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THE EFFECT OF SALES PROMOTION ON PRESCRIBING BEHAVIOR OF PRESCRIBER'S IN TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA

BY: KALKIDAN ASCHALEW TSEGAHUN

June, 2019

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RESEARCH THESIS SUBMITTED TO SCHOOLS OF GRADUATE STUDIES OF ST. MARY'S UNIVERSITY IN PARTIAL FULFILMENTS OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ART IN MARKETING MANAGEMENT

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Kalkidan Aschalew

Acronyms

CME- Contentious Medical Education

FMHACA- Food Medicines and Health Care Administration and Control Authority

MR- Medical Representative

SPSS- Statistical Package for Social Sciences

WHO- World Health Organization

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Abstract

Medicines are an essential component of health care delivery. When used rationally, they produce the desired effect of improving patients 'ailments. The main objective of pharmaceutical marketing is to increase the profitability of the organization by accommodating the needs and wants of consumers. In different commercial industries it is much easier for the customer to make brand and item choice consistent with their necessities and prerequisites. The purpose of this study is, thus, to assess factors that influence prescribing behavior of physicians in Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia. Accordingly, the thesis assessed very important research questions in relation with prescribing behavior. The study was conducted in Tikur Anbessa Specialized Hospital. A Descriptive study design was used. Cluster sampling technique was employed and 148 representative populations were included in the study. A set of self-administered questionnaires were distribute to those physicians. 69% of the respondents were male and 55 (42%) respondents were between the ages of 31and 40 years. Of 148 population 68 (51.9%) respondent's practice year was < 10 yr. Majority (mean, 4.24) of the respondents strongly agreed on availability of promotional items does have a role in medication choice. Financial incentives and tags on the package of gift items encourage physicians to prescribe the drug as rated with mean scored value of 2.26 and 2.91 respectively. Scientific knowledge of the detailers' on the medicine (mean 4.19), Sales representatives provide accurate and up to date detailing regarding drug brand (mean 4.01), Frequency of sales representative's visit has an influence on prescription choice (mean 3.64), Sales representatives demonstrate free drug sample to persuade physician to prescribe medicine (mean 3.35) and The physician detailer interpersonal relationships motivates the physician to prescribe the medicine (mean 3.34) encourages physician's prescription decisions. Price of medicine doesn't have a role in medication choice (mean 1.58) but Information related to price from medical representative is helpful in prescription choice (mean 4.22). Based on the result, different promotional factors have an effect on the physicians' prescription decision.

Key terms; *Physician, Prescription Behavior, Pharmaceuticals*

CHAPTER ONE
INTRODUCTION

1.1. Background of the study

Marketing is, as in other industries is the driving force in pharmaceutical industry (Lexchin, 1992). Similar to other industries, the main objective of pharmaceutical marketing is to increase the profitability of the organization by accommodating the needs, wants and ultimately satisfaction of consumers (Sattar and Maqsood, 2003). The physician prescription behavior is the real thought for all the pharmaceutical organizations (Wazana, 2000).

The prescription is one of the therapeutic transactions between physician and patient (Davis T, 2013). The clear communication of a prescription order to other members of the health care team and to the patient is a vital step in drug therapy. Ideally, prescription will be written for an optimal drug product for the specific patient and indication. It will contain no errors, be free of ambiguity and contains all of the necessary information to allow it to be filled properly by the pharmacist and taken appropriately by the patient (Lauraolea E. and Dan M., 2001). Physicians' prescription behavior is a wide discourse in pharmaceutical marketing research, where it is searched for optimal solutions (Shaw and Jones, 2005).

A marketer can succeed if they manage to create a difference. It is essential that a product has multiple reasons for being purchased which is different from other available products. And it becomes more challenging in the industry wherein the customer who takes decision is not the ultimate consumer (Neeti Kasliwal, 2013).

The World Health Organization (WHO) define drug promotion as all informational and persuasive activities by manufacturers and distributors, the effect of which is to influence the prescription, supply, purchase or use of medicinal drugs (Norris *et al*., 2007). The pharmaceutical industries spend between 15 and 25% of its total budget on promotional activities, and this proportion is even higher in third world countries (Laporte, 1985).

Pharmaceutical marketing is unique and diverse compared to other forms of general marketing, since the focus is on the physicians as opposed to the patients. The main objective

of pharmaceutical marketing is to increase the profitability of the organization by accommodating the needs and wants of consumers. In different commercial industries other than pharmaceutical it is much easier for the customer to make the choice to which brand and item ought to be obtained consistent with their necessities and prerequisites. Whereas in the pharmaceutical marketing customers and the people who consumes falls in two distinctive classes (Saad Shamim-ul-Haq and Rizwan Rahim Ahmed, 2014)

The pharmaceutical industry, however, is faced with a complex situation in which the customer is not the client. Physicians, therefore, are the chief players in pharmaceutical marketing since they specify the prescriptions to be used by the patients. As a result, pharmaceutical organizations understand that it is crucial to influence the prescription behavior of physicians by utilizing different types of promotional tools, such as sales promotion, public relations, direct marketing, personal selling, and advertising (Al-Haddad MS, Hamam F and Al-Shakhshir SM, 2014).

The doctor plays an important role in deciding which pharmaceutical brand is suitable for patient's treatment, so the main focus of pharmaceutical industry is to influence the decision making process of physicians (Peters *et al*., 2009). The researchers have observed that physicians have two types of medicines; evidence based and marketing influenced medicines, and concluded that evidence based medicine is a noble idea, while marketing based medicine is the current reality (Spielmans and Parry, 2010).

Among factors of influence on the behavior of prescription of the medicines by the physicians are: - quality of the product, availability of the product, image of the company, regular visits of the representatives of the producing companies, research in the molecular domain, the specialty literature/journals, the personality of the medical representatives, sponsorships for participating in conferences, new combinations, medical educational programs, presentation way (package), obtained incentives, personally received gifts, samples of the products, free campaigns for the identification of illnesses and existence of the websites of the medicine producers (Luminița Mihaela, 2009).

According Handa *et al*., (2013), pharmaceutical firms spend a significant amount of their budget on promotions. Thus, it becomes imperative to study the perception of physicians, at

whom a major share of these promotional efforts is targeted. Various studies have examined physician prescription behavior as an impact of detailing activities of medical representative, salespersons and marketing mix variables deployed, with little emphasis on the network connectedness aspects of the physician-salesperson, and its impact on the physician prescription behavior (Singh, 2008). Therefore, the aim of this research is to determine what influence physicians' prescription behavior.

1.2 Statement of the problem

Although people buy products for the curing of the disease they suffering from it depends on the condition, but which brand should customer buy is the ultimate choice of physician. Physicians are the main decision makers regarding drug prescription. This motivates pharmaceutical companies to employ various promotional strategies to influencing physicians' prescribing behavior (Sherman E, Mathur A and Smith R B, 1997).

The aim of marketing strategies with respect to customers i.e. prescribing physicians, retail pharmacist & purchasing consumer i.e. patients the sales promotion employees which belongs to internal customers of the company they are also considered before they launch the marketing strategy and at the time of designing of marketing strategy unlike other industries pharmaceutical products are more specific products while sales promotion rely on scientific knowledge sharing within limited norms and that too the people (doctors) who have got the enough information that those, who are promoting (Saad Shamim-ul-Haq, 2014)

Since the main customers of pharmaceutical industries are physicians and other medical practitioners, these care providers are perceived by pharmaceutical companies as the ultimate decision makers regarding which drugs should be prescribed to patients (Zaki N, 2014). Marketing strategies are revolving around product, price and promotions and companies are making marketing tools to draw the attention of physicians for prescribing the brands.

In the last few years the relations between the physicians and pharmaceutical companies have received considerable attention. Physicians are privileged with the right of recognizing the need of their patients and recommend medications for the wellbeing of their patients. Hence the relation between the physicians and the pharmaceutical companies may create a conflict

between ethical professional interest of a doctor and his financial self-interest. The increase in incentives to attract the doctor's prescription behavior reflects as a rise in the price of prescription medicines. The pharmaceuticals resort to many ways in marketing their product. Giving away gifts, free lunches, sponsoring education and holidays have all been criticized as inducement which compares a doctor to prescribe without scientific basis. Many physicians, however do not feel that their prescriptions are not influenced by gifts and other incentives provided by the pharmaceuticals (Mir Monir Hossain, 2013*).*

An inappropriate prescription decision of the medicines to the patient is caused by a lot of elements which are in permanent interaction. The elements which lead to the emergence of the prescription errors can be: insufficient information of the physicians regarding the last innovations in the field of pharmacology, intense promotion of the medicines by the medical representatives of the pharmaceutical companies (Avorn, Chen and Hartley 1982), errors which are based on omissions from the prescribing physicians, ignoring the cost elements of the medicines, pressure from the patient or his family to be recommended a certain medicine contrary to the indications, increased trust for the previous medicine experiences regarding certain medicines in the treatment of certain illnesses to the detriment of the scientific studies, the necessity to be given by physicians a medicine for health problems which have no clear medical solution (for example dementia) and respectively the big volume of the medical practices focused on the prescription of medicines as a strategy to decrease the time of medical examination.

Between a third and a half of the consultations carried out by physicians result in filling in a prescription. The appropriate customs for the prescription of medicines to the patients involves the use by the physician of a limited number of pills which this one knows beforehand. The risk of an inappropriate prescription is higher in case of physicians who recommend a large number of medicines. The changes emerging within the medicines prescription customs are influenced by a series of elements, from which we can specify the scientifically works, recommendations of the specialists, of the colleagues, of the patients or of the pharmaceutical companies (Luminița Mihaela, 2009).

In Ethiopia, pharmaceutical companies use different promotion strategy in order to sell their brand. This pharmaceutical company's don't know which marketing strategy is the most

effective (FMHACA, 2012). The primary purpose of this study is to assess factors which influence physician's prescription patterns and behaviors. It is creating a provision to researcher to identify this factors which create push for the doctors to prescribe branded drugs. In this study, researcher looking to identify to what extent promotion strategies of pharmaceutical companies had influence on doctors to prescribe the branded drugs in Addis Ababa, Ethiopia.

1.3 Basic Research Questions

The basic research questions for this study:

- How does pharmaceutical marketing influence prescribing behavior of physicians?
- What is the impact of medical samples on prescribing behavior of physicians?
- What is the effect of brand promotion on the prescribing behavior of physicians?
- What is the effect of drug cost on prescribing behavior?

1.4 Objectives

1.4.1 General objective

The effect of sales promotion on prescribing behavior of physicians in Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia.

1.4.2 Specific objectives

- ✓ To determine the pharmaceutical marketing on the prescribing behavior of physicians.
- ✓ To assess the effect of promotion on the prescribing behavior of physicians.
- ✓ To evaluate the effect of public relations on physician prescription behaviors
- ✓ To assess the effect of drug cost on prescribing behavior.

1.5 Hypothesis of the study

H1; There is significant positive impact of promotional material on prescription behavior.

H2; There is significant positive impact of regular follow up on prescription behavior.

H3: There is significant positive effect of medicine/drug cost on prescription behavior.

H4: There is significant positive effect of public relation on physician prescription behaviors.

1.6 Significance of the Study

To sustain in this cut throat competitive business, a viable strategy is needed. The most important part of this strategy is to study the effect of sales promotion on prescribing behavior of prescriber's in Tikur Anbesa specialized hospital which is seen as a cognitive activity wherein pros and cons of the behavior are weighed before a drug choice is made. Influences of marketing on prescribing behavior of physicians are not clearly understood and its impacts are largely under researched. Thus, there is a need to do an in-depth investigation in order to understand its impact. So this study help to identify the effect of sales promotion on prescribing behavior of prescriber's in Tikur Anbesa specialized hospital and show the scope of the problems in the study area so that valuable recommendation that may initiate interventions by the responsible authorities can be forwarded.

This study provides appropriate information to the pharmaceutical industry to identify the effect of sales promotion on prescribing behaviors. The study serves as base line survey for further investigation in this field. Furthermore, this study also provides baseline data to assist policy makers in developing appropriate evidence-based strategies.

1.7 Scope of the study

Conceptually, this study focuses on the evaluation of the effect of sales promotion on prescribing behavior of prescriber's. It was conducted on medical doctors who are actively working for Tikur Anbesa Hospital. Other health care practitioners' perceptions such as health officers, nurses, optometrists, etc. who are authorized to issue prescriptions are excluded as they are not the intention of this study. On the other hand, physicians working at different organizations in Addis Ababa and also in regional states are excluded due to time and financial constraints.

1.8 Organization of the study

The study work is divided into five chapters. The introduction part includes background of the study and organization, statement of the research problem, research questions, research objectives, significances of the study, and delimitation/scope of the study. The second chapter

deals with a review of related literature. The third chapter presents research design and methodology through research design/type and sampling design. The result was analyzed in descriptive and organization of the paper. Discussion of the result found from the study is presented in chapter fourth. The fifth chapter contains summary, conclusion and recommendation of the study respectively.

CHAPTER TWO
LITERATURE REVIEW

Introduction

Pharmaceutical marketing is quite different from general marketing as the decision makers are the physicians (secondary customers) not the patients (original consumers), thus maximum marketing strategies are designed on focusing to the physicians. This study explores the influence of pharmaceutical marketing on the prescription practices of physicians in Ethiopia. In this regards, this chapter reviews different literatures about the concepts of theoretical and empirical review. At the end, a conceptual framework is provided.

2.1 Theoretical review

Physician prescription behavior is affected by pharmaceutical marketing in a significant, positive way. Marketing efforts create awareness among physicians about new drugs and their specifics (Carter, 2001).

2.1.1 Influence of promotion on physicians' prescribing behavior

Though physicians could not agree on the influence of promotion on their prescription behavior (Burashnikova *et al*., 2008), the results of these findings prove that promotion of drugs affect prescription behavior of physicians positively (Vancelik *et al*., 2007). To affect the prescription behavior of physicians positively and get increased prescription, MRs use variety of promotional techniques including gifts, drug samples, sponsorship, CMEs and journal advertising (Schramm *et al*., 2007, Majumdar *et al*., 2003). However, the impact of promotional effort on prescription generation depends on the kind of brands (Pedan and Wu, 2011), disease categories, specialty of the physician, work settings and economic status of a patient (Joyce *et al*., 2011, Spurling *et al*., 2010, Tan *et al*., 2009, Lobo *et al*., 2012).

Informative and persuasive effects

In the early stages of the product life cycle marketing functions more as an informative instrument, later this function becomes more persuasive. The informative effect implies that marketing serves as a communication channel, which educates physicians and exposes consumers to information that may improve their health outcomes and medical options. (Rubin, 2003). The persuasive effect eventually will lead to overuse, misuse and wrong prescription of drugs (Chetley, 1995). It will put extra pressure on physicians to prescribe onerous expensive drugs even when a cheaper generic drug would be appropriate (Mot, 2005). These findings are in accordance with the findings in former research by Caves & Hurwitz (1988) and Rizzo (1999).

2.1.2 The definition of physician prescribing behavior

Leo and Kangis (2000) examine and presented how the medical doctors decide about their prescription pattern of different medicines. According to these authors, of particular interest is the assessment of the extent to which behavior is entirely volitional and thus completely under the physician's control. This would determine the extent to which external stimuli, such as communications from the pharmaceutical industry and the media, have any influences or not. The analysis of the influence of different factors has found that prediction of intended prescription behavior increases significantly when behavioral control is added to the measurements of attitude and subjective norm. In circumstances of high behavioral control, the theory of planned behavior seems to collapse in favor of the theory of reasoned action (Leo and Kangis, 2000).

Taneja Girish (2008) concluded that private sector doctors attached more importance to personal selling, sponsorships and educational promotional tools while scientific promotional tools were considered more important by higher qualification doctors. It is also indentified that promotional policy that emphasized relationship with opinion leaders and personal selling were labeled as successful marketing efforts (Stros *et al*., 2009).

Henry David (2012) discussed the relationship between doctors and drug companies that lead to inappropriate prescribing which harm patients; create conflict of interest and conflict of communication thereby diminishing professional standing of doctors in the eyes of the patients. These relationships lead to use of unnecessary and expensive medications thereby affecting the overall health cost of the nation (Henry David, 2012).

2.1.3 The influence of promotional tools by pharmaceutical industry

The influence of promotional tools by pharmaceutical industry on prescribing behaviors of doctors has a greater impact. The general promotional tools like gifts and etc. These are more influential rather than scientific promotional tools for the physicians contrast with consultants (Boltri JM, *et al.,* 2002).

The effectiveness of free dug samples and gifts and other promotional tools on physicians' attitude and prescribing behavior considering as most appropriate and least unethical in the study by (Morgan *et al.,* 2006) and these free samples have led the doctors dispense and subsequently prescribe drugs even the times when those drugs are not their preferred drug choice (Chew LD *et al.,* 2000, Warrier *et al.,* 2010).

Clark MM and his colleges (1998) analyzed the effect of drug sample availability on physician prescribing behavior. Based on their review, they investigate that most accepted view that the medicines free samples are beneficial to the patients and indirectly the good caring response come from the doctors from the free samples that's why it should be reconsidered (Clark MM *et al.,* 1998).

Corckburn J. and Pit S. (1997) examined the prescription behavior among Medicare beneficiaries with capped prescription benefits. They find that the prescription behavior has significant impact on the Medicare choices members. The ethical activities from the medicine companies to the medical professionals are through communications by medical sales representatives. Small gifts such as pens, notepads, dinners sponsored by pharmaceutical companies, sponsorship to the conferences and many other activities under taken by physicians. Many doctors do not take into account accept small gifts as unethical and inputs

such Rx affect its structure. A doctor agrees that such activities by the pharmaceutical companies are the indirect requirement of their drug prescriptions (Corckburn J, 1997 & Couturier C., 2000)

A research conducted in Bangladesh found that sales personnel activity, personal relation, product quality and reputation of the company influence the prescription behavior of a physician (Mir Monir Hossain *et al.,* 2013). A research conducted in Pakistan has found the new drug, promotional tools and drug samples significantly affect the prescription behavior of physicians and remaining factors do not leave any major effect. Branded products are always expensive than local products therefore the brand prescription is less affective on prescription behavior of physician because of the cost factor (Saad Shamim-ul-Haq *et al.,* 2014).

2.1.4 The influence of follow up by sales representative

Among the factors that play a major role in the success of pharmaceutical companies are drug promotion and drug marketing. Currently, one of the most used techniques is detailing by pharmaceutical sales representatives, who communicate directly with physicians about the virtues of a particular product (Hoffman, 2012). The physicians' suitable prescription is influenced by several factors that act on the decision to prescribe medication, such as: drug characteristics (quality, price, and availability), patient's state, and the prescriber, professional background (Luminița Mihaela and Mir Monir Hossain. *et al.,* 2013).

Frequency of visit to the physicians by the sales personnel and personal relationship of the physician with the medical representatives are mostly influence the prescription behavior of the physicians. It is a quiet simple equation. In Ethiopia, there are more than 125 pharmaceutical companies with more than 10000 brands (FMHACA, 2017). For example, calcium, generic has more than 15 brand names. Which one will a doctor write for his/her patient? Answer is simple, the brand which is more visited to the physicians. That's why frequency of visit and personnel relation is most important than others.

2.1.5 Effect of pharmaceutical marketing on prescription behavior

Pharmaceutical marketing can have direct effects and indirect effects. Direct effects, also called reminder effects, are effects that directly influence physician adoption of drugs, here good will, achieved by constant interaction between pharmaceutical representatives and physicians, influences the preferences for certain drugs and products. The direct effects positively influence physicians' probability to prescribe (Honka, 2005). Indirect effects can be explained as effects that indirectly affect physician adoption. Important is the perceived product quality, marketing communication makes it possible for consumers to change attitudes and reduce uncertainty about the exact quality of a new drug through a process of learning (Narayanan, 2005).

Another important influence that direct to physician marketing practices on the adoption of new drugs is social contagion. That is, physicians are influenced by exposure to other physicians' attitudes, knowledge, or behavior when deciding to adopt a drug (Van, 2001). When a physician makes a decision to adopt he/she influences other physicians near him/hers (Berndt, 2003).

A study by Wieringa (2010) suggests that marketing effects are largest in size in the period right after the introduction of a brand or a new drug and that the marketing efforts directed at physicians become less effective at a later stage in the product life cycle. This can be explained by the fact that most information is dispersed in the early stages in the product life cycle of a new drug. In addition, a study by Srinivasan (2001) suggests that up to a certain point marketing communication directed at physicians positively affects the prescription probability of a drug, when passing that point excessive marketing efforts generate adverse effects.

2.1.6 Impact of detailing and free samples

Sales representatives in the pharmaceutical industry (detailers) offer information on generic and current modes of therapy, the appropriate drug usage, indications, contraindications, and side effects. In addition to information about drug usage and positioning, detailers give retail price information and dispense free samples. Physicians are expected to benefit from spending time with sales representatives, because the information they receive ultimately leads to higher patient recovery rates that speak well of the physicians' competence and expertise. Although it is clear that physicians retrieve drug alternatives from memory before writing a prescription (rather than check the contents of their medicine cabinet), free samples left by drug representatives after the detailing session might act as long-term reminders of the existence of the drug and dampen the increased price sensitivity effect (Fusun F. Gonul, *et al,* 2001).

To show the impact of promotion on the impact of prescription drugs studies were conducted and proved that promotion of competitive drugs adversely affect the physicians' prescription behavior and have a negative impact on less promoted products (Manchanda and Chintagunta, 2004; Pedan and Wu, 2011). Similarly another study also showed that the interaction of medical representatives have an influence on prescribing behavior of promoted drugs (Wang and Adelman, 2009, Zipkin and Steinman, 2005). In general different research findings suggested that drugs promotion has a positive impact on physicians' prescription behavior. However, studies recommend that to optimize their return on investment pharmaceutical companies should use an efficient allocation of resource (Pedan and Wu, 2011).

Some researchers also studied that Physician's personal attributes, cost of the medicine, and pharmaceutical industries' marketing and promotion strategies were mostly mentioned to influence prescribing decision. The identified factors showed prescribing is not only geared for patient benefit, but also towards physician's interest (Majid Davari *et al.,* 2018).

2.1.7 Relationship of physicians and pharmaceutical companies

In Pharmaceutical Industry doctor is a major role player, who speaks on behalf of the company and makes decisions by prescribing the medicines and also influences to other

doctor's prescription behavior, which is a critical factor for the Pharmaceutical Companies (Lamand D. Michael, 2004). The relationship between physician and pharmaceutical companies is always remained controversial, because of personal interests and clash between money and ethics (Agarwal, S.S. Desai, M. Holcomb and A. Oberoi, 2001). According to many researches, if Medical Reps have established good relations with physicians, the more chance of doctor's prescriptions for a certain drug (Singh, A., P.K. Sharma and R. Malviya, 2011).

2.1.8 The effect of price on physicians prescribing decisions

A study done by (Gönül *et al.,* 2001) shows that generally speaking physicians' priority in prescription decision is efficacy of the drug and the patient conditions but not price (Gönül *et al.,* 2001); however, in Medicare patients the decision factor is price of the drug. Likewise a study done by (Campo *et al.,* 2005) shows that price generally does not affect prescription decision, especially when prescription choices have limited financial consequences. Sometimes price sensitivity is revealed when new generic drugs are entering to the market. Studies show that the availability of generic drugs make the price sensitive physicians switch from branded to generic drug because these physicians believe that they reduced the financial burden of their patients by prescribing cheaper generic drugs (Gonzalez *et al.,* 2008). Likewise physicians' prescription decision is also affected by the availability of insurance or Medicare. For instance, physicians become more prices sensitive when they treat patients without insurance coverage and they prescribe cheaper drugs but when these doctors find out that their patients are reimbursed generously, they become price insensitive to prescribe branded drugs (López-Valcárcel 2011).

Though the findings about influence of price of prescription drugs are not conclusive at the moment, it is expected that price will be one of the most important marketing tool to sell drugs. This is due to government regulation and insurance companies' guidelines that enforce prescription of generic drugs, and also the apparently higher sensitivity of younger physicians (Campo *et al.,* 2005).

Contrary to the above findings physicians' prescription decision is also affected by their own financial gain. Physicians who prescribe and at the same time dispense drugs tend to prescribe more expensive drugs to benefit out of the higher margin. This kind of behavior suggests that such physicians are acting like imperfect agents to the patient (Liu *et al.,* 2009).

A study showed that besides other therapeutic and compliance factors the cost of a drug affect the prescription decision of physicians (Tan *et al.,* 2009, Tichelaar *et al.,* 2010). For instance, a study conducted by (Reichert *et al.,* 2000) showed that 88% of physicians are conscious about cost of a drug during prescription decision and 71% of the physicians are willing to scarify efficacy to make drugs more affordable to their patients; however, all these doctors lack accurate information about the price of the drugs they are prescribing. Similarly a study conducted on General Practitioners (GPs) also showed that price of a drug is an important factor when they choose their first line drugs (Buusman *et al.,* 2007).

2.2 Empirical review

2.2.1 Pharmaceutical promotional material on prescribing behavior of physicians

There are so many aspects which impact the Physicians' prescribing behavior a study conducted in Marathwada region India 2011 (Sagar DN, 2012) with selected aspects, which impact the doctor's prescribing behavior while recommending the drugs. Similar like other sectors, drug promotion choices are taken to increase productivity of the company, by fulfilling the needs & wants of the clients. It is quite simple in non-pharmaceutical sectors as the client (consumer) can make up their mind to what item & in what requirements it should be bought. In drug promotion, the client & the customers are two different individuals. Even though the products are being bought by the patients for treating the infected situation, the choice of what item that individual should the physician takes purchase. Therefore the marketing policies are designed by keeping in view the consent of customers' i.e. prescribing physicians, retail chemists & purchaser (customer) i.e. patients. Not only these three but even the factors influencing prescription behavior of physicians: A study with internal customers of the company that is the sales promotion employees of the company are taken into consideration before or along with formulation of marketing strategies (Sagar DN, 2012).

Free of cost samples of the drugs, free medical camps, product folders, Continuous Medical Education (CMEs), Gifts & other promotional inputs, Research Molecule, Incentives and Sponsorships to conferences appear to influence prescribing (Lundin, 2000) but more research is needed on this issue.

2.2.2 Promotional materials used by medical representatives

Pharmaceutical organizations often use drug samples as a technique in the ambulatory proper care establishing. Little is known about how the accessibility to drug samples affects physicians' prescribing behavior. In this research (Lundin, 2000) of self-reported doctor actions, avoiding cost to the drug sample was the most reliable motivator for physicians to use drug samples, although physicians recognized other advantages of drug samples that varied with the medical conditions. The recognized advantages of drug samples often led physicians to review that they would distribute or recommend medicine that differed from their preferred medication choice.

2.2.3 Promotional material influence on physicians' prescribing behavior

The influence of promotional materials by pharmaceutical industry on prescribing behaviors of doctors has a greater impact. The general promotional tools like gifts and etc. These are more influential rather than scientific promotional tools for the physicians contrast with consultants (Boltri JM and Chew LD, 2000).

Analyze the effect of drug sample availability on physician prescribing behavior. Based on their review, they investigate that most accepted view that the medicines free samples are beneficial to the patients and indirectly the good caring response come from the doctors from the free samples that's why it should be reconsidered (Clark MM, 1998). Examine the prescription behavior among Medicare beneficiaries with capped prescription benefits. They find that the prescription behavior has significant impact on the Medicare choices members. Small gifts such as pens, notepads, dinners sponsored by pharmaceutical companies, sponsorship to the conferences and many other activities under taken by physicians. Many doctors do not take into account accept small gifts as unethical and inputs such Rx affect its

structure. A doctor agrees that such activities by the pharmaceutical companies are the indirect requirement of their drug prescriptions (Corckburn J, 1997; Couturier C, 2000). The personalized pharmaceutical marketing along with the facility of gifts and sponsorship to education recreational activities the factors influencing prescription behavior of physicians are Price of the product, Availability of the product, Communication made by MR the product quality that is being promoted. The conclusion shows that marketing strategies influence the physician prescription behavior in this study.

2.2.4 Perception of physicians on the quality of promotional information they received from medical representatives

The study done in India (Meenakshi Handa, 2013) indicates that physicians perceive conferences/symposia to be the most credible and quality information source. The study indicates a positive correlation between credibility/quality of promotion tools and the extent to which it influence prescription behavior.

CHAPTER THREE
METHODOLOGY

3.1 Study area

The study was conducted in Tikur Anbessa Specialized Hospital. Tikur Anbessa Specialized Hospital is a referral hospital and sees approximately 370,000 - 400,000 patients a year but the exact number is not known. The hospital has 800 beds, with 169 specialists, 65 non-teaching doctors. It has also eight major operating theatre rooms. The hospital is affiliated with the Addis Ababa University's school of medicine. It is the training center for fellows, post graduate, undergraduate, medical students, dentists, nurses, radiographers and laboratory technicians. Here are about 25 fellows, 500 residents, 1396 medical students & 99 interns. The study was conducted from April 15 to April 23, 2019.

3.2 Research design

Exploratory research allows the researcher to define the problem more precisely and to generate hypotheses for the upcoming study. Descriptive research is undertaken to describe answers to questions of who, what, where, when, and how (Alvin C. Burns & Ronald F. Bush, 2014). Since this study was undertaken to know what factors influence prescription behavior of physicians, additionally the research identified the specialty and work experience of the prescribers a descriptive study design was employed. In this research descriptive and explanatory research approach is used with the unit of analysis being individual people (physicians) and the core being prescribing behavior.

3.3 Research approach

The means of data collection during the research process can be classified into two broad categories: quantitative and qualitative. Quantitative research is defined as research involving the administration of a set of structured questions with predetermined response options to a large number of respondents. Qualitative research involves collecting, analyzing, and interpreting data by observing what people do and say. Qualitative research techniques afford rich insight into consumer behavior (Alvin C. Burns & Ronald F. Bush, 2014). Because the

research involves measuring or counting and evaluation of prescribing behavior, a qualitative and quantitative research approach was used.

3.4 Data types and data source

To address the objective of this thesis, different type of data were employed. The following primary and secondary data sources are used.

3.4.1 Primary data sources

Primary data were gathered through questionnaire. The questionnaire was designed for physicians of different specialty who are practicing in Tikur Anbessa specialized Hospital. The survey captured information related to socio demographic variable, prescribing decisions and its determinants, physician's exposure to promotional activities, preference to promotional tools, and the impact of pharmaceutical promotion on prescribing behavior. The questioners are present in Appendix – I.

3.4.2 Secondary data sources

The secondary source of information include: relevant reports, unpublished sources, reference books, internet websites were recognized as a main source of information and used as a main input for the design of spatial database application. The reference materials includes journals, report, books, internet websites were also recognized as a main source of information.

3.5 Target population, study area and sample size

3.5.1. Target population

The study population constitutes the prescribing physicians that are currently practicing at Tikur Anbessa specialized Hospital.

3.5.2. Population and sample of the study

The source of population constituted all physicians practicing in Tikur Anbesa specialized hospital. Physicians who were not actively prescribing at the time of the survey were not included as part of the study subjects.

3.5.3. Sample size

Cluster sampling was used because this kind of sampling technique is due to the whole population is very much scattered and spread in a larger sub-units (Inpatient, outpatient, oncology and emergency) of the hospital. Further, the whole population is heterogeneous. In order to get the samples different clusters will be collected from different Sub units of the Hospital.

To calculate the sample size simplified formula provided by (Yemane, 1997) is used since the population is known (physicians who are currently work at Tikur Anbesa hospital which is 234)

$$n = \frac{N}{1+N(e)2}$$

Where

n = corrected sample size, N = population size, and e = Margin of error (MoE), e = 0.05

$$n = \frac{234}{1+234(0.05)2}$$

$$n = 147.63$$

$$n = 148$$

The samples of this research will be 148.

A proportionate sampling technique was used to determine the sample size for each category and then simple random sampling was employed to select sample from each category. Accordingly from 148 study population, 66 specialists, 72 general practitioner and 10 consultants were included in the study.

3.6 Data processing and analysis

A self-administered questionnaire will be used to collect data for the cross-sectional survey. Most of the questions were in Likert-scale measures. The collected data will be cleared, categorized, coded and interred in to computer and analyzed using SPSS. If there is any missing data, it will be excluded from the analysis. Then, the result was presented using tables and figures.

3.7 Model specification

In order to investigate the impact of sales promotional strategy dimensions on overall doctors' prescription behavior, overall doctors' prescription behavior score was regressed against promotional strategy dimensions. Multiple linear regression analysis was applied to investigate the relationship aiming to see the extent to which overall physician prescription dimensions are affected by sales promotional dimensions.

3.8 Ethical considerations

Confidentiality of their response of the respondents was maintained at a high level to make the respondents feel comfortable so that their responses are considered non-biased and reflect the truth about the situation in question. The study was conducted after the participant confirms his or her willingness to take part on answering the questionnaire. It is participant's right to escape a question. Privacy and data confidentiality is ensured by putting codes instead of participants name in the filled questionnaire and placing it in locked cabinet so that others except the researcher cannot access the data.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

This chapter presents the data analysis and interpretation of the research findings. The data analysis was made with the help of Statistical Package for Social Science (SPSS 20). To test hypothesis and achieves the study objectives, different inferential statistics were employed. By using T-test and ANOVA the mean difference between demographic profile of respondents and underlying factors of physician prescription behavior were analyzed. Multiple linear regressions were also employed to test hypothesis and achieve the study objective that focuses on identifying the most important promotional tool of pharmaceutical suppliers that enhance the prescription behavior of the physician. Pearson correlation coefficient was used to test goodness and internal consistency of the measure. Results are presented in graphical and tabular format based on the responses given by the respondents.

In order to make the collected data suitable for the analysis, all questionnaires were screened to be complete. Out of the 148 distributed questionnaire 88.51% (131) response rate has been obtained.

4.1 General information

The general information is organized in the following areas: gender, age, specialty and year of experience. The purpose of the general information was to find out the characteristics of the respondents and to show the distribution of the population in the study.

4.1.1 Gender of respondent

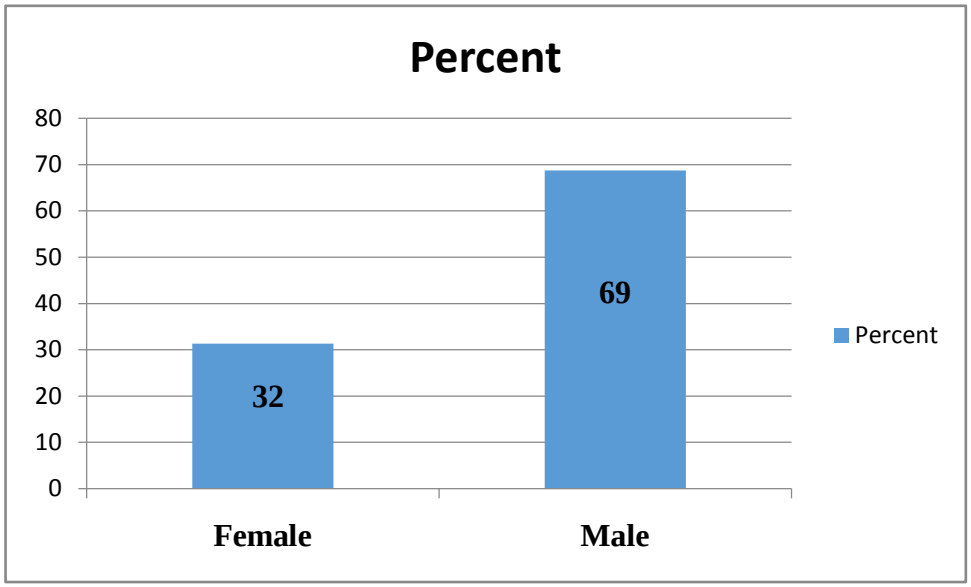


Fig 4.1 Gender of respondents.

The above figure shows that distribution of respondent's gender 31% of the respondents was male, while 69% of the respondents were female. This implies that majority of the participants in the research were male.

4.1.2 Age of respondent

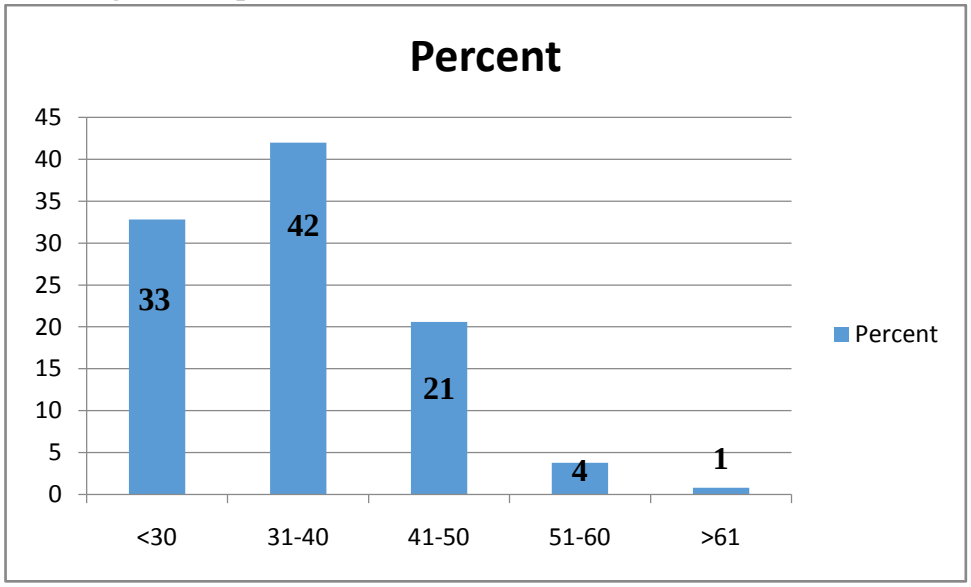


Fig 4.2 Age of respondents.

Analysis of the data collected revealed that 55 (42%) respondents were between the ages of 31 and 40 years. Of the respondents, 43 (33%) were below the age of 30 years. And the proportion of respondents were between the age of 41-50 years and 51-60 years 27 (21%) and 5 (4%) respectively. Of all participants, only 1 (1%) of them have age above 60 years. These imply that majority of the respondents were in the physician are in the range of 31– 45 years old.

4.1.3 Year of practice of respondent

Table 4.1 practice year of respondents

Year of practice			
Year of practice		**Frequency**	**Percent**
Valid	<10	68	51.9
	11-20	47	35.9
	21-30	15	11.5
	>31	1	0.8
	Total	131	100

In addition analysis of the collected data revealed that 68 (51.9%) respondent's practice year was < 10 yr. 47 (35.9%) practice medicine between 11-20 yr. The remaining 15 (11.5%) 21-30 and only one respondent was practice medicine more than 31 yr. These imply that majority of the respondents were physician who practice medicine for less than 10 yr.

4.1.4 Specialty of respondents

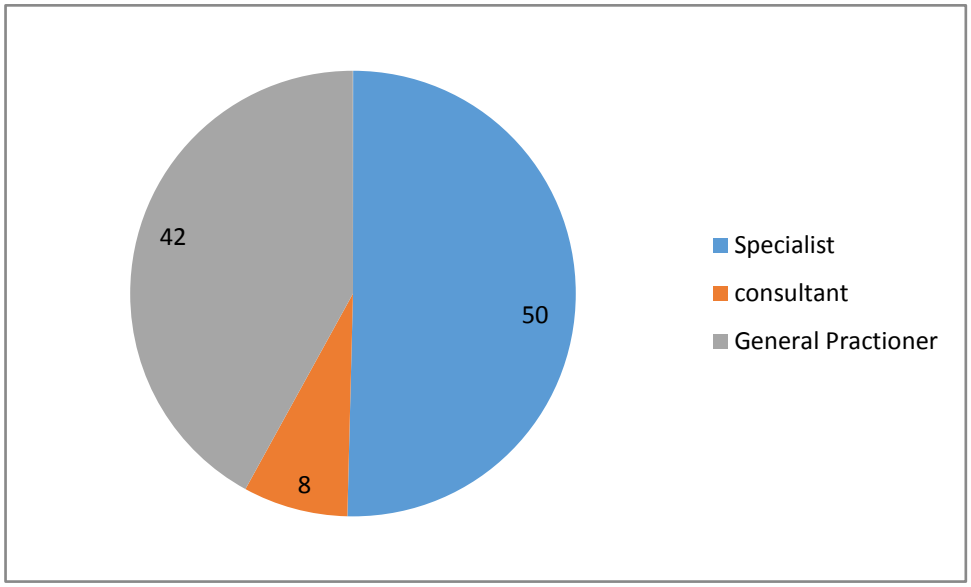


Fig. 4.3 Respondents specialty

Regarding specialty 66 (50%) physicians were specialists, 55(42 %) were general practitioner and 10 (8%) respondents were consultant. Overall the general information implies that majority of the respondents were specialists

.

4.2 Promotional material

To understand the influence of promotional techniques respondents were asked a set of questions that were answered based on selecting an appropriate choice on a scale from a given list. The scale was 5 point, where, 1-strongly disagree, 2-disagree, 3-neutral, 4-agree and 5-strongly agree.

Table 4.2 Respondents' perception on promotional material

Descriptive Statistics	N	Mean	Std. Deviation
Availability of promotional items does have a role in medication choice	131	4.24	0.618
Availability of promotional materials can influence prescription choice	131	3.52	0.649
Firms promote drugs through scientific journals encourage physician to prescribe drug	131	4.24	0.528
Free drug samples encourage trying the drug	131	3.99	0.638
Words on the packaging of gift items encourage physicians to prescribe the drug	131	2.91	0.662
Low cost gifts (pen, paper weights, writing pads, etc. depicted drug brand) from pharmaceutical suppliers remind drug brand while prescribing	131	3.72	0.558
Financial incentives, given that there are similar competitive medicines motivate physicians to prescribe	131	2.26	0.78
The firms interest to educate the physicians on new medicine through financing their participation to international scientific conference	131	3.48	0.612
Overall mean and SD		3.55	0.63

Source: Own survey, 2019

The above table demonstrates in detail about the mean and the standard deviation of the Physicians response, the interpretation is depended on the table proposed by (Andrich and David, 1978).

Rating scale

Mean Range	**Interpretation**	**Response Made**
1.0 - 1.7	Very low	Strongly disagree
1.8 - 2.5	Low	Disagree
2.6 - 3.3	Neutral	Not Sure
3.4 - 4.1	High	Agree
4.2 - 5.0	Very High	Strongly Agree

Based on this the results revealed that majority (mean, 4.24) of the respondents strongly agreed on availability of promotional items does have a role in medication choice. However, financial incentives, given that there are similar competitive medicines motivate physicians to prescribe and words on the packaging of gift items encourage physicians to prescribe the drug as rated with mean scored value of 2.26 and 2.91 respectively.

Table 4.3 Respondents' perception on follow up of sales representative

Descriptive Statistics	**N**	**Mean**	**Std. Deviation**
Sales representatives provide accurate and up to date detailing regarding drug brand	131	4.01	0.548
The detailers' scientific knowledge on the medicine encourages physician's prescription decisions.	131	4.19	0.646
Frequency of sales representative's visit has an influence on prescription choice.	131	3.64	0.569
Sales representatives demonstrate free drug sample to persuade physician to prescribe medicine	131	3.35	0.701
The physician detailer interpersonal relationships motivates the physician to prescribe the medicine	131	3.34	0.71
Overall mean and SD	131	3.70	0.63

Source: Own survey, 2019

The results on Table 4.3 revealed that the mean scored values of the follow up of sales representative attributes ranges from 3.34 to 4.19. Among them, scientific knowledge of the detailers' on the medicine encourages physician's prescription decisions (mean 4.19); Sales representatives provide accurate and up to date detailing regarding drug brand (mean 4.01); Frequency of sales representative's visit has an influence on prescription choice (mean 3.64); Sales representatives demonstrate free drug sample to persuade physician to prescribe medicine (mean 3.35); and the physician detailer interpersonal relationships motivates the physician to prescribe the medicine (mean 3.34).

Table 4.4 Respondents' perception on Public relations/ Publicity

Descriptive Statistics	N	Mean	Std. Deviation
Supplier's product launch meeting, lunch or dinner encourages physician prescribing drug brand	131	3.49	0.56
Suppliers arranging clinical or scientific meetings on several special days	131	3.65	0.567
Suppliers conducting a discussion by a specialist doctor is helpful to remind drug brands to prescribe	131	3.85	0.601
Suppliers sponsor physician for conferences to influence them to prescribe their brands more	131	3.21	0.744
Overall mean and SD	131	3.55	0.62

Source: Own survey, 2019

Table 4.4 revealed that the mean scored values of perception on public relations/ publicity ranges from 3.21 to 3.85. Among them, suppliers conducting a discussion by a specialist doctor is helpful to remind drug brands to prescribe (mean 3.85); and suppliers sponsor physician for conferences to influence them to prescribe their brands more (mean 3.21).

Table 4.5 Respondents' perception on medicine/ drug cost

Descriptive Statistics	N	Mean	Std. Deviation
Price of medicine doesn't have a role in medication choice.	130	1.58	0.594
Information related to price from medical representative is helpful in prescription choice.	130	4.22	0.532
Overall mean and SD	130	2.9	0.563

Source: Own survey, 2019

Table 4.5 revealed that physicians perception among medicine cost, Price of medicine doesn't have a role in medication choice (mean 1.58) and Information related to price from medical representative is helpful in prescription choice (mean 4.22).

Physician prescription behavior

The study shows that pharmaceutical marketing influence the prescription behaviors of physicians greatly. The effectiveness of different method varies widely physicians to physicians and sales personnel to sales personnel.

Table 4.6 Physician prescription behavior

Descriptive Statistics	N	Mean	Std. Deviation
Initial perception (clinical observation) of the medicine matters most to me	130	3.77	0.604
Detailing of the sales representatives has a role on my prescription behavior	130	3.78	0.682
Sales promotion doesn't encourage me to prescribe a medicine	130	1.53	0.516
Advertisement of brands on scientific journals inspires my prescription behavior	130	4.28	0.707
Financial sponsorship for training, conferences, and gatherings persuade me to prescribe a medicine	130	2.92	0.794
Peer groups (colleagues, specialists, trainers,…) influence my prescription behavior considerably	130	3.45	0.624
Overall mean and SD	130	3.29	0.654

Advertisement of brands on scientific journals inspires my prescription behavior, detailing of the sales representatives has a role on my prescription behavior, Initial (clinical observation) perception of the drug, and peer groups (trainer, colleagues, senior specialists) influence their prescription behavior considerably as majority expressed their strong agreement with mean scored value of 4.28, 3.78 and 3.77 respectively. They also negated the inability of sales promotion encourage physicians to prescribe a medicine with strong disagreement (mean scored value 1.53). However, Peer groups (colleagues, specialists, trainers…) influence my

prescription behavior considerably (mean 3.45) and financial sponsorship for training, conferences, and gatherings persuade me to prescribe a medicine (mean 2.92).

4.2 Descriptive analysis of the independent variable

Table 4.7 descriptive analysis of the independent variable

Descriptive Statistics			
Descriptive Statistics	N	Mean	Std. Deviation
Promotional material	131	3.5448	.26947
Regular follow-up	131	3.7115	.30093
Brand image	131	3.5847	.29312
Medicine cost	131	2.8931	.38234
Physician prescription behavior	131	3.2863	.26253
Overall mean and SD	131	3.404	0.301

Source: Own survey, 2019

Based on this, the mean value of prescribing behavior and medicine cost lie on neutral 3.2 and 2.8 respectively. The mean score of regular follow-up is 3.7 which is the physician's agreed on sales representative follow up. The mean value of promotional material and brand image lay on 3.5 which is physician's agreed on both factors.

4.3 Correlation analysis

Different authors suggest different interpretations; however, (Cohen, 1988) suggests the following guidelines:

Small r=.10 to .29

Medium r=.30 to .49

Large r=.50 to 1.0

These guidelines apply whether or not there is a negative sign out in the front of your r value.

Table 4.8 Correlations

Correlations

	Promotional material	Regular follow up of sales representative	Brand image	Medicine cost	Physician prescription behavior
Promotional material	1	-.006	.175*	-.146	.008
		.948	.045	.096	.927
	131	131	131	131	131
Regular follow up of sales representative	-.006	1	.026	.072	-.113
	.948		.770	.415	.197
	131	131	131	131	131
Brand image	.175*	.026	1	.281**	.108
	.045	.770		.001	.220
	131	131	131	131	131
Medicine cost	-.146	.072	.281**	1	.035
	.096	.415	.001		.696
	131	131	131	131	131
Physician prescription behavior	.008	-.113	.108	.035	1
	.927	.197	.220	.696	
	131	131	131	131	131

Source: Own Survey, 2019

The results on Table 4.8 showed that promotional material, brand image and cost of medicine has positive relationship with physician prescription behavior. Whereas regular follow up of sales representative has negative relationship with physician prescription behavior.

4.4 Inferential statistics

4.4.1 Validity and reliability

To assure the construct validity that is whether the measure adequately represents the underlying supposed to measure, theoretical assessment of validity was undertaken. Accordingly, the items were partially adopted from previous studies and partially based on the definition given by different researchers, besides, appropriate research procedures were applied to find the answers to the basic question. With this the construct validity was also measured.

Data collected were subjected to reliability analysis to establish the reliability of the measures and to ensure consistent measurement among the various items in the instrument (Singleton *et al*, 1993). A reliability test was carried out on the questionnaire using the Cronbach's alpha test.

Table 4.9 Reliability analysis of the variables

Variables	**No. of Items**	**Cronbach's Alpha Coefficients**
Promotional material	4	0.880
Regular follow-up of sales representative	4	0.709
Brand image	4	0.918
Medicine cost	5	0.730
Physician prescription behavior	6	0.791
Total	27	0.811

Source, Own survey, 2019

It is a coefficient of reliability used to measure the internal consistency of the scale; it represented as a number between 0 and 1. According to Zikmund *et al*. (2010) scales with coefficient alpha between 0.6 and 0.7 or higher are considered adequate to determine reliability. Thus, the alpha coefficient was calculated for all factors, almost all constructs were between 0.709 and 0.918. As a result, all constructs were accepted as being reliable for the research.

4.5 Regression analysis

The multiple regression analysis was conducted. Multiple regressions are an extension of simple linear regression. It is used when we want to predict the value of dependent variable based on the value of two or more independent variables. It is conducted to investigate the influence of independent variable on the dependent variable and identify the relative significant influence of the independent variable (promotional material, regular follow up, medicine/drug cost, and brand image) to the dependent variable physician prescription behavior.

4.6.1 Assumption testing for regression analysis

Meeting the assumptions of regression analysis is necessary to confirm that the obtained data truly represented the sample and that researcher has obtained the best results (Hair *et al.*, 1998). Four assumptions for regression analysis used in this study will be discussed for the individual variables: normality, multi-collinearity, linearity and homoscedasticity (Hair *et al*., 1998). In the following paragraphs, each assumption is explained.

4.6.2 Normality

Outliers can cause the model to be biased because they affect the values of the estimated regression coefficient (Andy 2005). The normality of the data and selection of outliers in this study, thus, were done by checking the skewness (lack of symmetry) and kurtosis (heavy-tailed or light-tailed relative to a normal distribution). First, in which all the skewness value is less than two and the value for the kurtosis value is less than six (Mardia,1970) so that this value was checked and no data collected which have skewness above two and all have the kurtosis value less than six. Based on the results, there were no obvious outliers between scores because in most points it falls within the vicinity of other points. The result implied that as the marketing communication changed, physician prescription behavior also changed to same direction. It can be concluded that the two variables had direct relationship.

4.6.3 Multi-collinearity

Hill *et al*., (2003) explain that economic variables may move together in systematic ways when the data are the result of an uncontrolled experiment. Such variables are believed to have problems with collinearity or multi-collinearity when several variables are involved (Hill *et al*., 2003). Generally, as multi-collinearity rises, it will complicate the interpretation of the variables because it is more difficult to confirm the effect of any single variable, owing to their interrelationship (Hair *et al*., 1996). According to (Hill *et al.,* 2003), multi-collinearity is not a violation of the assumptions of regression but it may cause serious difficulties. Hill et al., (2003) propose that these serious difficulties include variances of parameter estimates may

be unreasonably large; parameter estimates may not be significant; and a parameter estimate may have a sign different from what is expected.

The initial inspection of the Pearson Correlation Matrix for the regression models revealed that the correlations between the independent variables did not exceed 0.80. While checking, the independent variables showed significant relationship with the dependent variable (above .3 preferably). Also the researcher checked that the correlation between each of independent variables is not too high. Hill (2003) suggests that before including two variables with a bivariate correlation of, say, 0.7 or more in the same analysis should be checked considerably. As it can be observed from the correlation table there is no correlation between the independent variable which is above 0.7. Therefore, all variables were retained.

4.6.4 Linearity

The linearity of the relationship between the dependent and independent variable represented the degree to which the change in the dependent variable is associated with the independent variable (Hair *et al*., 1998). In a simple sense, linear models predict values falling in a straight line by having a constant unit change (slope) of the dependent variable for constant unit change of the independent variable (Hair *et al*., 1998). Conventional regression analysis will underestimate the relationship when nonlinear relationships are present, i.e., R^2 underestimates the variance explained overall and the betas underestimate the importance of the variables involved in the non-linear relationship. Substantial violation of linearity implies that regression results may be more or less unusable (Malhotra *et al*., 2007). The result of the regression models, visually inspected, didn't reveal any systematic pattern, thus providing support for the specified linear relationship.

4.6.5 Homoscedasticity

Hair *et al*. (1998) identify homoscedasticity as homogeneity of variance. This assumption is referred to as the description of data in which the variance of the error terms (e) appears constant over the range of values of an independent variable. The assumption of equal variance of the population ε (where ε is estimated from the sample value, e) is critical to the

proper. As can be inferred from the model summary, overall physician prescription behavior is explained. In this case the R^2 value is 0.582 which is expressed by a percentage. This means that the model explains 58.2% of the variance in the overall prescription behavior, thereby confirming the fitness of the model.

Table 4.10 Regression results of factors on physician prescription behavior.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.763[a]	0.582	0.575	0.33903

a. Predictors: (Constant), cost of medicine, regular follow up, promotional material, brand image

b. Dependent Variable: Prescription behavior

From the ANOVA analysis table (*F=88.253, p<0.05*), a good fit was established between marketing communications and physician brand preference with *P = 0.000*.

The result summary table 4.10 shows that value of R=0.763 which is greater than 0.50 indicates that there is a strong correlation between the dependent variable (prescribing behavior) and the independent variable with effect on the dependent variable 58.2% (R-Square=0.582).

Table 4.11 ANOVA

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	68.923	1	8.923	88.253	0.000[b]
	Residual	103.027	130	.781		
	Total	171.950	131			

a. Dependent Variable: Physician prescription behavior

b. Predictors: (Constant), cost of medicine, regular follow up, promotional material, brand image

As we see from the above ANOVA table the P value is 0.00 which is less than the level of significance or 0.05. Thus, the combination of the variables significantly predicts the dependent variable (F=88.253; P< 0.05). Therefore, the overall regression model is significant.

Table 4.12 Coefficients

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.009	0.26		3.881	0.004		
	Promotional material	0.027	0.776	0.261	0.035	0.109	0.928	1.078
	Regular follow up	0.408	0.848	0.799	0.481	0	0.995	1.005
	Brand image	0.199	0.101	0.757	1.97	0.042	0.873	1.145
	Cost of medicine	0.518	0.493	0.502	1.051	0	0.878	1.139
a. Dependent Variable: prescribing behavior								

Source: Own survey, 2019

Before interpreting the regression data result we have to check whether assumption of Multicollinearity and normality assumptions are violated or not. Multicollinearity can be checked using VIF and tolerance. Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model and is calculated using the formula 1–R squared for each variable. If this value is very small (less than .10) it indicates that the multiple correlation with other variables is high, suggesting the possibility of Multicollinearity. The other value given is the VIF (Variancefla tion factor), which is just the inverse of the Tolerance value (1 divided by Tolerance). VIF values above 10 would be a concern here, indicating Multicollinearity. The result from Table 4.12 shows the VIF is below ten and the tolerance result didn't exceed 0.10. Hence, we have not violated the multicollinearity assumption.

The above table shows that the standardized Beta Coefficients that present the contributions of each variable to the model. The results of regression analysis of each model, the result show that relationship marketing co-jointly predicted by promotional material β = 0.261, p<0.05), regular follow up (β = .799, p< 0.05), brand image (β = .757, p< 0.01), and cost of medicine (β = .502, p< 0.01).

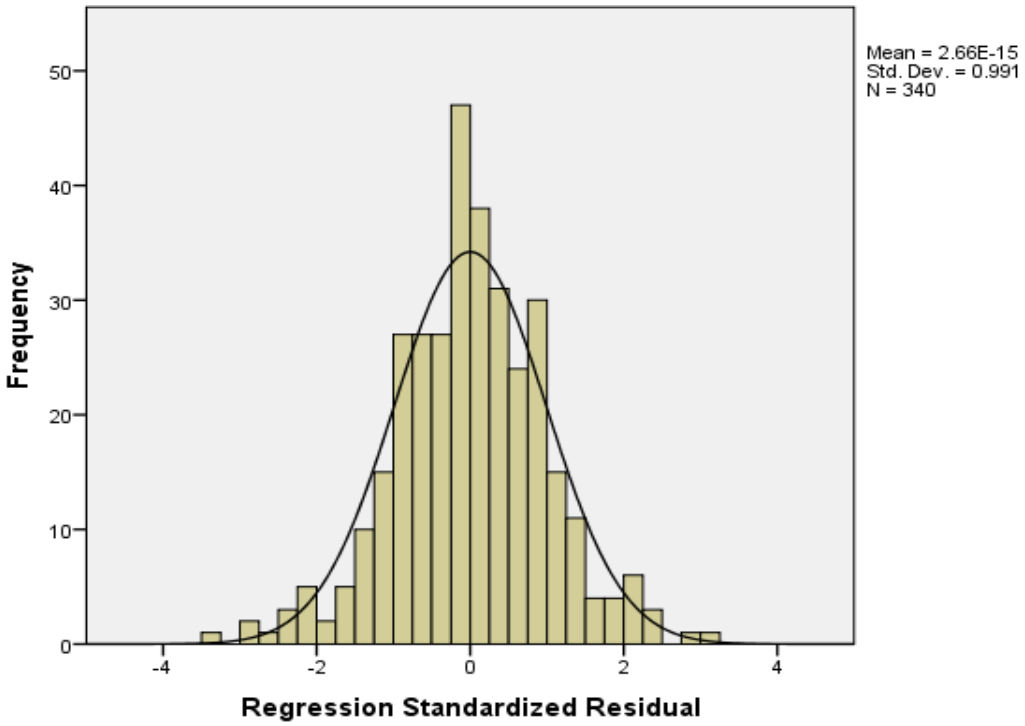
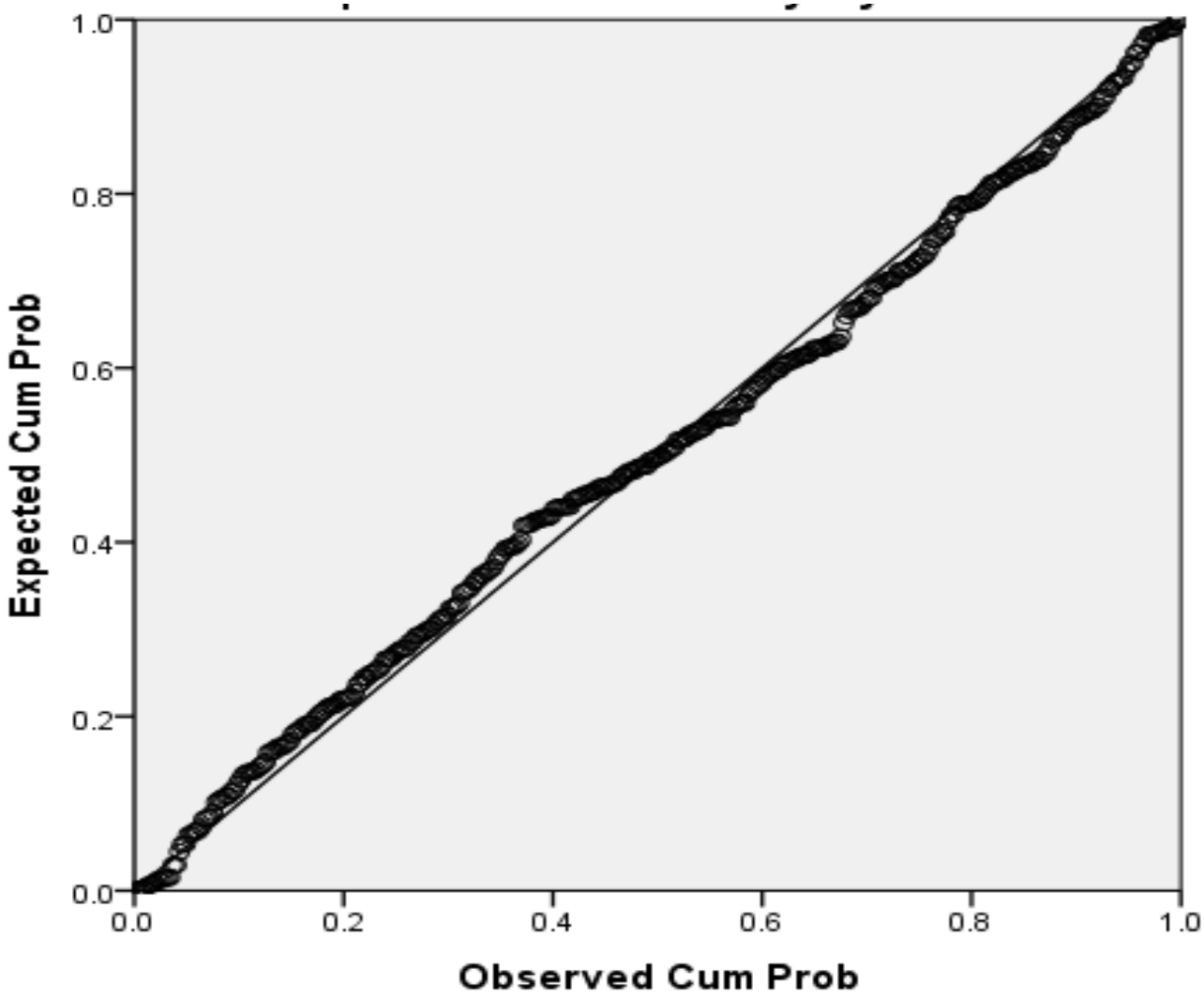


Fig 4.4 Regression standardized residual



Normality can be checked by histogram and p-plot. In the Normal P-P Plot, you are hoping that your points will lie in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. As we can see from the histogram and p-plot graph in the above diagram we can say the variables are normally distributed. Based on the results analyzed above, the proposed hypotheses $H_{2,3}$, and $_4$ is supported or accepted while H_1 is rejected. Summary of the hypotheses are presented on Table 4.13.

Table 4.13 Summary of proposed hypotheses

Code	Hypothesis	Status
H_1	There is significant positive impact of promotional material on prescription behavior.	Rejected
H_2	There is significant positive impact of regular follow up on prescription behavior.	Accepted
H_3	There is significant positive effect of medicine/drug cost on prescription behavior.	Accepted
H_4	There is significant positive effect of public relation on physician prescription behaviors	Accepted

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter includes summary of major findings, conclusions, and recommendations of the study.

5.1 Summary of major findings

The study was conducted to assess factors that affect prescribing behavior of physicians working at Tikur Anbessa specialized hospital. The analysis was performed to assess the effect of marketing communications on overall physician prescription behavior.

The results show four major factors that influence prescription behavior. Majority physicians strongly agreed that the most important strategy that influences the prescription behavior was regular follow up (mean 3.71) of sales representative. Next to regular follow up, brand image and promotional material were found most influential strategy with the rating of mean scored value 3.58 and 3.54 respectively.

5.2 Conclusion

This study was done to asses factors affecting prescribing behavior of physicians and has highlighted the complex interrelated factors that affect physicians' prescription pattern. The study results indicated that the current promotional techniques had a great role in influencing physicians' prescription pattern; however, the influence of these techniques was not similar. With regard to the Pearson correlation analysis, it can be clearly seen as that the independent variable namely promotional material, cost of medicine/drug, regular follow up of sales representative, and brand image are positively Related to prescribing behavior of physicians looks like the following:-

- Promotional material and prescribing behavior have moderate relationship.
- Regular follow up sales representative and prescribing behavior have negative relationship.
- Brand Image and prescribing behavior have small relationship.

- Cost of medicine and prescribing behavior has moderate relationship.

The regression analysis (58.2%) it clearly shows that independent variables (promotional material, cost of medicine, brand image and regular follow up of physicians) explains prescribing behavior of physicians in Tikur Anbesa specialized hospital.

5.3 Limitation of the study

This study is depended on the responses of the physician, is a tendency among responders to give socially desirable responses to questions relating to one's behavior. Disclosure of unethical prescription behavior may inhibit them to tell the actual truth on ground. This also affects the credibility of the major findings and respective conclusions.

5.4 Recommendations

This study raised a number of research questions and developed hypotheses related to the study variables. The purpose of the study was to assess factors influence prescription behavior of physicians. The study applied a descriptive study in Tikur Anbesa specialized Hospital Addis Ababa, Ethiopia and tried to infer the findings through testing the hypotheses. And based on the conclusions drawn above the following recommendations are forwarded for the concerned bodies:

- Pharmaceutical companies need to understand what physicians value most and address that need in a more economic and ethical manner.
- Pharmaceutical companies need to train their medical representatives about their products and professional ethics.
- Pharmaceutical companies need to pay attention to other factors such as price, quality and other variables related to their products.
- Pharmaceutical companies need to use ethically acceptable promotional materials and methods.
- Pharmaceutical companies, regulatory authorities and customers need to work hand in hand for the benefit of the patient.
- Pharmaceutical companies need to balance the information they use during one-on-one or CMEs presentations so that they can help physicians get appropriate information that can address their patients' problem, and on top of that if physicians get valuable and trustworthy information from medical representatives, they will have positive perception about medical representatives and value the information they get.
- Regulatory authorities need to follow the ethical practice of pharmaceutical promotion.

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APPENDICES

Appendix-I: Survey Questionnaire

St. Mary's University

Master's in Marketing Management

Survey Questionnaire

My name is Kalkidan Aschalew and I am currently enrolled at St. Mary's University, School of Graduate Studies. I am writing my MA in marketing thesis as a partial fulfillment. The purpose of this questioner and your answers is to help me understand the factors that influence prescription behavior of physicians. 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.

Kalkidan Aschalew

Telephone: 0913532109

Part I. General Information

1. Gender Female ☐ Male ☐

2. Age ≤30 years ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ > 61 years ☐

3. Specialty Specialist ☐ Consultant ☐ General Practitioner ☐
Other, please specify ☐ _____

4. Years of practice ≤10 years ☐ 11- 20 years ☐ 21-30 years ☐
≥ 31 years ☐

Part II. Questions related with Marketing Communications and Physician Prescription Behavior

Please read each statement carefully and show your level of agreement on the statements by putting "X" mark in the boxes using the following 5-scale Likert scales: Strongly agreed (SA)=5, Agreed (A)=4, Neutral (N)=3, Disagreed (DA)=2, and Strongly disagreed (SDA)=1

	SDA	DA	N	A	SA
1. Promotional Material related questions	1	2	3	4	5
Availability of promotional items does have a role in medication choice					
Availability of promotional materials can influence prescription choice					
Firms promote drugs through scientific journals encourage physician to prescribe drug					
Free drug samples encourage trying the drug					
Words on the packaging of gift items encourage physicians to prescribe the drug					
Low cost gifts (pen, paper weights, writing pads, etc. depicted drug brand) from pharmaceutical suppliers remind drug brand while prescribing					
Financial incentives, given that there are similar competitive medicines motivate physicians to prescribe					
The firms interest to educate the physicians on new medicine through financing their participation to international scientific conference					
2. Regular follow-up of sales representative	1	2	3	4	5
Sales representatives provide accurate and up to date detailing regarding drug brand					
The detailers' scientific knowledge on the medicine encourages physician's prescription decision					
Frequency of sales representative's visit has an influence on prescription choice					
Sales representatives demonstrate free drug sample to persuade physician to prescribe medicine					
The physician – detailer interpersonal relationships motivates the physician to prescribe the medicine					
3. Public Relations/ Publicity	1	2	3	4	5
Supplier's product launch meeting, lunch or dinner					

encourages physician prescribing drug brand					
Suppliers arranging clinical or scientific meetings on several special days					
Suppliers conducting a discussion by a specialist doctor is helpful to remind drug brands to prescribe					
Suppliers sponsor physician for conferences to influence them to prescribe their brands more					
Frequency of medical representatives' visit has a role in brand reminding and influence prescription choice					
4. Medicine/Drug cost	1	2	3	4	5
Price of medicine doesn't have a role in medication choice.					
Information related to price from medical representative is helpful in prescription choice.					
5. Physician Prescription Behavior	1	2	3	4	5
Initial perception (clinical observation) of the medicine matters most to me					
Detailing of the sales representatives has a role on my prescription behavior					
Sales promotion doesn't encourage me to prescribe a medicine					
Advertisement of brands on scientific journals inspires my prescription behavior					
Financial sponsorship for training, conferences, and gatherings persuade me to prescribe a medicine					
Peer groups (colleagues, specialists, trainers,…) influence my prescription behavior considerably					

Many Thanks for Your Valued Time!!