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The Impact of Marketing Activities of Pharmaceutical Companies on Physicians' Prescription Pattern in Addis Ababa

A Thesis Submitted to Addis Ababa University College of Business and Economics, Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration, Specialization in Management

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Declaration

I, Belachew Tigist, hereby declare that the thesis entitled ***The Impact of Marketing Activities of Pharmaceutical Companies on Physicians' Prescription pattern in Addis Ababa*** is my own original work and has not been submitted for any degree in any other University. It is offered for the award of the degree of Master of Business Administration in Management from Addis Ababa University.

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Statement of Certification

This is to certify that the thesis prepared by Belachew Tigist entitled: entitled *The Impact of Marketing Activities of Pharmaceutical Companies on Physicians' Prescription Pattern in Addis Ababa* and submitted in partial fulfillment of the requirements for the degree of Master of Business Administration Specialization in Management compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Acronyms

CME	Continuing Medical Education
FMHACA	Food, Medicine and Health Care Administration and Control Authority of Ethiopia
FDA	Food and Drug Administration
FMOH	Federal Ministry of Health
PSRs	Pharmaceuticals Sales Representatives
SPSS 23	Statistical Software Packages for Social Science: Version 23
WHO	World Health Organization

Abstract

The purpose of this study is to determine the impact of pharmaceutical marketing activities-personal selling on Physicians' prescription pattern in Addis Ababa. Therefore, this study aims to bridge this gap in literature and knowledge. The study employs a descriptive research design and uses quantitative approach. A survey is conducted by using structured close ended questionnaires which is distributed to 234 doctors practicing in Addis Ababa. Descriptive, correlation and multiple regression statistical tools were used to examine the relationship between Pharmaceutical marketing activities and physicians' prescribing behavior. The result of the research revealed that sponsoring of meetings and drug samples are best predictors of physicians prescribing behavior. Hypotheses testing revealed that there is positive and significant relationship between marketing activities of the pharmaceutical companies and physicians' prescribing behavior. Recommendation and future studies are forwarded.

Key words: *Detailing, Samples, Meetings, Physician, prescribing*

Chapter One -Introduction

1.1. Background of the Study

The pharmaceutical industry is one of the most important driving forces, and dominant player in the global modern economy, securing approximately one trillion US dollars in revenue every year. According to the International Trade Administration (2016), in the past decade, the pharmaceutical market has consolidated its position as one of the fastest growing markets in the world, with the US, China, and Japan ranked as the first, second, and third largest pharmaceutical markets in the world, respectively. However, as noted by competition in this large pharmaceutical market is intense. (Shepherd, 2017) Therefore, most pharmaceutical companies spend more than one third of their sales revenue on marketing, which is approximately double the amount they spend on research and development, in an attempt to retain and maximize their market share (Kaur, 2016). No matter how successfully developed a product may be, it is worthless except its benefits are made clear and appreciated by the target customers.

Promotional strategies are communication strategies through which a company passes across the benefits of its products to its customers. Pharmaceutical marketing is quite different from general marketing as decision makers are the physicians (secondary customers) not the patients (original customers), thus maximizing marketing strategies are designed on focusing to the physicians. The patients are the end users but they are not direct customer to the pharmaceutical companies. They really focus on doctors to promote their products using specific techniques of promotions tools, such as sales promotion, public relation, direct marketing, personal selling, and advertising. The significant matter is does it make a sense to doctors for prescribing the branded drugs (Al-Haddad, 2014). The World Health Organization (WHO) defines drug promotion activities as “all informational 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, 2010)

Pharmaceutical companies have used marketing tools to draw doctors' attention to pharmaceutical products and influence the decisions made regarding adopting and using these products (Steinbrook, 2016). Some of the promotional techniques that pharmaceutical companies have used to maximize their profit margins are informed by two factors: the need to promote

specific drugs; and the need to enhance company reputation through stronger relation with physicians (Kane et al, 2017). However, Pharmaceutical company that improves its reputation likely to sell more drugs, while a company that enhances a specific drug will also have improved chances of acquiring a positive reputation (Al-Areefi et al, 2013). One of the common approaches to promoting specific drugs is the use of Medical representatives (MRs) or Pharmaceutical sales representatives (PSRs), with the largest portion of pharmaceutical budget being used on this. Medical representatives are frequently the only source of information about medicines in the developing countries where there may be as many as one representative for every five doctors (Lexchin, 2014). Medical Representatives give detailed information about the new medications to care providers and also act as a support team to answering their queries. Besides the information provided orally by MRs, they also give expensive gifts, such as buying dinners or lunches when they visit, or even more exclusive and lucrative gifts, such as event tickets, electronic devices, sponsored travel, meals and vacations for families, educational seminars, honorarium to promote the product at the event, and funding for research projects (Lodha, 2010). Studies suggested that interaction between doctors and pharmaceutical companies affect doctor request to add medication to hospital formularies as well as doctors prescribing behavior. (Bowman and Pearle, 2015)

In Ethiopia, Pharmaceutical companies, especially those that deal with prescription drugs operate in a very competitive environment because of the existence of various brands of generic drugs. The competitive nature of the business environment makes it mandatory for them to develop and implement strong promotional strategies in order to gain and maintain a reasonable share of the market. However, the impact of their marketing activity on doctors' prescription pattern is not yet studied. This study, therefore, is to examine the effect of the marketing strategies of the pharmaceutical companies on the prescription practices of physicians working in Addis Ababa.

1.2. Statement of the Problem

Pharmaceutical companies use multifaceted promotion approaches incorporating detailing and presenting gifts by medical representatives. Though some studies exist on their influence on doctors' prescription pattern worldwide, there is few or limited studies done in Ethiopia in this area (Workneh MD et al, 2016, Mulugeta Negash et al, 2017). The studies carried out were survey oriented and thus able to measure relationships but not prove causation. Some of these

studies tested multiple components of promotional activities that may have little or no combined effect on prescribing but have a significant effect when analyzed separately. Also, the majority of the studies were conducted in different countries with diverse cultural and social backgrounds. This variability is reflected in the results and deductions of the studies. This review is based on results of studies with different methodological objectivity.

Hence a question arises, “Are the pharmaceutical promotional activities really able to influence the decision behavior of doctors in our context?” This study, therefore, is to examine the impact of the marketing strategies of the pharmaceutical companies on the prescription pattern of physicians working in Addis Ababa.

1.3. Research Questions

1. What is the influence of pharmaceutical marketing activities on doctors’ prescription behavior?
2. How does a physician choose a brand among the alternative choices?
3. Which factors influence the prescription behavior of the physicians?

1.4. Objective of the study

General Objective

- To determine the impact of pharmaceutical marketing activities on the prescription pattern of doctors in Addis Ababa

Specific objectives

- To examine whether pharmaceutical promotion activities is a reason for change in prescribing practice
- To identify determinants of the impact of pharmaceutical promotion activities on prescribing decision
- To determine the association between doctors involvement in the marketing activity of companies and change of prescribing practice

1.5. Research Hypotheses

Hypothesis can be defined as a logically speculated relationship between two or more variables expressed in the form of a testable statement. Relationships are estimated on the basis of literature reviews. In this particular study, the relationship between the independent variables (face to face detailing, drug samples, gifts, sponsoring events and meal invitation) and the dependent variable (Physicians prescribing decision) has been examined. Having the theoretical and empirical arguments explained in chapter two of the thesis, the following hypotheses are proposed:

H1: There is a significant and positive association between Face to face detailing and Physicians' decision behavior

H2: There is a significant and positive association between free drug samples and Physicians' decision behavior

H3: There is a significant and positive association between gifts and Physicians' decision behavior

H4: There is a significant and positive association between sponsoring event and Physicians' decision behavior

H5: There is a significant and positive association between meal invitation and Physicians' decision behavior

1.6. Definition of Terms

1.6.1 Conceptual Definition

- ✓ **Drug (or Pharmaceutical):** mean any substance or mixture of substances or medical equipment or supplies, used for human and animal health care (i.e. diagnosis, treatment, mitigation or prevention of disease or symptoms) including poison, narcotics and psychotropic substances, chemicals, blood and blood products, vaccines, sera, radioactive pharmaceuticals, medicated cosmetics and sanitary products, household and industry pesticides, medicated food stuffs, and Animal food additives.

Source FMHACA, Guidelines for the regulation of promotion & Advertisement of drugs. Ethiopia, 2014

- ✓ **Promotion'**: includes any representation such as sound, word, sign, image, electronics or other means whatever, for the purpose of promoting directly or indirectly the prescription, sale or dispense of any drug. (FMHACA, 2014)
- ✓ **'Medical representative' or 'Pharmaceutical sales representatives'**: means a representative of a manufacturing firm directly or through the distributor, licensed by the Authority to conduct promotional activities through provision of information on the drugs manufactured by the firm (FMHACA, 2014).
- ✓ **'Health professional'**: means medical practitioners and veterinaries, Health officers, Pharmacists and druggists (FMHACA, 2014).

1.6.2 Operational Definition

- ✓ **Pharmaceutical Marketing activities:** is an activities by Pharmaceutical companies includes Face to face detailing, Distribution of drug samples, giving gifts for physicians, Sponsoring meetings and inviting professionals for meals.
- ✓ **Face to face detailing (or Visit)** applies to Medical Representatives, refers to any contact with medical staff, to induce the prescription, supply, purchase and/or use of drugs.
Source: Consumer international, Drugs, Doctors and Dinners. How drug companies influence health in the developing world, London, 2011, p.18.
- ✓ **Gifts:** Gifts from Medical Representatives can be as innocuous as pens, notepads, medication samples, and meals or as substantial as travel, cash honoraria, and research support
Source: Day M. Industry association suspends Drug Company for entertaining doctors. Br Med J 2016; 332:381
- ✓ **Drug Samples:** Prescription and non-prescription medications which are provided to the sites by Medical representatives for complementary distribution to patients as starter doses.
Source: The prescription project. A toolkit for Academic Medical Centers; Pharmaceutical Samples, Boston, 2012, P.4

1.7. Significance of the Study

To the best knowledge of the researchers such kind of study has not been done in Ethiopia. Hence, this research work will be significant in many ways. The study will be a basis for researchers interested in researching the same or related topics in the future. Results and findings will contribute valuable information to the existing body of knowledge adding significant value to the understanding of the impact of pharmaceutical promotion on the prescription pattern of doctors. Scholars and future researchers will find this work beneficial because it is bound to contribute information, and enlighten them on the usefulness of pharmaceutical marketing.

From a managerial perspective, a good understanding of drug companies influence on physicians provide pharmaceutical company managers a framework to optimize promotion activities by firstly deciding where to focus their efforts to increase their benefits and secondly by choosing the best promotional approach and tool to persuade physicians best and thus avoiding any wasteful expenditure.

1.8. Scope and Delimitations

Scholars recommended longitudinal research design to make universal cause-effect relationship between these variables. However, due to time and financial constraints this research depended on cross-sectional data that were collected only from Addis Ababa during 2019. Although a number of other relevant factors could be possible moderators between physicians' prescribing behavior and pharmaceutical companies marketing activities, this study has focused only on five variables that are critically relevant.

1.9. Limitations of the Study

□ Empirical research in pharmaceutical companies marketing activities and physicians' prescribing behavior area in Ethiopia is limited. This has put challenge in proceeding with this research smoothly. This research, thus, tried to see the experience of other countries.

□ This research is entirely quantitative and depends on data collected through questionnaires. It could be more informative if other techniques of primary data collection were administered side by side. But with time and resources constraints, only questionnaire survey data used for the research.

1.10. Organization of the Research

The rest of the thesis is organized as follows.

Chapter two: Literature Review - this chapter will deal with the synthesis of the relevant literatures that have been reviewed including concepts and theoretical framework.

Chapter three: Research Methodology – in this chapter, the type and design of research, the subject /participant of the study; source of data; the data collection tools/ instruments employed; the procedures of data collection; and the method of data analysis used will be described.

Chapter four: Results and Discussions - this chapter will summarize the results/findings of the study, and interpret and/or discuss the findings.

Chapter five: Summary, Conclusion and Recommendation- this chapter contains summary of the findings, conclusion, recommendations and suggestions for potential future research.

Chapter Two -Literature Review

Related works of theoretical, empirical and conceptual framework literatures to the topic discussed in this chapter.

2.1. Theoretical Review

2.1.1. Defining marketing activities by Pharmaceutical Companies

Marketing activities by Pharmaceutical companies is a set of activities. Promotional strategies are communication strategies through which a company passes across the benefits of its product and services to its target customers. No matter how successfully developed a product may be, it is worthless except it is backed up by the marketing activities of the pharmaceutical companies. A company's promotional strategies comprise basically of message and media strategy, consisting of the appropriate use of branding, logo or slogan. The World Health Organization defines drug promotion strategies as "all informational 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)

Pharmaceutical companies typically direct their marketing efforts toward physicians. The marketing efforts directed at physicians comprise personal selling through sales representatives (Detailing) (Jeremy E. Greene, 2004). The most common approaches used to promote specific drugs using Pharmaceutical Sales representatives (PSRs), with the largest portion of pharmaceutical budget being used on this. Sales representatives are frequently the only source of information about medicines in the developing countries where there may be as many as one representative for every five doctors (Lexchin, 2014). This marketing approach refers to face-to-face promotional activities directed toward physicians and pharmacy directors. Pharmaceutical representatives typically visit doctors to pitch their drugs. Marketing activities of pharmaceutical companies also includes taking doctors out for meals and giving them free product samples, gifts in the form of medical textbooks and sponsoring for meetings and inviting for meals.

2.1.2. Perception Towards pharmaceutical Sales Activities

The evidence is not conclusive; there is a strong association between reliance on promotion and less appropriate overall use of prescription drugs (Wazana A., 2000). Heavy promotion of new

drugs leads to widespread prescribing and use before the safety profile of these products is fully understood. Newer, more expensive medicines displace older, less costly ones without any evidence of an improvement in therapeutic outcomes (Lexchin J., 2002). Sales representatives sometimes crossed ethical boundaries by giving gifts. 14% of internal medicine residency programmed directors reported observing unethical activities by sales representatives (Keim et al, 1993), these included detailing in clinical areas, making false claims, giving monetary gifts, and conducting unauthorized studies. A study by Poirier et al in 1994, of people who make decisions about formularies in US private hospitals; found that most (93%) felt that providing non-monetary benefits to doctors to influence formulary decisions or product use was unethical. Ahmad and Bhutta, 1990 found 95% of the doctors they interviewed in Karachi relied upon industry promotional material as their main source of information about drugs. They also found extremely high levels of irrational prescribing and dispensing for children. (Ahmad and Bhutta, 1990)

2.1.3. Physicians' Prescribing Decision

The prescribing decision is a complex process that involves a number of factors. In many cases, the decisions of physicians' are multifactorial. Physicians may adopt several strategies when making prescribing decisions and several kinds of critical heuristics in conducting their duties of patient treatment. Despite the several opinions on physicians' decision-making in literature, none of the theories can solely explain the drug prescription decision of physicians and its related factors. (Reyna VF, Rivers SE, 2008) Consequently, complex theories have been used to understand how several factors influence physician decision-making in general practice. This has resulted in demands for more theoretical research to develop better interventions needed to change the behavior of physicians. According to recommendations made by several researchers, there is a crucial need for further research into the conceptual framework of physicians' prescribing behavior. Thus, prescribing research may benefit from having multiple perspective views on decision making. (Godin G. et al, 2008)

Some studies have attributed inappropriate prescriptions to the behavior of physicians and factors related to their decision-making. These factors include marketing efforts of pharmaceutical firms and patient characteristics (requests and expectations). (Buisman A. et al, 2007, Reyna et al, 2008, Godin et al, 2008) In addition, the poor collaboration between physicians and pharmacists

has been recognized as a significant factor responsible for an inappropriate prescription. Nevertheless, the understanding of these factors and optimal approaches needed to improve the prescribing behavior of physicians is incomplete. (Buusman A., 2007)

2.1.3. Impact of Pharmaceutical Marketing activities on Doctors' Prescription Pattern

Pharmaceutical marketing is unique as the decision making of buying the medicine lies in the hands of intermediate customer (doctor) rather than final consumer (patient). Thus pharmaceutical companies try to influence the customer (doctor) rather than final consumer (Patient). Thus doctors are the most important players in pharmaceutical marketing system. Doctors write the prescriptions that determine which drugs (brands) will be used by the consumer (patient). Thus influencing the doctor is a key to the pharmaceutical sales. Pharmaceutical companies try to influence prescription pattern of doctors in favor of their brands by offering various kinds of marketing activities: face to face detailing, giving free medical samples, gifts and sponsorships etc. (Arora and Taneja, 2006). Usual marketing practices followed by most of the large and mid-sized companies include valuable gifts, arranging foreign trips with family and complimentary tickets and memberships for social activities to doctors (Jayakumar, 2008). Recent research suggests that interactions between doctors and pharmaceutical companies affect doctor requests to add medications to hospital formularies as well as prescribing behavior.

2.2. Empirical Review

2.2.1. Components of Pharmaceutical Marketing Activities

Initially research identified five most common elements of marketing activities by pharmaceutical companies namely: Face to face detailing, providing free medical samples, gifts like pens, stationary items, or note pads, sponsoring meetings either in local or international meetings, and inviting for meals. (Saito et al, 2010)

a. Face to face detailing:

Previous studies revealed that pharmaceutical drug promotions influence drug prescription. There are studies which showed evidence of an association between exposure to the information provided by pharmaceutical Sales representatives (PSRs) and a higher frequency of prescription.

Reviews of information presented by pharmaceutical sales representatives have noted that pharmacologic information is often inaccurate. In Britain, Canada, New Zealand, and the United States 80-90% of doctors see pharmaceutical representatives. Of statements made by pharmaceutical representatives 11% are false and of the false statements all are in favor of the representatives' drugs. While very few doctors consider themselves susceptible to detailing, 84% of them believed that their colleagues are. (Ziegler MG et al. 1995)

Poirier et al find out that only 24% of the physicians were satisfied with detailing and 48% were dissatisfied. These skeptical attitudes were confirmed by finding that only 20% of the physicians believed in the accuracy of presented information while 44% did not. Nevertheless, 56% admitted that medical representatives could influence formulary decisions if efficacy, toxicity, and cost were the same, while 28% disagreed with this statement (Poirier et al, 1994). Heavy promotion of new drugs leads to widespread prescribing and use before the safety profile of these products is fully understood. Newer, more expensive medicines displace older, less costly ones without any evidence of an improvement in therapeutic outcomes. (Lexchin, 2002)

Andaleeb and Tallman's (1996) examination of physicians' relationships with sales representatives showed that although physicians viewed sales representatives as an important source of information, they thought they also get the needed information from another source. The study found that physicians had friendly relationship 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 viewed negatively.

Industry interactions correlate with doctors' preferences for new products that hold no demonstrated advantage over existing ones, a decrease in the prescribing of generics, and a rise in both prescription expenditures and irrational and incautious prescribing. (Katz et al, 2003)

Gupta et al (2016) finds out that 37% doctors responded that they interacted with Medical Representatives once a week whereas 25.9% told that they interact with Medical Representatives twice a month. About 69.1% doctors think that Medical Representatives exaggerate the benefits of medicines and downplays the risks and contraindications of medicine. 61.7% doctors think that Medical Representatives has an impact on their prescribing.

As salespeople, PSRs regularly visit the physicians and with time, build interpersonal relationship with them. The quality of interpersonal relationship can be described by the intensity of the interaction (frequency of visits to physicians) between PSR and a physician or how sincere

the salesperson communicate and be involved with the physician (that is, probing: longer depth interviews); the interaction intensity and mutual disclosure affect the salesperson performance (Boles et al., 2000) and high intensity interpersonal relationship has positive effect on the sales volume, while the “friendship” interpersonal relationship is regarded as high intensity (above average) interaction and the “business” interpersonal relationship regarded as low intensity interaction (Herbst and Forrest, 2008).

Physicians agreed that sales representatives provide useful and accurate information about newly and already established drugs, but only slightly agreed that they performed an important teaching function. Physicians strongly agree that sales representatives should be banned from making presentations where physicians practice (Caudill 1996).

In 1981, approximately a year after temazepam was introduced in Australia. Peay and Peay found that contact with a sales representative about temazepam most consistently predicted a favorable reception of temazepam at various points in the adoption process. Doctors who had seen a sales representative reported earlier awareness of temazepam, prescribed it earlier, were more likely to rate it as a moderate (rather than minor) advance over other drugs, were more likely to have prescribed it, reported prescribing it earlier, and were more likely to prescribe it routinely in preference to other alternatives. Compared to those who saw sales representatives less frequently, those who saw representatives more than once a week were aware of temazepam earlier, prescribed it earlier, and (amongst GPs) were more likely to prescribe it than other alternatives. They also found no relationship between doctors’ professional involvement, and involvement in the medical community, and beliefs about temazepam. The study has considerable advantages over those described above. It does not ask doctors to assess themselves whether promotion has affected their decisions. It does not ask them to rate their own level of reliance on commercial information. (Peay and Peay, 1981)

Lurie et al. surveyed internal medicine faculty and house staff at teaching hospitals about the nature, frequency, and effects of their contacts with sales representatives. Both faculty and house staff averaged 1.5 brief conversations per month with sales representatives. Twenty-five percent of faculty and 32% of residents reported having changed their practices at least once in the preceding year based on contact with a detailer. But detailing activity also potentially influences prescribing through another channel: hospital formularies. Based on the suggestion of a sales representative, 20% of faculty and 4% of residents had recommended an addition to the

formularies at least once during the past year. Using stepwise logistic regression, Lurie et al. found that brief conversations, extended conversations, and free meals predicted a change in faculty prescribing practice. (Lurie et al, 1990)

Taylor and Bond studied the association between new prescriptions and factors of influence. They collected prescription behavior of 189 British practitioners and asked them to indicate up to two influences. Pharmaceutical representatives were listed as the second most important source (20% of total number of times mentioned) and mostly influenced the prescription of anti-infective preparations and non-steroidal anti-inflammatory agents (Taylor and Bond, 1991).

Bower and Burkett found that family physicians that relied least on sales representatives were most likely to prescribe generic drugs (33%), while only 12% of those who said they relied "a great deal" on detailers prescribed generic drugs. Physicians who relied "some or not at all" on sales representatives as a source of information also recognized more generic and trade name drugs (Bower and Burkett, 1987). Manchanda and Chintagunta studied physicians' response to detailing at the individual level. They modeled the number of prescriptions as a function of detailing frequency and quality measured by the number of provided samples. Their results showed that both measures of detailing and their interaction effect positively affected the number of prescriptions. They also investigated sales force effectiveness assuming partial knowledge of the response parameters. Though most physicians responded positively to sales calls, they found that physicians were not detailed optimally. High-volume physicians were detailed to a greater extent than low-volume physicians without regard to their responsiveness to detailing. (Manchanda and Chintagunta, 2004)

The extent of involvement in promotional activities was greater among physicians who prefer to ask PR for information when a new medication becomes available, physicians who are not satisfied with the patient encounter ending only with advice, and physicians who prefer to prescribe brand-name medications when generic options are available (Saito et al. 2010)

From the discussion above, it seems that physicians are beginning to acknowledge that detailing has an impact on physician prescription behavior. However, the general perception that detailing has no effect on prescription behavior still persists. This perception may exist because physicians are unwilling to admit their reliance on detailing or their lack of awareness of such influence.

H1: There is a significant and positive association between Face to face detailing and Physicians' decision behavior

b. Drug Samples:

Sufrin and Ross reported that free drug samples have been shown to affect physician prescribing behavior. Physicians with access to free samples are more likely to prescribe brand name medication over equivalent generic medications. Other studies found that free samples decreased the likelihood that physicians would follow standard of care practices. (Sufrin and Ross 2008) Receiving pharmaceutical samples does not reduce prescription costs. Even after receiving samples, sample recipients remain disproportionately burdened by prescription costs. It is argued that a benefit to free samples is the “try it before you buy it” approach. Free samples give immediate access to the medication and the patient can begin treatment right away. Also, it saves time from going to a pharmacy to get it filled before treatment begins. Since not all medications work for everyone, and many do not work the same way for each person, free samples allow patients to find which dose and brand of medication works best before having to spend money on a filled prescription at a pharmacy. (Alexander et al 2008)

Saito et al found out that physicians in practice for 21 years or more were less likely to receive drug samples than those in practice for 20 years or less. Physicians whose workplaces banned both meetings with PRs and gifts were less likely to receive drug samples. Internists, orthopedic surgeons, pediatricians, and ophthalmologists were more likely than psychiatrists to receive drug samples. (Saito et al, 2010)

H2: There is a significant and positive association between free drug samples and Physicians’ decision behavior

c. Gifts:

Wood et al found out that gifts from pharmaceutical companies are associated with more prescriptions per patient, more costly prescriptions, and a higher proportion of branded prescriptions with variation across specialties. Gifts of any size had an effect and larger gifts elicited a larger impact on prescribing behaviors. Our study confirms and expands on previous work showing that industry gifts are associated with more expensive prescriptions and more branded prescriptions. (Wood et al 2017)

Gifts from the Pharmaceutical Sales Representatives can be as innocuous as pens, note pads, medication samples, and fast food, or as substantial as travel, cash honoraria, and research support. Irrespective of the content, gifting is ubiquitous. A survey noted that 92% of doctors had received free drug samples, 61% had received meals, free access to entertainment, sporting

events or travel, and nearly one in seven had received financial benefits. Social science research continues to show that the impulse to reciprocate from even a token gift can be a powerful influence on behavior, thereby producing a possible conflict of interest for the recipient (doctor). This conflict of interest exists when there is an inconsistency between an ethical or professional interest and self-financial concern. This becomes evident when pharmaceutical companies persuade doctors to write prescriptions, an act not only with financial and health sequelae for the patient, but with possible financial consequences for the doctor. A classic study has shown that most doctors (61%) believe that they are not influenced by detailers' gifts; however, they believe the same is true for only 16% of their colleagues. Medical students acknowledge gifts as more difficult ethically for professions other than their own. (Reist and Vande Creek, 2004)

Physicians whose workplace banned both meetings with PSRs and gifts were less likely to receive gifts. Nearly 20% of physicians feel that gifts offered by drug representatives affected their prescription of a certain drug. Gifts, no matter their size, have a powerful effect on human relationships. Reciprocity is a strong guiding principle of human interaction. Even gifts of small value, such as "modest" industry-sponsored lunches, may foster a subconscious obligation to reciprocate through changes in prescribing practices. United Kingdom generated the most important body for regulation of interactions with the medical profession, which is Association of the British Pharmaceutical Industry. It included that any gifts given to physicians must be of a value of less than £6. These regulations must be more understandable and implemented to reach the goal (Al Zaharani, 2014, Saito 2010). It has been shown that a meal with a value of less than \$20 can increase the prescribing of branded statins, beta-blockers, ACE inhibitors, and antidepressants. Recently available public data show that industry gifts are common among physicians in general and among specialists (i.e. surgeons, emergency medicine physicians, obstetricians/gynecologists, radiation oncologists, gynecologic oncologists, otolaryngologists, and pediatricians).

In about 74% of the emergency medicine residents surveyed felt that sales representatives sometimes crossed ethical boundaries by giving gifts. 14% of internal medicine residency programmed directors reported observing unethical activities by sales representatives (Keim et al, 1993), these included detailing in clinical areas, making false claims, giving monetary gifts, and conducting unauthorized studies. In 1994 a study by Poirier et al, of people who make

decisions about formularies in US private hospitals; found that most (93%) felt that providing non-monetary benefits to doctors to influence formulary decisions or product use was unethical.

H3: There is a significant and positive association between gifts and Physicians' decision behavior.

d. Sponsoring meetings:

Saito et al found out that Female (vs. male) and hospital-based (vs. office-based) physicians were more likely to participate in industry-sponsored CME events at the workplace. In terms of specialty Obstetrician-gynecologists were less likely than internists to participate in such events. Obstetrician-gynecologists and ophthalmologists were less likely to receive financial subsidies to attend CME events than the other specialists. Physicians whose workplaces banned both meetings with PRs and gifts were less likely to participate in industry-sponsored CME events outside the workplace than those whose workplaces had no such rules. (Saito et al 2010)

Accepting funding to attend a symposium was independently associated with increased formulary addition requests for the sponsor's drug (ChrenandLandefeld 1994). This interaction was also found to impact hospital prescribing practices 2 years after 2 groups of physicians accepted all-expenses-paid trips to a drug-sponsored symposium. This occurred despite the continued prescribing of the two drugs that the new ones were to replace and the lack of concern about the interaction among all but one beneficiary (Orlowski et al 1992). The physicians were not randomly selected, thus raising the unlikely possibility that physicians more partial to the sponsor's drug chose to participate. It is nonetheless striking to note that the changes occurred at an institutional level.

H4: There is a significant and positive association between sponsoring event and Physicians' decision behavior

e. Invitation for meal:

A study done in Japan by Saito et al showed that Female (vs. male) physicians, physicians in practice 21 years or more (vs. 20 years or less), and hospital-based (vs. office-based) physicians, and physicians whose workplaces banned both meetings with PRs and gifts or banned gifts only were less likely to accept meals outside the workplace. Orthopedic surgeons were more likely to accept such meals than obstetrician-gynecologists and ophthalmologists. (Saito et al 2010)

There was an independent association between benefiting from sponsored meals and formulary addition requests for any drug that was clearly dose-related (Lichstein et al 1992).

H5: There is a significant and positive association between meal invitation and Physicians' decision behavior

2.3. Conceptual Framework of the study

As explained above, Pharmaceutical product is sold indirectly as the pharmaceutical industry cannot sell their product directly to patients or the selling is based on physician prescription as required by regulations. In market, there are various name and types of drugs in which this is categorized into generic, generic branded, and patented drugs. The most difference among products is price. The study is expected to uncover phenomena in drug sales regarding prescription process of physician, decision making of physician to select drug to patients, and as interaction between patient, physician and pharmaceutical companies. The framework of thought is presented as follows:

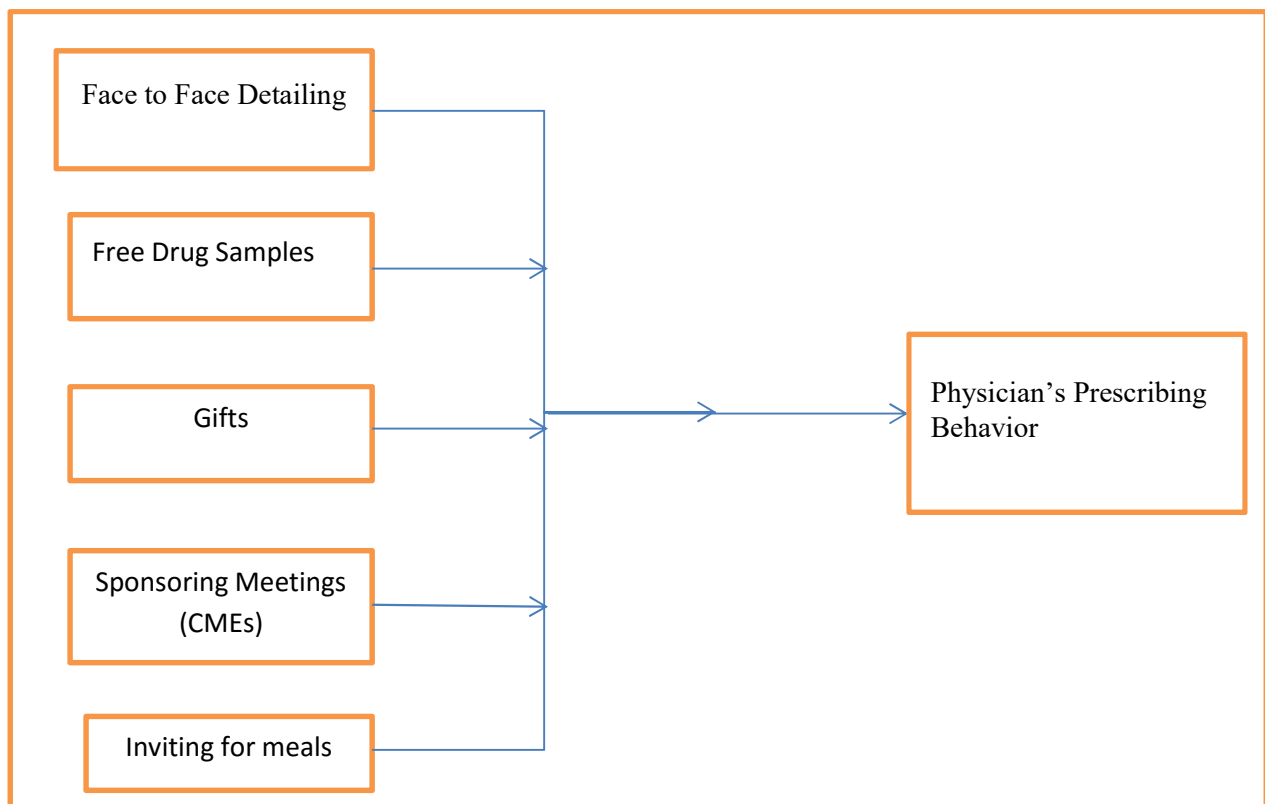


Figure 2.1 A conceptual model of physician's prescribing decision under the Influence of Personal selling activities adopted from May Alowi et al. (2018).

Chapter Three -Research Design and Methodology

This chapter discusses the research design and methodology in detail so as to have a clear picture on the processes and techniques used in conducting the study. The research design shows the general plan how to answer the research questions. It also gives information on how a sample respondent drawn from the population and gives description on the number of respondents and how they were selected. It also discuss about research design and the instruments for data collection. This chapter also discusses data analysis method and measures used to ensure validity and reliability of the study

3.1. Research Method

The aim of this study is to examine the impact of pharmaceutical marketing activities on physicians' prescribing decision. So as to answer the research questions and meet the objectives of the research, descriptive design is suitable for this study. Descriptive researches are those studies for which the purpose is to produce an accurate representation of persons, events or situations (Saunders et al., p.590). The main focus of descriptive research studies is to describe the characteristics of a particular individuals or group. Therefore, this study used descriptive method in order to examine the effect of the marketing strategies of the pharmaceutical companies on the prescription pattern of physicians.

3.2. Research Design

According to Creswell (2009), there are three research designs to consider, quantitative, qualitative and combination of the two. According to Cooper et.al (2003) as cited by Farhadi (2009) quantitative research helps to determine the relationship between an independent variable and a dependent variable in a population. It also used to explain causal relationships to facilitate generalization and to predict the future whereas qualitative research methods provide a complete picture of the situation by increasing the understanding of social process and interrelations.

Based on the objectives of the study and the availability of relevant information, this study used quantitative research design which helped us to arrive at possible research final destination efficiently. The quantitative approach was applied to examine the relationship between the dependent variable (i.e. doctors' prescribing behavior) and the independent variables (i.e. promotion activity by companies)

A survey strategy provides a quantitative or numeric of trends, attitudes or opinions of population by studying a sample of population (Creswell, 2009, p.146) and it is a popular and common strategy in business and management research and the most frequently used to answer who, what, where, how much and how many questions (Saunders et al., 2009, p.175). The aim of selecting survey strategy for this study is the method enables researcher to generalize or make a claims about the population from sample result. The survey strategy preferred because surveys are concerned with hypothesis formulation and testing the analysis of the relationship between non-manipulated variables (Kothari, 2004, p.121) that fits with the aim of this study that investigates the relationship between pharmaceutical marketing activities and physicians' prescribing behavior by formulating and testing hypothesis, and also survey research strategy is preferable because of its economical nature that enables to make inference about large population from a small group of sample.

According to Creswell (2009, p.146), survey research strategy is categorized under longitudinal and cross-sectional. A cross-sectional refers to data collection at one point in time while longitudinal survey design implies with data collection over time. In this study data is collected from different health facilities in Addis Ababa in one time. Therefore, researcher uses a cross-sectional research method

3.3. Study design and Target Population

Cross-sectional study was conducted with the participation of doctors of different specialty who are practicing in Addis Ababa public and private health facilities (Clinics and Hospitals)

3.4. Sampling Technique

There are two types of sampling methods: probability and non-probability sampling method. Probability sampling techniques could be simple random sampling, systematic sampling, stratified sampling, cluster sampling or multistage sampling. While non-probability sampling could be convenience sampling, purposive sampling, judgmental sampling, quota sampling, or snow ball sampling. To achieve to optimum outcomes I used a combination of convenience and random sampling method. By complete listing of the physicians who are practicing in private and public health facilities in Addis Ababa.

This study was planned to determine what proportion of physicians affected by the promotional strategies of companies on their decision making process of prescription. Suppose that the level of precision I require is such that a 95% confidence interval no wider than 5% (0.05). Taking 50% as estimate proportion, as it is the most conservative value, resulting in the highest estimate of interviews needed.

Therefore, the sample size calculation is as follows;

$$n_0 = \frac{(Z\alpha/2)2P(1 - P)}{d^2}$$

$$= (1.96)^2 \times 0.5 \frac{(1-0.5)}{(0.05)^2}$$

$$= 386.16$$

According to FMHACA around 650 physicians are expected to practice in Addis Ababa public and private health facilities.

Sample size determination using the finite population correction factors will be;

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

$$n = \frac{384.16}{1 + \frac{384.16}{650}}$$

$$n = 241$$

Inclusion and Exclusion Criteria

All Doctors working in public and private health facilities in Addis Ababa will be included in the study. Doctors in Administrative positions in facilities, retired or on leave will be excluded from the study.

3.5. Data Sources and Data Collection technique

There are two types of data collection method, Primary and secondary data collection. The primary data are those which are collected a fresh and for the first time, and thus happen to be original in character and collected through observation, interview method, through questionnaires (Kothari, 2004, p.95) while secondary data refer to the data which have already been collected and analyzed by someone else, it is either be published data or unpublished data (Kothari, 2004, p.111). Primary and secondary data sources were used in the study both quantitatively and qualitatively. According to Kothari (2004, p.112) each method of data collection has its uses and none is superior in all situations, selecting the appropriate method depends on the nature, scope and objective of the study, the availability of time and fund and precision required for the study. Data was collected via a self-administered structured questionnaire by the researcher. The questionnaires were filled out by the doctors in the presence of the researcher. When the doctors were not able to fill out the questionnaires because of the heavy workload or were not available, they were visited a second and third time. Doctors were provided with a letter explaining the purpose of the study and verbal consent were obtained to participate in the study.

3.6. Data Quality Assurance

The questionnaire was pretested for its validity and reliability before being administered in the study. A pilot study was conducted to determine whether the questionnaire actually measure what it is intended for. Furthermore, 15 respondents were conveniently sampled from different locations to test the research instrument before distributing it to the whole sample.

3.7. Measurement of Variables

The following table indicates measurements of the constructs and the sources from which questionnaires are developed:

Table 3.1 Measurement of Variable

	Variables	Measures	Sources
Independent Variables	Face to face detailing	Question No. 7a, 8a to e	Saito et al (2010), Ali et al. (2014), Noah M. Zaki (2014)
	Drug samples	Questions No. 7b, 9a to c	Saito et al (2010), Alowi et al (2018)
	Gifts	Questions No 7c, 10 a to d	Saito et al (2010) Alowi et al (2018)
	Sponsoring meetings	Questions No.7d, e, 11 a and b	Saito et al (2010), Noah M. Zaki (2014)
	Inviting for meals	Questions 7 e, 12 a and b	Saito et al (2010)
Dependent Variable	Physician's prescribing decision	8d,e, 9b,c, 10a, 12 to 19	Saito et al (2010), Noah M. Zaki (2014)

3.8. Research Model Specification

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_n X_{ni} + \epsilon_i$$

Where: Y_i is dependent variable for i^{th} observation;

X_i is independent variable for i^{th} observation;

β_0 is the intercept;

β 's are regression coefficients

ϵ_i is the error term for i^{th} observation

This basic regression model is rewritten in terms of the variables used in this research to show the relationship among them based on the research conceptual frame work.

Based on the above, the model is modified based on the research variables that described in the conceptual framework in chapter two, to examine the impact of the marketing strategies of the pharmaceutical companies-personal selling on the prescription pattern of physicians.

$$PPB = \beta_0 + \beta_1 FFD + \beta_2 DS + \beta_3 GF + \beta_4 SMs + \beta_5 IM + \epsilon$$

Where;

PPB= Physician's Prescription Behavior

FFD= Face to Face detailing

DS= Drug Samples

GF= Gifts

SMs= Sponsoring of Meetings

IM= Invitations for Meals

β_1 FFD= The partial change in physicians prescription behavior due to a change in Face to face detailing while other things remain constant

β_2 DS= The partial change in physicians prescription behavior due to a change in drug samples while other things remain constant

β_3 GF= The partial change in physicians prescription behavior due to a change in gifts while other things remain constant

β_4 SMs= The partial change in physicians prescription behavior due to a change in Sponsoring of meetings while other things remain constant

β_5 IM= The partial change in physicians prescription behavior due to a change in invitation for meals while other things remain constant

3.9. Data Analysis Technique

To assess drug promotion activities as a reason for change in prescribing practice, prevalence of factors as rated by doctors that affect their prescribing decisions was computed. Characteristics of doctors as determinants of the self-reported effect were analyzed with the Pearson Chi-Square analysis. The collected data was analyzed in the form of descriptive, correlation and multiple regressions. The descriptive statistics was employed to quantitatively describe variables using mean, standard deviations, frequency or mode. The correlation analysis was performed to identify the direction and the strength of the relationship between variables using Pearson correlation analysis. However, as correlation analysis only shows the direction and degree of association between variables, multiple regression analysis was performed to make causal inferences regarding the relationship between variables.

The data analyzed and presented in the form of diagrams, charts, and tables by using SPSS (Statistical Package for Social Science) software version 23. Various statistical tools such as descriptive arithmetic mean of constructs, correlation, and multiple regressions were used to

analyze the effect of the independent variables on the dependent variables. Finally, conclusions were made based on the findings/results of the study and recommendations were forwarded on the basis of the data analyzed.

3.10. Validity and reliability issues

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure (Kothari, 2004, p.73). One of the methods to test validity, content validity, refers to whether or not the content of the manifest variables (questionnaire) is right to measure the latent concept (PPB) that we are trying to measure (Muijs, 2010, p.66). In this study the researcher tried to develop a content-valid constructs by extensive search of literature to select carefully all the variables and their measurements from prominent sources (Saito et al (2010), Ali et al. (2014), Noah M. Zaki (2014). Additionally, the measurements were validated by other senior lecturer of Department of Management in addition to my advisor comments and ensured that the statements represent the entire range of possible items to be measured in the study. The questionnaire was modified according to their suggestions.

The reliability of a measure refers to its consistency. One of the types of reliability, internal reliability, is particularly important in connection with multiple-item scales. It refers whether each scale is measuring a single idea. According to Taneja and Kaushik (2007), Cronbach's Alpha values higher than 0.6 show data reliability. This threshold is, also applied by many researchers such as Zachry et al. (2003).

3.11. Ethical Consideration

The purpose of the study was explained to institutions where the study was conducted and to the study subjects. Verbal informed consent was obtained from all study participants before administering the questionnaire by the researchers. The study was conducted if participant confirms his/her willingness to take part in the interview. It is participants' right to escape questions; stop the interview at any time. Privacy and data confidentiality were ensured by putting codes instead of participants name in the filled questionnaire and placing it in locked cabinet so that others except the researcher can hardly access the data.

Chapter four - Results and Discussion

This chapter focuses on presentation, discussion and interpretation of data collected through questionnaire. The data collected were analyzed using SPSS version 23. Mainly multiple linear regression analysis has been applied in the quantitative analyses and to test the hypotheses.

4.1. Demographic Characteristics of Respondents

Overall response rate was 234/241 doctors (97%). Table 4.1 displays the doctors' characteristics. Of the subjects, 66.7 % were male and 33.3% were females. When we see the age composition of the respondents', the majority of the sampled respondents' age group fall between the ages of 30 up to 40 which accounts 47.4 % of the total number of sampled respondents. The percentage of ages below 29, 41-50, 51 to 60, and above 60 is 9.0%, 27.8%, 11.1% and 4.7% respectively. Most of the physicians (88.5% of the respondents) get their degree from public or government universities while only 11.5% of the respondents studied at the private universities or colleges. 29.9% were general practitioners, 30.3% were internists, 8.5% were surgeons, 9.4% gynecologists, 9.8% pediatricians and 12% were other specialist like dermatologist, ophthalmologists, etc. 59.8% of the respondents are working in public hospital and 40.2% are working in private health facilities in regular basis. Among doctors reporting year of practice, 44.4% were having practicing experience of 5 to 10 years. Of the respondents 35%, 12.4%, 4.3% and 3.8% were having work experience of less than 5 years, 11 to 15 years, 16 to 20 years, and more than 20 years respectively.

The extent of doctors' exposure to pharmaceutical promotional activities

Table 4.2 shows respondents' exposure to promotional activities. Most doctors met with PSRs, received drug samples and stationery, and half of them accepted meal invitation by Pharmaceutical sales representatives. Less than half of the respondents participated in industry-sponsored continuing medical education (CME) events at and outside the workplace. On average, they met with PSRs two times per month and received gifts or participated in events nearly once per month.

Table 4.1 Respondents' profile

		Frequency	Percent	Valid percent	Cumulative percent
Age	Less than 29	21/234	9.0	9.0	9.0
	30 to 40	111/234	47.4	47.4	56.4
	41 to 50	65/234	27.8	27.8	84.2
	51 to 60	26/234	11.1	11.1	95.3
	Greater than 60	11/234	4.7	4.7	100.0
Sex	Male	156/234	66.7	66.7	66.7
	female	78/234	33.3	33.3	100.0
University graduated	Public university	207/234	88.5	88.5	88.5
	Private university	27/234	11.5	11.5	100.0
Specialty	General practitioner	70/234	29.9	29.9	29.9
	Internist	71/234	30.3	30.3	60.3
	Surgeon	20/234	8.5	8.5	68.8
	Gynecologist	22/234	9.4	9.4	78.2
	Pediatrician	23/234	9.8	9.8	88.0
	Others (dermatologist, Ophthalmologist, etc.)	28/234	12.0	12.0	100.0
Practice setting	Public Health facility	140/234	59.8	59.8	59.8
	Private health facility	94/234	40.2	40.2	100.0
Years of practice	Less than 5 years	82/234	35.0	35.0	35.0
	5 to 10 years	104/234	44.4	44.4	79.5
	11 to 15 years	29/234	12.4	12.4	91.9
	16 to 20 years	10/234	4.3	4.3	96.2
	Above 20 years	9/234	3.8	3.8	100.0

Source: own survey SPSSv23, 2020

Table 4.2 Physician involvement in various types of pharmaceutical promotional activities

Type of pharmaceutical promotion activities	Number of respondents who meet with PSRs, receive gifts, or participate in event	Frequency of exposure per month
	Number/Total number (%)	Mean (SD)
Meetings with PSRs	217/234 (92.7)	2.64 (1.006)
Drug samples	141/234 (60.3)	1.75 (0.757)
Gifts like Stationery such as pens and notepads	168/234 (71.8)	1.76 (0.566)
Industry-sponsored CME events	94/234 (40.2)	1.45 (0.586)
Financial support for CME	10/234 (0.04)	1.07 (0.364)
Meals with PSRs	85/234 (21.7)	1.72 (0.784)

Source: own survey SPSSv23, 2020

Most physicians in our survey were involved in promotional activities. The extent of such involvement varied according to certain physician characteristics. Many physicians valued PSRs as a source of information and believed they were unlikely to be influenced by promotional activities. The self-reported effect of promotion on the prescribing decisions of doctors was significantly higher if doctors who were exposed to promotional activities frequently, i.e. more than one time per week. There were differences in the extent of involvement in different types of promotional activities. Doctors who reported that their prescribing decision influenced by promotional activities had significantly higher mean of exposure to promotional activities such as face to face detailing, gifts: stationeries like pen and notepads, drug samples, industry sponsored CME events or meals invitation.

Similar to our study, studies from several countries also showed that roughly 80-95% of physicians exposed to drug promotion, resulting in inappropriate prescribing habits. It has been reported that industry interactions correlate with doctors' preferences for new products that hold no demonstrated advantage over existing ones, a decrease in the prescribing of generics, and a rise in prescription expenditures and irrational and incautious prescribing. Internists and general practitioners were involved in promotional activities more than the mean Exposure index, i.e. more than twice or three times per week. These findings are similar to those of a national survey in the US, which found that internists exposed to promotional activities ten times per month more frequently than other specialists. (Ziegler MG et al. 1995) These doctors may be

prescribers of high number of drugs per day. We noticed that the frequency of the visits to doctors performed by PSRs was higher for the doctors with high number of patients per day.(Katz et al, 2003)

4.2. Reliability Study

The reliability of a measure refers to its consistency. One of the types of reliability, internal reliability, is particularly important in connection with multiple-item scales. It refers whether each scale is measuring a single idea. According to Taneja and Kaushik (2007), Cronbach's Alpha values higher than 0.6 show data reliability. This threshold is, also applied by many researchers such as Zachry et al. (2003).

All items applied to measure constructs were adopted from validated sources from literature as indicated in section 3.5 (Table 3.1). Data were initially cleaned for potential non-response, invalid answers, or any incomplete questionnaires and some 10 responses were rejected due to these problems.

Based on the test for reliability shown in table 4.4below, the scale was found to be highly reliable (5 items; $\alpha = 0.802$), with the reliability Cronbach's Alpha statistics of individual constructs ranging from 0.705 to 0.891. Thus, based on the test of the scales and constructs included, it is revealed that each scale represents a reliable construct.

Concerning validity, on the other hand, the results are likely to apply to other physicians in Ethiopia as the socio-cultural context and the drug promotional strategies exhibit similarity all over Ethiopia.

Table 4.3 Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
0.802	5

Source: own survey SPSSv23

Table 4.4 Reliability test indices

Personal selling activities	Cronbach's Alpha
Face to Face Detailing (FFD)	0.836
Drug Samples (DS)	0.705
Gifts (GF)	0.891
Sponsoring Meetings (SMs)	0.803
Invitation to meals (IMs)	0.783
Reliability Statistics of Total scale	0.802

Source: own survey SPSSv23

4.3. Correlation analysis

Correlation analysis shows the degree of association between variables and indicates the direction in which the variables associate - positively or negatively (Saunders et al., 2009). The value of correlation ranges from - 1 to 1 and the strength of association can be categorized from very low with correlation coefficient (r) less than 0.2 to very high with coefficient greater than 0.9.

As we can see from table 4.5 below, dependent variables; Physicians' prescribing behavior and has a strong and positive correlation with many of independent marketing activities.

When we see the dependent variable Physicians' prescribing behavior (PPB) has high and moderate correlation with Face to Face detailing (FFD) ($r=.635$, $P<0.01$), Drug Samples (DS) ($r=.764$, $P<0.01$), Gifts (GIF) ($r=.581$, $P<0.01$), Sponsoring meetings (SMs) ($r=.725$, $P<0.01$), and invitation for meals (IM) ($r=.452$, $P<0.01$). These independent variables has a positive and significant relation with the dependent variable PPB, thus the increase in activities of Face to face detailing, Free drug samples, Gifts, Sponsoring meetings and Invitation to meals by Pharmaceuticals sales representatives improve physicians' prescribing behavior.

However, correlation analysis shows only the strength and directions of one independent and dependent variables, it does not permit the researcher to make analysis of more than one independent and dependent variables, and fall short in predicting the coefficients or beta values of independent variables that explains the dependent variable, and in making inferences

regarding the overall relationship between the identified variables. Hence, to analysis the impact of personal selling activities of the pharmaceutical companies on prescribing behavior of physicians the researcher uses regression analysis that overcomes the shortcomings of correlation analysis.

Table 4.5 Pearson Correlations

Correlations							
		FFD	DS	GIF	SMs	IM	PPB
FFD	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	234					
DS	Pearson Correlation	-.389**	1				
	Sig. (2-tailed)	.000					
	N	234	234				
GIF	Pearson Correlation	.012	.313**	1			
	Sig. (2-tailed)	.338	.000				
	N	234	234	234			
SMs	Pearson Correlation	.472**	-.293**	.155**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	234	234	234	234		
IM	Pearson Correlation	-.336**	.472**	-.247**	-.347**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	234	234	234	234	234	
PPB	Pearson Correlation	.635**	.764**	.581**	.725**	.452**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	234	234	234	234	234	234
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: own survey SPSSv23, 2020

4.4. Diagnostics of Assumptions in Regression

Before conducting a regression analysis, the basic assumptions concerning the original data must be met. This is a mandatory prerequisite in explaining the relationships between dependent and independent variables. The important assumptions that are to be tested in this section are; independent variables shouldn't be too strongly correlated to one another (Multicollinearity), the value of residuals to be independent from one another and the residuals should be normally distributed. In this study these important least square assumptions were checked and explained as below:

4.4.1 Normality

This assumption is used to determine whether the data is normally distributed or not. This assumption can be tested by using Skewness and Kurtosis (Cramer D, 1998). Depending on the sample size, the Skewness and kurtosis values should be closer to zero or skewness and kurtosis z- values (value divided by Standard Error) should be between -1.96 and +1.96 for sample size of <50, the Z values ranges -3.29 to +3.29 if our sample size is between 50 and 300, and if we have larger sample size, the absolute skewness value should be between -2 and +2 and absolute kurtosis value should be between -7 and +7 to conclude that data is approximately normally distributed.

Regarding skewness and kurtosis, our data are a little skewed and kurtotic, from the table 4.6 below the skewness value for PPB is .094 (.159) and kurtosis -.292 (.317) and for all independent variables FFD skewness value of -.460 (.159) and kurtosis value of -.735 (.317), DS skewness value of .510 (.159) and kurtosis value of -.826 (.317), GIF skewness value of -.032 (.159) and kurtosis value of .033 (.317), SM skewness value of -.396 (.159) and kurtosis value of .038 (.317), and IMs skewness value of .470 (.159) and kurtosis value of .663 (.317), but it does not differ significantly from normality. We can assume that our data are approximately normally distributed in terms of skewness and kurtosis, which shows that our data is approximately normally distributed. This is an indication that the assumption of normality is met.

Table 4.6 Normality test using skewness and kurtosis

Descriptive Statistics										
	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
FFB	234	3.00	13.00	8.6966	.14444	2.20948	-.460	.159	-.735	.317
DS	234	2.00	10.00	5.4829	.11089	1.69629	.510	.159	-.826	.317
GIF	234	3.00	12.00	6.8248	.11394	1.74294	-.032	.159	.033	.317
SM	234	1.00	5.00	3.5085	.05288	.80897	-.396	.159	.038	.317
IMs	234	1.00	5.00	2.5641	.06517	.99686	.479	.159	.663	.317
PPB	234	6.00	16.00	11.5171	.12237	1.87190	.094	.159	-.292	.317
Valid N (listwise)	234									

4.4.2 Multicollinearity

Ho (2006) defines multicollinearity as a situation in which the predictors or independent variables are highly correlated. In a regression analysis the presence of multicollinearity implies that one is using redundant information in the model, which can easily lead to unstable regression coefficient estimate. This assumption can be tested using different methods: Tolerance and Variance Inflation Factors (VIF) are one of the test methods. Tolerance varies from 0 to 1. A value close to 1 indicates that the other predictors do not explain the variance in that variable. A value close to 0 implies almost all the variance in the variable is explained by the other independent variables. While Variance Inflation Factors (VIF) is the inverse of tolerance and a value less than 5 means that there is no multicollinearity and if it is greater than 10 then there is a problem of multicollinearity or the variables are highly correlated. This test permits us to more formally check that our independent variables are not too highly correlated. To check the presence of multicollinearity the value of Tolerance need to be more than 0.2 and the value of VIF need to be less than 10 to conclude that there is no correlation between the independent variables i.e., Multicollinearity. In the table 4.7 below, the values of Tolerance values are .725, .886, .779, .641, and .701 which are greater than 0.2 and VIF values are less than 5. So the assumption is met.

Table 4.7 Multicollinearity test

Coefficients^a								
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	1.645	.581		2.830	.005		
	FFD	.265	.078	.209	3.405	.001	.725	1.379
	DS	.336	.084	.221	3.987	.000	.886	1.129
	GIF	.396	.125	.187	3.169	.002	.779	1.284
	SM	.393	.084	.306	4.692	.000	.641	1.561
	IMs	-.694	.099	-.438	-7.030	.000	.701	1.427

a. Dependent Variable: PPB

Source: Own survey SPSS V23, 2020

4.4.3 Homoscedasticity

This assumption requires even distribution of residual terms or homogeneity of error terms throughout the data. Homoscedasticity can be checked by visual examination of a plot of the standardized residuals by the regression standardized predicted value (Osborn & Waters, 2002). If the error terms are distributed randomly with no certain pattern then the problem is not detrimental for analyses. Figure 4.1 below shows that the standardized residuals in this research are distributed evenly indicating heteroscedasticity is not a serious problem for this data.

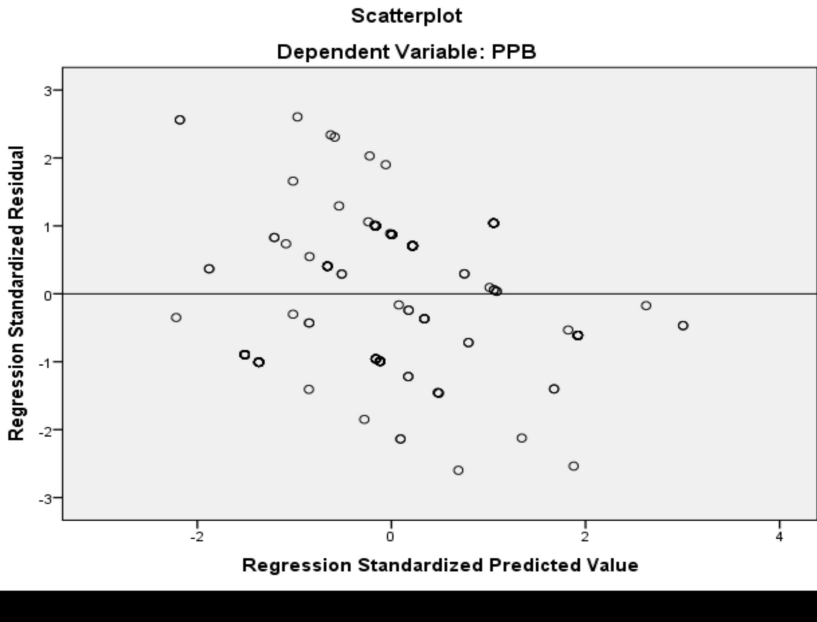


Figure 4.1 SCATTER PLOT OF STANDARDIZED RESIDUALS

4.4.4 Autocorrelation

In this assumption the value of residuals is independent from one another (or uncorrelated). To check this assumption we need to look at the regression output of model summary box. Durbin-Watson statistic is used to test the assumption that residuals are independent (or uncorrelated). This statistic can vary from 0 to 4. For no Autocorrelation assumption, Durbin-Watson statistic value needs to be close to 2. A value of two indicates no autocorrelation. A value of towards zero indicates positive autocorrelation. A value towards four indicates negative autocorrelation (Saunders et al., 2009)

Table 4.8 Autocorrelation test

Model Summary ^b						
Model	R	R square	Adjusted Square	R	Std. Error of the estimate	Durbin-Watson
1	0.616 ^a	0.379	.366		1.02020	2.053
a. Predictors: (constant), FFD, DS, GIF, SMs, IM						
b. Dependent Variable: PPB						

Source: Own survey SPSS v23, 2020

Thus, from the above table 4.8 we can see that Durbin-Watson value for model is 2.053 which is a score near 2. Thus we can conclude that there is no Autocorrelation problem as the Durbin-Watson statistic showed the value close to 2.

4.5. Regression Analyses and Hypothesis Testing

Before hypothesis test of this research, multiple linear regression technique is performed:

Regression analysis is the technique implemented to analyze and measure a relationship between variables. As Saunders et al explained multiple regression analysis is a statistical technique that can be used to analyze and measure a relationship between two or more variables (Saunders et al., 2009). In our case, the technique uses to identify which personal selling element is the best predictor of physicians' prescription behavior and the amount of variance explained in physicians' prescription behavior (dependent variable) by all pharmaceutical marketing activities of the pharmaceutical companies. Generally this method enables the researcher to make stronger causal inferences from observed interrelationships among variables and to predict a dependent variable based on values of a number of independent variables.

As shown in table 4.9 below, the coefficient R in this model summary indicates the square root of R and is the correlation between the independent and dependent variable. From the table 4.8 below, $R = .616$ indicates that there is a strong positive correlation between the dependent variable (PPB) and the set of five independent variables (Pharmaceutical marketing activities i.e., Face to face detailing, free drug samples, gifts, sponsoring of meetings, and invitation for meals by pharmaceuticals sales representatives). The overall model statistics of dependent variable Physicians' prescription behavior (PPB) revealed that the R square value of .379. It means that all independent variables (Face to face detailing, free drug samples, gifts, sponsoring of meetings, and invitation for meals by pharmaceuticals sales representatives) included in the model explained 37.9% of variance ($.379 \times 100\%$) in dependent variable (Physicians' prescription behavior (PPB)). The remaining 62.1% of the variation in Physicians' prescription behavior can be attributed to other variables which is not included in this study. Hence, the overall model 1 statistic in table 17, ($R^2 = .379$), is supported the view that marketing activities of pharmaceutical companies has a positive influence on the prescribing behavior of doctors.

ANOVA test (F- test) was performed to test significance of this model. As shown below on multiple regression analysis (table 4.9), it can be observed from the ANOVA table that the model as a whole is significant ($F(5, 228) = 27.868, P=.000$). F test is a statistical test its purpose is to examine whether the independent variables, taken together, have a significant effect to the dependent variable. If the significance value of the F statistic is small; that means smaller than the error margin 0.05, then the independent variables explain the variation in the dependent variable significantly.

Table 4.9 The regression model statistics of PPB

Model Summary ^b						
Model	R	R Square	Adjusted R square	Std. Error of the estimate		
1	.616 ^a	.379	.366	1.02020		
a. Predictors: (Constant), FFD, DS, GIF, SMs, IM						
b. Dependent Variable: PPB						
ANOVA ^a						
Model		Sum of Squares	df	Mean square	F	Sig.
1	Regression	145.025	5	29.005	27.868	.000 ^b
	Residuals	237.329	228	1.041		
	Total	382.329	233			
a. Dependent Variable: PPB						
b. Predictors: (Constant), FFD, DS, GIF, SMs, IM						

Source: Own survey SPSS v23, 2020

The hypotheses of the studies:

H1: There is a significant and positive association between Face to face detailing and Physicians' decision behavior

H2: There is a significant and positive association between free drug samples and Physicians' decision behavior

H3: There is a significant and positive association between gifts and Physicians' decision behavior

H4: There is a significant and positive association between sponsoring event and Physicians' decision behavior

H5: There is a significant and positive association between meal invitation and Physicians' decision behavior

Table 4.10 The Coefficient statistics

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.645	.581		2.830	.005
	FFD	.265	.078	.209	3.405	.001
	DS	.336	.084	.221	3.987	.000
	GIF	.396	.125	.187	3.169	.002
	SM	.393	.084	.306	4.692	.000
	IMs	-.694	.099	-.438	-7.030	.000

a. Dependent Variable: PPB

Source: Own survey SPSS v23, 2020

This study assumed that Pharmaceutical marketing activities (Face to face detailing, Drug samples, gifts, sponsoring meetings, and invitation for meals by Pharmaceuticals sales representatives) have a significant and positive effect on improving physicians' prescription behavior. In correlation analysis we have seen Physicians' prescription behavior has a moderate correlation coefficient with marketing activities Face to Face detailing (FFD) ($r=.635$, $P<0.01$), Drug Samples (DS) ($r=.764$, $P<0.01$), Gifts (GIF) ($r=.581$, $P<0.01$), Sponsoring meetings (SMs) ($r=.725$, $P<0.01$), and invitation for meals (IM) ($r=.452$, $P<0.01$). But Correlation analysis alone does not provide enough information regarding the interrelationships between the variables and not implies a cause-effect relationship between the variables; multiple linear regression analysis has been used to test this hypothesis.

Based on table 4.10 above, we can compare the contribution of Pharmaceutical marketing activities (independent variables) to dependent variable physician prescribing behavior (PPB) by

using beta values under unstandardized coefficients. We need to look at unstandardized coefficient beta so that the variables all measured changed to same scale.

From coefficient table 4.10 above, we can see the positive and significance relationship found at independent variables Face to Face detailing ($\beta = .265$, $p = .001$), Drug Samples ($\beta = .336$, $P = 0.000$), Gifts ($\beta = .396$, $p = .002$), and Sponsoring meetings ($\beta = .393$, $p = .000$). There is a negative relationship found with invitation for meals ($\beta = -.694$, $p = .000$).

As noted above the beta values for the independent variable are positive except for Invitation for meals which show that there is a positive relationship between the independent variables (FFD, DS, GIF and SM) and dependent variables (PPB). There is a negative relationship between Invitation for meals and physicians' prescribing behavior.

Once again when comparing the effect of the independent variables on the dependent Variable by using standardized coefficient values from table 4.10 above, there is a negative relationship between invitation for meals ($\beta = -.438$, $p = .000$) and the positive and significance relationship found at independent variables Face to Face detailing ($\beta = .209$, $p = .001$), Drug Samples ($\beta = .221$, $P = 0.000$), Gifts ($\beta = .125$, $p = .002$), and Sponsoring meetings ($\beta = .306$, $p = .000$).

The individual independent variables with higher beta values have stronger relationship with the dependent variable. So Sponsoring meetings ($\beta = .306$) and Drug Samples ($\beta = .221$) are the best predictors of physicians' prescribing behavior followed by Face to Face detailing ($\beta = .209$) and Gifts ($\beta = .187$).

Similar to our study, previous studies found out that Face to face detailing (Poirer et al 1994, Saito et al 2010 and Gupta et al 2016), Drug samples (Sufrin and rose, 2008, Saito et al 2014 and Alexander et al 2008), Gifts (Wood et al 2017, Saito et al 2010), and Sponsoring of events (Saito et al 2010, Chren and Landefed 1994) has an impact on doctors prescribing practices.

In contrast to the proposed hypothesis 5, Our result on invitation to meals (IMs) is negative which also disagrees with the findings of Saito et al 2010 who found out that meal invitation by pharmaceutical representatives has an influence on the prescription decision of doctors in Japan. This may be due to the fact that most pharmaceutical companies commonly practice other

activities more often than IMs and physicians might think that having meal invitation is very unethical.

Thus the four proposed hypotheses:

H1: There is a significant and positive association between Face to face detailing and Physicians’ decision behavior, H2: There is a significant and positive association between free drug samples and Physicians’ decision behavior, H3: There is a significant and positive association between gifts and Physicians’ decision behavior, H4: There is a significant and positive association between sponsoring event and Physicians’ decision behavior are accepted.

While the fifth hypothesis: There is a significant and positive association between meal invitation and Physicians’ decision behavior is rejected.

4.5.1. Summary of multiple regression results and hypothesis testing

Summary table 4.11 below shows summary of regression results of the model which was discussed in the above sections

Table 4.11 Summary of multiple regressions

		Effect of personal selling activities on PPB
R value		.616
R ²		.379
F test (ANOVA)		F (5, 228) = 27.868, P=.000)
Sig. Beta coefficients	Face to Face detailing	($\beta = .209$, p= .001)
	Drug Samples	($\beta=.221$, P=0.000)
	Gifts	($\beta = .187$, p= .002)
	Sponsoring meetings	($\beta = .306$, p= .000)
	Invitation for meals	($\beta = -.438$, p= .000)
Best predictors	Sponsoring meetings	($\beta = .306$, p= .000)
	Drug Samples	($\beta=.221$, P=0.000)

Source: Own survey SPSS v23, 2020

The Hypothesis of this study is tested by using multiple linear regression techniques and the results are summarized in the table 4.12 below:

Table 4.12 Hypothesis summary

	Hypothesis	Result
H1:	There is a significant and positive association between Face to face detailing and Physicians' decision behavior	Accepted
H2:	There is a significant and positive association between free drug samples and Physicians' decision behavior	Accepted
H3:	There is a significant and positive association between gifts and Physicians' decision behavior	Accepted
H4:	There is a significant and positive association between sponsoring event and Physicians' decision behavior	Accepted
H5:	There is a significant and positive association between meal invitation and Physicians' decision behavior	Rejected

Source: Hypothesis testing result, 2020

Chapter five – Summary, Conclusions and Recommendations

In this chapter results of the main findings summarized, conclusion will be made base on the results and recommendations given based on the research findings and the limitation of the study is mentioned. And finally, the study forwarded some suggestions for further research in the area.

5.1. Summary

In this study the effects of marketing activities of pharmaceutical companies on physicians' prescribing decision were examined; Pharmaceutical marketing activities were selected from previous researches and its effect on physicians' prescribing behavior was examined quantitatively. Based on the results of the regression analysis the following summaries of findings were drawn.

Before the regression analysis the correlation between variables examined and it is confirmed that there is moderate to strong association between all the independent and the dependent variables ranging from $r > 0.452$ to 0.764 . This is an indication that pharmaceutical marketing activities have moderate to strong relationship with physicians' prescribing behavior. The correlation among the independent variables is moderate and free from multicollinearity problem Heteroscedasticity and autocorrelation.

To test significance of the model ANOVA (F- test) was performed, it can be observed from the ANOVA table that the model as a whole is significant ($F(5, 228) = 27.868, P = .000$).

To test Hypotheses Linear multiple linear regression analysis was performed the overall model statistics of dependent variable physicians' prescribing decision revealed R value of .616 which indicates strong correlation between PPB and the set of five independent variables (FFD, DS, GIF, SM, and IMs). The R square value of .379 that all independent variables included in the model explained 37.9% of variance in dependent variable (Physicians' prescribing decision). Hence, the overall model statistic of PPB ($R^2 = .379$), is supported the view that pharmaceutical marketing activities has a positive influence on physicians' prescribing decision.

From the coefficient table of dependent variable PPB, positive and significance relationship found in four of marketing activities; Face to Face detailing ($\beta = .209, p = .001$), Drug Samples ($\beta = .221, P = 0.000$), Gifts ($\beta = .125, p = .002$), and Sponsoring meetings ($\beta = .306, p = .000$).

While the coefficient of invitation for meals invitation for meals ($\beta = -.438$, $p = .000$). Among these independent variables, Sponsoring meetings ($\beta = .306$) and Drug Samples ($\beta = .221$) are the best predictors of physicians' prescribing behavior. Thus, a change in the above mentioned variables will result in a significant change on the dependent variable Physicians' prescribing decision (PPB).

5.2. Conclusions

The main purpose of this study is to determine the impact of marketing activities of pharmaceutical companies on the prescription pattern of physicians in Addis Ababa.

From the correlation analysis the correlation coefficient between dependent variable and independent variable is between 0.452 to 0.764 showing there is a moderate to strong association, thus it is concluded that there is a strong association between Pharmaceutical marketing activities and physicians' prescribing behavior. And in regression analysis of overall PPB, 37.9% PPB is found to be due to the marketing activities by pharmaceutical companies. The beta values of the independent variables are positive except for invitation for meals. Hence, it can be concluded that there is positive and significant relationship between marketing activities such as face to face detailing, Drug samples, gifts and sponsoring of meetings and physicians' prescribing behavior. There are also similar evidences from previous literatures which revealed successful execution of these activities benefited pharmaceutical companies in achieving their marketing and sales objectives. These activities are Face to face detailing (Poirer et al 1994, Saito et al 2010 Manchanda and Chintagunta, Gupta et al 2016), Drug samples (Sufirin and rose, 2008, Saito et al 2014 and Alexander et al 2008), Gifts (Wood et al 2017, Saito et al 2010), and Sponsoring of events (Saito et al 2010, Chren and Landefed 1994, and Orłowski et al 1992). Contrary to the previous studies by Lichstein et al 1992, Saito et al, 2010 who found out that there is a positive relationship between invitation to meals and physicians' prescribing behavior. Our result showed that there is a negative relationship between invitation to meals and physicians prescribing behaviors.

Among the independent variables, Sponsoring meetings and drug samples are the best predictors of physicians' prescribing behavior. This implies providing free medical samples to the practicing physician to test the effectiveness of that specific medicine use for patients,

sponsoring the physician to meeting, support the physician in attending the international or local meetings results a dominant effect on influencing the prescribing decision of physicians. Face to face detailing and providing gifts like pens, note pad or stationary by pharmaceuticals sales representatives also has a strong positive effect on influencing the physicians prescribing behaviors.

The findings of this study also supports the results of prior studies of Saito et al. (2010) which aimed to identify the key pharmaceutical marketing activities that influence the physicians' prescribing decision in Japan practicing physicians. In their findings Face to face detailing, free drug samples, gifts, sponsoring of meetings and invitation for meals inside or outside their work area has influence on physicians prescribing decision.

5.3. Recommendations

This study examined the impact of pharmaceutical marketing activities on Physicians prescription behavior. On the basis of the findings and conclusions mentioned, the following recommendations were forwarded:

- Pharmaceutical companies should focus on using the marketing activities in the form of Sponsoring meetings and gifts as brand reminder such as pens, stationary items etc. to effectively influence physicians' prescribing decisions. Thus the pharmaceutical companies need to allocate budget for those activities to achieve their marketing and sales objectives.
- Sales representatives of pharmaceutical companies should be provided with appropriate training about ethical and professional promotion that would enable PSRs to act in such a way that the communication is desirable and appreciable by physicians.
- Pharmaceutical companies need to understand what physicians need most and tried to address that need, which will benefit both the company and the practicing physician.
- Physicians should give due attention to hear the pharmaceutical sales representatives ideas that may help to develop their professional competency in using and prescribing right medicine for best treatment outcome.
- The government body or professional societies need to take action to make concretely defining appropriate interactions between doctors and pharmaceutical industry or prohibiting inappropriate interactions in their code of ethics.

5.4. Limitation of the study

- This study has some limitations. First, the fact that this study was based on self-report of doctors about the effect of pharmaceutical promotion on their prescribing decision the reliance of self-report is one of the main issues of the studies similar to ours.
- The major constraints faced by the researcher while conducting this study were: First, lack of empirical research on the related study area especially in our country, and also the non-availability of adequately published and documented data on the topic
- The study was conducted on licensed physicians who were exposed to promotion and other information from pharmaceutical companies using self-administered structured Questionnaire. Moreover, it is limited only to practicing physicians at the time of the study and may not show the practices of other health professionals who have the power of prescribing.

5.5. Future research

- ✓ This study is conducted only based on data collected from Addis Ababa public and private health facilities. However the impacts of pharmaceutical marketing activities need to include other area of the country outside the capital so that we can make a generalization about the prescribing behavior of physicians practicing in the whole of Ethiopia.
- ✓ Further longitudinal research is required to make certain cause – effect relationship for the generalizability of the actual relationship between pharmaceutical marketing activities and physician prescribing decision in Ethiopian context
- ✓ Further interventional studies need to be conducted to strengthen the findings of this study

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Annex 1.



Addis Ababa University

College of Business and Economics

Master's in Business Administration (MBA) Program.

Title: The impact of Marketing Activities of Pharmaceutical companies on Doctors' prescription pattern in Addis Ababa

My name is BelachewTigist and I am currently enrolled at Addis Ababa University, College of Business and Economics. I am writing my MBA thesis as a partial fulfillment.

Dear Respondents:

This study is done to examine the impact of marketing activities of pharmaceutical companies on Doctors' prescription pattern in Addis Ababa. Please be honest in filling this questionnaire as the results of this study can be used as a basis for further study. Your keen participation in supplying the required data is highly essential for successful completion of the study. The information you provide will be kept confidential and be used only for an academic purpose.

I would like to thank you in advance for your participation and sharing your busy schedule. Please do not hesitate to ask me or to call/mail if you have any doubt on the questions.

BelachewTigist

0911877770.

betigist79@gmail.com

Writing your name is not necessary.

Put tick mark “√” for each question as required or answer the questions in the space provided.

Part One: Demographic questions

1. Age: 1. below 29 2. 30- 40 3. 41-50 4. 51-60 5. >61
2. Sex: Male Female
3. University/College from which you Graduated or got your first degree? 1. public/Governmental University/College 2. Private College/University
4. Your specialty of Practice: (1)General Practice (2)Internist (3)Surgeon Gynecologist (5)Pediatrician (6)Other
5. Type of current practice setting:
 1. Public 2. Private
6. Years of practice
 - (1) Less than 5 year’s (2) 5 - 10 years (3) 11 - 15 years
 - (4) 16 - 20 year’s (5) Greater than 20 years

Part Two: Questions related to the Effect of personal selling activities on doctors’ prescribing decision

	7.	Never(1)	once a month or less(2)	Twice or three times a month(3)	Once a week(4)	Twice or three times a week(5)	Nearly everyday (6)
a	On average, how often do you meet pharmaceutical representatives (PRs)						
b	On, average, how often do you receive Drug samples						
c	On, average, how often do you receive gifts like stationery such as pens and notepads						
d	On average, how often do you participate in industry-sponsored CME events inside the workplace						
e	On average, how often do you receive financial subsidies to attend CME events						
f	On, average, how often do you receive or participate in meals with PSRs						

	8. Face to face detailing	Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
a	PRs play an important role in CME for practicing physicians						
b	PRs provide accurate information about new medications						
c	PRs provide accurate information about old (established) medications						
d	Discussions with PRs have an unfavorable impact on my prescribing behaviors						
e	Physician-pharmaceutical industry relationships has an impact on prescribing a drug						
	9. Drug Samples	Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
a	The availability of free medical samples may not affect prescription choice						
b	Free drug samples encourage prescribing the drug						
c	Free drug samples from PRs have an impact on other physicians' prescribing behaviors						
	10. Gifts	Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
a	Gifts from PRs have an unfavorable impact on my prescribing behaviors, regardless of the monetary value						
b	Gifts from PRs have an unfavorable impact on other physicians' prescribing behaviors, regardless of the monetary value						
c	It is appropriate to receive gifts of low monetary value from PRs						
d	It is appropriate to receive gifts of high monetary value from PRs.						
	11. Sponsoring meetings	Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
a	Most talks sponsored by drug companies are helpful and educational						
b	Drug companies sponsored talks are often biased in favor of their products						
	12. Inviting for meals	Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	
a	Invitations for meals by PSRs encourages prescribing the drug						
b	Invitations for meals by PSRs have an impact on other physicians' prescribing behaviors						

13. To what extent have you had an opportunity to learn physician-pharmaceutical industry relationships?

- A. Very low
- B. Below Average
- C. Average
- D. Above Average
- E. Very High

14. To what extent have you had an opportunity to learn critical appraisal skills of the medical literature about treatment?

- A. Very low
- B. Below Average
- C. Average
- D. Above Average
- E. Very High

15. Which of the followings do you do first most commonly when a new medication becomes available?

- A. Seek published findings for its effectiveness
- B. Ask colleagues/specialists for their opinions
- C. Collect information from pharmaceutical representatives
- D. Use on a few patients and monitor

16. Which of the followings do you do most commonly when faced with a patient who expects a prescription which is not clinically indicated?

- A. Agree readily without explaining it is not clinically indicated
- B. Explain it is not clinically indicated, but prescribe reluctantly
- C. Explain it is not clinically indicated, and not prescribe

17. How satisfactory/unsatisfactory do you feel about a patient consultation that ends with advice only (without prescribing any medications)?

- A. Satisfactory
- B. Somewhat satisfactory
- C. Somewhat unsatisfactory
- D. Unsatisfactory

18. When generic options are available, which of generic or brand-name medications do you think you should prescribe?

- A. Prescribe generic medications
- B. Neutral
- C. Prescribe brand-name medications

19. Are there rules banning gifts from PRs and/or meetings with PRs in your current workplace?

- A. There are rules banning gifts from PRs, but not meetings with PRs
- B. There are rules banning meetings with PRs, but not gifts from PRs
- C. There are rules banning both gifts from and meetings with PRs
- D. There are no rules banning both gifts from and meetings with PRs