs[1]. If the gastric pH is increased, an enteric-coated product may dissolve in the stomach rather than in the intestinal tract, changing its absorption characteristics[1]. To avoid drug interaction, enteric-coated medicines (eg aspirin) should not be given concurrently with antacids, since an increase in the pH of the stomach may affect the enteric coating of the tablets[2].

1.2 Enteric Coated Medicines

Pharmaceutical products come in different dosage forms. Tablets are solid dosage forms manufactured for oral use except a few that are administered otherwise. Tablet coating as a pharmaceutical unit process has origins which can be traced to the time of the ancient Egyptians[3].

There are three (3) types of tablet coating commonly used, namely:

a. Sugar coating
b. Film coating
c. Press coating (compression coating)[3].

The major reasons for tablet coating (sugar, film and press) can be summarized as follows[3]:

a. Protection of ingredients from the environment particularly light and moisture.
b. Masking of bitter or unpleasant taste.
c. Tablet coating makes it somewhat easier to swallow than uncoated ones.
d. Improvement in patient compliance with dosage schemes.
e. Coloured coatings aid in the rapid identification of product by the manufacturer, dispensing pharmacist and patient.
f. Functional film coatings are used to impart enteric or controlled released properties to the coated tablet. Enteric coating is an example of functional film coating.

Enteric coating is used to protect the tablet core from disintegration in the acid environment of the stomach. This technique is used for one or more of the following reasons:

a. To facilitate absorption of a drug preferentially absorbed in the duodenum or in the intestines.

b. Prevention of acid attack on active constituents which may be unstable at low pH of the stomach.

c. Protection of the stomach from the irritant effect of certain drugs.

This implies that polymers that are used for the enteric-coating must exhibit a differential pH solubility profile.

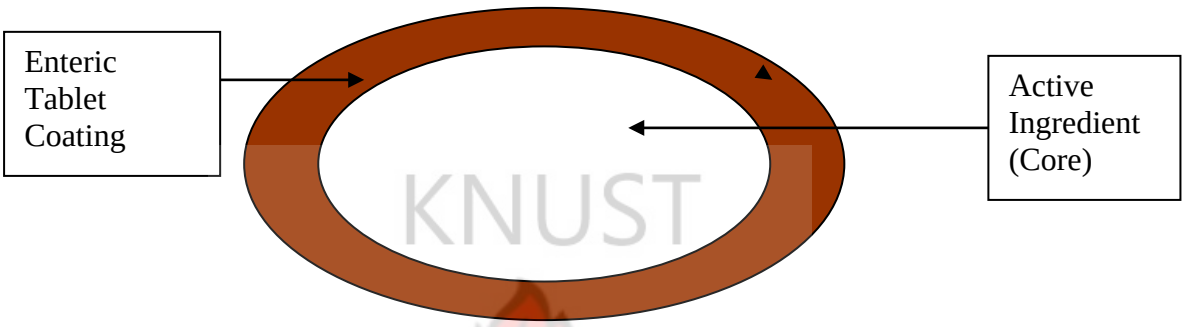


Figure 1.1 shows enteric-coated tablet

The following polymers are among those commonly used for the purpose of enteric coating:

a. **Cellulose acetate phthalate**: It is cellulose in which some of the hydroxyl groups are acetylated (21.5 to 26.0%) and some are esterified by hydrogen phthaloyl groups (30.0 to 36.0%).

   Cellulose acetate phthalate is unaffected by immersion in acidic media in the stomach but softens and swells in the intestinal fluid. Therefore it is used in pharmaceutical manufacturing as an enteric-coating material for tablets and capsules[4].

b. **Polyvinyl acetate phthalate**: It is a reaction product of phthalic anhydride and partially hydrolyzed polyvinyl acetate, containing 55 to 62% of phthalyl

groups. It is a viscosity modifying agent which is used in the manufacture of enteric coating for tablets[5].

c. **Acrylates** $(-CH_2-\underset{|}{CH}-COOH)_n$

{Chemical structure of the polymers}

These polymers possess free carboxylic acid groups on the polymer backbone, hence exhibiting a differential pH solubility profile. That is they are almost insoluble in aqueous media at low pH but as the pH rises they experience a sharp, well defined increase in solubility at a specific pH. At pH 5.2, the solubility increases for cellulose acetate phthalate.

The British Pharmacopoeia disintegration test for enteric-coated tablets directs that six (6) tablets should withstand 2 hours in 0.1M hydrochloric acid without disintegration but on replacing the fluid with pH 6.8 phosphate buffer all six should disintegrate within 1 hour[6].

This implies that as the enteric-coated medicines are administered and get into the stomach, the enteric coating of the medicine should not dissolve (fig. 1.2) but when the pH increases the solubility of the polymer used for the enteric coating also increases leading to the release of the active substance (drug) into the gastro-intestinal tract.

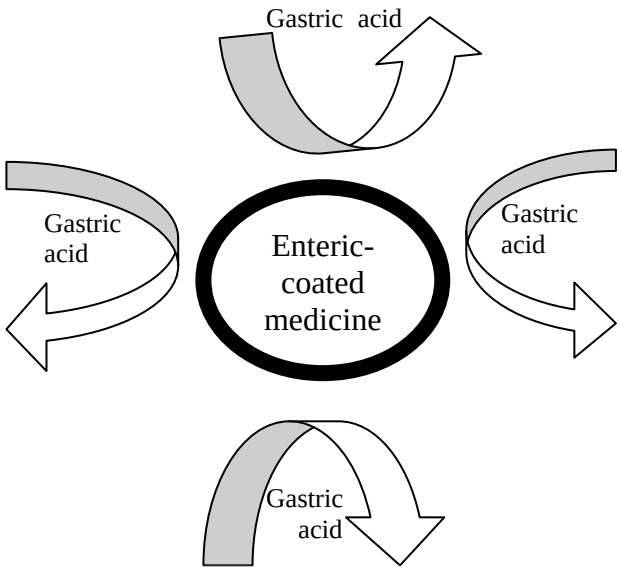


Figure 1.2 Enteric-coated medicine in the stomach in the presence of the gastric acid

1.3 Antacids

Antacids are basic compounds which neutralize hydrochloric acid in the gastric secretions and are used in the symptomatic management of gastro-intestinal disorders associated with gastric hyperacidity such as dyspepsia, gastro-oesophageal reflux disease and peptic ulcer disease[7].

Antacids are normally given between meals and at bedtime when symptoms would usually occur. They may interact with numerous other drugs, affecting the rate and extent of their absorption and in some cases their renal elimination. Changes in gastric pH affect the dissolution of other drugs and together with altered gastric emptying can markedly influence absorption[7].

Because antacids alter gastric pH and affect absorption of ingested substances, they have a high potential for drug interaction leading to destruction of the coating of enteric-coated medicines, and premature drug dissolution of the enteric-coated medicines in the stomach. In view of this, interactions can be minimized by administering antacids and other medications 2 to 3 hours apart[7].

Stomach or ulcer medications that work by lowering the amount of stomach acid (eg. antacids) should not be taken with enteric coated medicines (eg. enteric-coated Naprosyn) because they may break down the enteric coating and cause the medication to be released too quickly[8].

In clinical practice antacids are prescribed and dispensed with enteric-coated drugs for the same patient to use for different indications. However, enteric-coated medicines are supposed to remain intact in the stomach having acidic medium and to yield their content only in the small intestines which have a basic medium; therefore co-administration of enteric-coated drugs and antacids calls for an adequate counselling of clients in order to achieve maximum therapeutic effect of both drugs when these medicines are supposed to be used by the same client. Consequently, there is the need to give adequate counselling to avoid premature disintegration and dissolution of the enteric-coated medicines in the stomach.

Quality of pharmacotherapy is highly dependent on the process of choosing a drug in relation to the nature of the disease. In the process of choosing the best medicine for the patient, factors like route of administration, dosage, contraindications, drug interactions, potential for adverse drug reactions and costs play an important role.

Most medicines are orally administered for absorption through the mucous membrane of the gastrointestinal tract. An alteration in gastric pH due to the presence of antacids has the potential to affect the absorption of other drugs. Most of the interactions which occur in the gut results in reduced or delayed absorption of administered medicines.

The alkalinizing effects of antacids are short-lived and the potential for interaction may be minimized by leaving an interval of at least 2 hours between the antacid and the potentially interacting drug.[12]

Enteric coated tablets are tablets covered with one or more layers of coatings intended to resist the gastric fluid but permit disintegration in the intestinal fluid.[13] Thus, enteric coatings dissolve in an alkaline pH. Oral administration of antacids with enteric coated medicines such as enteric-coated aspirin, erythromycin, bisacodyl or diclofenac results in gastric irritation due to the premature dissolution of the enteric coating in an alkaline pH.

Neafsey et al[14] revealed in their study that older adults who used antacids or calcium supplements took them at the same time or within an hour of their other medicines and these resulted in premature dissolution of the enteric coated medicines (eg. enteric coated low dose aspirin) or delayed in absorption of the other drugs.

Singh et al[15] in their study also revealed that antacids reduce the absorption of medicines such as levothyrozine, digoxin, phenytoin and ciprofloxacin and nutrients such as iron, zinc, vitamin B_{12} and thiamine and treatment outcome is significantly affected.

Therefore clients should be counseled to take antacids at least 2 – 3 hrs apart from other medicines and nutrients.

Enteric coated medicines are to withstand the gastric acid in the stomach for at least 2 hours as specified in British Pharmacopoeia 1988 Vol. II Appendix XII. Thus, the disintegration test determines whether tablets or capsules disintegrate within a prescribed time when placed in a liquid medium under the prescribed experimental condition.

Testing for disintegration of enteric coated medicines the British Pharmacopoeia 1988 Vol. II Appendix XII states that when one tablet is introduced into each of the 6 tubes and assembly suspended in the beaker containing 0.1M hydrochloric acid for 120 minutes unless otherwise stated in the individual

monograph , no tablet should show signs of cracks that would allow the escape of the content or disintegration apart from fragments of coating. However, when the liquid in the beaker (i.e. 0.1M hydrochloric acid) is replaced with mixed phosphate buffer pH 6.8, all the six tablets have to disintegrate.

This implies that an increase in pH in the stomach leads to premature disintegration of the tablets instead of the intestines where the enteric-coated medicine is supposed to normally disintegrate and be absorbed into systemic circulation.

Enteric coated medicines are to be administered whole. Some of the enteric coated formulations come as enteric coated pellets which are encased in capsules and where patients' co-morbidity condition cannot allow him/her to swallow the capsules directly, alternative means are to be used so that the enteric coating does not prematurely dissolve in the stomach.

Zimmermann et al[16] reviewed alternative method of proton – pump inhibitor administration which are enteric coated. Their objective was to summarize reported methods of administration of enteric-coated proton pump inhibitors and to describe resulting clinical outcomes in patients who cannot swallow intact capsules or who have nasogastric, duodenal, or feeding tubes in place or critically ill patients, geriatric patients and pediatric patients.

Zimmermann et al identified four main methods of administering proton pump inhibitors (PPI) to patients with swallowing obstacles in their study:

(1) simple flushing of the intact granules with water;

(2) preparation of a sodium bicarbonate-based suspension which allows the granules to dissolve;

(3) administration of the intact granules in acidic fruit juices, or

(4) sprinkling intact granules on applesauce and yogurt.

Although omeprazole and lansoprazole are enteric coated medication, Zimmermann et al came to a conclusion that all four methods of proton pump inhibitor administration were identified in patients unable to utilize intact capsules of enteric coated omeprazole or lansoprazole. All the four methods were used to administer the drug successfully.

Pharmacists, as dispensers, are saddled with a lot of task; among other things having to deal with rising volume of prescriptions coupled with increased time spent on national health insurance claims as well as fulfilling administrative duties. With this huge workload, often patient counseling is neglected.

Standard Operating Procedures[17] (SOP) 2005 stated that during dispensing process, the dispenser must make sure the right medicine together with the relevant information is given to the patient to ensure their proper use.

In public health facilities, the SOP[17] stated that dispensers are to provide

- routine patient counselling
- written information preferably patient information leaflets inserted in patients' medicine packets from the manufacturer
- demonstrate the use of medical devices to the patient
- give adequate counselling to patients on their prescription medicines in order to improve patients' treatment outcome.

1.4 Statement of the Problem

Pharmacy practice is one of the key areas in the health sector in any country. The practice within the health facilities has become a client-focused service provision rather than a product oriented one.

With the high attrition rate of pharmacists who are dispensers in the public health sector, other staff working in pharmacies tend to dispense medications and other pharmaceutical products to their clients. Some of these service providers do not have any formal training but are trained on the job. The patient has to benefit from the medication prescribed, dispensed and administered to him or her.

Currently, different coated drugs are dispensed at the various health facilities in the country and the ability of dispensers to identify or know these different types of coated medicines and counsel their clients accordingly is of much concern during the dispensing process.

Inadequate professional staff in pharmacy departments in public health facilities, inadequate knowledge of different types of coated medicines, lack of clinical meetings, poor staff attitude to clients during dispensing etc, are likely to contribute to poor patient counselling. Therefore there is the need to assess the effect of these factors on the quality of counselling given by dispensers in the co-administration of enteric-coated medicines and antacids.

Hence, there is the need to assess the quality of counselling given when dispensing enteric-coated medications and antacids to a client to be used concurrently because different categories of dispensers are now dispensing and counselling clients in the pharmacies at the public health facilities.

1.5 Aim

To assess the quality of counselling given by dispensers in some selected public health facilities in the Volta Region when dispensing enteric-coated medications and antacids to their clients to use concurrently and make appropriate recommendations.

1.6 Objectives

1. To identify and assess the extent to which formal educational status of dispensers in public health facilities affects the quality of counselling given to clients during the dispensing of antacids and enteric-coated medicines to be used concurrently.
2. To assess the extent to which skills acquired by dispensers in the public health facilities during service provision affects the quality of counselling given in co-administration of enteric-coated medications and antacids
3. To find out dispensers knowledge about enteric-coated medicines and antacids stocked or dispensed in their health facilities and their ability to list or mention a few.
4. To find out the counselling given to clients when dispensing enteric-coated medicines and antacids to be administered concurrently.
5. To make appropriate recommendations.

CHAPTER TWO

METHODOLOGY

2.1 Study Type, Variables and Data Collection Techniques

The study was a descriptive cross-sectional one which was conducted in 10 randomly selected public hospitals in the Volta Region of Ghana within a 2-week period in May to June 2009.

The data collection tools included an open-ended and closed ended questionnaire structured for self-administration.

Data collectors were trained to collect data on selected variables.

The variables of the data collection instrument were as follows:

- Grade or professional qualification of dispensers working in the health facilities selected for data collection. This information helps to know their level of formal education.
- Number of years the dispensers served at the pharmacy department so as to correlate the responses to the working experience
- Knowledge and use of enteric-coated medicines and antacids in the selected health facilities and ability of dispensers to differentiate other coated medications from enteric-coated ones.
- Number of clinical meetings held in the pharmacy department and the respective topics treated
- Number of continuous educational programmes organized by the Pharmacy Council and the Pharmaceutical Society of Ghana attended

Table 2.1 Variables to be measured in this study.

Objective	Variable Name Needed for analysis	Variable type	Descriptive /inferential analysis required
1) Grade or professional qualification of dispensers working in the health facilities selected for data collection.	Category of dispensers	Nominal (Dispensers)	Number or percentage of categories of dispensers
2) To assess the extent to which skills acquired by dispensers in the public health facilities during service provision affects the quality of counseling given in co-administration of enteric-coated medications and antacids	No. of years serving as a dispenser	Nominal (Dispensers)	Descriptive Numbers or percentages of dispensers' working years. Cross tabulation
3) To find out dispensers knowledge about enteric-coated medicines and antacids stocked or dispensed in their health facilities and ability to mention a few	Knowledge of enteric-coated medicines and antacids	Nominal (Dispensers)	Descriptive Numbers or percentages of dispensers knowledge about enteric-coated medicines and antacids Cross tabulation
4) To find out the counselling given to clients when dispensing enteric-coated medicines and antacids to be administered concurrently.	Quality of counselling	Nominal (Dispensers)	Descriptive Numbers or percentages of dispensers knowledge on quality of counselling given when dispensing enteric-coated medicines with antacids Cross tabulation
	Number of clinical meetings held	Nominal (Dispensers)	

The followings were some of the techniques used during the data collection:

- Based on the assumption that the number of patients seen at the out-patients department is always heavy in the mornings, data collectors were at each health facility in the morning since most of the pharmacy staff were on the morning shift so that a minimum of 6 respondents could be interviewed
- The data collectors sat down beside each respondent (dispenser) at a comfortable place within the selected health facilities. This was to ensure that respondents understood each question well and the questionnaire was fully completed.
- Respondents were assured of confidentiality.
- Data collectors reviewed all the questionnaires filled in each health facility prior to their departure so that questionnaires that were not fully answered were completed by calling back the respondents to help fill them.
- Data collection instrument (questionnaire) used on the field is at appendix 1

2.2 Study site and Population

The study was carried out in the Volta Region of Ghana within 2-week period in May to June 2009.

Volta Region has thirteen (13) public hospitals and convenience samples of 10 hospitals (nine district hospitals and one regional hospital) were selected at random out of the 13 public health facilities. The selected facilities were from the northern, central and southern parts of the region. The target groups were all dispensers in the selected district and regional hospitals and in all sixty-six (66) respondents were interviewed.

A dispenser, for the purpose of this research, was defined as a person working in the dispensary or pharmacy department for more than three (3) months and who gives out medicines to clients and counsel them on their use. However, students on practical attachment in the department were excluded from the survey.

2.3 Sampling Method

There are thirteen (13) public hospitals in the Volta Region. The following sampling techniques were used for the selection of the ten (10) public health facilities:

- The pharmacy department in the regional hospital was selected.
- Three district hospitals were randomly selected from the northern, central and southern parts of the Volta Region, resulting in a total of 9 district hospitals
- Staff with a working experience of more than 3 months in the pharmacy department (except students on practical attachment) who dispense medicines to clients or patients were interviewed with a questionnaire.

2.4 Data Processing And Analysis

Data processing and analysis started after collecting all the data on the field. The filled questionnaires were sorted into the following three (3) categories:

- Pharmacist
- Dispensing Technician and Technologist (DTT) and
- Dispensing Assistant and Attendants

Data analysis was done by the use of Microsoft excel after categorizing the data, coding and summarizing it on a data master sheet.

2.5 Ethical Considerations

For ethical reasons the following measures were adopted on the field:

- The researcher informed the Medical Superintendent and the entire Hospital Management Team of his hospital about the research and asked for permission of absence and sponsorship from the hospital.
- Research team members were trained on the data collection tools and they took part in the pre-testing of the methodology.
- Within each health facility, the data collectors formally called on the Management Team of the hospital and briefed them about the survey and did seek permission for the conduction of the interview.
- In the pharmacy department, the research team leader briefed the head of the department as well as the staff working in the department about the survey and their roles or involvement in the process.
- In each health facility, at the completion of the data collection, the research team met with the Hospital Management Team and the staff of the pharmacy department to show appreciation for their cooperation.

2.6 Pre-Testing

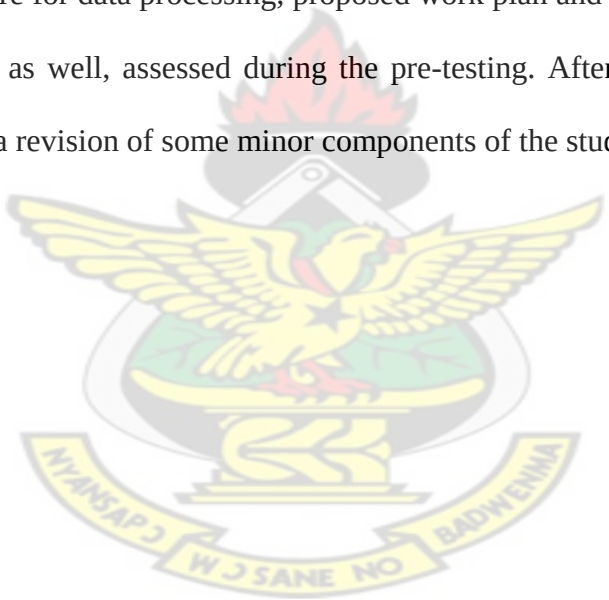
The pre-testing of the tool was carried out at in a health facility which was not part of the 10 selected public hospitals where the actual data collection was carried out. Five dispensers were interviewed at the health facility.

The pre-testing of the questionnaire had made it possible to identify potential problems in the proposed study. It gave the opportunity to re-examine the tools in terms of reliability, feasibility, novelty, researcher's interest in the study and other ethical issues.

Issues of concern which were assessed during and after the pre-testing were the time to be spent on a questionnaire during the interview process, appropriateness of wording of the questionnaire and sampling procedure, accuracy of the translation, relevance of the data to be collected.

Dispensers' reaction to the research procedure and their willingness to respond to the interviewers were also assessed during the pre-test period. This technique helped in selecting an appropriate time frame to conduct the interview. There was a research team leader. During the pre-testing there was an assessment of co-ordination and teamwork among members.

Procedure for data processing, proposed work plan and budget for the research activities were, as well, assessed during the pre-testing. After the pre-testing of the tool, there was a revision of some minor components of the study.



CHAPTER THREE

3.0 RESULTS

3.1 Grade or Category of Dispensers

A total of 66 dispensers were interviewed. 14 (21.2%) were pharmacists, 24 (36.4%) dispensing technicians or technologists (DTTs) and 28 (42.4%) dispensing assistants or attendants (DAAs), (figure 3.1).

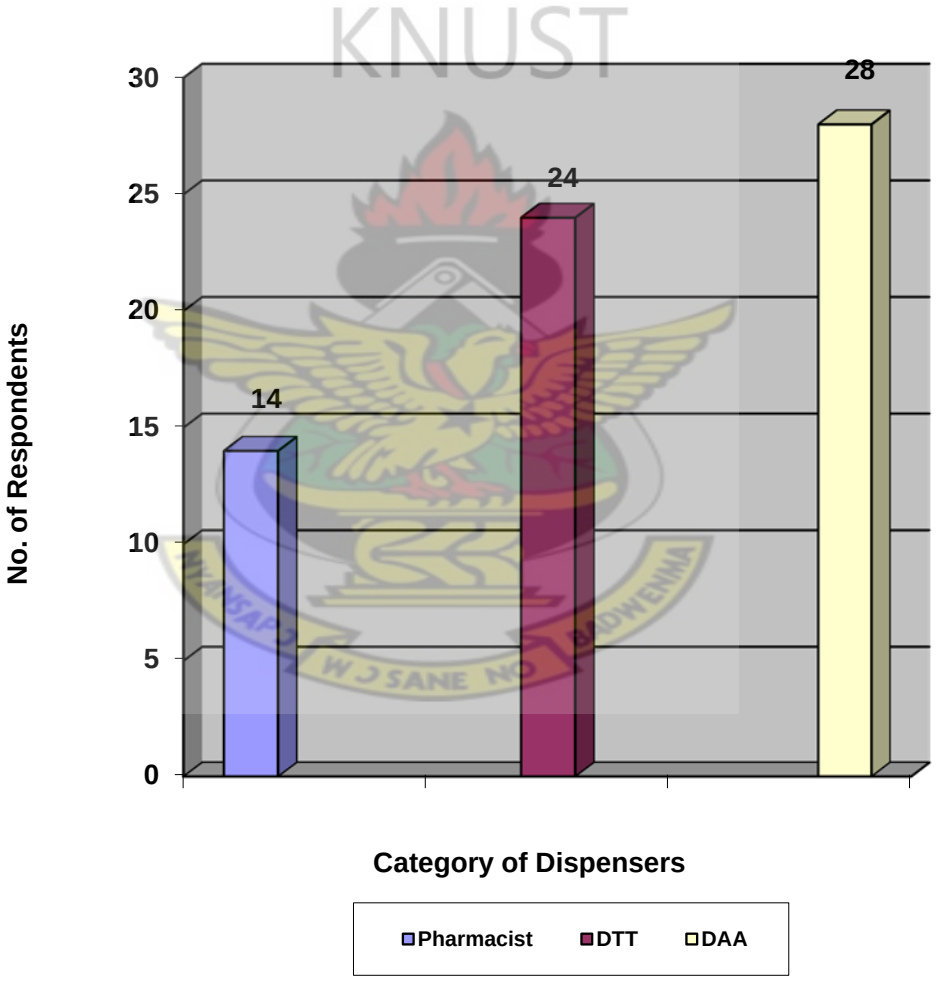


Figure 3.1 Number of Respondents against the category of Dispensers

3.2 Number of Years of Practice

3.2.1 Number of years of Practice of Pharmacists as Dispensers

A total of 14 pharmacists were interviewed, 6 (42.9%) had spent less than one year as a dispenser, 4 (28.6%) had worked between 1 to 5 years whilst the remaining 4 (28.6%) had worked for more than 5 years (Figure 3.2).

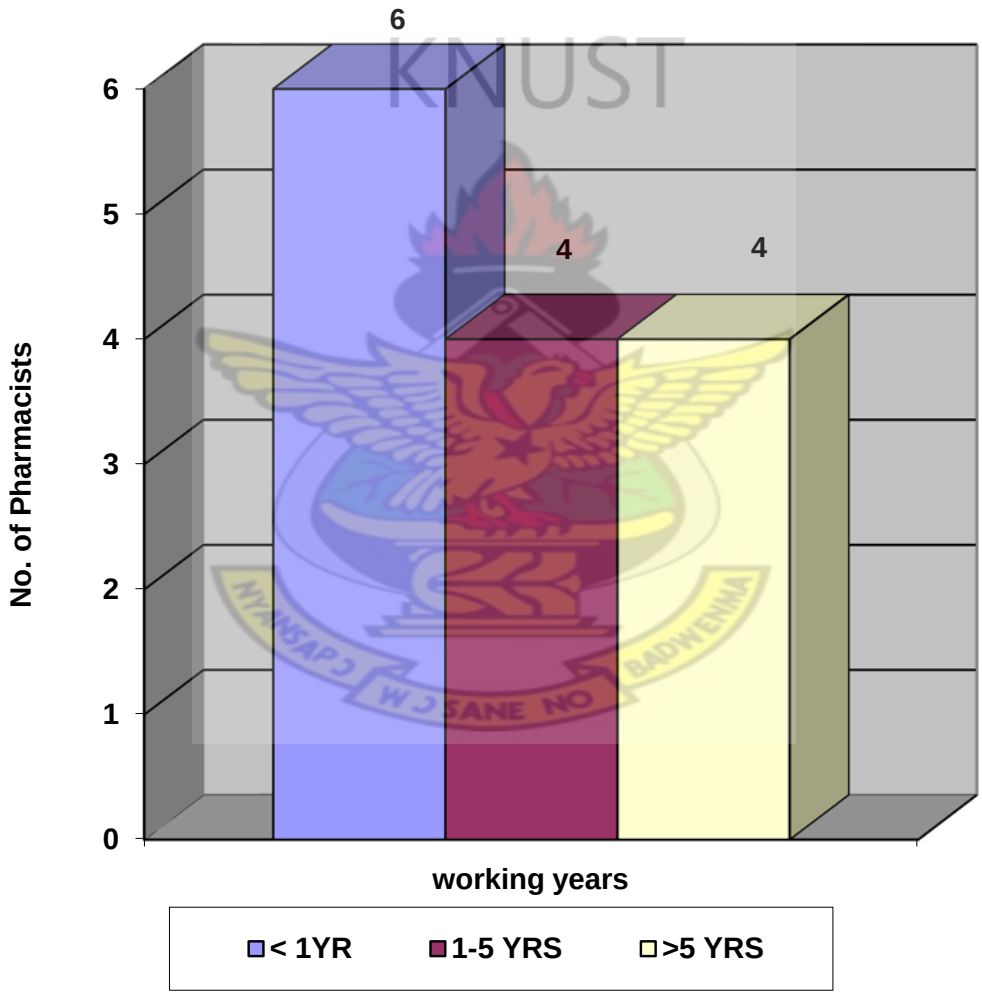


Figure 3.2 Number of Years of Practice as Pharmacists

3.2.2 Number of years of practice as Dispensing Technicians or Technologists

Twenty four dispensing technicians and technologists (DTTs) were interviewed, 3 (12.5%) had worked for less than one year, 9 (37.5%) had worked as dispensers between one to five years whereas 12 (50%) DTTs dispensed for a period more than 5 years (figure 3.3).

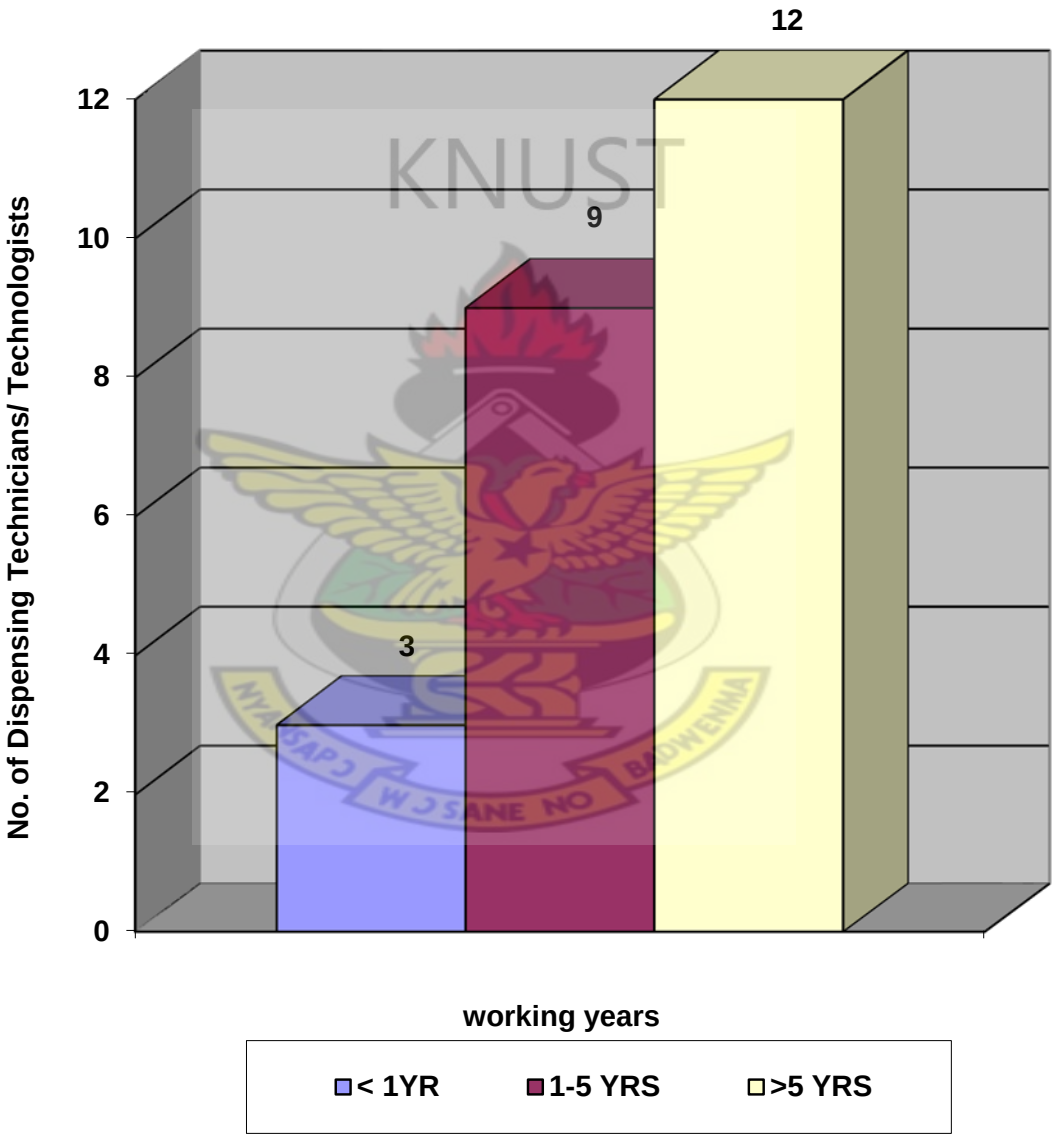


Figure 3.3 Number of Years of Practice as Dispensing Technicians and Technologists

3.2.3 Number of Years of Practice as Dispensing Assistants and Attendants

Twenty eight dispensing assistants and attendants (DAAs) were interviewed. Eight (28.6%) had worked as dispensers between one to five years, 20 (71.4%) respondents had worked for more than five years. However, there was no respondent who had worked below one year (figure 3.4).

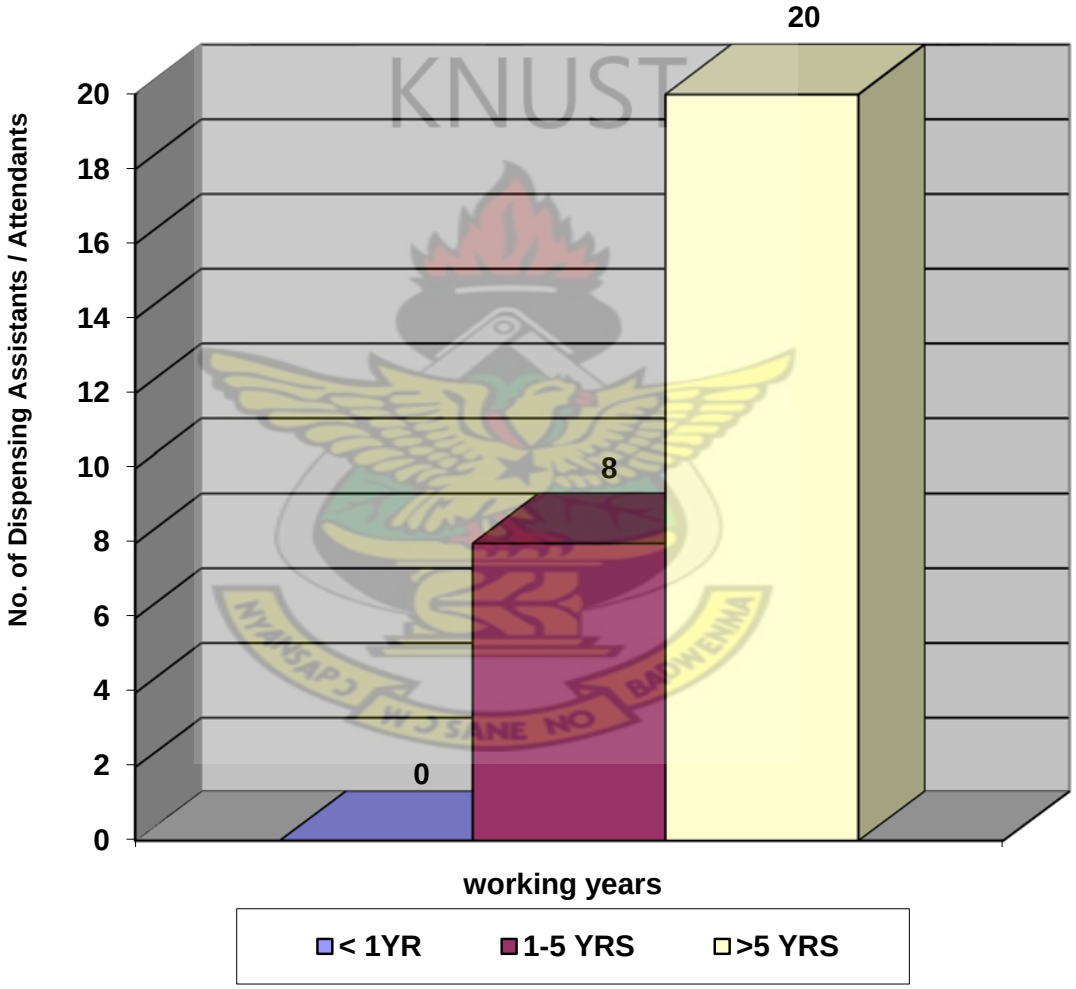


Figure 3.4 Number of Years of Practice as Dispensing Assistants and Attendants

3.3 Knowledge of enteric-coated medicines

A total of 14 (100%) pharmacists, 24 (100%) dispensing technicians and technologists and 16 (57.1%, n=28) dispensing assistants and attendants answered the questionnaire that enteric-coated medicines were stocked and used in their facilities. However, 12 (42.9%, n=28) dispensing assistants and attendants interviewed could not answer whether enteric-coated medicines were stocked and used within their facilities

3.4 Ability to mention enteric-coated medicines

With respect to the ability to mention enteric-coated medicines, 10 (71.4%, n=14) pharmacists were able to mention two or more enteric-coated medicines used or stocked within the health facility and 4 (28.6%, n=14) pharmacists mentioned only one enteric-coated medicine.

Fifteen (62.5%, n=24) dispensing technicians and technologists were able to mention only one enteric-coated medicine and 9 (37.5%) dispensing technicians and technologists could not mention any enteric-coated medicine.

Only 12 (42.9%, n=28) dispensing assistants and attendants were able to mention one enteric-coated medicine while 16 (57.1%, n=28) could not list any of the enteric-coated medicine stocked or used within the health facility. Although other coated medicines were mentioned by all the categories of the dispensers interviewed, these were not enteric-coated rather they were sugar-coated medicines.

3.5 Dispensers' knowledge and ability to mention antacids

All the 66 respondents (100%) had knowledge of antacids stocked and were able to mention two or more antacids that were stocked and used in their health facilities (Figure 3.5).

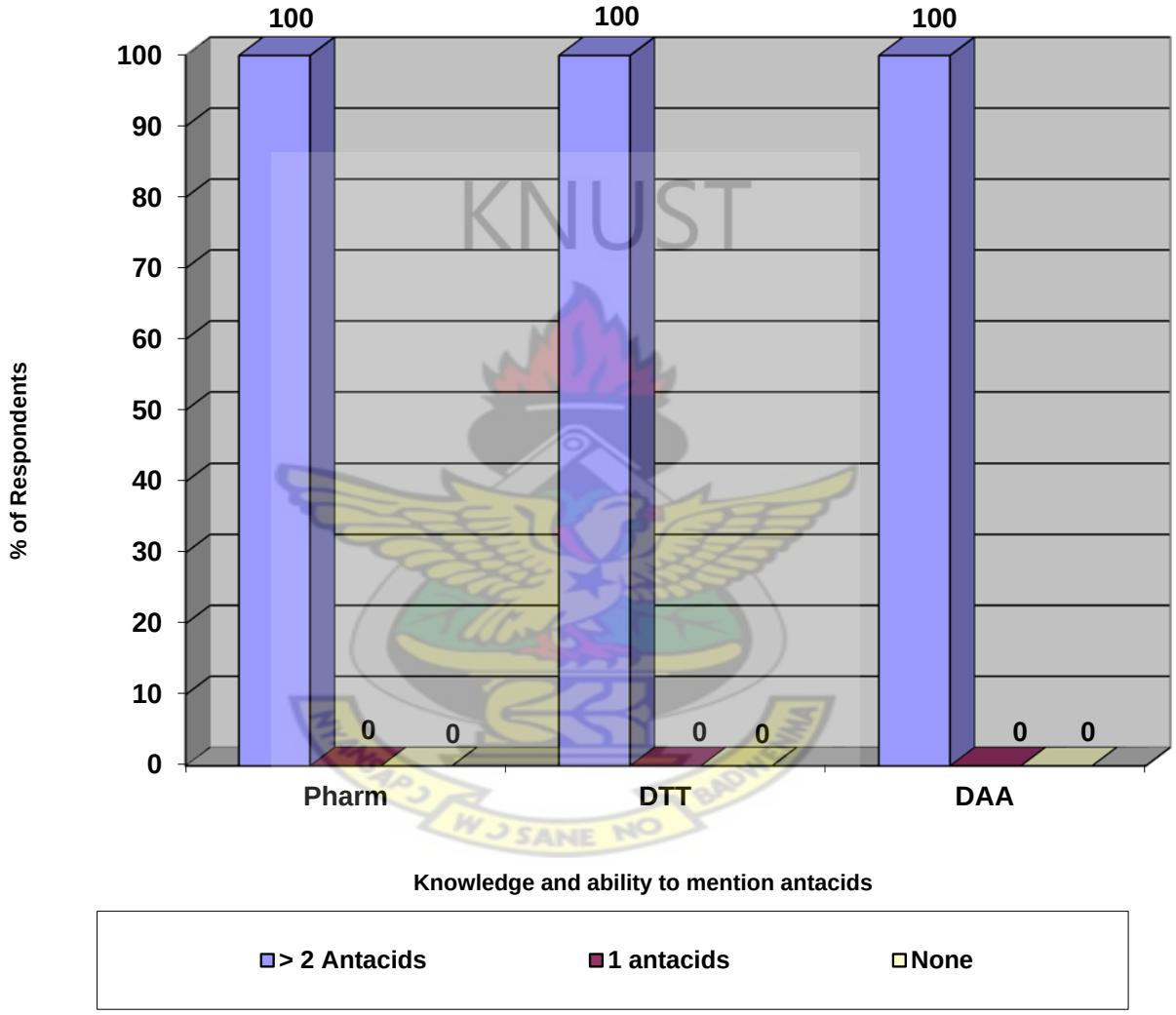


Figure 3.5 Dispensers' knowledge and ability to mention antacids

3.6 Dispensing of enteric-coated medicines with antacids

Fourteen (100% n=14) pharmacists, 24 (100% n=24) dispensing technicians or technologists and 24 (85.7% n=28) dispensing assistants/attendants responded that they had been dispensing enteric-coated medicines and antacids to patients to be used concurrently. However, 4 DAAs who never dispensed such drugs said that they would be in a position to provide adequate counseling to these patients when the need arose. (figure 3.6)

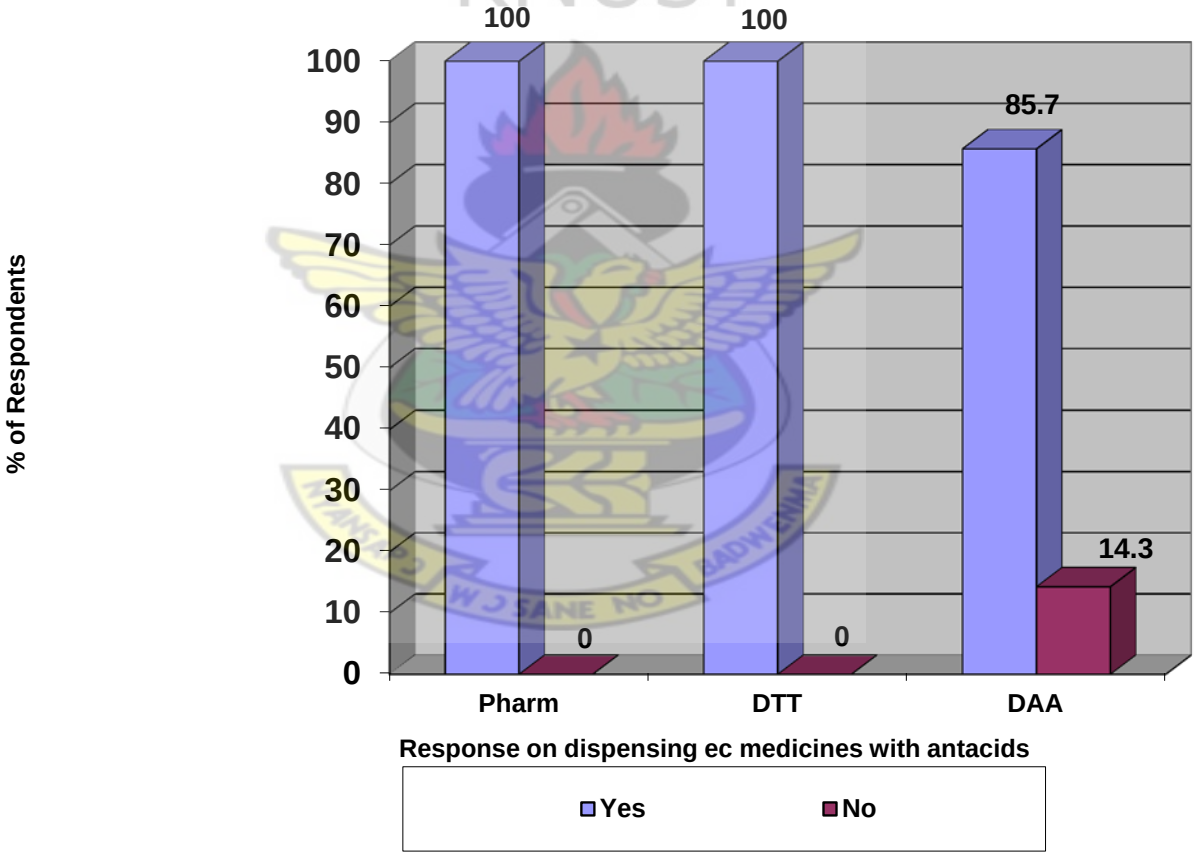


Figure 3.6 Percentage of respondents dispensing enteric-coated medicines with antacids

3.7 Dispensers' response on antacid and enteric-coated medicines use at the same time of day

A total of 12 (86%, n=14) pharmacists, 18 (75%, n=24) dispensing technicians and technologists and 24 (86%, n= 28) dispensing assistants and attendants interviewed stated that antacids are not to be taken at the same time of day as enteric coated medications, while 2 (14% n=14) pharmacists, 6 (25% n=24) dispensing technicians/technologists and 4 (14% n=28) dispensing assistants/attendants said the two drugs can be taken at the same time of day (figure 3.7).

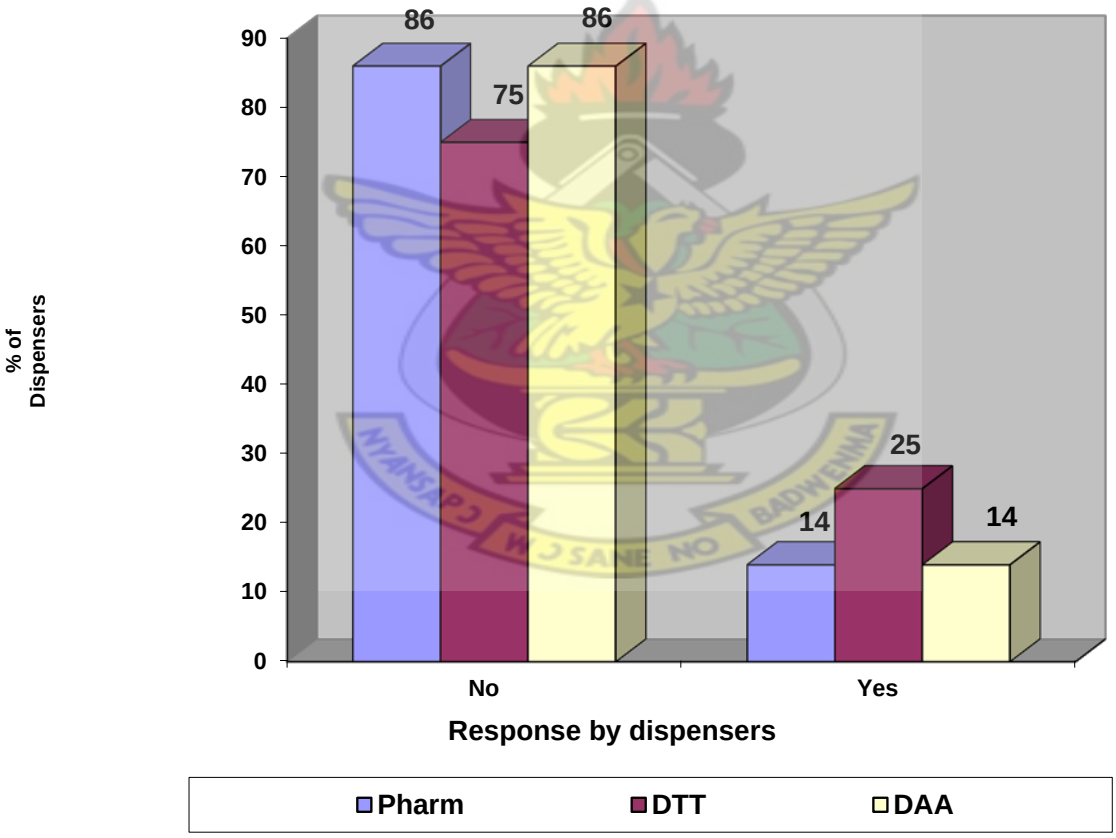


Figure 3.7 Dispensers' response on antacid and enteric-coated medicine use at the same time of day

3.8 Dispensers response to antacids use 2-3 hours after enteric coated medicines administration

Twelve (85.7% n=14) pharmacists, 15 (62.5% n=24) dispensing technicians and technologists and 16 (57.1% n=28) dispensing assistants and attendants said antacids are to be taken 2-3 hours after enteric coated medicines whereas 2 (14.3% n=14) pharmacists, 9 (37.5% n=24) dispensing technicians/technologists and 12 (42.9% n=28) dispensing assistants/attendants said antacids should not be administered 2-3 hours after enteric coated medications (figure 3.8).

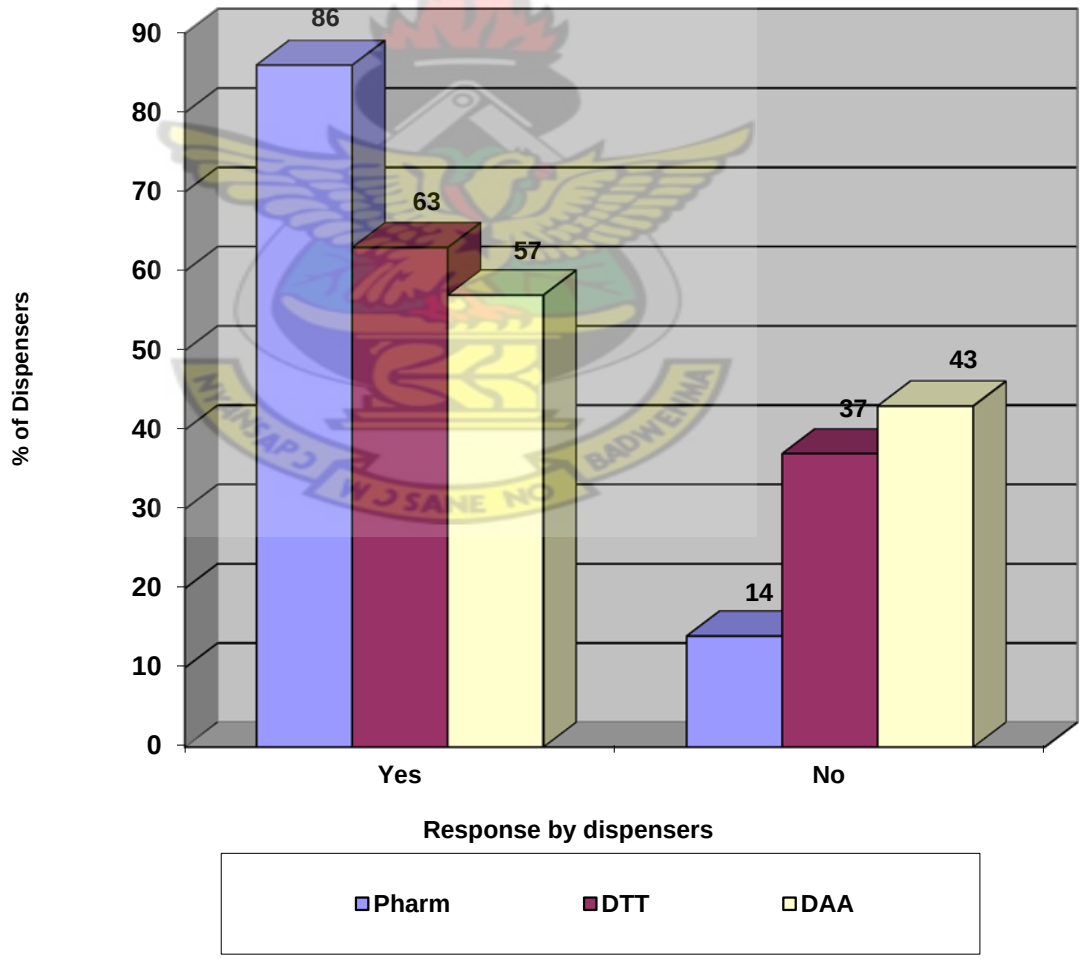


Figure 3.8 Dispensers' response to antacids use 2-3 hours after enteric coated medicines administration

3.9 Dispensers' response to the use of antacids about 30 minutes after enteric-coated medicines administration.

A total of 10 (71.4% n=14) pharmacists, 21 (87.5% n=24) dispensing technicians and technologists (DTTs) and 12 (42.9%) dispensing assistants and attendants (DAAs) responded that antacids should not be taken about 30 minutes after enteric-coated medication whilst 4 (28.6, n=14) pharmacists, 3 (12.5%, n=24) DTT and 16 (57.1%, n=28) DAA agreed that antacids should be taken about 30 minutes after enteric-coated medication. (figure 3.9)

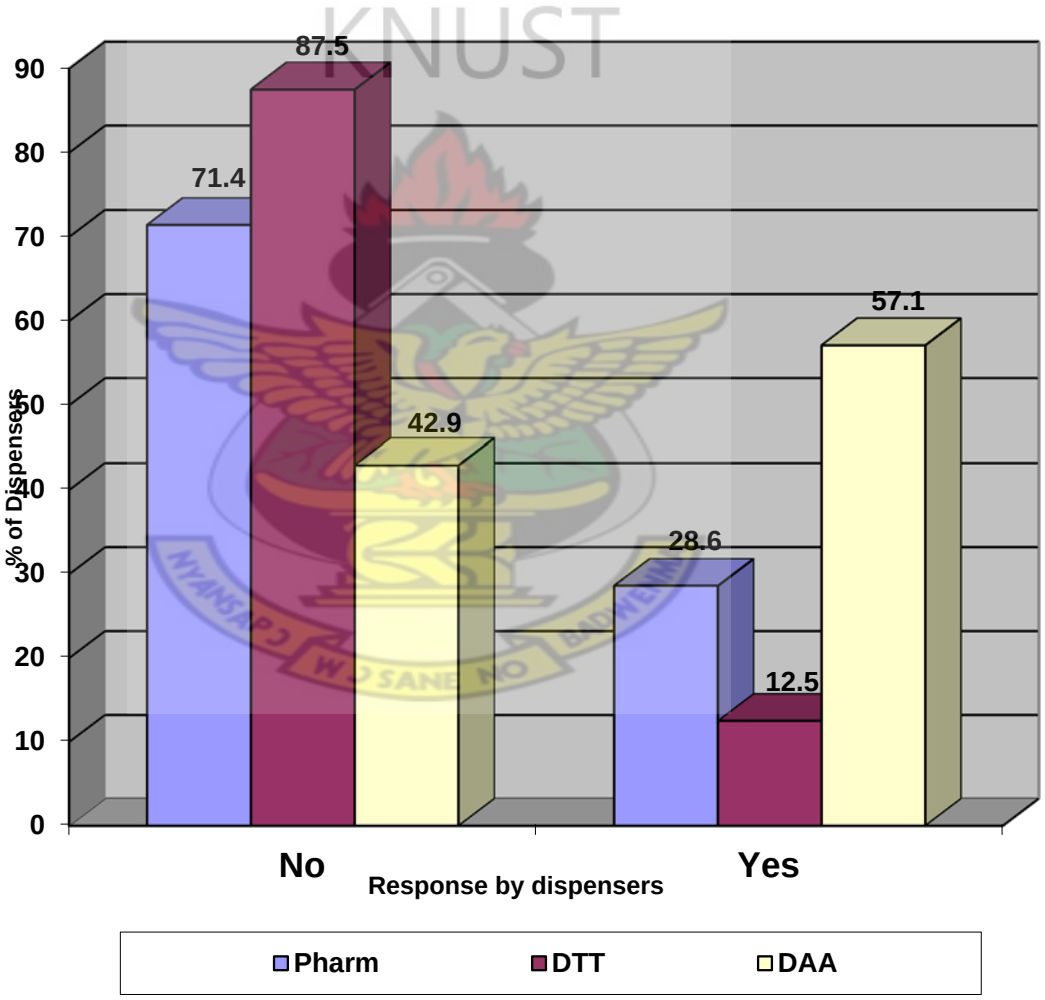


Figure 3.9 Dispensers' response to the use of antacids about 30min. after enteric-coated medicines administration.

3.10 Dispensers' response to the use of antacids about 30min. before enteric-coated medicines administration.

Ten (71.4% n=14) pharmacists, 12 (50% n=24) dispensing technicians and technologists and 16 (57.1% n=28) dispensing assistants and attendants disagreed to this while 4 (28.6% n=14) pharmacists, 12 (50% n=24) dispensing technicians and technologists and 12 (42.9% n=28) dispensing assistants and attendants stated that antacids should be taken 30 minutes before the administration of enteric coated medicines (figure 3.10).

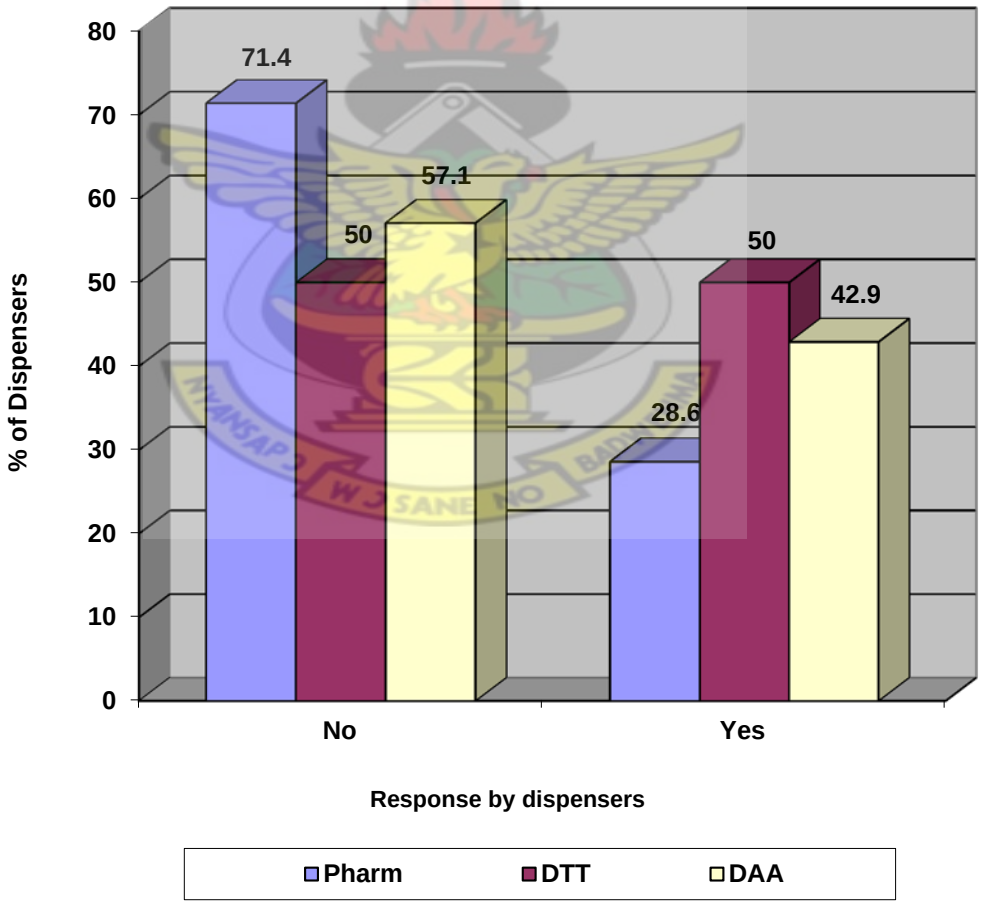


Figure 3.10 Dispensers' response to the use of antacids about 30min. before enteric-coated medicines administration.

3.11 Response on the oral administration of enteric-coated medicines

Regarding the administration of enteric-coated medicines, all the 66 dispensers responded that enteric-coated medicines should be swallowed whole with water and not to be chewed with water

3.12 Response on Clinical Meetings organized in the Pharmacy Departments

The response given by the dispensers interviewed indicated that clinical meetings in the pharmacy department were held in only three health facilities (n=10) whilst such clinical conferences were not held in the remaining seven pharmacy departments.

3.13 Continuous Education Programmes

Thirteen (92.9% n=14) pharmacists participated in the continuous education programme organized by the Pharmacy Council and the Pharmaceutical Society of Ghana (PSGH) in the years 2007 and 2008. One pharmacist could not participate in the continuous educational programme.

CHAPTER FOUR

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1 Discussion

This study was intended to explore the knowledge and quality of counseling given by dispensers working in public health facilities in the Volta Region of Ghana when dispensing enteric-coated medicines and antacids to patients to be administered concurrently.

Patients counseling is an important and an integral part of quality pharmaceutical service provision in the health care sector of any growing economy since wealth creation is proxy to health. The consequences of non-compliance to ones medications may be attributed to poor education and counseling of patients about their medical conditions and medications dispensed to them.

The study revealed that there were three categories of dispensers who were interviewed. They were pharmacists', dispensing technicians and technologists' (DTTs) and dispensing assistants and attendants' (DAAs) categories. It could be deduced that pharmacists and dispensing technicians/ technologists interviewed had formal training in pharmaceutical service provision in recognized universities and polytechnics respectively and they constituted 57.6% (n=66) of the respondents while the remaining 42.4% (n=66) were likely to have no formal training but were trained on the job (Figure 3.1).

The results further showed that 36 (54.6%, n=66) dispensers spent more than 5 years as dispensers and dispensing assistants and attendants and DTTs constituted 55.6% (n=36) and 33.3% (n=36) respectively whilst the remaining 11.1% (n=36) are pharmacists (figures 3.2: 3.3 and 3.4).

Analysis of the data revealed that pharmacists interviewed had spent the least number of years working as dispensers in the facility (figure 3.2) followed by the dispensing technicians and technologists' category (figure 3.3) and most of the dispensing assistants/ attendants had spent more than five years practising as dispensers (figure 3.4). Certainly, during this period some amount of skill and knowledge would have been acquired as the amount of time spent investing in skill is a proxy for the amount of skill a person has acquired and the most common input-based measures in the economics literature are years of education and years of work experience[9]. Therefore, it may be that some dispensing assistants and attendants who had no formal education in pharmaceutical service provision had acquired some knowledge and skill in this service provision during these years as well as the other categories of dispensers.

The study further revealed that the 81.8% (n=66) of the dispensers stated that they knew enteric-coated medicines except twelve (18.2%, n=66) dispensing assistants and attendants who answered in the negative (subsection 3.3). However, the ability of dispensers to mention specific enteric-coated medicines stocked and used within their facilities showed that all the categories of dispensers interviewed confused other coated (sugar, film) medicines with the one in question.

Ten (71.4% n=14) pharmacists as dispensers were able to list two or more enteric-coated medicines than the other categories of dispensers as stated in subsection 3.4 above. On the other hand, 62.5% (n=24) of dispensing technicians and technologists stated only one enteric-coated medicine. A total of 12 (42.9% n=28) dispensing assistants and attendants could list only one enteric-coated medicine stocked and used within their facilities. (Subsection 3.4)

The response provided by dispensers based on their knowledge of enteric-coated medicine as analyzed in subsection 3.3 and the ability of dispensers to list or

mention the enteric-coated medicines stocked and used within their health facilities as analyzed in subsection 3.4 should have a correlation. But it was rather clear that there is a considerable disagreement between dispensers' responses based on knowledge of enteric-coated medicines (subsection 3.3) and their ability to mention a few stocked and used within their facilities (subsection 3.4).

Analysis of the data collected based on the dispensers' knowledge of enteric-coated medicines (subsection 3.3) revealed that 100% of pharmacists (n=14) and dispensing technicians and technologists (n=24) indicated that they knew what enteric-coated medicines are but when they were asked to mention or list them (subsection 3.4), it was realized that there had been a knowledge gap in the sense that dispensers listed other coated drugs as enteric-coated tablets.

With regards to the listed or mentioned enteric-coated medicines, it was realized that 4 (28.6% n=14) pharmacists and all the 24 dispensing technicians and technologists and all the 28 dispensing assistants and attendants interviewed stated other coated medicines as enteric-coated medicines which obviously implies that the dispensers were not taking interest in reading either the primary or secondary labels on the packaging materials of medicines stocked and used, hence they could not differentiate enteric-coated medicines from the other coated ones. Ten pharmacists were able to list 2 or more enteric-coated medicines without confusing it with other coated medicines.

Regarding the knowledge and ability to mention antacids, all (100%) the dispensers interviewed had a high level of knowledge about antacids and were able to mention the required number of antacids requested from them. (Subsection 3.5)

The majority of dispensers (93.9%) according to the study stated that they had been dispensing enteric-coated medicines together with antacids to be used

concurrently (fig 3.6). However, co-administration of both medicines requires special counselling to avoid drug interaction[1, 2].

Provision of quality pharmaceutical care which includes adequate counselling of patients on their medication in order to improve compliance and have a successful treatment outcome has become one of the essential roles for practicing pharmacists or dispensers in hospital pharmacies[17].

The study revealed that 81.8% (n=66) of dispensers stated that antacids and enteric-coated medicines should not be used at the same time of the day and this is consistent with previous literature and findings[10] which states that indigestion remedies should not be taken at the same time of day as enteric-coated tablets so as to avoid the possibility of premature dissolution of the coating in the presence of an alkaline pH On the contrary, 12 (18.2% n=66) dispensers disagreed to this (fig 3.7).

Certainly, if the two drugs are administered together, premature dissolution of the enteric coating of the coated medicine would occur, leading to the release of the active drug into the stomach instead of the duodenum[7].

The results further showed that 65.2% (n=66) of the dispensers, interviewed were of the view that antacids should be used 2 to 3 hours after the administration of enteric-coated medicines (figure 3.8) and this response was in line with previous findings[8, 10], which states that medications that work by lowering the amount of stomach acid (eg. antacids) should not be taken at the same time with enteric coated medicines (eg. enteric-coated Naprosyn) because they may break down the enteric coating and cause the medication to be released too quickly and these interactions can be minimized by giving (administering) antacids and other medications 2 to 3 hours apart.

However, 34.8% of the dispensers (n=66) comprising 2 (14.3%, n=14) pharmacists, 9 (37.5%, n=24) dispensing technicians and technologists and 12 (42.9% n=28) dispensing attendants and assistants had opposing views to this (figure 3.8). This implies that this proportion of dispensers having different views contrary to previous literature and findings[8, 10] would be counselling their patients differently that might be leading to the premature dissolution of the enteric-coated medicines.

Regarding the use of antacids about 30 minutes after enteric-coated medicines have been administered, 65.2% (n=66) of the dispensers interviewed responded that antacids should not be administered 30minutes after enteric-coated medicines have been used (figure 3.9) and this was in line with previous studies[1, 6,] which states that if the gastric pH is increased, an enteric-coated product may dissolve in the stomach rather than in the intestinal tract, changing its absorption characteristics.

The remaining 23 (34.8% n=66) dispensers interviewed stated that antacids should be used within 30 minutes after the administration of enteric-coated medicines (figure 3.9).

The administration of antacids minutes after the use of enteric-coated medicine would still cause dissolution of the enteric-coating and premature release of the medicine into the stomach since there is a higher possibility of a pH change of the stomach in the presence of the enteric-coated medicine.

One of the most significant findings of the study was that 42.4% (close to 50%) of dispensers interviewed, made up of 4 (28.6% n=14) pharmacists, 12 (50% n=24) dispensing technicians and technologists and 12 (42.9% n=28) dispensing assistants and attendants stated that antacids should be administered 30 minutes before enteric-coated medicines are used (figure 3.10). Dispensers were not able to relate that the presence of antacids would change the pH of the stomach prior to the

administration of enteric-coated medicines and the presence of the antacids in the gastro-intestinal tract reduces the absorption of other medicines co-administered as well with it[7].

Nevertheless, 38 (57.6%, n=66) dispensers stated that antacids should not be used 30 minutes before enteric-coated medicines are used and this is in line with literature[7, 8] which stresses on pH change of the stomach content leading to the premature dissolution of the enteric-coating and increased interaction of the antacid with other drugs administered.

All the dispensers (dispensers with formal training and those who were trained-on-the job) stated in the study that enteric coated medicines are to be swallowed whole with water (subsection 3.11) coinciding with literature[11] which recommends that patients are to be advised to swallow enteric-coated medicines whole with water.

If enteric coated medicines are chewed then the enteric-coating is damaged or destroyed in the mouth before it is swallowed. In this case, the medicine would be exposed to the gastric contents of the stomach where further interaction takes place which would affect the rate and extent of its absorption. Finally the patient never benefits so much from such enteric-coated medicines being prescribed and used. And this may worsen the patient's medical condition leading to hospitalization or death.

It was realized that one way of imparting knowledge and skill is through training. Therefore, continuous educational programmes organized for pharmacists by the Pharmacy Council and the Pharmaceutical Society of Ghana (PSGH) and the departmental clinical meetings organized for the staff of the pharmacy department in various public hospitals should improve the quality of pharmaceutical service provision.

However, the study revealed that out of the ten (10) public health facilities visited for the data collection, pharmacy departmental clinical meetings were held in only three (subsection 3.12).

Thirteen (92.9%, n=14) pharmacists stated that they attended the continuous educational programmes organized in 2007 and 2008 (subsection 3.13).

Unfortunately, dissemination of the information gathered at the continuous educational programmes was not done effectively since it was revealed that departmental clinical meetings were organized in only 30% of the public health facilities visited.

Based on the analysis of the result, it was realized that the quality of counseling given to patients in the public health facilities in the Volta Region decline with respect to the educational level of the dispensers.

It was made clear that pharmacists' knowledge and quality of counselling given was better than that of the dispensing technicians/ technologists and that of the latter was better than the knowledge and quality of counselling provided by the dispensing assistants/ attendants. That is, the quality of counselling tends to decline with respect to the level of formal education in pharmaceutical service provision.

Lastly but not the least, there is the need for all the category of dispensers to take accurate counselling of clients on their medications seriously since the consequences of not giving the right information to patients may lead to non-compliance to their medicines and the development of multi-drug resistant strains and adverse drug reactions.

4.2 Conclusion

The study showed that a lot of dispensers (42.4%) practicing in public health facilities in the Volta Region of Ghana had no formal training in pharmaceutical service provision but were trained-on-the job.

It was revealed that very few pharmacists were working in the public hospitals and the pharmacists interviewed spent the least working years (working experience) as dispensers, followed by the dispensing technicians/ technologists' and the dispensing assistants/ attendants were the longest serving category of dispensers.

However, during this period of pharmaceutical service provision, some amount of knowledge and skill were acquired compared with the knowledge and skill of these staff when they were not employed or about to be employed.

It is important to say that dispensers were confusing other coated medicines with enteric-coated ones. This evidence was based on the answers provided by the dispensers interviewed to some parts of the questionnaire. Dispensers who had formal training (pharmacists and dispensing technicians/ technologists) were also among the category of respondents listing other coated medicines as enteric-coated ones. However, all the dispensers were able to list all the antacids stocked and used within their health facilities.

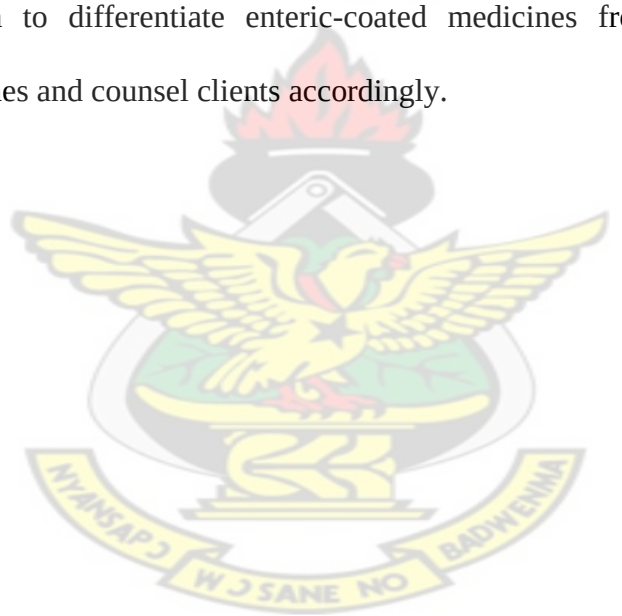
The study showed that there was much awareness among dispensers not to administer antacids and enteric-coated medicines concurrently but what was not clear was to the dispensers was the actual time interval in the administration of these medicines.

4.3 Recommendation

Based on the findings of the study, the following recommendations are forwarded for consideration:

- The Ministry of Health (MoH) and other policy makers should collaborate on the increase recruitment and retention of pharmacists in public health facilities
- The Ministry of Health and other stakeholders in education should collaborate on production, recruitment and retention of middle-level health professionals like the dispensing/ pharmacy technicians and assistants since the later group would have a formal training.
- Government policy on pharmacy education should be reviewed. More qualified tertiary institutions should be given accreditation to run a course in pharmacy and pharmacy related programmes. If this is done, more graduates with pharmacy-oriented backgrounds could be employed leading to an increase in the number of practicing pharmacists and pharmacy technician/ technologists in the various public health facilities.
- The Human Resource Departments (HRD) of the MoH and the Ghana Health Service should expedite action on early employment of newly qualified pharmacists and pharmacy technicians / technologists so as to have more staff having formal training in pharmaceutical service provision being employed and this may lead to a reduction in the rate of attrition of these professionals to the private sector.
- Pharmacy Council together with the Pharmaceutical Society of Ghana to increase the number of continuous educational programmes organized for pharmacists and to bring on board the pharmacy or dispensing technicians/ technologists as well.

- Government and Hospital Pharmacists' Association (GHOSPA) should start looking at capacity development for her members by organizing training workshops in current trends in pharmacy practice.
- Within the various hospitals, special efforts should be made by the heads of the pharmacy departments to organize frequent clinical meetings for their staff in order to update their knowledge in quality pharmaceutical care provision to patients.
- Staff of the pharmacy departments should take special interest in reading labels and literatures added to medicines. In this case dispensers would be in a position to differentiate enteric-coated medicines from the other coated medicines and counsel clients accordingly.



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APPENDIX A.

DATA COLLECTION INSTRUMENT

TOPIC: ASSESSING THE QUALITY OF COUNSELLING GIVEN BY DISPENSERS IN CO-ADMINISTRATION OF ENTERIC-COATED MEDICATIONS AND ANTACIDS

1. NAME OF FACILITY ……

2. DATE ……

3. GRADE OF DISPENSER (**Tick appropriately**)

   a) PHARMACIST [ ]

   b) DISP. TECHNOLOGIST [ ]

   c) DISP. TECHNICIAN [ ]

   d) DISPENSING ASSISTANT [ ]

   e) DISPENSING ATTENDANT (ORDERLY) [ ]

   f) ANY OTHER (SPECIFY) ……

4. FOR HOW LONG HAVE YOU BEEN PRACTICING AS A DISPENSER IN THE PHARMACY OF YOUR HEALTH FACILITY? (**Tick only one**)

(1) < 1 YEAR [ ] (2) BETWEEN 1 TO 5 YEARS [ ] (3) > 5 YEARS [ ]

5. DO YOU HAVE OR USE ENTERIC-COATED MEDICATIONS IN YOUR DEPARTMENT OR FACILITY? (**Tick only one**)

1. YES [ ] 2. NO [ ] 3. DON'T KNOW [ ]

IF YES, CAN YOU MENTION A FEW THAT YOU STOCK OR DISPENSE

a) ……..

b) ……..

c) ……..

IF NO, DO YOU STOCK OR DISPENSE

a) DICLOFENAC TABLETS [ ] (if available, check to see if they are e.c)

b) OMEPRAZOLE CAPS [ ] (if available, check to see if they are e.c)

c) BISACODYL TABLETS [ ] (if available, check to see if they are e.c)

d) ANY OTHER E.C DRUG [ ] (check tally cards for other e.c. medicines)

6. DO YOU HAVE/ USE ANTACIDS IN YOUR DEPARTMENT OR FACILITY?

(**Tick only one**)

1. YES [ ] 2. NO [ ] 3. NO IDEA [ ]

IF YES, CAN YOU MENTION A FEW THAT YOU STOCK OR DISPENSE IN YOUR FACILITY

a) ……..

b) ……..

c) ……..

IF NO, DO YOU STOCK OR DISPENSE.

a) ALUMINIUM HYDROXIDE TABLETS [ ]

b) ALUMINIUM HYDROXIDE GEL [ ]

c) MAGNESIUM TRISILICATE TAB [ ]

d) MAGNESIUM TRISILICATE MIXTURE [ ]

e) MAGACID SUSPENSION [ ]

f) GASTRONE SUSPENSION [ ]

g) ANTACID SUSPENSION [ ]

h) ACINIL SUSPENSION [ ]

i) RES-Q SUSPENSION [ ]

j) KACINIL SUSPENSION [ ]

7. DO YOU EVER DISPENSE ANY ENTRIC COATED MEDICATIONS TOGETHER WITH ANY ANTACID (S)? (**Tick only one**)

1. YES [ ] 2. NO [ ]

8. HOW DO YOU COUNSEL PATIENTS TO ADMINISTER ANTACIDS WITH ENTERIC COATED MEDICINES?

- AT THE SAME TIME OF DAY AS ENTERIC COATED MEDICATIONS YES[ ] NO[ ]
- ABOUT 2 TO 3 HOURS AFTER ENTERIC COATED MEDICATION YES[ ] NO[ ]
- ABOUT 30 MINUTES AFTER ENTERIC COATED MEDICATIONS? YES [ ] NO [ ]
- ABOUT 30 MINUTES BEFORE ENTERIC COATED MEDICATIONS? YES[ ] NO[ ]

9. HOW ARE ENTERIC COATED MEDICATIONS ADMINISTERED?

1) CHEWED WITH WATER [ ] 2) SWALLOWED WHOLE WITH WATER [ ]

10. DO YOU NORMALLY HAVE CLINICAL MEETINGS IN YOUR DEPARTMENT? [ ] (**Tick**)

YES [ ] NO [ ]

IF YES, HOW OFTEN?

…….

11. CAN YOU PLEASE MENTION ANY FOUR (4) TOPICS TREATED DURING THE PREVIOUS YEAR?

(a)……

(b)……

(c)……

(d)…….

12. HAVE YOU ATTENDED ANY CONTINOUS EDUCATION PROGRAMME

1.YES [ ] 2. NO [ ]

13. CAN YOU MENTION ANY TWO (2) TOPICS TREATED AT THE CONTINOUS EDUCATION PROGRAMME?

(a) ……..

(b) …….