



**School of Commerce Department of
Marketing Management Post Graduate
Program**

The Effect of Promotion on Medical Students Prescribing
Behavior: Evidence from Yekatit12 Medical College Students

By: Hanan Seid

Thesis Submitted to Addis Ababa University School of Commerce
Department of Marketing Management Post Graduate Program in
Partial Fulfillment of the Requirements for the Degree of Master of Art
in marketing management

June 2017

Addis Ababa

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ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF MARKETING MANAGEMENT
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Statement of Certification

This is to certify that this thesis work, “The Effect of Promotion on Medical Students Prescribing Behavior: Evidence from Yekatit 12 Medical College Students”, undertaken by Hanan Seid for the partial fulfillment of Masters of Art in Marketing Management at Addis Ababa University, is an original work and not submitted earlier for any degree either at this University or any other Universities.

Research Advisor: Rakshit Negi (Ph.D.)

Signature: _____

Date: _____

Declaration

I, Hanan Seid declare that this work entitled “The Effect of Promotion on Medical Students Prescribing Behavior: Evidence from Yekatit12 Medical College Students”, is the outcome of my own effort and study and that all sources of materials used for the study have been acknowledged. I have produced it independently except for the guidance and suggestions of the Research Advisor.

This study has not been submitted for any degree in this University or any other Universities. It is offered for the partial fulfillment of degree of Masters of Art in Marketing Management.

By: Hanan Seid

Signature _____

Date _____

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Addis Ababa University
College of Business and Economics
School of Commerce
Graduate Studies
Marketing Management Program Unit

***The Effect of Promotion on Medical Students Prescribing
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Students***

By: Hanan Seid

Approved by the Board of

Examiners:

Advisor

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Internal Examiner

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Abstract

The purpose of this study is to assess the effect of promotion on medical students' prescribing behavior. A total of 164 medical students in Yekatit 12 Hospital were used in the study. Self-administered survey questionnaire was used to collect data. Accordingly the thesis assesses very important research questions on medical students' prescribing behavior due to the promotional activity, PSRs, Gifts, Detailing and Sample drugs, by pharmaceutical companies. The finding show that the overall level of promotion and medical students prescribing behavior is in a good range specially for detailing which is in a strong range relatively. Correlation analysis was used to examine the relationship between study variables. Regression analysis were used to conclude the result of undertaken study and conclusion suggests the PSRs, Detailing and sample drugs have direct and significant effect on medical students' prescribing behavior while gift does not affect significantly. Finally, suggestions and recommendations are forwarded for ensuring the effective and ethical pharmaceutical promotion.

Key words: *Pharmaceutical Promotion, Pharmaceutical sales representatives, Detailing, Sample drug, Gifts, Prescribing behavior, Medical Students, prescriber Ethiopia*

List of tables

Table 1 Reliability Test	27
Table 2 General Demographic Information	30
Table 3 Percentage, mean and Std. deviation responded of each item towards PSR	31
Table 4 Percentage, mean and Std. deviation responded of each item towards Gifts	33
Table 5 Percentage, mean and Std. deviation responded of each item towards Detailing	34
Table 6 Percentage, mean and Std. deviation responded of each item towards Sample drugs.....	35
Table 7 Percentage, mean and Std. deviation responded of each item towards MSPB	36
Table 8 Correlation Matrix.....	38
Table 9 Collinearity Statistics.....	39
Table 10 Model Summary.....	40
Table 11 ANOVA.....	40
Table 12 Coefficients.....	42
Table 13 Summary of Hypothesis Result.....	43
Table 14 Normality Test	44
Table 15 linearity test.....	45
Table 16 Heteroscedasticity test	46

List of figure

Figure 1 Conceptual Framework.....	21
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Table of Contents

<i>Abstract</i>	I
List of tables	II
Table of Contents	III
CHAPTER ONE	1
INTRODUCTION	1
1.1. Back ground of the study	1
1.2. Statement of the problem	4
1.3. Research Questions	5
1.3.1. Main Questions	5
1.3.2. Sub Questions	5
1.4. Objectives of the Study	6
General Objective	6
Specific Objectives	6
1.5. Significance of the Study	6
1.6. Scope of the Study	7
1.7. Conceptual Definitions	7
1.8. Organization of the paper	8

Review of related literatures	9
2.1. Introduction.....	9
2.2. Theoretical Review.....	9
2.2.1. Concepts of Pharmaceutical Marketing.....	9
2.3. Empirical Review.....	13
2.3.1. Pharmaceutical Sales Representatives and Physicians prescribing behavior	13
2.3.2. Detailing by PSRs and Physician Prescribing Behavior	15
2.3.3. Promotional Gifts and Physician Prescribing Behavior	16
2.3.4. Sample Drugs and Physician Prescribing Behavior	18
2.3.5. Overall Influence of Promotion on Prescribing Behavior	19
2.4. Conceptual Framework	21
2.5. Hypothesis.....	21
RESEARCH METHODOLOGY.....	22
3.1. Introduction	22
3.2. Research Approach	22
3.3. Research Design.....	23
3.4. Population and sampling.....	24
3.5. Sample & Sampling Techniques	25

3.6.	Sources and Tools/Instruments of Data collection.....	25
3.7.	Procedure of Data Collection	26
3.8.	Data Analysis Techniques	26
3.9.	Reliability and validity	27
3.10.	Ethical Considerations.....	28
4.1.	Introduction.....	29
4.2.	Response Rate.....	29
4.3.	Descriptive analysis of the Study.....	29
4.3.1.	Respondent’s profile	29
4.3.2.	Pharmaceutical promotion efforts	30
4.3.3.	Medical Students Prescribing Behavior.....	36
4.4.	Correlation Analysis	37
4.5.	Multiple Regression Analysis	38
4.6.	Normality Test.....	44
4.7.	Linearity test	45
4.8.	Heteroscedasticity test.....	46
SUMMARY, CONCLUSION AND RECOMMENDATION.....		47
5.1.	Introduction.....	47
5.2.	Summary of Major Findings and Discussions	47

5.3. Conclusion	50
5.4. Recommendations	50
5.5. Limitation and direction for further research	51
References	52
Appendix I	I
Appendix II	VI

CHAPTER ONE

INTRODUCTION

The introductory part deals with background of the study, statement of the problem, research questions, objectives of the study, significance of the study, scope of the study, conceptual definition of terms and organization of the study.

1.1. Back ground of the study

World Health Organization (WHO) defines pharmaceutical promotion as “all information and persuasive activities by manufacturers and distributors, the effect of which is to induce the prescription, supply, purchase and/ or use of medicinal drugs (WHO, 1988). Drug promotion has a key role to stimulate prescription and sales of pharmaceuticals (Douglas, et al., 2007). It has also an important impact on the rational use of pharmaceuticals, drug price-control mechanisms, the manufacture, availability and use of essential drugs, equity of drug distribution and the cost of health care system. It thus becomes a public health concern (Birhanu, et al., 2016).

Companies ranging from large multinational corporations to small retailers increasingly rely on promotion to help them market products and services (Austad & kristen, 2011). There is an increase in promotional expenditure in global marketplace year to year (Geoffrey, et al., 2015). The growth in promotional expenditures also reflects the fact that marketers around the world recognize the value and importance of promotion (Belch & Belch, 2003).

Pharmaceutical manufacturers spend vast sums of money on promotion, including sales representatives, samples, advertisements in broadcast and print media, and sponsorship of educational events and conferences (Geoffrey, et al., 2015). In 2000 and 2002 almost US\$15.7 billion and US\$21 billion respectively was spent on promotion in US alone (Zaki, 2014).

Promotional strategy is very important in marketing programs of companies as they try to communicate and sell their products (Othman, et al., 2009). Promotional mix has included major elements like advertising, sales promotion, publicity, public relations, personal selling, direct marketing, and interactive media that modern-day marketers use to communicate with their target market (Belch & Belch, 2003). Among these major promotional mix elements personal selling is a critical component of pharmaceutical marketing that is why pharmaceutical companies have engaged in extensive personal selling (Limu & Mark, 2010).

According to the regulation, pharmaceutical companies are prohibited from promotional efforts directed to general public, especially for prescribed medicine. Companies are only allowed personal selling effort by certified pharmaceutical company representatives (PCRs) only to health professionals (FMHACA, 2012). In Ethiopia, DTCA is not allowed and personal selling is the only means of promotion for pharmaceutical products (Degaga, 2015). Hence pharmaceutical companies in Ethiopia should give appropriate care when communicating their target customer.

Edwards & Ballantyne (2009) stated, in pharmaceutical industry, the patient is end customer and the doctor is direct customer, especially for those pharmaceutical companies which sell prescribed medicines. Pharmaceutical companies typically direct their marketing efforts toward physicians (Manchanda & Honka, 2005). Some literatures identified that, the marketing efforts towards practicing physician and trainee physician include: pharmaceutical sales representatives (PSRs) communicate pharmaceutical and marketing information to physicians (detailing)), Provision of drugs at no cost (sampling), Provision of different kinds of gifts, and etc. (Limu & Mark, 2010; Zaki, 2014).

These pharmaceutical companies promote their drugs through medical representatives (MRs) by using different promotional materials like drug

samples, gifts (pens, notepad and coffee mugs) (Austad, 2011; Brandtonies, 2010; Douglas, 2007; ShahuIngole, et al., 2011; Siddiqui, et al., 2014) and these could extend from financial support of companies for medical education to providing of detailed information and educational material that helps them to increase acceptability of their product (ShahuIngole, et al., 2011). These promotional activities affect the attitudes towards the drug company and its medical products (Zaki, 2014).

Pharmaceutical companies are making an effect on the decision maker either directly or indirectly (Geoffrey, et al., 2015). Promotion of prescription drug in Ethiopia is still at its infancy stage though the practice has been started long time ago (Bizuyeyhu, 2016). The reason is that the numbers of stakeholders specially the pharmaceutical companies who are active in promotion of prescription drugs are very few. In recent times, due to increased competition between the multinational companies, the practice is getting an attention from both regulatory bodies and manufacturers (Birhanu, et al., 2016).

In Ethiopia, number of sales representatives and promotional activities are growing from day to day, but ethical guidelines regarding promotion are little (Degaga, 2015). It is believed that the activity of pharmaceutical companies affects physicians' behavior. The influence can be expressed either by prescribing the drug or making an inclusion in hospital formularies or treatment guides (Bizuyeyhu, 2016). For these case, pharmaceutical promotion's impact on prescribing decision is a vital issue to research.

It is important to assess the behavior of practicing and trainee physician towards promotion implying to them, because if we want to alter the way people act, we need to change their hearts and minds (McKinney, et al., 1990). In this context the act needed is prescribing company's product by physician based on information from PSRs (detailing), sample drugs, and other promotional activities.

This survey attempt to assess the effect of promotion on medical students' prescribing behavior in YEKATIT 12 Hospital Medical College (Y12HMC). It is important to study doctors in training because this is where their behavior are formed (Norris, et al., 2005).

1.2. Statement of the problem

These days the pharmaceutical industry is spending a lot of money on promotion as compared to the money budgeted for Research and Development. It mainly affects prescribing behavior of doctors intern associated with change of attitude and preference of source of information. This broad cost for promotion is a potential threat for the negligence of Research and Development projects which have an important impact on the development of new, innovative and lifesaving medicines (Bizuayehu, 2016). And also concerns have been raised about the influence that pharmaceutical companies may have over the decision making of medical students (Douglas, 2007;Austad, 2011;Sarikaya, 2009) and the effect it could have on their future prescribing practice and character by getting them accustomed to receiving gifts and cultivating positive attitudes and a feeling of obligation towards pharmaceutical companies (Douglas, et al., 2007).

Many researches are attempted to assess the effect of pharmaceutical product promotion on physicians prescribing behavior in a wide world (Austad, 2011; Hodges, 1995; Hopper, et al., 1997; Janakiraman, et al., 2008; Lexchin, 1993; Machanda & Honka, 2005; Karayanni, 2010). However, in the best knowledge of the investigator, in Ethiopia there are only two resarches, these are assessemnt of prescription drug promotion effect on physician prescribing behavior practice (Bizuayehu, 2016) and infulence of meidcal representaives on prescrbing practice (Birhanu, et al., 2016), but there is no hardly any attempt being made to assess the effect of promotion on medical studnets prescribing behavior in Ethiopia.

For pharmaceutical marketers it is important to know what holds in the hearts and minds of both practicing and trainees doctors towards their promotional efforts to act accordingly. This is because physicians are actually the ultimate decision holder of which brand should be prescribed to their patients. Knowing the prescribing decision of these practicing and trainees physicians towards the promoted drugs would improve the pharmaceutical companies' to better allocate marketing expenditures, depending on whether their medicine is an established brand or a generic product and make marketing efforts more cost efficient and effective.

Therefore, this study attempts to assess the effect of promotion on medical students' prescribing behavior, which is made by pharmaceutical companies in Ethiopia.

1.3. Research Questions

1.3.1. Main Questions

- How does the pharmaceutical promotion effort influence the medical students' prescribing behavior?

1.3.2. Sub Questions

- Does PSRs affect medical students' prescribing behavior?
- Does detailing by PSRs affect medical students' prescribing behavior?
- Does gift from pharmaceutical companies affect medical students' prescribing behavior?
- Does sample drug from pharmaceutical companies affect medical students' prescribing behavior?

1.4. Objectives of the Study

General Objective

To assess the effect of promotion on medical students' prescribing behavior in Yekatit 12 Medical and Health Science College.

Specific Objectives

To examine the effect of PSRs on medical students' prescribing behavior?

To examine the effect of detailing by PSRs on medical students' prescribing behavior?

To examine the effect of gifts by pharmaceutical companies on medical students' prescribing behavior?

To examine the effect of sample drug from pharmaceutical companies on medical students' prescribing behavior?

1.5. Significance of the Study

This study will help managers of pharmaceutical companies to know if the techniques and tools used in promotion are effective and efficient or if there is a need for different approach. Why it is important to study doctors in training is because during this time behavior are formed and students' responses to this survey will present an interesting snapshot of how future physicians in Ethiopia view the promotional effort by pharmaceutical industry. The study will contribute to the regulatory authorities that will help them to understand the current practice and give direction if there is an acceptable ethical practice. The findings of this study also will give a clue to conduct further investigation in the area and evaluate the ethical practices of prescription drug promotion.

1.6. Scope of the Study

The study focused on the prescribing behavior of graduate medical students toward promotion by pharmaceutical companies in YEKATIT 12 hospital medical college during the school year 2017. It is directed towards examining the influence of promotional efforts, i.e PSRs, detailing, gifts and sample drug, on medical students prescribing behavior due to large amount of money invested by pharmaceutical companies for promotion.

1.7. Conceptual Definitions

Prescribe: To order a medicine or other treatment (Pharma Marketing Network, 2016).

Medical representative: Is a professional who is represented by drug manufacturer to generate prescriptions by promoting medicines (Pharma Marketing Network, 2016).

Detailing: Detailing refers to the activity of pharmaceutical sales representatives, providing "details" of approved scientific information, benefits, side effects, or adverse events, related to a drug (Pharma Marketing Network, 2016).

Sample drug: A unit of a drug, which is not intended to be sold and is intended to promote the sale of the drug. (Pharma Marketing Network, 2016).

Gifts: A gift is understood to mean: A sum of money, or any physical object, or the possibility to participate for free in events which are open to the public or are private in nature. (EMA, 2013).

1.8. Organization of the paper

The study was organized in to five chapters. Chapter one deals with background of the study, definition of key terms, and statement of the problem, research questions, objectives, significance, scope and limitation of the study. The second chapter was devoted to review of related literature. The third chapter was concerned with research design, sampling technique, source of data, instrument and procedures of data collection, methods of data analysis and ethical considerations. The fourth chapter focused on demographic variables of the respondents, data analysis and interpretation. The final fifth chapter consists of summary of major findings, conclusions and recommendations.

CHAPTER TWO

Review of related literatures

2.1. Introduction

This chapter presents the review of existing literatures in the area of the effect of pharmaceutical promotion on prescribing behavior in order to acquaint readers with better understanding of the subject matter. Which incorporates the theoretical review, empirical review and, the chapter also presents the conceptual framework and hypothesis of the study.

2.2. Theoretical Review

2.2.1. Concepts of Pharmaceutical Marketing

Bates, et al. (2002) states pharmaceutical marketing as a synergistic integrated activity. Activities work in tandem with each other to drive prescribing behaviors. Vasiljev and Pantelic (2010) also present that based on specific nature of its products and in the complex interests of the main constituents of market demand the pharmaceutical market represents one of the most dynamic and controversial markets. And they recommend the understanding of marketing theory and best practice logic and comparing it with on-going everyday practice to improve marketing practice in the pharmaceutical sector.

Marketing of pharmaceutical product is a unique and fascinating discipline, spiced with continuous interaction with target audience, and most of the communication taking place on a one to one basis (Ahmed & Sattar, 2014), which is the most successful strategy of the many approaches of marketing (Belch & Belch, 2003). This on one hand helps out any noises or interferences, which happens when different channels are involved in the communication process: but on the other hand it poses a challenge to markets of being effective during the few minutes they get from the doctors (Ahmed & Sattar, 2014).

Pharmaceutical companies are using various kind of promotional approach to sell their products that is in-line with their marketing strategy (Edward & Fox, 2010). Traditionally, marketing strategies have been built around the four Ps; i.e., the kind of Product the company is offering, the Price the company is charging for the product, a Place that the product will be distributed and more accessible to consumers, and Promotion of the product to communicate the feature and benefits of the product to the consumers (Belch & Belch, 2003). But, in the pharmaceutical industry two more Ps are relevant for the business; these are the Political relationship with the organization responsible for the payment and the Patients who have increasing economic input to their health and access to information (Edward & Fox, 2010).

There is no winning formula for pharmaceutical promotion. All one can do is to understand the purpose of each tool, and then try to create a mix which works well under the given scenario (Ahmed, et al., 2014). In clinic promotional mix includes detail aid; leave behind material, samples, gift/giveaways, and direct mailers. Out of clinic promotional mix includes clinical trials/studies, seminars/symposia/round table discussion sponsorships film shows advertisements, public relations, free medical camps, corporate marketing, hospital/ward improvement programs, E-marketing (Ahmed & Sattar, 2014).

Pharmaceutical marketing professionals are fast becoming aware of the latest development in discipline marketing, and they have also started to adopt latest theories in communication (Ahmed, et al., 2014).The model for marketing mix is made up of two streams of activities “the product chain” and “the prescription chain” (Wolpert, 2004).

The product chain starts with the selection of the molecules and passed through all the manufacturing process and finally the product is sent into the market, or commercialized. When a patient is suffered from an illness, he either

goes to a doctor in a hospital, or in his private clinic. At the hospital or clinic when a doctor prescribes a product, the patient may buy it from the hospital pharmacy or may choose to buy from a retailer outside the hospital's pharmacy (Vashishta, 2010). This is how the product chain completes, starting from the hospital, and ending in the patients hands.

The prescription chain starts with the information to the doctor by the company's sales team. The information is communicated through either in-clinic promotional activities, or out of clinic promotional efforts (Ahmed & Sattar, 2014). The doctor, if convinced, prescribes the product and the patient goes and buys the product, thus making the both product chain and prescription chain meet in the end, which was the basic marketing objective (Ahmed, et al., 2011).

The drug industry, the medical profession and the patient have a unique relationship. The industry makes products which it cannot sell to the patient (consumer) directly. On the other hand, the medical profession cannot treat the patient without drugs produced by the industry (ShahuIngole, et al., 2011). To stand-in these relationships, companies use different promotional techniques and approaches; for example, companies offer free meals, financial support for conferences, free drug samples and various items of both clinical and non-clinical relevance (Edwards & Ballantyne, 2009)

Many models attempt to determine the effects of pharmaceutical promotional efforts on the demand for pharmaceutical. Manchanda (2005) provided brief surveys by providing a significant body of emerging research that focuses on response model (i.e. quantifying the effect of a given instrument) and resource allocation (i.e. across all marketing instruments) models using data from the pharmaceutical industry. Many of these models are based on pooled data hence use a specific but very restricted model. These models are pooled over different brands which are in different stages of their product life cycle and pertain to different product categories (Peter, et al., 2010).

A well-known model was developed by Rizzo (1999) and modified by (Windmeijer et al.(2005). This Rizzo model is one of the first to empirically investigate the effects of marketing expenditures on price elastic of pharmaceutical demand, the outcomes indicate a persuasive effect of marketing efforts and are extensively cited in the marketing literatures (Narayana & Manchanda., 2009; Manchanda, 2005; Ahmed, et al., 2011)the effect had a substantial impact on public policy makers' opinions concerning the welfare effects of pharmaceutical promotion (Windmeijer, et al., 2005).

The marketing activities towards practicing physician and medical students comprise: Face to calls, where pharmaceutical sales representatives (PSRs) communicate pharmaceutical and marketing information to physicians (detailing) Limu, 2010, Provision of drugs at no cost (sampling) Zaki, 2014, Provision of different kinds of gifts, and etc.

The pharmaceutical marketing literature shows that physicians can be dynamic in their prescription behavior. Such dynamic behavior can arise from internal factors such as state dependence (Janakiraman, 2008 ; Manchanda, 2005)and learning (Narayana & Manchanda., 2009; Narayanan, et al., 2005) or from long term effect of marketing actions such as detailing and sampling (Janakiraman, et al., 2008; Manchanda, 2005; Narayanan, et al., 2005). By considering these research works an integrative nonhomogeneous HMM model was presented to dynamically target and allocate detailing and sampling across physicians. This model accounts for physician's heterogeneity and captures the dynamics in physicians' behavior and the long term effect of marketing activities (Montoya & Jedid, 2010).

The literature review done on researches on pharmaceutical promotion concludes, that, 'there is a wide range of evidence on different topics, using a range of different designs, suggesting that promotion affects attitudes and behavior (Austad & kristen, 2011). However there are gaps in the evidence and more high-quality studies are needed to establish causal relationships between

promotion and behavior of doctors and others (Norris, et al., 2005). Thus, the behavior object in this literature review and in this Survey is the effect of promotion efforts (PSRs, Detailing, Promotional Gifts, and Drug Samples) by pharmaceutical on medical students' prescribing behavior.

2.3. Empirical Review

As Manchanda & Honka (2005) reviewed many research works and point out that pharmaceutical companies directing all their marketing efforts towards doctors and Neeti Kasliwal (2013) also present Indian practice that pharmaceutical companies directing all their marketing efforts towards doctors to influence them to prescribe their products. The marketing effort is not only directed to practicing physicians but also directed to medical students even starting in early years of medical school (Sarikaya, 2009 ; Siddiqui, 2014).

2.3.1. Pharmaceutical Sales Representatives and Physicians prescribing behavior

Reviews of the research literature undertaken in 2000 and 2005 provide some evidence that drug promotion influences prescribing behavior. In 2000, Wazana identified eight studies linking pharmaceutical promotion to increased prescribing, "Non rational prescribing," and increased prescribing costs (Wazan, 2000). A 2005 review concluded that promotion influences the prescribing by physicians in training (Zipkin & Steinman, 2005), and a second review in the same year concluded that sales representatives influence prescribing (Manchanda & Honka, 2005).

One study in northwestern Pennsylvania suggest that physicians' attitudes were influenced by the information and educational support they received from PSRs, selling techniques used by PSRs to promote their products, and the volume of patients they saw (Andaleeb & Tallman, 1995). Another study pinpoint that Interactions with PSRs can increase prescriptions of the drug being promoted

and shift prescribing in ways that may not be consistent with evidence-based guidelines. The outcome will lead to the use of expensive treatments without therapeutic advantage over less costly alternatives (Eric, 2007).

In 1996 Caudill et al. surveyed physicians about their attitudes toward the educational value and behavioral influence of pharmaceutical sales representatives. Physicians agreed that sales representatives provided useful and accurate information about newly and already established drugs, but only slightly agreed that they performed an important teaching function and the physicians strongly agreed that sales representatives should be banned from making presentations where the physicians practice (Caudill, et al., 1996). The median overall attitude toward sales representatives was also reported as neutral in a study by Thomson et al. based on a survey of general practitioners in New Zealand (Thomson, et al., 1994).

A project on drug promotion that was carried out by WHO and HAI Europe which was surveyed by Hodges stated that, Most (71%) psychiatry trainees disagreed those sales representatives should be banned from making presentations in their training program (Hodges, 1995). Similarly, Andaleeb and Tallman's examination of physicians' relationships with sales representatives showed that although physicians viewed sales representatives as an important source of information, they thought they could also get the needed information from another source. The study found that physicians had friendly relationships with sales representatives and did not distrust them, but did not consider them a vital part of their practice. Selling methods were not viewed as manipulative, nor were sales representatives perceived negatively (Manchanda & Honka, 2005).

Other studies have documented more neutral physician attitudes to detailing and pharmaceutical sales representatives. Most directors of internal medicine residency programs (67%) felt that the benefits of sales representatives outweighed the negative effects (Lexchin, 1992). 81% of the medical students

were of the opinion that pharmaceutical companies should be allowed to interact with them at the college level (ShahuIngole, et al., 2011).

Another study examining the behavior of physicians trained in residency programs that limit contact with PSRs found that such policies shape subsequent decision making (Karayanni, 2010). Therefore, encouraging more rational prescribing among practicing physicians may require a better understanding of how medical students interact with the pharmaceutical industry (Austad & kristen, 2011).

2.3.2.Detailing by PSRs and Physician Prescribing Behavior

Poirier et al. surveyed physicians on their attitudes toward pharmaceutical marketing practices. They found that only 24% of the physicians were satisfied with detailing and 48% were dissatisfied. These skeptical attitudes were confirmed by the finding that only 20% of the physicians believed in the accuracy and objectivity of presented information, while 44% did not (Poirier, et al., 1994). Similarly, McKinney et al. examined physicians' attitudes toward detailing and its potential for ethical compromise. They found that physicians had somewhat negative attitudes toward the educational and informational value of detailing activities, but also acknowledged sales representatives' support for conferences and speakers (McKinney, et al., 1990).

Hopper et al. collected information on the effects of an educational intervention aimed at training physicians in interactions with sales representatives. They surveyed residents and faculty before and after the intervention. Before the intervention, physicians slightly agreed that contact with detailers was not beneficial, but strongly disagreed that it might influence their prescribing in negative ways. Participating residents more strongly believed than nonintervention residents that sales representatives may use unethical marketing practices and that interaction with detailers is likely to influence the prescribing of other physicians in negative ways (Hopper, et al., 1997). 92% of the

Canadian doctors surveyed by Strang et al. felt that sales representatives had product promotion as their major goal, and 80% felt they over emphasized medicines' effectiveness.

In a New Zealand study, Thomson et al. found that 58 out of a sample of 67 doctors saw sales representatives and 56 of them gave a reason related to learning about new or existing products. In this study most of New Zealand doctors felt that sales representatives are a good source of information about drugs and recognize practitioners' information needs, but is over-biased towards their own products (Thomson, et al., 1994).

A study done on medical students attitude towards detailing in a distinctive hospital St. Pawlos stated that, 66% of the respondents rated the benefit of detailing for the physician and 58% rated the benefit of detailing for the patient (Degaga, 2015). Similarly, a study by Mikhael et al (2014) report that, physicians believe, medical representatives provide physicians with good information about drug indication and a weak information about drug contraindications and side effects. Alssageer and Kowalski (2012) concluded that Doctors believe that the provision of drug information by PCR's in Libya is incomplete and often exaggerated. Pharmaceutical companies should ensure that their representatives are trained to a standard to provide reliable information regarding the products they promote. From this also it can be concluded that different attitudes are hold by both trainees and practicing physicians in this regard.

2.3.3.Promotional Gifts and Physician Prescribing Behavior

Considerable controversy has been generated regarding the appropriateness of physician acceptance of gifts from the pharmaceutical industry (Robert, et al., 2011). The concern for drug company-physician relationship and its negative influence on prescription writing, has led numerous professional organizations, such as the American Medical Association (AMA) and the American Medical

Student Association (AMSA), to develop guidelines and recommendations. AMSA recommendations discourage physicians and students from accepting gifts from drug companies, urge hospitals and residency programs to discontinue drug company-funded lectures and lunches, and oppose continuing medical education (CME) granted credit for drug company-sponsored events (Siddiqui, et al., 2014) .

The Pharmaceutical Manufacturer Association has included the same guidelines in its Ethics Code of Marketing Practices. The presence of guidelines from professional organizations, however, has not stilled the controversy (Robert et al, 2011). In this regard, AMSA initiated its Pharm Free campaign in 2002 and released a policy statement regarding best practice aimed for the benefit of both practicing and training physicians (Siddiqui, et al., 2014).

First contact to pharmaceutical industry occurs early in medical education. Frequency of exposure to pharmaceutical promotion increases with each additional academic year. Accepting small gifts, free meals and educational material sponsored by the pharmaceutical industry is considered to be normal, appropriate and ethically Unobjectionable by most students (Austad & kristen, 2011).

One study found that 85% of medical students believe it is improper for physicians to accept a gift, whereas only 46% found it improper for themselves to accept a gift of similar value from a pharmaceutical company (Koch, 2013).some research indicated that doctors/pharmacists who receive gifts are more positive towards the company and more likely to prescribe/dispense the company's products (Zaki, 2014).

67% of the faculty and 77% of the residents in the McKinney et al. study indicated that they believed that physicians could be compromised by accepting gifts from sales representatives. Specifically, the authors found that 50% of the faculty and 42% of the residents perceived gifts of \$100 or more to be likely to

compromise a physician's judgment (Mikhael, 2014). In a study that questioned residents and directors in emergency medicine found that 74% of the residents who responded to the survey believed that representatives sometimes cross ethical boundaries by giving gifts to physicians (Manchanda & Honka, 2005).

Strong evidence suggests that medical students are at-risk of being influenced by pharmaceutical company marketing strategies in the form of free gifts. Students who receive gifts may believe that they are receiving something for nothing, contributing to a sense of entitlement which is not in the best interests of their moral development as future doctors (Eric, et al., 2007). Alternatively, students may be subject to recognized or unrecognized reciprocal obligations that potentially influence their decision making (Austad & kristen, 2011). A randomized controlled experiment validated that subtle exposure to even small pharmaceutical promotional items influences implicit attitudes towards marketed products among medical students (Siddiqui, et al., 2014).

The studies available suggest that there is a range of views about gifts but a tendency for gifts that were smaller or more relevant to helping patients to be regarded as more acceptable. There is evidence that professionals believe that their acceptance of gifts goes below community standards and their own standards for other people in positions of responsibility.

2.3.4. Sample Drugs and Physician Prescribing Behavior

Many physicians view free samples positively and stock them to provide to patients who would otherwise have to pay for medicines and cannot afford them. A key reason that many physicians see sales representatives is to obtain free samples (Norris, et al., 2005). Providing free drug samples were considered to be the single most important service provided by PSRs; 65% of physicians thought it was very important. Almost all of those who would give a sample (97%) said avoiding cost to the patient was an important or very important reason for their choice (Geoffrey , 2015).

The effect of promotional materials on physicians' prescription behavior was assessed by asking about the materials that they think to influence prescription choice, 47.4% of them reported that free medical samples have brand reminder effect and influence prescription choice (Birhanu, et al., 2016).

Samples appear to influence prescribing, but more research is needed on this issue (Norris, et al., 2005). In Morelli and Koenigsberg's study¹²² samples which were dispensed as new medication for chronic problems were accompanied by a prescription for the same brand 48% of the time. This finding is hard to interpret, but it may suggest that the availability of a sample influences the choice of brand prescribed (Morelli & Koenigsberg, 1992). This area needs further investigation.

2.3.5. Overall Influence of Promotion on Prescribing Behavior

Some physicians see pharmaceutical promotion as a useful and convenient source of information. Others deny that they are influenced by pharmaceutical company promotion but claim that it influences other physicians (Edward & Fox, 2010; Steinman & shlipak, 2001). Because of the fears that pharmaceutical promotion might encourage physicians to prescribe inappropriate or needlessly expensive drug, many professional organizations have called for tighter control of promotional activities (Geoffrey, 2015).

Some researches shows that doctors who report relying more on commercial information, prescribe more heavily, less rationally, and adopt new medicines more quickly (Geoffrey, et al., 2015). Some researchers have interpreted this finding as showing that 'relying on pharmaceutical company information increases prescribing' (Edwards & Ballantyne, 2009). This interpretation is not justified by evidence from these studies. The studies cannot show whether doctors would prescribe differently if their level of reliance on promotion were to change. Some doctors may have characteristics (such as attitudes, skills) that

lead to both reliance on promotion, and heavy or irrational prescribing (Lexchin, 1993).

Qualitative studies suggest that there is a wide range of views amongst health professionals about pharmaceutical promotion, many perceive pharmaceutical promotion to be a useful and convenient source of information (Prosser & Walley, 2003). Many of these physicians are willing to give significant amounts of time to engaging in promotional activities (Blumenthal, 2004). By contrast, several professional organizations have called for more control of promotional activities (Rothman, 2009) because of evidence that promotion may be misleading (Othman, 2009).

A study done in 1981, approximately a year after temazepam was introduced in Australia (Peay & Peay, 1988). They found that Doctors who had seen a sales representative reported earlier awareness of temazepam, prescribed it earlier, rated it earlier as a moderate rather than minor advance over other drugs in preference to other alternative (Peay & Peay, 1988). This study showed a relationship between seeing sales representatives and prescribing one new drug.

Physicians are affected by their interactions with the pharmaceutical industry (Lexchin, 1993). Further research needs to be done in most cases to determine whether such interactions lead to more or less appropriate prescribing practices.

2.4. Conceptual Framework

The conceptual framework of this research shows the various variables under study. The predictor variable is promotional efforts by pharmaceutical company while the dependent variable is medical students' prescribing behavior. The independent variables are PSRs, Detailing, Gifts and Sample drugs.

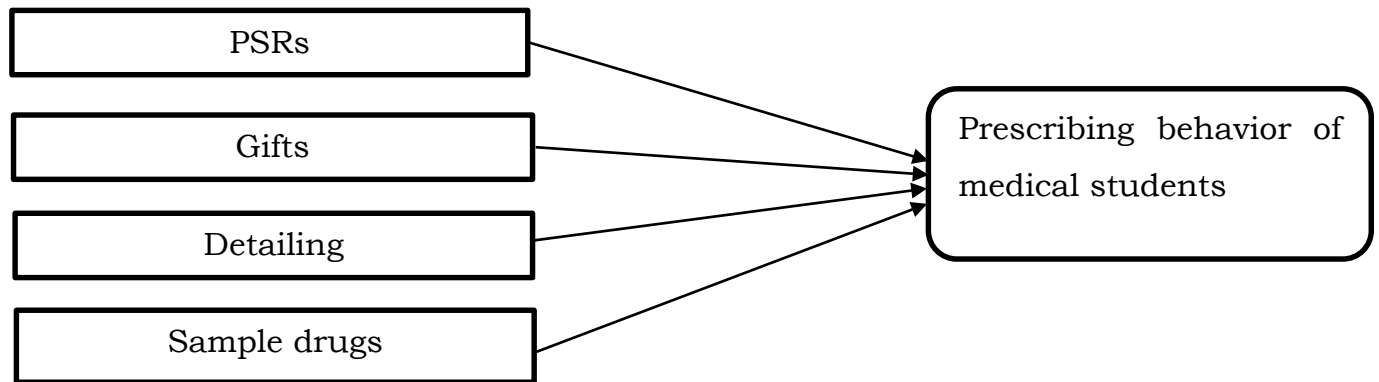


Figure 1 Conceptual Framework

Source: own illustration, 2017

2.5. Hypothesis

By reviewing related literatures the following hypothesis are formulated

Ha1: PSRs have direct and significant effect on medical students prescribing behavior.

Ha2: Gifts from pharmaceutical companies have direct and significant effect on medical students prescribing behavior.

Ha3: Detailing by PSRs have direct and significant effect on medical students prescribing behavior.

Ha4: Drug samples by pharmaceutical companies have direct and significant effect on medical students prescribing behavior.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

In this section of thesis, the selection of suitable research approach, research design, population and sampling, sample and sampling technique, source, tools and procedures of data collection, data analysis techniques, reliability and validity and ethical consideration will be discussed that enable the study to further investigate hypothesis.

3.2. Research Approach

Research approach indicates what type of research you are undertaking and how it is designed. There are three main research approaches (Cresswell, 2003). These are

A quantitative approach is one in which the investigator primarily uses post positivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data (Cresswell, 2003).

A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e., the multiple meanings of individual experiences, meanings socially and historically constructed. with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e., political, issue-oriented, collaborative. or change oriented) or both (Cresswell, 2003).

A mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information (Cresswell, 2003).

Quantitative approach was followed because it allows the study to examine the effect of promotion on medical students prescribing behavior and also the study aims at collecting and converting data into numerical form so that statistical calculations can be made and conclusions drawn.

3.3. Research Design

Research designs are plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Cresswell, 2003).

According to (Saunders, et al., 2012) there are three types of research designs; exploratory, descriptive and explanatory. Selection of one design is determined by the type of research and its purpose. The most common of them is descriptive research that combines descriptive with subject investigation (Nardi, 2003). As the name implies, descriptive designs are useful when describing certain situation such as persons or event (Saunders, et al., 2012). According to Nardi, exploratory is applied when researchers wish to develop an understanding of subject that has not received yet enough attention (Nardi, 2003) and the researcher aims to gain a deeper understanding of a subject by examining an open questions (Saunders, et al., 2012). In explanatory research design, the study emphasize the practice of determining casual relationships between constructs (Saunders, et al., 2012).

The study is mainly an explanatory research since it tries to examine the effect of promotion, i.e. PSRs, Detailing, Promotional gifts and sample drugs on medical students prescribing behavior. The study used a cross-sectional survey research, in order to get quantitative description of medical students' prescribing behavior. The study used both undergraduate (only internships) and Postgraduate doctors (Residence) in Yekatit 12 Hospital Medical College as a unit of observation.

3.4. Population and sampling

Population can be defined as all people or items (unit of analysis) with the characteristics that one wishes to study. The unit of analysis may be a person, group, organization, country, object, or any other entity that you wish to draw scientific inferences about (Bhattacharjee, 2012). The study population constituted medical students graduates of Yekatit 12 hospital.

There are four strategies to decide the sample size; census for small population, imitating the sample size of similar studies, applying formulas to calculate the sample size, and using published tables (Anol, 2012), the first strategy is appropriate for a population of 200 or less. It allows collecting data from all subjects, thus eliminating sampling error that occurs because only part of the population is directly contacted. This strategy, however, is impossible when conducting research on a larger population and when cost is a factor. The second strategy, imitating the sample size of similar studies, saves time but has a major drawback of repeating errors that were made in determining the sample size in previous studies. The third strategy allows the researcher to achieve the necessary sample size for a different combination of levels of precision, confidence, and variability of a particular study. The fourth strategy is simply using published tables (Marczyk, et al., 2005)

This study used the first strategy and the target population included all interns and residents practicing on the hospital. Students who are not actively

prescribing at the time of the survey are not included as part of the study subjects. Y12HMC was selected because of its admission procedure which is different from other public medical schools where Ministry of Education assigned students for them. Y12HMC based on its own criteria tries to balance the number of students admitted from each regional state of the country, in a way that promotes both gender equality and representation of less developed regions of the country. In addition, students from Addis Ababa University (Public), St.Pawlos Medical and Health Science College and Hayat Medical College (private) are assigned in the hospital for practical attachment.

3.5. Sample & Sampling Techniques

To collect primary data for this study all internship in 2017 class year and all residences in Y12HMC and willing to participate in this study was requested to respond to the questionnaire i.e. census was performed. This is because the total number of the targeted population is 190 according to the information gathered from each department.

According to the regulation (FMHACA), pharmaceutical sales representatives' promotion efforts are targeted to physicians who are prescribing medicines to the patients whether practicing or trainees' physicians in the hospital.

3.6. Sources and Tools/Instruments of Data collection

The research used primary data. The primary source for this study was questionnaires. Survey questionnaire was used those adopted from previous research works. The questions have 6 parts that contain a total of 32 items. Part I present questions about demographic characteristics of the respondents 4 items. Part II present questions towards Pharmaceutical Sales Representatives (PSRs) consists of 7 items in 5 point Likert-scale (1 Strongly disagree to 5 Strongly agree) adopted from McKinney (1990) in order to determine physicians' attitudes and behaviors towards the drug industry and was re-adapted by

Randall et al. (2005). Part III present items measuring gifts 8 items in 5 point Likert-scale (1 Strongly disagree to 5 Strongly agree) adopted from Siddiqui et al. (2014) which ask the exposure of medical students to gifts by receiving/participating on events with appropriateness rating. Part IV consists 5 items in 5 point Likert-scale (1 strongly disagree to 5 strongly agree) to measure toward detailing by PSRs that adopted from Mikhael. (2014). Part V consists 5 items in 5 point Likert scale (1 strongly disagree to 5 strongly agree) to measure sample drug adopted from ShahuIngole et al (2011). Final part consists of 4 items in 5 point Likert scale (1 strongly disagree to 5 strongly agree) to measure the effect of promotional activities on medical students prescribing behavior as adapted from Birhanue (2016). The research employed the questionnaires for respondent in order to get fertile information for the study.

3.7. Procedure of Data Collection

Self-administered survey questionnaires was distributed in the third and fourth weeks of the month of April 2017 for all internship from undergraduate students and all postgraduate students that had an attachment in the Y12HMC. This was done after getting the consent from both department heads and the students.

3.8. Data Analysis Techniques

The data from the survey was entered and all analyses was performed with the Statistical Package for the Social Sciences (SPSS version 21). Descriptive analysis was used to organize and summarize the demographic data of the respondents which include age, gender, educational level, University/college students studied, and the responses of items of the questionnaires. Correlation analysis was used to assess the strength of the association between the dependent variable and independent variables. On the other hand, multiple regression analysis was used to measure the effect of promotional efforts by pharmaceutical company as measured by PSRs, Gifts, Detailing and Sample

drug on medical students' prescribing behavior. That is, the attributes of pharmaceutical promotion were the independent variables while medical student' prescribing behavior was the dependent variable.

3.9. Reliability and validity

The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability. If the results can be reproduced under a similar methodology then the instrument is reliable (Cresswell, 2003). The reliability of questioners are tested using Cronbach's Alpha, if the Cronbach's alpha coefficient is greater than 0.9 it implies excellent, greater than 0.8 good, greater than 0.7 is acceptable, greater than 0.6 is questionable, greater than 0.5 is poor, and less than 0.5 is unacceptable (Anol, 2012).

After coding and entry of data into SPSS version 21, the first analysis conducted was to check the reliabilities of the scales used in the data collection instrument. The reliability of questioners was tested on 30 respondents. All of the scales used for this study are found to be reliable as their respective alpha values are higher than 0.7 which is acceptable according to Anol, 2012. The Cronbach's - alpha of each scale is presented in the following table.

Table 1 Reliability Test

Measurement scale	Cronbach's Alpha	N of Items
PSRs	0.763	7
Gifts	0.801	8
Detailing	0.740	4
Sample drug	0.728	5
Cumulative	0.758	24
Prescribing Behavior	0.793	4

Source: Survey Result, 2017

Validity determines whether the measuring instrument truly measures what it was intended to measure or how truthful the research results are. To measure the validity of results, we consider the theory and the measuring instrument used. Validity can be measured by factor Analysis. In order to check and establish the validity and to increase the accuracy of a research (Guion, 2002).

To assure validity in this research, the questionnaires are designed on the basis of previous studies questionnaires. Sample of the survey instrument was given to two academicians in St.Marry and Unity University colleges for evaluation prior to the final admiration. From their responses, the content of the questionnaire is in alignment with the research objectives.

3.10. Ethical Considerations

Data collection was started after official letter from Addis Ababa University, school of commerce department and ethical clearance from Y12HMC Institutional Review Board (IRB) obtained after reviewing the proposal. Also permission was granted from the respective departments of the hospital. The data collector gave a verbal explanation to each participant on the nature of the study, its purpose and the procedures involved. Participants will be guaranteed confidentiality of the information and right to refuse participation or quit participation at any time during their involvement in the study. No benefit were provided to participate in the study.

Chapter Four

Data Presentation and Analysis

4.1. Introduction

In this chapter, the data collected through survey were analyzed using statistical tool of SPSS Version 21. First, the survey response rate are discussed followed by discussion on the respondent's profile, pharmaceutical promotion and prescribing behavior using descriptive statistical tools. Finally, the results of correlation analysis, multiple regression analysis, normality, linearity and heteroscedasticity test are presented.

4.2. Response Rate

Out of the 190 questionnaires administered to students, a total of 179 questionnaires were collected, of which 15 were incomplete. Thus, 164 questionnaires were found to be usable and ready for analysis, which is 86.3 % response rate.

4.3. Descriptive analysis of the Study

4.3.1. Respondent's profile

The study focused on graduate medical students those start prescribing medicines to patients in the setting of Yekatit12 Hospital. For the analysis, the medical students were categorized with four demographic variables; gender, age, education level and University/College.

About 52.4% of the students were males and 47.6% were female. The total of the students categorized into four age groups, 23.8% were 20-25yrs, 51.2% were 26-30yrs, 19.5% were 31-35 years and 5.5% were 36-40 years of range. None of the respondents were found under 20 years age and above 41 years of age. The

internships take larger portion (64%) than the residents (36%).The majority (47.6%) was students of Y12MHC, and 23.2%, 15.9% and 13.4% were students of Addis Ababa University, St.Pawlos Medical and Health College and Hayat medical college respectively. The following table (Table 3) depict the descriptive data of the medical students based on the above demographic variables.

Table 2 General Demographic Information

Measure	Category	Frequency	Percentage %
Gender	Male	86	52.4
	Female	78	47.6
	Total	164	100.0
Age	20-25	39	23.8
	26-30	84	51.2
	31-35	32	19.5
	36-40	9	5.5
	Total	164	100
Educational Level	Internship	105	64.0
	Resident	59	36.0
	Total	164	100.0
University/College	Yekatit	78	47.6
	Addis Ababa	38	23.2
	Hayat	22	13.4
	St.Pawlos	26	15.9
	Total	164	100

Source: Survey Result, 2017

4.3.2. Pharmaceutical promotion efforts

4.3.2.1. Pharmaceutical sales representatives (PSRs)

Medical students' responses to items towards PSRs were reported as percentages of those surveyed who strongly agree, agree, neutral, disagree, and strongly disagree and mean of each items on table 4.

For the statement 'PSRs provide accurate and useful information about drugs' 60.4% of the respondents positively agree with the statement and 23.8% neutral and the remaining 15.9% negatively agree with the statement. Majority of the students positively agree with the statements: PSRs took over an important

educational role in my institution (64%), an educator that works in my institution should participate as an observer in all presentations made by PSRs (68.9%).

The mean value shows the average of all students' responses on each dimension, while standard deviation shows how diverse the responses of students are for a given construct (Hair, et al., 2004). For instance, high standard deviation shows that the data is wide spread meaning students gave variety of opinion and low standard deviation means students have close opinion.

Table 3 Percentage, mean and Std. deviation responded of each item towards PSRs.

Items	Strongly Agree	Agree	Neutral	Disagree	Absolutely Disagree	Mean	Std. Deviation
PSRs provide accurate and useful information about drugs.	15.9	44.5	23.8	11	4.9	3.58	1.041
PSRs took over an important educational role in my institution	39.0	25.0	13.4	15.9	6.7	3.75	1.305
PSRs use marketing techniques in their interactions with physicians.	18.9	25.6	25.0	20.7	9.8	3.23	1.251
I believe that PSRs, I met, are competent in their communication skills.	12.8	32.3	28.7	18.3	7.9	3.22	1.134
Presentations made by PSRs should be forbidden in my institution	9.8	31.7	19.5	27.4	11.6	2.99	1.206
An educator that works in my institution should participate as an observer in all presentations made by PSRs.	26.2	42.7	16.5	12.2	2.4	3.78	1.045
I would keep my relationship with PSRs on the same level, even without promotional activities, including social gatherings for dinner.	11.6	32.9	28.0	16.5	11.0	3.18	1.172
Average						3.39	1.164857

Source: Survey Result, 2017

The above table reveals the students average mean score towards PSRs i.e. 3.39, this shows that students have a good perception towards PSRs which falls above the cut point of 3.00 and also the variability of answers given by students is 1.16485714.

4.3.2.2. Gift items

Medical students' responses to items towards PSRs were reported as percentages of those surveyed who strongly agree, agree, neutral, disagree, and strongly disagree and mean of each items on table 5.

Majority of the students positively agree with the statements: Drug sample for patients are appropriate for physician to accept (73.2%), Medical textbooks from pharmaceutical companies are appropriate for physician to accept (71.3%), Medical pocket books from pharmaceutical companies are appropriate for physician to accept (65.9%), Paid for trip to an educational conference is appropriate for physician to accept (53.7%). But the majority of the students were neutral for the statement: Office supplies (pen, cup, notebook, etc.) from pharmaceutical companies are appropriate for physician to accept (31.2%).

As can be seen from the table below the average mean score is given as 3.33. Similar with PSRs it is above the neutral level and this indicates students' good perception towards gifts. The diversity of the responses given by students as indicated by the standard deviation is 1.161375.

Table 4 Percentage, mean and Std. deviation responded of each item towards Gifts.

Items	Strongly Agree	Agree	Neutral	Disagree	Absolutely Disagree	Mean	Std. Deviation
Drug sample for patients are appropriate for physician to accept	18.9	54.3	12.8	10.4	3.7	3.74	1.001
Drug sample for individual use is appropriate for physician to accept	14.0	28.0	22.0	25.0	11.0	3.12	1.238
Medical textbooks from pharmaceutical companies are appropriate for physician to accept	20.1	51.2	11.6	12.8	4.3	3.70	1.064
Medical pocket books from pharmaceutical companies are appropriate for physician to accept	22.6	43.3	13.4	14.6	6.1	3.60	1.164
Office supplies (pen, cup, notebook, etc.) from pharmaceutical companies are appropriate for physician to accept	7.9	24.4	34.1	23.2	10.4	2.96	1.102
Paid for trip to an educational conference is appropriate for physician to accept	15.9	37.8	18.9	15.9	11.6	3.30	1.245
Educational meeting with dinner or lunch is appropriate for physician to accept	13.4	27.4	22.6	23.2	13.4	3.05	1.26
Airline ticket to vacation spot is appropriate for physician	11.6	32.9	24.4	18.3	12.8	3.12	1.217
Average						3.33	1.161375

Source: Survey Result, 2017

4.3.2.3. Detailing by PSRs

Medical students' responses to items towards detailing were reported as percentages of those surveyed who strongly agree, agree, neutral, disagree, and strongly disagree and mean of each items on table 6.

Majority of the students positively agree with the statements: Medical representatives provide reliable and accurate information about drug indication (92.7%), drug side effects (85.3%), drug contraindication (86%), drug dosing and route of administration (90.2%).

Table 5 Percentage, mean and Std. deviation responded of each item towards Detailing.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation
Medical representatives provide reliable and accurate information about drug indication	38.4	54.3	6.1	1.2	0.0	4.3	0.638
Medical representatives provide reliable and accurate information about drug side effects	32.3	53.0	8.5	4.9	1.2	4.1	0.841
Medical representatives provide reliable and accurate information about drug contraindication	35.4	50.6	12.8	.6	.6	4.18	0.725
Medical representatives provide reliable and accurate information about drug dosing and route of administration	32.9	57.3	7.3	2.4	0.0	4.18	0.678
Average						4.19	0.7205

Source: Survey Result, 2017

As can be seen from the above table, detailing has the highest mean score as compared with other promotional efforts i.e. 4.19. This shows that students receive reliable and accurate drug information from pharmaceutical companies and also the diversity of response given by students is also small as compared with other promotional efforts i.e. 0.7205 which indicates their close opinion.

4.3.2.4. Sample drugs from pharmaceutical companies

Majority of the students positively agree with the statements: Drug samples permit quicker of therapy (50.6%), Drug samples fulfill an educational role through demonstration (56.1%), free medical samples has a brand reminder effect (70.1%).

Table 6 Percentage, mean and Std. deviation responded of each item towards Sample drugs.

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Std. Deviation
Drug samples permit quicker of therapy	16.5	34.1	18.9	22.0	8.5	3.20	1.221
Drug samples fulfill an educational role through demonstration	12.8	43.3	21.3	18.3	4.3	3.38	1.062
Drug samples are a source of medication for patients who cannot afford them	17.1	27.4	25.6	22.0	7.9	3.18	1.203
Drug samples serve to check the effectiveness of the medicine	14.6	32.3	23.2	20.7	9.1	3.20	1.2
Free medical samples has a brand reminder effect	17.7	52.4	17.7	9.8	2.4	3.71	100.0
Average						3.33	1.1266

Source: Survey Result, 2017

As can be seen from the above table students also shows similar mean point (3.33) with PSRs and gifts. This also indicates that students' perception towards sample drugs is in a good level. The diversity of the responses given by students as indicated by the standard deviation is 1.1266.

4.3.3. Medical Students Prescribing Behavior

Majority of the students positively agree with the statements: PSRs promotional activities influence my prescribing practice (55.5%), Information from medical representatives influence physicians' on medication choice (61.6%), Availability of free medical samples encourage prescribing the drug (54.9%) but the majority of the students negatively agree with the statement: Availability of promotional aids (gifts) does not affect prescription decision (39.6%)

Table 7 Percentage, mean and Std. deviation responded of each item towards MSPB.

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Std. deviation
PSRs promotional activities influence my prescribing practice	17.1	38.4	14.6	12.8	17.1	3.24	1.350
Availability of promotional aids (gifts) does not affect prescription decision	10.4	23.8	26.2	21.3	18.3	3.13	1.261
Information from medical representatives influence physicians' on medication choice	18.3	43.3	21.3	15.9	1.2	3.62	0.999
Availability of free medical samples encourage prescribing the drug	13.4	41.5	21.3	20.1	3.7	3.41	1.067
Average						3.35	1.16925

Source: Survey Result, 2017

As can be seen from the table 8, students have shown their prescribing decision with average Mean = 3.35 and SD = 1.16925. This shows that the mean falls above the cut point 3.00. This means students perception towards promotional efforts exhibit good prescribing behavior. The highest mean score given to the statement, Information from medical representatives influence physicians' on medication choice (3.62) these shows that students have high level of perception to be influenced with their prescription choice. The statement, 'availability of promotional aids (gifts) does not affect prescription decision', is given the lowest

mean score from all the indication of prescribing decision i.e. 3.13. This shows a little above the cut point 3 and indicates that students have slightly above neutral perception towards gifts to induce their prescribing decision. (Reverse coding has been given to this statement i.e. 1 strongly agree and 5 strongly disagree)

4.4. Correlation Analysis

The correlation matrix with the dependent and independent variables allows assessing the strength of the association between the variables of interest i.e. it allows to test the hypotheses. The level of association as measured by Pearson's correlation coefficient (r) falls between -1.0 and +1.0, which indicates the strength and direction of association between the two variables (Saunders, et al., 2012). If the correlation result of two variables lies between -1 and 0, the two variables are negatively related, if the correlation result lies between 0 and 1, they are positively related, and if the correlation is 0, this means that there is no relation between the two variables. When $r=+1$, it implies that there is a perfect direct relationship between the variables, when $r=-1$, it implies that there is a perfect negative/inverse relationship between the variables, when r is in between 0.10-0.29, it implies that the variables have weak relationships, when the value of r is in between 0.3-0.49, it implies that the variables have moderate relationship, and when the value of r becomes greater or equal to 0.5, it indicates that the relationship is strong. Correlation is significant at the level 0.01 (1-tailed). The correlation matrix for the overall sample is provided in the table below.

Table 8 Correlation Matrix

Correlations		PSRs	Gifts	Detailing	Sample drugs	MSPB
PSRs	Pearson Correlation	1	.519**	.273**	.219**	.400**
Gifts	Pearson Correlation	.519**	1	.123	.199*	.321**
Detailing	Pearson Correlation	.273**	.123	1	.423**	.545**
Sample drug	Pearson Correlation	.219**	.199*	.423**	1	.565**
MSPB	Pearson Correlation	.400**	.321**	.545**	.565**	1

Source: Survey Result, 2017

The above correlation table displays the relationship between various constructs of the study. The first construct to look at is how medical students prescribing behavior correlates with promotional efforts dimensions. MSPB seems to be positively related with all the dimensions since the r value is in between 0 & 1 for each relation. The correlation result of MSPB with PSRs, Gifts, Detailing and Sample drugs are 0.400, 0.321, 0.545 & 0.565 respectively. But the relationship is moderate for PSRs and gifts since the r value is in between 0.3 - 0.49 for each relation while the relationship is strong for detailing and sample drugs since the r value is greater than 0.5 for each relation.

4.5. Multiple Regression Analysis

Multiple regression analysis was conducted with the aim of identifying the relationship measures of pharmaceutical promotion with medical students prescribing behavior in the setting of Y12MHC. The four promotional efforts by pharmaceutical companies were used as an independent variables PSRs, gifts, detailing and sample size whereas medical students' prescribing behavior was used as dependent variable. The results of the regression analysis is discussed in this section.

Before running regression, one should check for the problem of multi-collinearity which is present if there is high correlation between some of the independent variables (Saunders, et al., 2012). The study checks this with the variance Inflation Factor (VIF) which calculates the influence of correlation among the independent variables on the precision of regression estimates. The VIF should not exceed 10 and should ideally be close to 1. Tolerance is an indicator of how much of the variability of the specified independent variable is not explained by the other independent variable in the model and is calculated using the formula $1-R^2$ for each variable. If this value is less than 0.1 it indicates that there is possibility of multi-collinearity, but if it is greater than 0.1 it means that there is no multi-collinearity problem with in the model (Hair, et al., 2004).

Table 9 Collinearity Statistics

Model	Collinearity Statistics	
	Tolerance	VIF
1 PSRs _X1	.685	1.460
Gifts _X2	.720	1.389
Detailing _X3	.783	1.277
Sample drugs _X4	.798	1.254

a. Dépendent Variable: MSPB_Y1

Source: Survey Result, 2017

The above multi-collinearity statistics shows the tolerance value to be greater than 0.1 and VIF value to be significantly below 10. This shows that there is no multi-collinearity problem with in the model.

Table 10 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estim
1	.701 ^a	.491	.479	.37977

a. Predictors: (Constant), Sample drugs, Gifts, Detailing, PSRs

Source: Survey Result, 2017

The adjusted R² value tells us how much of the variation in the dependent variable (MSPB) is explained by the model (the dimensions of Pharmaceutical promotion). In the above table, the model summary shows that the adjusted R² value is 0.479 which means that 47.9% of the variation in MSPB is explained by the variation of independent variables (PSRs, Gifts, Detailing and Sample drugs).

Table 11 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.158	4	5.539	38.408	.000 ^b
	Residual	22.932	159	.144		
	Total	45.090	163			

a. Dependent Variable: MSPB

b. Predictors: (Constant), Sample drugs, Gifts, Detailing, PSRs

Source: Survey Result, 2017

ANOVA tells us whether the model, overall, is acceptable from a statistical perspective i.e. whether the independent variables are in a significantly good degree of prediction of the outcome variable (Hair et al., 2004). As can be seen from the above table, the dimensions of independent variables (PSRs, Gifts, Detailing and sample drugs) significantly predict the dependent variable (MSPB) with $F=38.408$ and $\text{sig}=0.000$. F-test is used to find out overall probability of the relationship between the dependent variable and all the independent variables occurring by chance (Hair et al., 2004). The F-test result of the study is 38.408 with a significance of 0.000 meaning that the probability of these results occurring by chance is less than 0.05 i.e. the variation that is explained by the model is not simply by chance.

While the ANOVA table is a useful test of the model's ability to explain any variation in the dependent variable, it does not directly address the strength of that relationship (Hair et al., 2004). Table 13 shows the coefficients of the regression line. The sign of the coefficient indicates whether the predicted response increases or decreases when the predictor increases, all other predictors being constant (Hair et al., 2004).

Standardized coefficient (beta value) indicates the degree of importance of each of independent variables dimensions to medical students prescribing behavior (Anol, 2012). The regression result shows that all the dimensions contribute to medical students prescribing behavior, Sample drugs being the largest predictor with coefficient 0.364, followed by Detailing (0.330), PSRs (0.167) and gifts being the smallest predictor with coefficient 0.121. The t-tests were used to test the significance of the coefficient of each independent variable (George & Mallery, 2010). The t-values of the variable is given by PSRs (2.448), Gifts (1.811), and Detailing (5.169), and Sample drugs (5.752). The significant level all the variables are less than 0.005, except for Gifts, which is 0.072.

Table 12 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.658	.255		2.579	.011
	PSRs - x_1	.113	.046	.167	2.448	.015
	Gifts - x_2	.117	.064	.121	1.811	.072
	Detailing - x_3	.283	.055	.330	5.169	.000
	sample drug - x_4	.240	.042	.364	5.752	.000
Dependent variable: MSPB (Y)						

Source: Own survey result, 2017

Mathematical Equation

$$Y = a + bX_1 + cX_2 + dX_3 + eX_4$$

$$MSPB = 0.658 + 0.167X_1 + 0.121 X_2 + 0.330 X_3 + 0.364 X_4$$

Where Y=Medical students prescribing behavior a=Constant

X1=PSRs X3=Detailing

X2=Gifts X4=Sample drugs

b, c, d, and e are the coefficient of their respective independent variables.

From the above regression equation, it can be inferred that, an increase in the PSRs dimension by one unit would result in an increase in MSPB by 0.113 unit of value. As the gifts increases by one unit, MSPB will increase by 0.117 unit. The other dimensions also affect medical students' prescribing behavior with their respective beta values.

Hypothesis testing

Four hypothesis were formulated to test the effect of promotion efforts by pharmaceutical companies on medical students' prescribing behavior. The results are discussed below.

The table below displays the result of the hypothesis test based on the standardized coefficient (beta value) and P-value to see whether the hypothesis is accepted or rejected.

Table 13 Summary of Hypothesis Result

Hypotheses	Beta	t	p<0.05	Result
H1: PSRs→MSPB	.167	2.448	.015	Accepted
H2: Gifts → MSPB	.121	1.811	.072	Rejected
H3: Detailing→ MSPB	.330	5.169	.000	Accepted
H4: Sample drugs→ MSPB	.364	5.752	.000	Accepted

Source: Own survey result, 2017

Ha1: PSRs have direct and significant effect on medical students prescribing behavior

The PSRs have direct and significant effect on medical students prescribing behavior with beta value of 0.167 and p-value of 0.015 ($p < 0.05$). Therefore, the study supports the hypothesis.

Ha2: Gifts from pharmaceutical companies have direct and significant effect on medical students prescribing behavior

Gifts from pharmaceutical companies does not have direct and significant effect on medical students prescribing behavior with beta value of 0.121 and p-value of 0.072 which is greater than 0.05. Therefore, the study reject the alternative hypothesis and support the null hypothesis.

Ha3: Detailing by PSRs have direct and significant effect on medical students prescribing behavior.

Detailing by PSRs have direct and significant effect on medical students prescribing behavior with beta value of 0.330 and p-value of 0.000 ($p < 0.05$). Therefore, the study supports this hypothesis.

Ha4: Sample drugs from pharmaceutical companies have direct and significant effect on medical students prescribing behavior

Sample drugs also have direct and significant effect on medical students prescribing behavior with beta value of 0.364 and p-value of 0.000 ($p < 0.05$). Therefore, the study supports the hypothesis.

4.6. Normality Test

The normality of the population distribution is the basis for making statistical inferences about the sample drawn from the population (Kothari, 2004). Most studies, which involve statistical procedure, work under the assumption that observations have normal distribution. Any violation of the normality rule may lead to overestimation or underestimation of the inference statistic (Marczyk, et al., 2005). In order to examine normality one has to measure each variable's skewness, which looks at lack of symmetry of distribution, and kurtosis, which looks at whether data collected, are peak or flat with relation to normal distribution (Marczyk, et al., 2005).

Table 14 Normality Test

Descriptive Statistics		
	Skewness	Kurtosis
PSRs _X1	-.607	.548
Gifts _X2	-.661	.477
Detailing _X3	-.555	.562
Sample drugs _X4	.183	-.627
MSPB_ Y	-.364	-.289

Source: Survey Result, 2017

Table 14 above describes the level of skewness and kurtosis for the four constructs, which constitute 28 variables. The general rule-of-thumb for test of normality varies depending on the nature of the research. The common one mostly suggested mentioned in literature for both kurtosis and skewness to be between -2 and +2 (George & Mallery, 2010). As indicated in the table above, skew and kurtosis measures for this study are well within that range between -1 and +1 values. Therefore, the data for this study is normally distributed.

4.7. Linearity test

Linearity test aims to determine the relationship between independent variables and the dependent variable is linear or not. As regression analysis is based on the concepts of correlation, the linearity of the relationship between dependent and independent variables is crucial (Hair, et al., 2004). If the value sig. Deviation from linearity greater than 0.05, then the relationship between the independent variables are linearly dependent but if the value sig. Deviation from linearity is less than 0.05, then the relationship between the independent variables with the dependent variable is not linear (Saunders, et al., 2012).

Table 15 linearity test

	Sig. Deviation
MSPB * PSRs	.117
MSPB * Gifts	.498
MSPB * Detailing	.463
MSPB * Sample drugs	.064

Source: Survey Result, 2017

Based on the ANOVA output table, value sig. Deviation from linearity of 0.117, 0.498, 0.463 and 0.064 which is greater than 0.05, it can be concluded that there is a linear relationship between the variables of PSRs, Gifts, Detailing and Sample drug with MSPB.

4.8. Heteroscedasticity test

Heteroscedasticity which is the opposite of being homoscedasticity is used in the context of linear regression or for time series analysis, to describe the case where the variance of errors or the model is not the same for all observations, while often the basic assumption in modeling is that the variance are homogeneous and that the errors of the model are identically distributed. Violation of this assumption can be detected by either residual plots or simple statistical tests (Hair, et al., 2004).

Table 16 Heteroscedasticity test

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.202	.153		1.321	.188
1 PSRs	.030	.028	.100	1.079	.282
Gifts	.068	.039	.158	1.749	.082
Detailing	-.018	.033	-.048	-.557	.578
Sample drugs	-.029	.053	-.078	-.091	.094

Source: Survey Result, 2017

Based on output coefficients the obtained value of sig PSRs variable of 0.282, gifts variable of 0.082, detailing variable of 0.578 and sample drugs variable of 0.094, meaning that the value of the variable sig PSRs, gifts, detailing and sample drugs greater than 0.05, it can be concluded that there is no heteroscedasticity problem.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Introduction

This chapter summarizes the findings of the study with their discussion and concludes the study together with possible recommendations. It also discusses the limitation of this study and proposes further area of research.

5.2. Summary of Major Findings and Discussions

The study was conducted to assess the effect of promotion on medical students prescribing behavior. In order to get the result simple and understandable questionnaire (Likert scale) was filled by the target population (graduates medical students') in Yekatit 12 medical and health Science College. There were certain variables which have been used to conduct the research names are PSRs, Detailing, promotional gifts, and sample drug, these are the independent variables, and medical students' prescribing behavior was taken as dependent variable and took sample size of 164.

Descriptive analysis were used to find out the students' average mean score towards promotional efforts of the pharmaceutical companies, PSRs (3.39), gifts (3.33), Detailing (4.19), Sample drugs (3.33) and their prescribing behavior with average Mean = 3.35. Students' have good rating for all attributes of pharmaceutical promotion, especially for detailing which had a stronger rating relatively, and their prescribing behavior.

The relationship between the study variables was measured using Pearson's correlation coefficient. The correlation result of medical students' prescribing behavior with PSRs, Gifts, Detailing and Sample drugs are 0.400, 0.321, 0.545 & 0.565 respectively. This means medical students' prescribing behavior is positively correlated with all the dimensions but the relationship is moderate for

PSRs and gifts since the r value is in between 0.3 - 0.49 for each relation while the relationship is strong for detailing and sample drugs since the r value is greater than 0.5 for each relation.

Before running regression, the study checked to see whether there is high correlation between some of the independent variables. The result of the multi-collinearity test shows that there is no multi-collinearity problem with in the model since the tolerance value is greater than 0.1 and the VIF value is significantly below 10.

In this study, for the specific objectives, it can be observed that PSRs, Detailing and Sample drugs have direct and significant effect on MSPB. Hence, gifts from pharmaceutical companies doesn't have direct and significant effect on MSPB. Four hypotheses were formulated to test this relation. Multiple regression conducted to reveal that except gifts all the three hypotheses have direct and significant effect on MSPB.

The finding of this study was within a range of previously done similar studies. When the results of PSRs are compared with other findings, in another study the analysis explained that promotion by pharmaceutical companies, that in addition to providing a reminder effect constant interaction builds a stock of goodwill between a PSRs and the physician, translating into positive physician prescription behavior (Manchanda & Honka, 2005). The result is similar with the study which shows that PSRs affect the prescribing behavior of trainee and practicing physicians.

The results of detailing by pharmaceutical companies are compared with Strang et al. survey, from the total of practitioners 70% agreed that detailing affected their prescribing habits. This also revealed similar with the finding of this study that showed detailing by PSRs significantly affect medical students prescribing behavior.

In a study done by Geoffrey et al. 80% of physicians thought providing free drug samples were considered to be the single most important service provided by PSRs. Almost all of those who would give a sample (97%) said avoiding cost to the patient was an important or very important reason for their choice (Geoffrey, 2015). This study results are similar with this finding that shows sample drugs from pharmaceutical companies are significant for medical students prescribing behavior.

The results of gifts by pharmaceutical companies are also compared with other study and found that doctors slightly agreed that pharmaceutical companies giving gifts to physicians to influence their prescribing, but disagreed that, in general, gift giving influenced most physicians' prescribing behavior. This study questioned residents and directors in emergency medicine found that 74% of the residents who responded to the survey believed that representatives sometimes cross ethical boundaries by giving gifts to physicians (Machanda & Honka, 2005). And also other study found that 85% of medical students believe it is improper for physicians to accept a gift, whereas only 46% found it improper for themselves to accept a gift of similar value from a pharmaceutical company (Koch, 2013). As the result of this study showed that gifts does not affect the prescribing behavior of trainees and practicing physicians.

The extent to which medical students prescribing behavior is affected by the independent variables was examined using standardized coefficient (beta value). The regression result showed that all the dimensions contribute to medical students prescribing behavior Sample drugs being the largest predictor with coefficient 0.364, followed by Detailing (0.330), PSRs (0.167) and gifts being the smallest predictor with coefficient 0.121. The significant level for PSRs (0.015), Detailing (0.000) and Sample drugs (0.000) variables are less than 0.005, except for Gifts, which is 0.09. Therefore, the study supported all the alternate hypotheses except Ha2 which stated that gifts from pharmaceutical company have direct and significant effect on medical students prescribing behavior.

5.3. Conclusion

The benefit of promotion is indispensable both for marketer and customer as it communicates product information between seller and buyer. And it is useless to say that without promotion newly developed treatment options are not easily communicated to prescribers and users. However, in pharmaceuticals (medical) context it requires high ethical standards because decision maker (physician) and user (patient) are different, therefore pharmaceutical promotion may create conflict of interest. To avoid any conflict of interest and to act on medical ethics standards physician became skeptical to pharmaceutical promotion and hold negative attitude.

Regression analysis were used to find out the effect of promotion on medical students prescribing behavior and conclusion suggests the PSRs, Detailing and sample drugs have direct and significant effect on medical students' prescribing behavior while gift does not affect significantly.

Moreover, all the promotional efforts except gifts, are found to influence medical students prescribing behavior but sample drugs have the highest influence than the other three attributes, however even if the promotional efforts except gifts are significant to medical students prescribing behavior, the promotional strategy used by pharmaceutical companies are need critical evaluation.

5.4. Recommendations

Based on the study findings, the following recommendations can be forwarded:

- Pharmaceutical companies need to use ethically acceptable promotional materials and methods in order to make physicians to have strong and positive attitude towards their promotion activity.
- Pharmaceutical companies need to monitor their PSRs communication to ensure that it is up to standards rather than just look at sales generated.

- PSRs should act professionally and communicate unbiased scientific information. Their drug information should be balance to all needed information of the medicine like indication, side effect, contraindication, and so on.
- Pharmaceutical companies need to understand what physicians need most and address that need without the ethical boundary.
- Physician should consider the benefit of the pharmaceutical promotion as easily accessible, cheap, up-to-date, new information source without compromising their professional ethics.

5.5. Limitation and direction for further research

Since the study was conducted in a single site, the results did not represent the Promotional efforts in other hospitals of the country. This is because to conduct research in health facilities it needs the approval of IRRB of each hospital (for federal hospitals) and regional health bureaus. Besides, the nature of the study which is cross-sectional survey indicates only the prescribing behaviors that are predominant at the time of the study though the study would have been in best if done by longitudinal study.

In addition, the study focused on the effect of promotion on medical student's prescribing behavior, so it will not present the behavior of physicians or other health profession in which the pharmaceutical companies intensively made an effort on promoting their products to.

Further studies needed on practicing physician both in public and private setting, on trainee physicians in other hospital settings and also further studies needed on other health profession

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Appendix I

Addis Ababa University School of Commerce

Department of Marketing Management Post Graduate Program

Title: The Effect of promotion on medical students prescribing behavior: Evidence from of Yekatit 12 medical college students

My name is Hanan Seid and I am currently enrolled at Addis Ababa University, School of Commerce Post Graduate Studies. I am writing my MA thesis as a partial fulfillment. This study is done to examine the effect of promotion i.e. pharmaceutical sale representatives, gifts, detailing and sample drugs on medical students prescribing behavior. Please be honest in filling this questionnaire, as the results of this study can be used as a basis for further study. Your Confidentiality will be protected and any information collected in this Study will be granted with full confidentiality.

For any queries, Hanichoye2@gmail.com.

1. Respondents profile
 - 1.1. Sex Male Female
 - 1.2. Age 20-25 26-30 31-35 36-40
 - 1.3. Educational Level Internship Resident
 - 1.4. University/ College _____

2. Questions towards Pharmaceutical Sales Representatives (PSRs)

Please complete the following by ticking the appropriate choice that best represent your level of agreement/disagreement with the following statements

S.N	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2.1.	PSRs provide accurate and useful information about drugs.					
2.2.	PSRs took over an important educational role in my institution					
2.3.	PSRs use marketing techniques in their interactions with physicians.					
2.4.	I believe that PSRs, I met, are competent in their communication skills.					
2.5.	Presentations made by PSRs should be forbidden in my institution					
2.6.	An educator that works in my institution should participate as an observer in all presentations made by PSRs.					
2.7.	I would keep my relationship with PSRs on the same level, even without promotional activities, including social gatherings for dinner.					

3. Questions toward gifts from pharmaceutical companies

Please complete the following by ticking the appropriate choice that best represent your level of agreement/disagreement with the following statements

S/N	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
3.1.	Drug sample for patients are appropriate for physician to accept					
3.2.	Drug sample for individual use is appropriate for physician to accept					
3.3.	Medical textbooks from pharmaceutical companies are appropriate for physician to accept					
3.4.	Medical pocket books from pharmaceutical companies are appropriate for physician to accept					
3.5.	Office supplies (pen, cup, notebook, etc.) from pharmaceutical companies are appropriate for physician to accept					
3.6.	Paid for trip to an educational conference is appropriate for physician to accept					
3.7.	Educational meeting with dinner or lunch is appropriate for physician to accept					
3.8.	Airline ticket to vacation spot is appropriate for physician					

4. Questions towards Information from pharmaceutical companies (Detailing)

Please complete the following by ticking the appropriate choice that best represent your level of agreement/disagreement with the following statements

S.N	Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
4.1.	Medical representatives provide reliable and accurate information about drug indication					
4.2.	Medical representatives provide reliable and accurate information about drug side effects					
4.3.	Medical representatives provide reliable and accurate information about drug contraindication					
4.4.	Medical representatives provide reliable and accurate information about drug dosing and route of administration					

5. Questions towards Drug Samples from pharmaceutical companies

Please complete the following by ticking the appropriate choice

S.N	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5.1.	Drug samples permit quicker of therapy					
5.2.	Drug samples fulfill an educational role through demonstration					
5.3.	Drug samples are a source of medication for patients who cannot afford them					
5.4.	Drug samples serve to check the effectiveness of the medicine					
5.5.	Free medical samples has a brand reminder effect					

6. Effect of promotion activity on medical students prescribing behavior

Please complete the following by ticking the appropriate choice

S.N	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6.1.	PSRs promotional activities don't influence my prescribing practice					
6.2.	Availability of promotional aids(gifts) does not affect prescription decision					
6.3.	Information from medical representatives influence physicians on medication choice					
6.4.	Availability of free medical samples encourage prescribing the drug					

Appendix II

sex

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	86	52.4	52.4	52.4
Valid female	78	47.6	47.6	100.0
Total	164	100.0	100.0	

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 20-25	39	23.8	23.8	23.8
Valid 26-30	84	51.2	51.2	75.0
Valid 31-35	32	19.5	19.5	94.5
Valid 36-40	9	5.5	5.5	100.0
Total	164	100.0	100.0	

University/college

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yekatit	78	47.6	47.6	47.6
Valid Addis Ababa	38	23.2	23.2	70.7
Valid Hayat	22	13.4	13.4	84.1
Valid St.pawlos	26	15.9	15.9	100.0
Total	164	100.0	100.0	

Regression Analysis

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Sampledrugs, Gifts, Detailing, PSRs ^b	.	Enter

a. Dependent Variable: MSPB

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701 ^a	.491	.479	.37977

a. Predictors: (Constant), Sample drugs, Gifts, Detailing, PSRs

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	22.158	4	5.539	38.408	.000 ^b
	Residual	22.932	159	.144		
	Total	45.090	163			

a. Dependent Variable: MSPB

b. Predictors: (Constant), sample drugs, Gifts, Detailing, PSRs

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.658	.255	2.579	.011	.154	1.162		
	PSRs	.113	.046	.167	2.448	.015	.022	.205	.685 1.460
	Gifts	.117	.064	.121	1.811	.072	-.011	.244	.720 1.389
	Detailing	.283	.055	.330	5.169	.000	.175	.391	.783 1.277
	Sample drugs	.240	.042	.364	5.752	.000	.158	.323	.798 1.254

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	PSRs	Gifts	Detailing	sample drugs
1	1	4.903	1.000	.00	.00	.00	.00	.00
	2	.044	10.498	.00	.23	.04	.01	.57
	3	.026	13.733	.13	.47	.01	.12	.33
	4	.018	16.608	.01	.20	.45	.41	.07
	5	.008	24.301	.86	.10	.50	.46	.02

a. Dependent Variable: MSPB

Normality test

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
PSRs	164	-.607	.190	.548	.377
Gifts	164	-.661	.190	.477	.377
Detailing	164	-.555	.190	.562	.377
Sample drugs	164	.183	.190	-.627	.377
MSPB	164	-.364	.190	-.289	.377
Valid N (listwise)	164				

Correlation Analysis

		Correlations				
		PSRs	Gifts	Detailing	sample drugs	MSPB
PSRs	Pearson Correlation	1	.519**	.273**	.219**	.400**
	Sig. (2-tailed)		.000	.000	.005	.000
	N	164	164	164	164	164
Gifts	Pearson Correlation	.519**	1	.123	.199*	.321**
	Sig. (2-tailed)	.000		.116	.011	.000
	N	164	164	164	164	164
Detailing	Pearson Correlation	.273**	.123	1	.423**	.545**
	Sig. (2-tailed)	.000	.116		.000	.000
	N	164	164	164	164	164
Sample drugs	Pearson Correlation	.219**	.199*	.423**	1	.565**
	Sig. (2-tailed)	.005	.011	.000		.000
	N	164	164	164	164	164
MSPB	Pearson Correlation	.400**	.321**	.545**	.565**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	164	164	164	164	164

Heteroscedasticity test

Coefficients^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	.202	.153		1.321	.188
	PSRs	.030	.028	.100	1.079	.282
	Gifts	.068	.039	.158	1.749	.082
	Detailing	-.018	.033	-.048	-.557	.578
	Sample drugs	-.029	.053	-.078	-.091	.094

a. Dependent Variable: AbsUt

Linearity test

ANOVA Table

				Sum of Squares	df	Mean Square	F	Sig.
		(Combined)		14.907	26	.573	2.602	.000
MSPB * PSRs	Between Groups	Linearity		7.218	1	7.218	32.760	.000
		Deviation from Linearity		7.689	25	.308	1.396	.117
	Within Groups			30.183	137	.220		
Total				45.090	163			

ANOVA Table

				Sum of Squares	df	Mean Square	F	Sig.
		(Combined)		9.766	22	.444	1.772	.025
MSPB * Gifts	Between Groups	Linearity		4.637	1	4.637	18.509	.000
		Deviation from Linearity		5.129	21	.244	.975	.498
	Within Groups			35.324	141	.251		
Total				45.090	163			

ANOVA Table

				Sum of Squares	df	Mean Square	F	Sig.
		(Combined)		15.517	12	1.293	6.603	.000
MSPB * Detailing	Between Groups	Linearity		13.395	1	13.395	68.397	.000
		Deviation from Linearity		2.122	11	.193	.985	.463
	Within Groups			29.573	151	.196		
Total				45.090	163			

ANOVA Table

				Sum of Squares	df	Mean Square	F	Sig.
MSPB* Sampledrugs		(Combined)		19.072	17	1.122	6.296	.000
	Between	Linearity		14.382	1	14.382	80.705	.000
	Groups	Deviation from		4.690	16	.293	1.645	.064
		Linearity						
		Within Groups		26.018	146	.178		
	Total		45.090	163				