



ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF BUSINESS

**FACTORS AFFECTING DRUG PRESCRIBING BEHAVIOUR OF RESIDENT
PHYSICIANS:**
**THE CASE OF ADDIS ABABA UNIVERSITY BLACK LION SPECIALIZED
HOSPITAL**

BY
HASHIM AHMED ALI

MAY, 2018GC
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ACRONYMS/ABBREVIATIONS

AAUBLSH	Addis Ababa University ,Black Lion Specialized Hospital
CLRM	.....	Classical Linear Regression Model
CME	.....	Continuous Medical Education
ENT	.....	Ear Nose Trout Specialty
GPs	.....	General Practitioners
MRs	.....	Medical Representatives
OBS/GYN	Obstetrics & Gynecology
OTC	Over the Counter Drug
POM	Prescription only Medicine

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ABSTARCT

The main purpose of this study was to investigate the factors affecting resident physicians' drug prescribing behavior. A validated questionnaire was distributed to 199 resident physicians' in Addis Ababa Black Lion Specialized Hospital by using convenience sample and response rate was 93.97% ;Descriptive statistics, correlation and multiple regression analysis is used to fulfill the research objective .The findings indicated that drug price awareness, physicians knowledge and experience ,drug characteristics factors had statistically significant positive effect on physicians' drug prescribing behavior where as patient's expectation and pharmaceutical marketing strategies were not shown to be statistically significant ,and the most important influential factor was physicians knowledge and experience .Based on the research findings, and in order to enhance the approaches that are directed to the resident physicians in Addis Ababa Black Lion specialized Hospital it was concluded that Ethiopian pharmaceutical companies should pay more attention to the mentioned factors in order to better affect physicians' prescribing behavior in their favor. Providing better quality drug having better effectiveness, efficacy, patient compliance and less side effect with better availability enhance resident physicians' drug prescription. For those companies which has price competitive advantage it seems important to increase physicians' drug price awareness since respondents were seems price sensitive and those companies which have no price competitive advantage need to focus on other strategy like product differentiation or drug character advantages . Also ,it seems important that Addis Ababa university Black lion specialized Hospital give more attention to have computerized prescribing system having updated alternative drug choices with their corresponding price so that the physicians prescribe affordable and drug of choices for the patient . Moreover it seems important if the Hospital give more attention to educate and influence the resident physicians to consider basic, acceptable and important patient expectations in their treatment protocol.

Keywords: *Marketing Strategies, Resident Physicians' ,Drug, Patient Expectations', Knowledge and Experience, Drug Price Awareness*

CHAPTER ONE

INTRODUCTION

This chapter presents the introductory part of the study. It embrace about background of the study, back ground of the organization ,statement of the problem, research questions, objective of the study ,definition of terms, significance of the study, scope of the study and organization of the study.

1.1. Background of the Study

According to Theodorou et. al .,2009, the prescribing decision is a complex process that involves a number of factors also in Prosser et al 2003 finding it states that in many cases, the decisions of physicians' are multi factorial. In 2005 study of Schommer it states that Physicians may adopt several strategies when making prescribing decisions. (Murshid, 2017) .According to 1984 and 2009 review by Gehlbach et al and James, Peabody , Solon , Quimbo , Hanson similar to other industries, the main objective of pharmaceutical marketing is to increase the profitability of the organization by accommodating the needs and wants of consumers. In different commercial industries other than pharmaceutical marketing it is much easier for the customer to make the choice to which brand and item ought to be obtained consistent with their necessities and prerequisites. Whereas in the pharmaceutical marketing customers and the people who consumes falls in two distinctive classes (as cited in Saad,Rizwan,2014)

The Competition is increasing day by day in Business area and one who reacted timely against these frequent changes can survive in the competition, same in the field of pharmaceutical marketing, every day different companies bringing different brands with continuously increasing the size of market. In this competition medical practitioner and physicians are the key customers for this industry. Physicians are actually the ultimate decision holder of which brand should be prescribed to their patients. Therefore, all the marketing strategies are being focused towards them. Marketing strategies are revolving around product, price and promotions and Companies are making marketing tools to draw the attention of physicians for prescribing the brands(Shamim-ul-Haq, Ahmed, Nawaz Ahmad, Khoso,and Parmar,2014).

The competition in pharmaceutical market in Ethiopia implies that pharmaceuticals companies without having any evidence based study they are spending a lot of money and also they expose practicing physician's constantly to various competing stimuli, thus regular, continuous study of factors affecting the prescribing behavior of physician's is essential for pharmaceutical marketer and these information can help the companies to establish current and study based effective marketing strategies and also it helps the policy makers to identify the measures needed to improve the effectiveness of health policy .In this study I tries to have hypothesis tests and use liker scales using qualitative and quantitative questioners .

1.2. Background of the Organization

In 1998, the former Tikure Anbessa Specialized hospital (TASH), the largest referral hospital in the country, with 700 beds, was transferred to the School by the Federal Ministry of Health, and it has since become a University teaching hospital. The TSH is now the main teaching hospital for both clinical and preclinical training of most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation.(The International Network For Cancer Treatment and Research . (2017).

in our country different pharmaceutical companies use different marketing strategies like giving free medical sample(some companies not give), in kind and in cash gifts ,pen, note pad clock and other promotional tools gift, holiday gifts, sponsorship for research papers, entertainment(inside or outside the country) ,lunch invitation, CME ,drug price discounts ,promoting new brand innovative molecules ,etc but all the different marketing strategies used not based on research finding or based on evidence based level of importance .This is because of the reason that to know which marketing strategy is very important to maximize return on investment by increasing number of prescription it needs research based evidence which states which marketing strategies shall the company used? based on the company resource and competitive advantages which factor does most importantly affect physicians drug prescribing behavior ?which marketing strategy is much more effective and efficient? and other related questions .As a result o to address those questions researcher highly motivated to do this research and contribute new finding for the country in the pharmaceutical industry .

Approximately 1055 resident physicians' (year one to four depending on specialty type) attend in Addis Ababa University BLSH . They are distributed into more than twenty three departments namely: internal medicine, surgery, pediatrics, family medicine, obstetrics & gynaecology, ophthalmology, psychiatry, ENT, neurology, dermatovenerology, emergency medicine radiology, dentistry, orthopedics and trauma, preventive medicine, pathology ,clinical oncology, anesthesia and anesthesiology. Under Addis Ababa University Health Science college departments there is resident physician's who mainly work in other Hospitals Like Paulose Hospital, Yekatite hospital and others (BLSH HR data, on 2018GC).

1.3. Statement of the Problem.

The Competition is increasing day by day in Business area and one who reacted timely against these frequent changes can survive in the competition, same in the field of pharmaceutical marketing, every day different companies bringing different brands with continuously increasing the size of market. In this competition medical practitioner and physicians are the key customers for this industry. This is because of the reason that physicians are actually the ultimate decision holder of which brand should be prescribed to their patients. As a result to increase the sales or increase the market share the pharmaceutical companies need to affect drug prescribing behavior of the physicians and also have to know level of significance of those factors .

The Ethiopian Pharmaceutical market is highly fragmented & nature of competition is intense. As a result there are different factors which affect physician's drug prescribing behavior .Moreover in this modern times influencing physician's' prescription decision has become very complex as there is little systematic knowledge about factors affecting the physician's prescription behavior and the weight of individual factor. There are certain study in other country like in America, India ,Jordan, Germany ,Iraqi and other countries. However in Ethiopia upon this topic still there is no study to know what are the factors? most significant factors? least significant factors ?Regardless of this pharmaceutical companies in Ethiopia be it local or foreign to affect physician's prescribing behavior and increase their sale or market share without having any research data or findings on the above data ; spend a lot of money. Therefore, the present study focused to comprehensively identify and measure the most important physician's prescribing behavior determinants in Addis Ababa University Black lion Specialized Hospital(AAUBLSH).

1.4. Research Questions

Based on the above statement of the problem ,this research raised the following research questions with the view to provide possible solutions with the view to provide possible solutions

- I. How does the physician's awareness on drug prices influence their drug prescribing behavior?
- II. To what extent do physician's professional knowledge and experience influence their drug prescribing behavior?
- III. To what extent do drug characteristics influences physician's' drug prescribing behavior?
- IV. How does patient's expectations influence physician's drug prescribing behavior?
- V. To what extent do pharmaceutical marketing strategies influences physician's drug prescribing behavior?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study is to identify factors that affect drug prescribing behavior of resident physicians in Addis Ababa University Black lion Specialized Hospital ,Addis Ababa, Ethiopia and to suggests their level of significance .

1.4.2 Specific Objectives

- I. To investigate awareness of physician's on drug prices and the extent of its effect on physician's drug prescribing behavior.
- II. To assess the effect of physician's professional knowledge and experience on their drug prescribing behavior.
- III. To assess the effect of drug characteristics on physician's' drug prescribing behavior.
- IV. To assess the effect of patient's expectations on physician's' drug prescribing behavior
- V. To assess the effect of pharmaceutical marketing strategies on physician's drug prescribing behavior

1.5 Definition of Terms

In order to avoid some ambiguities and individual interpretation of certain concepts used in this research, the researcher defined those concepts used in this study bellows:

Drug s: prescription only medicines (POM) are licensed medicine regulated by legislation, and requiring a prescription for purchase.

Resident Physician :in medicine ,a physician who has finished medical school and is receiving training in specialized area, such as surgery, internal medicine, orthopedics, dermatology ,pediatrics etc . (retrieved on December ,2017 from <https://medicinenet.com>)

Prescriber: in this study it is to mean resident physicians who prescribe drugs for the patient .

Drug Characteristics : in this study drug characteristics are important factors for making prescribing decisions include efficacy, quality, side effects and others.

Drug's Effectiveness is the extent to which the drug reduces the likelihood of negative clinical endpoints.

Drug's Side Effects are secondary, and usually adverse, effects of a drug

Drugs' Brand

Brands often offer points of differentiation between competing drugs and therefore, can be considered crucial in influencing prescribing decision

Drug Information

There are various resources of the drug information the physician depends on when prescribing such as scientific studies, medical journals, and the Internet.

Patient Expectations

The patients' expectations are not directly influenced, but the physicians' perception of these expectations that influence prescribing decision.

Drug Characteristics:

The drug characteristics are important factors for making prescribing decisions include efficacy, quality, side effects and others (Murshid and Mohaidin,2017).

1.6. Significance of the Study

As most studies related to factors affecting physician's drug prescribing behavior have taken place in a limited number of countries, conducting a study of this type in Africa particularly in Ethiopia having a different culture- will help in understanding the factors that affect the physician's' drug prescribing behavior and give more insights to better understanding of the relationship and impact of these factors when prescribing drugs by physicians. In this regard, the importance of this study can be viewed from two dimensions: Theoretical contributions and Practical implications:-

1.6.1 Theoretical Significance :-

- The research out put will serve to fill an important gap in the literature regarding factors affecting physician's drug prescribing behavior. Therefore, the findings of this study can add to the existing body of the literature and can serve as a starting point on which further studies can be built.

1.6.2 . Practical Significance:-

- To help the pharmaceutical companies to reduce unnecessary marketing costs .
- To help decision makers to identify the major factors that may affect physician's prescribing behavior. Such information can also help pharmaceutical companies in formulating appropriate marketing strategies in order to achieve high return on investment
- To help both local and foreign pharmaceutical companies to identify the most significant factors which affect physicians drug prescribing behavior , to develop an effective marketing strategy or to know major factors on which marketing strategies should focuses and to help them compete effectively against other computing companies in the market.

- To help the hospital and policy makers to identify major rational drug prescribing behaviors and to improve the effectiveness of health policy, consequently contribute towards a greater economic and clinical efficiency and effectiveness in Ethiopia specially Addis Ababa Black lion Specialized Hospital .

1.7. Scope the Study

The study has been conducted in Addis Ababa which is the capital city of Ethiopia .The researcher select Addis Ababa University Black line Specialized Hospital (AAUBLSH) by purposively as target area for study . As a result this research is not include physicians who work other health institutions located in Addis Ababa. Therefore, the findings of this research might not be the reflection of factors affecting drug prescribing behavior of physicians working in other hospitals located in Addis Ababa or other area of the country . Moreover in this study regardless of the availability of around 1050 resident physicians in AAUBLSH is around twenty three departments ;the researcher consider only 187 residents physicians found in the five specialty (Dermatology, Orthopedic, Gynecologist, Internal medicine and Pediatrician) were purposively considered .This is because of the reason that those specialties are the one who prescribe drug much more or whose department out patient or inpatient department is mainly found in black lion hospital(easy of accessibility) . In addition to that the researcher chose to study the prescription only medicine (POM) drugs because it constitutes the main sector of the international pharmaceutical industry. Moreover the researcher use non probability sampling specifically convenience sampling method and also the research use only five independent variables since to include other variables their is resource like time, money and reference materials limitations.

1.8 Limitation of the Study

In this stud the researcher was face limitations of resources like finance, most importantly time, absence of related books on pharmaceutical marketing, absence of easily accessible similar or related published studies , lack of organized statistical data about pharmaceutical companies or physicians . In addition to that because of the difficulties to get sampling frame for the population and inability to get the resident physicians(since they are too busy and they don't have fixed place of work).

1.9 Organization of the Research Report

This research report comprises of five chapters. Accordingly the first chapter presents background of the study, background of the organization statement of the problem, research objectives, significance of the study, definition of terms , and scope and limitations of the study .In the second chapter provides a related literature review informing the reader about what is already known in this area of study. The third chapter discusses the methodology employed in the study, including, research design and approach ,population ,sample size and sampling technique, source of data and data collection tools, procedure of data collection ,data analysis method, reliability and validity of instruments and ethical considerations . The fourth chapter consists of data analysis and interpretation and the fifth chapter consists summary , conclusion and recommendations based on the analysis and presentations of the collected data.

CHAPTER TWO

RELATED LITERATURE REVIEW

This chapter aims to provide a review of related literature. In line with the objectives of this study, this chapter covers concepts related to prescribing behavior, prescribing process, marketing strategy, finding of previous research from different authors on ,patient expectation, physician's professional knowledge and experience ,drug characteristics factor, drug price awareness factor, marketing strategies, and drug prescriber behavior. In addition to that the theoretical framework , conceptual frame work and hypothesis of the study is also included. Therefore through a literature survey, researches will be in a position to study and describe the general position of the subject concerned.

2.1.Overview about of Literature Related Terms/Items

2.1.1 Drug

There are two major types of pharmaceutical products(drugs), prescription only medicines (POM) and over-the-counter drugs (OTC). POMs are licensed medicine regulated by legislation, and requiring a prescription for purchase. On the contrary, OTC drugs are medicines directly sold to patients and not requiring a prescription from a healthcare professional, i.e. physician. This paper has chosen solely study marketing techniques tailored for POMs. The researcher chose to study the POM market because it constitutes the main sector of the international pharmaceutical industry; and it is challenging for research because it involves a complex buying and decision making process where patients can only dispense POMs with a physician's prescription (**British Medical Association, 2006**).

2.1.2 Prescription

Prescription is an instruction written by a medical practitioner/physician that authorizes a patient to be issued with a medicine or a physician's order for the preparation and administration of a drug or device for a patient treatment.(retrieved on March 12,1018, from <https://en.oxforddictionaries.com/definition/prescription>).

The **prescription** is an important therapeutic transaction between the clinician and the patient. It reflects the diagnostic skills and the therapeutic expertise of the clinician. For the patient, it

transpires into palliation or restoration of health. However, it has to be routed through the pharmacist who will convert the prescription order in the form of compounded medicine, which the patient can take. The prescription order can be therapeutically useful only if properly communicated to the pharmacist and also contains clear, understandable instructions for the patient as regards the administration of the medicine(Goodman & Gilman,2015).

The word **prescription** has its genesis in two Latin terms; ‘pre’ -before’ and ‘scribo’- write’. It is defined as the formula, which a physician writes specifying the substances he intends to administer to the patient(Remington’s Practice of Pharmacy, 2006)

2.1.3. Physician Prescribing Behavior

In short it is to say behavior of physicians decision to prescribe prescription drugs .Physician prescribing behavior is a very broad concept including various dimensions. In this research the focus were on adoption. According to the American Marketing Association (2010) adoption can be explained as a process that individuals and firms, in this specific case, physicians, go through when accepting new products. The different stages in the process of adoption include; new product awareness, gathering information, developing positive attitudes towards the product, testing it in some direct or indirect way, finding satisfaction in the trial and adopting the product into a standing usage or repurchase pattern. The process of adoption often is also referred to as the process of diffusion, the process by which new ideas and products become accepted by a society. According to a study by Rogers (1995) this process is a social process, where social contagion initiates adoption. That is, a physician’s decision to adopt a drug is influenced by their exposure to other physicians’ attitude, knowledge, or behavior (Van den Bulte&Lilien, 2001).

2.1.4.The Prescribing Decision: Rational or Emotional?

A physician is required to be reasonably well informed about pharmacological attributes of a drug molecule. In a given situation, he is the best judge to choose the right drug. While the ultimate consumer of medicines is the patient, the physician is empowered to decide on the behalf of the patient. Learned as a physician is, he is expected to exhibit a rational decision process, while making out a prescription.

A rational decision, as the connotation implies, is one, which is taken after taking into consideration all available information about the alternatives available to choose from. While in the medical school and thereafter, he is properly trained in pharmacology, the science of drugs; and he is also aware of the arsenal of different drug molecules and their brands, he is to choose from. The choice of the drug molecule is dependent on numerous variables: the patient's pathological history, physical condition, the disease, drug sensitivity, age, repertoire of available drugs in the market and patient's economical background. The choice of brand is also dependent on a number of variables, like company variables, MR variables, promotion and advertisement, cost of a drug and feedback from earlier use. A rational decision is one when the process of decision-making is logical, with preconceived clear objectives before the decision maker, who evaluates all the alternatives available and matches his needs with the need-satisfying capabilities of the product/service and makes his decision accordingly. Whereas, the emotional decision is one when the decision maker is swept away by product attributes or advertisement appeals that have no relevance with the need-satisfying capabilities of a product. It however should be pointed out that rational decision and intelligent decision are not always identical. The same applies to emotional decision and irrational/unintelligent decision making. More often than not a decision making process is a combination of rational and emotional factors. Marketers believe that the prescription decision is just that: a combination of rational and emotional processes. The physician's choice of the drug molecule for drug therapy is a rational decision, while his choice of brand is an emotional decision. When it comes to deciding the brand to be prescribed, it is probable that his decision may be more emotional than rational. His decision may be influenced by such factors as: the pleasant mannered medical representative, the gifts and trinkets offered by him, the corporate image of his company, an easy to remember brand name, the frequent reminders of the brand through seminars, CME programs etc. These attributes have nothing to do with the need satisfying properties of a product(Bhatt,1996).

2.1.5. The Pharmaceutical Marketing

In order to answer the question what is pharmaceutical marketing a clear definition of the concept is highly relevant. According to the Prescription Drug Marketing Act (PDMA), a law of the United States federal government, "pharmaceutical marketing is the business of advertising or otherwise promoting the sale of pharmaceuticals or drugs" (U.S. Department of Health and Human Services, 2006)

2.1.6. Marketing Strategies

The **marketing strategies** employed in the pharmaceutical industry sharply contrast with those typically adopted in other markets. One of the primary reasons for the difference is that in the prescription drug market there is a distinct approach in buying decision process. The decision maker is the physician, who chooses among an array of drug alternatives, but it is the patient who consumes the drug and ends up paying for the choices made by the physician. Therefore, it is conceptually harder to define the customer in such transactions(Bamoriya,2012).

2.1.7. Medical Representatives (MRs) or Professional Sales Representatives (PSRs) are the most direct point of contact with the physicians. All pharmaceutical companies employ, directly or indirectly, medical representatives to promote and sell their products In fact 50% of the total expenditure on promotion is on account of the medical representatives and the managers who control and guide their activities. Similarly, in North America and Canada, one third of the company's budget is allocated to the sales force(Kelley ,2000).

Medical Representative as a Personal Selling Professional is the most widely employed method in pharmaceutical marketing the world over. Although a very costly method of promotion, it is most effective in generating prescriptions, the principal mover of pharmaceutical goods. Like all technological products, pharmaceutical products, need to be promoted on one-to-one basis(Kelley ,2000).

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

2.1.9 Marketing Communications mix

In case of pharmaceutical sector, customer for company is physician, as major selling occurs through him. The marketing communications mix consists of eight major modes of communication advertising, sales promotion, public relations and publicity, events and experiences, direct marketing, interactive marketing, word-of-mouth marketing, and the sales force, used for promoting the product. These factors are explained below:

1. **Advertising:** any paid form of non-personal presentation and promotion of ideas, goods, or services by an identified sponsor via print media (newspapers and magazines), broadcast media (radio and television), network media (telephone, cable, satellite, wireless), electronic media (audiotape, videotape, videodisk, CD-ROM, Web page), and display media (billboards, signs, posters).
2. **Sales Promotion:** A variety of short-term incentives to encourage trial or purchase of a product or service including consumer promotions (such as samples, coupons, and premiums), trade promotions (such as advertising and display allowances), and business and sales force promotions (contests for sales reps).
3. **Events and Experiences:** Company-sponsored activities and programs designed to create daily or special brand-related interactions with consumers, including sports, arts, entertainment, and cause events as well as less formal activities.
4. **Public Relations and Publicity:** A variety of programs directed internally to employees of the company or externally to consumers, other firms, the government, and media to promote or protect a company's image or its individual product communications.
5. **Direct Marketing:** Use of mail, telephone, fax, e-mail, or Internet to communicate directly with or solicit response or dialogue from specific customers and prospects.
6. **Interactive marketing:** Online activities and programs designed to engage customers or prospects and directly or indirectly raise awareness, improve image, or elicit sales of products and services.
7. **Word-of-Mouth Marketing:** People-to-people oral, written, or electronic communications that relate to the merits or experiences of purchasing or using products or services.

8. **Personal Selling:** Face-to-face interaction with one or more prospective purchasers for the purpose of making presentations, answering questions, and procuring orders .(Philip Kotler,2000).

2.1.10 Marketing Cost as a Percentage of Revenue

The pharmaceutical promotion and marketing expenditure average 20-30% of sales turnover, which is about two to three times the average expenditure on research and development. The term has several definitions. In strictly commercial terms, it denotes informational and marketing activities, which are aimed at generating prescriptions from the physicians, supplying and administering medical products. These activities are quite broad in expanse and include the activities of the medical representatives and all other aspects of sales promotion such as journal and direct mail advertising, participation in conference & exhibitions, the audio-visual materials, sampling, gifts & trinkets, hospitality for medical profession, and seminars/CME programs etc(Bhatt,1996).

2.2. Theories and Models Relevant to Factors Influencing Prescribing decision

This section elaborates on previous theoretical models and relevant literature related to marketing, social, behavioral and consumer theories. These theories aid the specification of how drug information sources are processed when decisions to prescribe drugs are made. (Raisch ,1990).

2.2.1. Previous Theoretical Models Overview

Some studies have attempted to develop theoretical models to explain the factors influencing prescribing behavior of physicians. The most influential previous theoretical models of physician prescribing behavior are elaborated on in this section as a theoretical background for the proposed conceptual framework.

2.2.1.1. Knapp et al. Model

Asimplistic model of physician decision termed Benefit/Risk Ratio Model was developed by **Knapp et al.** The model takes into consideration of the demographic variables such as age and site of practice. It also includes four variables such as severity of the disease, possible decisions, benefits and side effects of medication, and physician's specialty. However, the model excluded

several factors had been proved to significantly impact on the prescribing. (cited in Murshid et al.,2017).

2.2.1.2 Hemminki, Model

Hemminki, proposed a more complex model of prescribing. The author suggested the incorporation of a number of variables such as years of practice, the number of work hours and the number of patients administered to daily to effectively explain the drug prescribing decisions of physicians. However, the explanatory power of the model is overlooked. (cited in Murshid et al.,2017).

2.2.1.3. Raisch Model

Another model of **Raisch** ,proposed very complex model that incorporates several direct and indirect factors influencing prescribing decisions. The direct factors include formularies, prescribing restrictions and required consultations, while the Indirect factors comprise promotions of pharmaceutical firms and visits by medical representatives (MRs), opinions of colleagues, the scientific data derived from randomized and controlled clinical trials as well as medical training. The demographics variables of physician and practice factors such as case mix and organizational structure were also included. Factors such as individual and practice are thought to affect prescribing decisions by influencing the thought process of the physician. The patient factors that influence the physician prescribing decision such as patient's presenting symptoms and physician's diagnosis were considered in addition to psychosocial factors. (cited in Murshid et al.,2017).

2.2.1.4 .Gallan Model

Gallan, developed a general theoretical model based on the review of related literature and empirical examination in an outpatient setting. The model incorporated three main components: predecessors, the process of interpreting the perceived need for a medication therapy into the prescription decision of physician, and outcomes. The predecessors include marketing efforts of pharmaceutical firms, economic and government factors and other variables that affect the drug prescribing decision of physicians. (cited in Murshid et al.,2017).

2.2.1.5. Singh,Model

Singh, developed a conceptual model of the dyadic relation between MRs and physician prescribing. The model encompassed three dimensions such as network interconnection aspects,

the possibility of transfer of resources (RT), activity integration and circulated actor relationship as predictors of physician prescribing behaviour. RT such as product knowledge gained by the detailing/MRs activities is associated with high prescription behaviour. The relationship between product knowledge and prescribing behaviour is stronger when the interaction between MRs and physicians is strong. Similarly, the higher density of promotional efforts like continuing medical education provided by MRs to physician's and the launch of new drugs are associated with the high prescription rate of physicians. (cited in Murshid et al.,2017)

2.2.1.6. Kyle et al,Model

Kyle et al, made efforts through literature review to develop a qualitative prescribing model that assesses the influence of economic factors on physician prescribing behavior. The model displays an array of direct and indirect commercial impacts on physician prescribing decision. For example, physicians are directly influenced by visits of MRs, sampling, gifts and conference travel. Although these tools have an indirect influence on GPs, it does not appear to be related to pharmaceutical promotion designs. (cited in Murshid et al.,2017)

2.2.1.7. Godin Model

Recently, **Godin**, developed a single model based on the TPB to provide a possible framework for studying behaviors and intentions of health care professionals. The TPB was shown to be a suitable theory to explain the prescribing behavior of physicians. Habit (past behavior), which is distinct from physician characteristics, has a strong impact on physician prescribing. The authors also reported that non-psychological factors influence choice behavior. (cited in Murshid et al.,2017).

2.2.1.8. Stros and Lee Model

Stros and Lee, conducted a review of marketing dimensions in the prescription industry to develop a conceptual pharmaceutical marketing model. The review provides insight into marketing factors which are based on marketing mix strategy (4Ps), specifically, product, price, place, and promotion that influence physician prescribing. The results concluded that the policy of promotion such as MRs, advertising, drug sampling, and information) is the most relevant followed by price policy, and then product policy includes branding, product attributes (concerning side effects, risks, safety, efficacy and indication), drug delivery and packaging. The policy of distribution is the least important factor in the pharmaceutical context. Nonetheless, the effect of variables related to the 4Ps marketing mix concept on physician prescription behaviour

needs further investigations. The deception of the models varied and related to study variables. (cited in Murshid et al.,2017)

2.2.2 .Theories Relevant to Factors Influencing Prescribing Decision.

2.2.2.1.Agency Theory

The basic concept of agency theory was first established by Jensen and Meckling(Eisenhardt ,1989) ,academic literature(Shapiro, 2005), by introducing the initial perspective of different objectives for the theory. Eisenhardt³³ reviewed the concept, context, and principles of the Agency Theory. As stated in Eisenhardt reviewed the theory presents a framework for analyzing relationships between interdependent to identify the problem that exists between parties and mechanism to solve it(Eisenhardt ,1989) . The agency relationship occurs when the first party (the principal) relies on the second party (the agent) to perform certain actions on behalf of the client(Mott , Schommer , Doucette & Kreling,1998).

Within the context of this review, the focus is really on two critical agency relationships, that of the physician (agent) and patient (principal), and the pharmaceutical firm (principal) and physician (agent). In the first relationship, the pharmaceutical firms as principal obviously depend on the physician's as the agent to select the drugs they are offered in the market. The patient, in their role as principal, depends on the physician, acting as the agent, to select the appropriate drug. Physicians make decisions of prescribing drugs on behalf of their patients. That the principal might be concerned that the agent may not take actions that are in the best interest of the principal(Eisenhardt ,1989) .Although these may be the two primary relationships considered in this research, it should be noted that interventions of pharmacists may also influence the physician prescribing of drugs, however this maybe a second agency relationship.

Based on the above approach with respect to the pharmaceutical firm, the pharmaceutical firm (principal) is (1) motivated to sell its products (adapting various marketing efforts) and generate a profit, (2) while full disclosure is required, the firm typically emphasizes only a limited amount of the available information related to both the sale of that product to the physician and its safe use,(3) it believes in its products (drugs), and being at arm's length from the patient: physician relationship, is assuming less risk and(Groves ,2006) ,(4) its success is often influenced by environmental factors over which it may have little control (within the context of this research i.e. habit persistence and drug cost/benefit ratio). On the physician-patient relationship, where

the patient is the principal. Patients, in fact, rely on the physician's to diagnose and then prescribe the right medicine (Epstein & Ketcham, 2014). This dependence originates from the technical skills and specialized knowledge required to make prescribing decisions (Schommer & Hansen, 2005). The patient (1) is, of course, interested in the most efficient, practical, least invasive moreover, cost effective treatment, (2) may know something about their condition, but does not understand the effectiveness or other properties of the prescription alternatives, and have little insight into the physician's the rationale for the selection of one product over another, (3) is the individual to whom an intervention is being prescribed, and, all things being equal, is less inclined to take unnecessary risks, unless it is the only alternative, and finally (Groves, 2006), (4) the physician's prescription is a function of many variables over which the patient has little control (within this research, e.g., drug characteristics, drug cost/benefit ratio, habit persistence).

In this case, the effects of the agency may in part caused by the influence of the standard social pressures moreover, thus the impact on prescription. For instance, prescribers may perceive the patient's expectations and requests for a drug as a social pressure to write the drug. Physician's said that the inability to prescribe medication that the patient wants might hurt the patient - physician's relationship and reduces the possibility of a therapeutic functional cooperation (Knight, 2013). In other words, when the physician meets the patient's wishes for a particular drug through the provision of a prescription, the patient's confidence that the prescription is the right response is enhanced.

2.2.2.2. Theory of Persuasion

Persuasion has an effect on everyone on a regular basis, by controlling decision making or a successful attempt to convince or influence (Schommer & Hansen). The persuasion is also defined as a human communication intended to manipulate others by altering their philosophies, principles or points of view (O'keefe, 2002). Persuasion comprises both emotional and cognition responses to the condition in which people find their selves. Persuasion is an interaction between cognition and emotion that may alter the behavior of an individual towards the objective. Theoretically, persuasion has four key dimensions: (1) sender of information (e.g. representatives of drug companies), (2) the receiver (e.g. a physician's), (3) the exchange between the sender

and receiver, either interactive or active, (4) the modification in behavior (e.g. prescription behavior), which can be elective, and there is a certain amount of time required for the deal to occur. Persuasion stipulates that behavior of individuals changes willingly when they are subjected to a particular stimulus, and thus the mind alters the interaction (Bettinghaus , 1980). In most cases, this alteration of mind is related to the singular needs of individuals (physicians) and their desires (e.g., prescriptions needed by their patients). Such changes could be achieved instantaneously (prescribing decision), or it may take several days or months or even years (need more conviction)(Storey , 1997).

Persuasion theory is used in prescription literature to identify better ways of providing interventions to enhance the prescribing behavior of physicians such as marketing activities (Raisch ,1990).The theory provides a significant amount of knowledge to solve the questions relevant to pharmaceutical marketing issues in the context of drug prescription (Schommer et al., 2005).Elaboration Likelihood Model (ELM) is the most extensively used model in the context of persuasion theory(Petty & Cacioppo ,1986). Elaboration entails “engaging in issue-relevant thinking(O’keefe, 2002).The model proposes that individuals use both cognitive abilities and emotional reaction to interpret data and make decisions. More specifically, ELM model indicates that the source of information (marketing efforts of medical representatives), and the way that can be offered, as well as the receiver characteristics (e.g., physician’s), may affect the understanding of the information needed to make appropriate decisions, which in turn has a persuasive influence on behavior (e.g., physician prescribing)(Petty & Cacioppo ,1986). ELM model is composed of two methods of persuasion: the focal and peripheral. The focal method comprises a high level of planning and cognitive effort while peripheral method includes a lower level. Petty et al.(Petty & Cacioppo ,1986) suggested that when fewer people are interested in a case, they pay less attention to the information provided and are less motivated to argue cognitively.¹⁵ In contrast, when the incentive for the issue is low, the way of the terminal becomes more significant (O’keefe, 2002). For example, in commercials, when an individual is not hungry (a necessity), the advertising of hamburger becomes insignificant in the foundation. Watchers or viewers are more inclined to observe the marginal signs, be intrigued by the charisma or integrity of the presenter, the backdrop music or optical glasses. In contrast, hunger draws attention to the food itself. Consequently, marketing efforts of pharmaceutical companies

can be studied to validate if the delivery of information through MRs effectively convinced physicians and subsequently change their prescribing behavior. More specifically, physicians may be influenced in much the same way as any highly involved consumer who can assimilate information and subsequently undertake extensive cognitive processing, an approach described by the ELM model (Petty & Cacioppo, 1986). These influences include (but not restricted to) environmental stimuli (patient and pharmacist), personal relationships with MRs and pharmacist, marketing stimuli (drug information, branding, and promotional tools), physician characteristics (e.g., habit persistence), and drug characteristics, all of which emotionally impact on the decision-making of physicians during prescribing. Information deduced from this model is the process of the buyer's (physician) consciousness from external stimuli to the purchase (prescribing) decision. As a consumer, a physician's is confronted with several of the same influences that an individual might face with a typical purchase decision. The model proposes that the stimulus combined with a proper adjustment and specific population will result in a response that can be anticipated by the vendor. The marketing mix factors and other stimuli enter the "black box" which is known as the client (i.e. the physician) and generate some choice replies/purchases. All of these stimuli enter the black box of the buyer and are converted into a range of observed responses of the purchaser. On the other hand, a vendor wants to absorb how stimuli are translated into replies within the black box of the consumer, which consists of two parts (Kotler, 2003). Firstly, the buyer (physician) properties will affect how stimuli are absorbed, visualized and interpreted by the marketing motivators. The characteristics of the purchaser (physician's) can be attributed to private variables such as social and psychological factors. Secondly, the decision-making process of the buyer (physician) will ultimately define what, if any, buy (prescriptions) behavior occurs see belows figure 2.1 (Kotler, 2005).

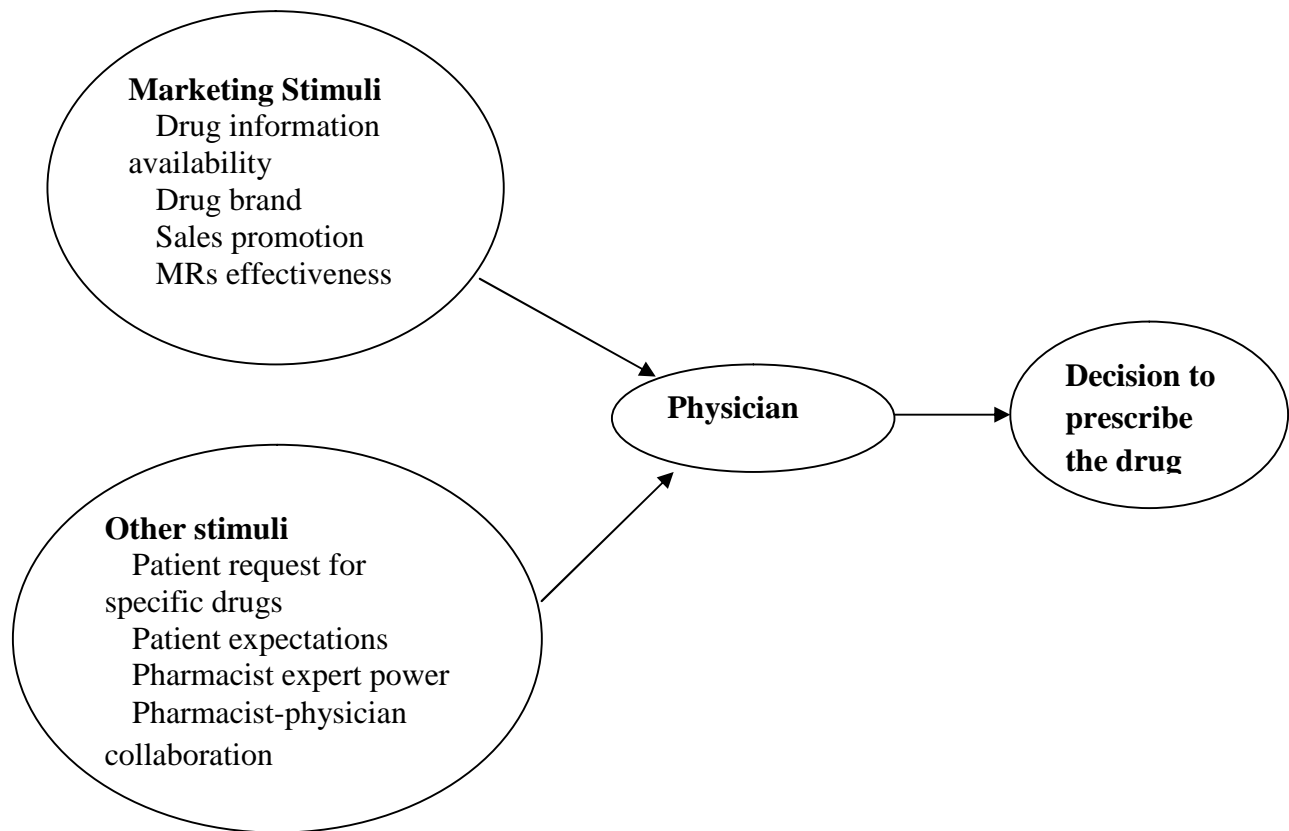


Figure 2.1. Stimulus-response model of physician behavior adapted from Kotler (2003).

Pharmaceutical companies offer their products to physician’s for the purpose of increasing sales in the market as well as promoting sales revenue(Vukadin, 2014).Thus, the goal of marketing activities for pharmaceutical companies, such as drug information, free drug samples, and other promotional tools is to stimulate behavioral change in physician’s as regards drug prescription. Furthermore, marketing strategies related to product, place, promotion and price are considered tools for motivating the physicians to prescribe specific brands(Stros & Lee , 2015). For instance, MRs have proposed expensive dinners to physicians along with an educational program about a new drug, or an innovative use of a drug already on the market. These incentives will likely motivate physicians to prescribe more of the pharmaceutical firm’s product discussed at the dinner or program.

2.2.3.3.Theory of Planned Behavior

There are some mid -level theories from social and behavioral science that may aid the understanding of prescribing behavior. The TPB theory is one of the most appropriate and

frequently considered behavioral theory when attempting to modify or influence physician prescribing (Eccles, Grimshaw, Shekelle, Schunemann, & Woolf, 2012). In the meta-analysis conducted by Godin et al. (Godin, Belanger-Gravel, Eccles, & Grimshaw, 2008), the TBP demonstrated high ability to predict the behavior of physicians within the context of health care. TBP has proved to be a successful analytical tool to handle the factors influencing prescribing behavior (Ponnet, Wouters, Van Halbeek, Heirman & Walrave, 2014; Kramer, 2014; & Perkins, 2007). This review is based on a model of TPB¹¹ which elucidates and tests the ability of attitude, personal norm and perceived behavioral control to predict behavioral intentions and physicians' prescribing behavior. Attitude expresses the degree of like or dislike for something, which may affect the "tendency or behavior" to act in specific ways. To be precise, attitude is the extent to which a physician has a favorable or unfavorable attitude towards marketing efforts will influence their prescribing. The attitude of medical practitioners towards the marketing efforts of pharmaceutical companies will determine their prescribing behaviour. Attitude can be measured as the degree at which physicians approve of four factors, specifically, available drug information, drug brand, sales promotion, and effectiveness of MRs.

A second element within the context of the TPB is a function of the influence of subjective norms (SN), namely, the expectation (pressure) to perform according to some group. In this review, this can manifest by social influence (perception of pressure resulting from patient or pharmacist) such as patient demands for drugs, patient expectations, pharmacist expert power and pharmacist-physician collaboration.

The third element within the context of the theory of planned behavior, consider perceived behavioral control (PBC), which is a function of conduct, as it reflects experience (product knowledge) while anticipating future problems. PBC signifies a physician's perception of the extent to which performance of the behavior is easy or difficult. PBC is attributed to the existence of the variables that may facilitate or hinder the change of the behavior (e.g. prescribing) (Ajzen, 1991). These factors could be contextual, such as drug characteristics, cost/benefit ratio of a drug, habit persistence of physicians and trustworthiness of physicians in pharmacists (i.e., the responsiveness of physicians' decision making to marketing efforts, patient characteristics and pharmacist factors), thus affecting the prescribing decision of physicians. Thus, this review seeks to extend the model of TBP by including contextual variables as

moderators and investigating its influence on the relationship between marketing efforts, patient characteristics, pharmacist factors, and the prescribing decisions of physicians.

2.3. Empirical Study of Factors Affecting Drug Prescribing Behavior of Physicians

2.3.1 Awareness of Drug Price

In different studies ,Khajuria,et al. 2013,Carrin, 1987, and Bradley, 1992 states that there are factors that change physician's drug prescribing behavior. Those factors are drug price awareness(Abulhaj ,Abu, Samen and Alabbadi,2013), patient's expectations drug costs ,drug cost knowledge and sources of information (Forster, 1991, Coleman, et al. 2000 and Ryan, et. al. 1990), level of postgraduate medical education (Becker, et al. 1972), social and logistic factors such as GPs time pressures (Carrin, 1987, Bradley, 1992).Moreover in other study most physician's said drug costs should be borne in mind when choosing a patient's treatment (Ryan,Yule,Bond, and Taylor,1990).

In three other studies the cost of a drug to a patient was identified as the most substantial influence on prescribing (Arroll,et al.,2005,Allan, Innes, 2004, Abulhaj ,Abu,Samen and Alabbadi,2013) and also in other study price awareness affect prescribing behavior significantly,(Allan, Innes, 2004).However the finding in Scottish general practitioners states that perceptions of drug costs are often inaccurate regardless of this it is well known that better knowledge of costs would change their prescribing behavior, (Allan, Innes, 2004).

2.3.2 Physician's Professional knowledge and Experience

In one study it shows that physician knowledge of drugs affects physician prescribing behavior (Forster, 1991, Coleman, et al. 2000).Moreover In other study find that early experience of using a drug influences future use, so feedback from the first few patients has an impact on whether or not a GP continues using a new drug (Jones et al 2001). Personal and professional experiences may have a strong impact on whether or not GPs implement evidence-based medicine – particularly the GPs' personal life experiences or experiences of hospital medicine as students or junior physician's. Accidents, mishaps and spectacular clinical successes have been shown to directly influence subsequent practice (Freeman and Sweeney 2001).

2.3.3 Drug Characteristics

In one study found that drug Safety, effectiveness, were considered highly influential on drug prescribing behavior (Schumock et al,2004).

2.3.4 Patient Expectation

Also, most physicians considered that patient preferences only had a small influence on their prescribing decisions, whereas in two studies found that patient preferences were a powerful driver (Avorn et al 1982,Abulhaj et al.,2013) and also GPs' perception of patient pressure is strongly associated with prescribing (Little et al 2004).

Also in other settings, scholars found a positive relationship between patient requests and prescription (Kravitz, et al. 2003; Lyles 2002; Mintzes, et al. 2003). This positive relationship is driven by patient pressure, and research has shown that when physicians do not comply with patient requests, patients are less satisfied with their physician visit (Kravitz, et al. 2003).When the general practitioner thought the patient expected medication the patient was 10 times more likely to be prescribed a medication than when the practitioner thought that the patient did not expect any medication(Cockburn and Pit ,1997).

2.3.5. Pharmaceutical Marketing Strategies

In one study it find that pharmaceutical marketing strategies factors have a statistically significant positive effect on physician's prescribing behavior(Abulhajet al.,2013).Pharmaceutical company information, especially that provided by visiting representatives, may be a very important prescribing influence (Prosser and Walley 2003).Detailing and samples have a mostly informative effect on the prescribes (Goniil, et al. 2001).

Gönül et al. (2001) and Manchanda and Chintagunta (2004) find that marketing efforts by pharmaceutical companies to the physician positively affect prescriptions issued by a physician, According to the prior literature, firms' marketing efforts may have a positive effect on prescription behavior, because detailing visits or symposium meetings provide information to the physician on efficacy and side effects of the drug (Gönül, et al. 2001).

In other study find that the early new promoted drug prescribers are greater users of information from the pharmaceutical industry and read less published information than their less innovative colleagues(Strickland-Hodge & Jepson ,1982).

According to several studies (Manchanda, Phil, &Honka, 2005) (Nair, Manchanda, & Bhatia, 2009) on effects of Direct-to-Physician marketing physician prescribing behavior is affected by pharmaceutical marketing directed at physicians in a significant, positive way.

In Brett et al, '2003 ,and Agarwal,et al ,2004, study, it was found that there are many different ways by which drug companies relate directly or indirectly with physician's. These range from the seemingly trivial (e.g., the ubiquitous dispensing of gifts such as pens and writing-pads with drug names inscribed) to the much more fascinating gifts(e.g., the ghost writing of articles for teaching faculty, the payment of large sums in cash to prominent physicians who extol the virtues of company products and the support of lavish trips and entertainment for physicians who commonly prescribe company products) .

Many junior as well as senior physicians seek sponsorships or financial aids from pharmaceutical companies to attend national as well as International Conferences. Even pleasure- trips within the country and abroad for a few heavyweight physician's and their immediate family members are arranged and funded by some pharmaceutical companies. The physician's, in turn, tend to reciprocate by prescribing medical products of these companies.(cited in Bansaland Das,2005)

Most GPs had regular visits from pharmaceutical sales representatives. Many informants stated that they used sales representatives as a source of information on new drugs(Prosser ,Almond, and Walley,200,p.210).Physicians accept various types of gifts from pharmaceutical companies; those can influence physician prescribing pattern and result in early adoption to prescribe newly medications depending on promotional information (Mikhael, and Alhilali, 2014).Moreover the other factors found in the study which affect prescribing behavior is availability of drug samples (Schumock et al,2004).

2.4 Conceptual Framework of the Research

This conceptual frame work was taken based on the literature reviewed about factors affecting drug prescribing behavior of physicians and supports the conceptualization of objectivities and research questions of this study .The conceptual frame work states that drug price awareness, physician’s professional knowledge and experience, drug characteristics, patient expectation and marketing strategies.

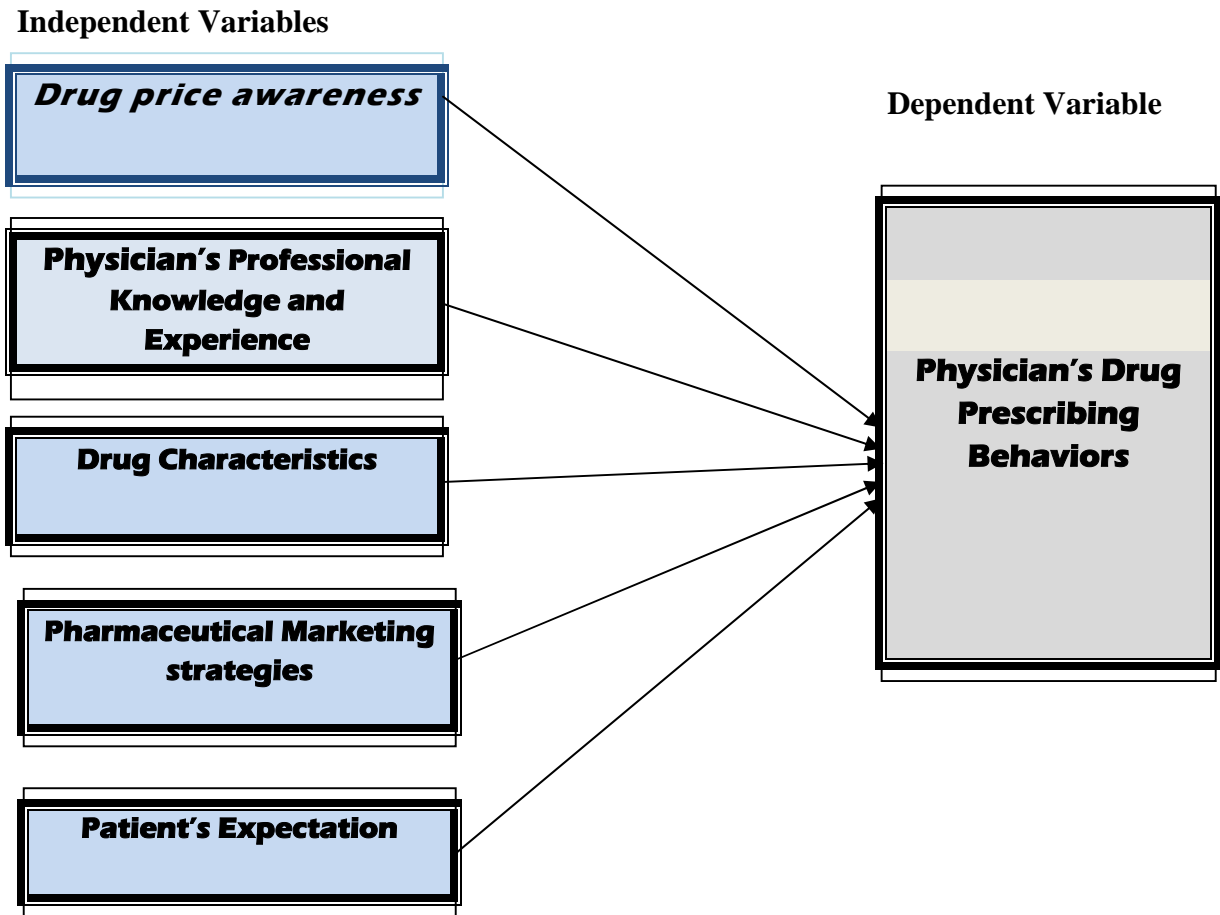


Figure :-2.2.: Shows the Conceptual Framework Proposed Model.

Source: -Adopted and Modified (Abulhaj et al., 2013)

2.5 . Research Hypothesis

Based on the review of existing literature and problems identified the hypotheses of the study were:

Hypothesis 1(H1)

H1: There is statistically significant positive relationship between physician's drug price awareness and their drug prescribing behavior.

Hypothesis 2(H2)

H2: There is statistically significant positive relationship between physician's professional knowledge and experience and physician's' drug prescribing behavior.

Hypothesis 3(H3)

H 3: There is no statistically significant positive relationship between drug characteristics and physician's' drug prescribing behavior.

Hypothesis 4(H4)

H4: There is statistically significant positive relationship between patient's expectations and physician's' drug prescribing behavior.

Hypothesis 5(H5)

H5: There is statistically significant positive relationship between pharmaceutical marketing strategies and physician's' drug prescribing behavior.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter explain the methodological approach adopted when conducting the research. The research design, sample and sampling techniques, source and tools of data collection, procedure of data collection and method of data analysis will be briefly explained.

3.1 Research Design and Approaches

Research can be classified as descriptive, explanatory and exploratory depending on the specific purpose that the research tries to address. Descriptive research and quantitative and qualitative research approaches were sets out to describe and to interpret what is. It looks at individuals, groups, institutions, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and the events that constitute the various fields of inquiry. It aims to describe the state of affairs as it exists. On the other hand, explanatory research, aims at establishing the cause and effect relationship between variables. The researcher uses the facts or information already available to analyze and make a critical evaluation of the data/information. Exploratory research is less formal, sometimes even unstructured and focuses on gaining background information and helps to better understand and clarify a problem. It can be used to develop hypotheses and to develop questions to be answered(Sounders et al. 2009).

Accordingly, in this paper the researcher was employed both **descriptive and explanatory research** design using **quantitative** and **qualitative** methods were used to analyze data collected from the resident physicians.

3.2. Population ,Sample Size and Sampling Techniques

3.2.1.Population

As shown bellows (table 1.)the target population of this study comprises of resident physicians in Black lion Specialized Hospital .

Table 3.1. Resident Physicians in Each department

Department	No. of resident physicians in each department	Calculation	Sample size
Dermato–Venerology	41	$(41/402)*199$	20
Internal Medicine	100	$(100/402)*199$	50
OBS/Gyn	90	$(90/402)*199$	45
Orthopedics	90	$(90/402)*199$	44
Pediatric and Child Health	80	$(80/402)*199$	40
Total sample size	401		199

Source: AAUBLSHDs(Addis Ababa University Black Lion Specialized Hospital Departments).

3.2.2. Sample Size and Sampling Technique

This study involving resident physician’s attending in Addis Ababa Black lion Specialized Hospital .Approximately 1050 resident physician’s are in hospital. They are distributed into more than twenty three departments namely: internal medicine, surgery, pediatrics, Family medicine, obstetrics & gynecology, ophthalmology, psychiatry, surgery, ENT, neurology, dermato venerology, emergency medicine radiology, dentistry, orthopedics and trauma, preventive medicine, pathology ,clinical oncology, anesthesia and anesthesiology(AAUBLSH HR data). Only five (5) of these departments resident physician specialty which are Internal Medicine, Pediatrics, Gynecology, Derma to Venerology , and Orthopedics and trauma, were selected for this study. Other departments were excluded either because drugs not routinely prescribed ,only a few varieties of drugs were routinely prescribed or they mainly prescribe drug in other hospitals . Moreover resident physician specialty who are less likely to interact with the pharmaceutical sales representatives(PSRs) were grouped under the excluded departments. Given a study population of 401 Addis Ababa university Black lion Specialized Hospital resident physicians, a sample of 199

physician's which was calculated as $(196+201)/2=199$ chosen for the study. The sample size is determined using the table developed by **Krejcie and Morgan (1970) using the formula for sample size determination** when the population size is known (Appendix B). Furthermore, a **quota sample** from the chosen sample size is selected based on the departments(see table1 3.1.above) . Therefore, the sample size selected for this study goes in tandem with the total population of the study. In summery the researcher is employed **non-probability sampling** especially **convenience sampling**. The reason for using sample is the effort, cost incurred and the time that spent for the accomplishment of the study can be reduced. It is also difficult to access each population unit and difficult to get them hence the study not employed probability sampling technique. In addition, **convenience-sampling technique** is chosen because in this case the respondents are accessible to the researcher.

3.3. Source of Data and Data Collection Tools

3.3.1.Source of Data

There are two types of sources when collecting data; primary and secondary data sources (Arbnor and Bjerke, 1994) as cited in OlleStromgren, 2007. Primary sources are directly related to the study purpose. Primary data consists of all the data that will be collected throughout the study and that directly can be related to the study purpose, both personally gathered as well as data from a third party that has been collected with equivalent purpose. Secondary data on the other hand, contains relevant data that has been collected for a different purpose, but from which the conclusion is valuable for the purpose. Throughout the study, the researcher was used both primary and secondary data sources.

3.3.1.1. Primary Data,

Which is directly related to the purpose was collected through an empirical study. The empirical study were done through distributing questionnaire regarding factors affecting physician's drug prescribing behavior.

3.3.1.2. Secondary Data

Secondary sources of data were collected from review of related literatures from published journals, books, the internet and relevant document various materials , the hospital department statistic records. This secondary data is also used to construct the basic framework of the study.

3.3.2. Data Collection Tools

To collect the data the researcher referring different literatures(adoption and modification) prepare conceptual model which has both one dependent and five independent variables as a result from this the researcher developed hypothesis test and questioners which consists different factors .Therefore, respondents was asked to rate factors as to whether they feel as important by anchoring the Likert 5 -point scale ranging from 1 (strongly disagree) to 5 (strongly agree) for each of the above factors in five major areas.

3.4. Procedures of Data Collection

After reviewing different previous studies that evaluate the factors affecting drug prescribing behavior of physicians specifically for the purposes of this study the researcher developed the highly modified and adopted questionnaire The questionnaires(appendices A) contain **three parts** in the **first part** includes personal information/ focused on the demographics of the physician's; in the **second part includes** regarding to factors affecting physicians' drug prescribing behavior and dependent factor **.In this part** there are **six sections**. The **first** section about influence of drug price awareness **second section** about influence of Physician's professional knowledge and experience, **third section** influence of drug characteristics ,**fourth section** influence of patient's expectations and **fifth section** influence of pharmaceutical marketing strategies **sixth section** drug prescribing behavior factors .In each case a typical five-level Likert item was used. The **third part** contain open-ended question .

3.5. Data Analysis Method

This study was used survey method of data collection which was comprises of self administered questionnaires in the form closed ended questions and open ended question .The self administered questionnaire had two sections. The first section was designed to solicit data on socio-demographic characteristics of the respondents. The second section, to address data regarding factors affecting

drug prescriber behavior using **five points of Likert scales**. Finally, pre-tests session with 10% of the study population (20) was conducted to find out whether the questions are clear and detecting any faults prior to the actual data collection process. After the data collected from Addis Ababa University Black Lion Specialized Hospital resident Physicians ,it was first loaded into SPSS version 21 ,so that the required output of frequency distribution for demographic data ,correlation and multiple regression for basic questions of factor affection physician's drug prescribing behavior and the dependent variable Physician's drug prescribing behavior was obtained.

Pertinent to the methodology ,descriptive statistic for analyzing the demographic data and correlation as well as multiple regression for analyzing the basic constructs of factors affecting physician's drug prescribing behavior was used

In analyzing ,correlation and multiple regressions, between the response variable and the predictor variables, the average of the response obtained from the resident physician's was taken into consideration. Data collected using a five point Liker scale was measured at an ordinal level and it is usually non parametric in nature .due to this ,average was calculated in order to convert the data into continuous and hence took the nature of parametric test where it is possible to conduct Pearson correlation and linear multiple regression.(www.stasticsconsultalt.com).

3.6. Reliability and Validity of Instruments

3.6.1. Reliability

Reliability refers to the degree to which the data collection tools or analysis procedures will yield consistent findings.(Saunders ,Lewis & Thornhill ,2009).

Reliability analysis measures the internal consistency of a group of items which is used in the questionnaire construction. It also examines the homogeneity or cohesion of the items that compromise each scale.

3.6.2. Validity

According to Sounders ,et al.(2009),validity is soundness or rationality; whether the findings are really about what they appear to be or the degree to which results obtained from the analysis of the data actually represents the phenomena under study. The validity of data gathering instrument is confirmed by the ability & willingness of the respondents to provide the information requested.

In-order to make the questionnaire valid, relevant & objective to problem, it was properly commented by the advisor, and it also tested on available respondents and based on the issues which were not properly clear by the respondents were corrected and refined.

Cronbach’s alpha coefficient is the most frequently used index of reliability . Cronbach’s alpha coefficient is the most common way to asses reliability, a value of Cronbach’s alpha coefficient above 0.70 is regarded as acceptable.(Saunders ,et.al.2009).

Prior to the actual data collection ,to have reliability test and to check whether the data collection instrument was consistent and dependable in measuring what it intends to measure pilot survey were conducted on convenience technique base available resident physicians .Accordingly to 20 respondents (10% of the sample population) ,20 questionnaire were distributed and collected and as the result is indicated in table3.2 bellow the average Cronbach’s Alpha was 0.732 ,which is acceptable .From this we can conclude that the data collection instruments was consistent and dependable.

Table 3.2.The Reliability Coefficient Cronbach’s Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.732	0.745	27

Source; Own survey ,2018GC

3.7. Ethical Considerations

In the context of research, according to Saunders, Lewis and **Thornhill(2001)**, “ ethics refers to the appropriateness of your behavior in relation to the rights of those who become the subject of your work, or are affected by it”. The data was collected from those of willingness sample respondents without any unethical behavior or forcefully action. The results or a report of the study was used for academic purpose only and response of the participants was confidential and analyzed in aggregate without any change by the researcher. In addition, the researcher respects the work of previous investigations or study and cited appropriately those works that has been taken as a basis.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

This chapter will present a discussion of the final results and the process through which the results were obtained. In addition to this, background information of the respondents will be presented. Finally; the statistical method of analysis were discussed, which included a descriptive analysis, CRM assumption analysis, correlation, and multiple regression analysis by using SPSS version 21.

In this chapter, results have been presented and discussed to address the research questions and objectives. The following are the main headings: Response rates, Respondents' characteristics, assumptions' results of the regression analysis and discussion of the results.

4.1. Response Rate

Out of one hundred ninety nine(199) questionnaires were distributed to resident physicians in Addis Ababa Black Lion Specialized hospital with the help of trained data collector nurse from the total questioners distributed the researcher collected about 187 and the remaining twelve(12) were both uncollected and not correctly filled or responded. as a result response rate is about 93.97%.

Table 4.1. Response Rate

Total questioner Distributed	Total both uncollected or not filled properly	% of Total both uncollected or not filled properly	Total collected questionnaire	Response rate in %
199	12	6.03	187	93.97%

Source: own survey,2018

4.2. Respondents Profile

4.2 .1. Gender of the Respondents

From 187 samples drawn from the total population , 31%(58) of them are female respondents who are randomly appeared in the morning session or in the hospital and the remaining 69%(129) are represented by male respondents who took the biggest share of the total population considered under the study.

4.2.2. Age of the Respondents

The SPSS out put result on the age of the respondents showed that ,the largest proportion of the respondents fall on the age category of from 25-35 years which accounts 79.1%(148) ,followed by respondents who's age is less than 25 years ,covering the second largest proportion of 16%(30).The remaining age category, meaning respondents with the age category from 36-46 years , accounted for 4.8 %(9) .from this result we figured out that most of the respondents are from the productive age.

Table 4.2. Gender and Age category of the Respondents

Gender of the resident physicians		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	58	31.0	31.0	31.0
	Male	129	69.0	69.0	100.0
	Total	187	100.0	100.0	
Age category of the resident physicians					
Age category of the resident physicians		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 25 years	30	16.0	16.0	16.0
	from 25-35 years	148	79.1	79.1	95.2
	From 36-45 years	9	4.8	4.8	100.0
	Total	187	100.0	100.0	
Experience in years category of the resident physicians					
Experience in years category of the resident physicians		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 5 years	149	79.7	43.9	43.9
	5-10 years	29	15.5	41.7	85.6
	11-20 years	9	4.8	14.4	100.0
	Total	187	100.0	100.0	
Average Number of patients seen per day category					
Average Number of patients seen per day category		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Up to 15	82	43.9	43.9	43.9
	From 16-30	78	41.7	41.7	85.6
	More than 30	27	14.4	14.4	100.0
	Total	187	100.0	100.0	

Source: Own survey ,2018

4.2.3. Respondents Years of Experience

Based on the data obtained from the respondents, the majority of them are grouped from the category of less than 5 years, which accounted for 79.7%(149). The second which is 15.5%(29) and the third 4.8%(9) ranked proportion were goes to the group of respondents which fall between the category of 5-10 years and 11-20 years respectively.

4.2.4. Respondents Number of Patients Seen Per Day

As it is clearly depicted on the above table, the largest percentage of respondents fall in the category of up to 15 patients seen per day, comprised of 43.9%(82), followed by those respondents within the range of 16-30 patients seen per day, accounted 41.7%(78). The remaining 14.4%(27) of the respondents were grouped under more than 30 patients seen per day.

4.3. Analysis of Data About the Study

4.3.1. Descriptive Statistics Analysis of Independent variables

The model contains 27 questions and a five point likert scale is used to measure the level of acceptance the factors affecting physicians' drug prescribing behavior in Addis Ababa Black Lion specialized hospital by resident physicians is clearly high (mean >3; Table 4.3) (Abdulhaj A. et al. 2013). For all the independent variables mean and standard deviations have been computed. The table 4.3 below shows that from the described independent factors physicians knowledge and experience has highest mean 3.94, followed by drug characteristics 3.797, drug price awareness 3.32, pharmaceutical marketing strategies 3.29, and patient expectation 3.03.

Table 4.3. Descriptive Analysis for Independent Variables

Independent variables	Mean	Std. Deviation	N
Drug price awareness	3.3241	0.55417	187
Physicians Knowledge and Experience	3.9401	0.55750	187
Drug characteristics	3.7979	0.46094	187
Patient expectation	3.0321	0.65708	187
Pharmaceutical marketing strategies	3.2920	0.58484	187

Source : Field survey.2018

4.3.2. Test Results for Classical Linear Regression Model(CLRM) Assumptions

Classical Linear Regression Model(CLRM) assumptions namely normality, linearity, homoscedasticity, multicollinearity and independence of the residual are conducted and discussed as follows

4.3.2.1. Normality Test

Test for normality ,its determining whether the data is well modeled by normal distribution or not .This test of normal distribution could be checked by graphical(histogram and dot plot) method of tests. The normality assumes a critical role when a study is dealing with a small sample size ,data less than 100 observation.**(Gujarati,2004)**

Even though the normality assumption is not a treat since the observation or sample size of the study is large enough ,more than 100 observations ,the researcher tested it using normal probability plot(NPP).The decision rule is ,if the fitted line in the NNP is approximately a straight line, one can conclude that the variables of interest are normally distributed.**(Gujarati,2004)**

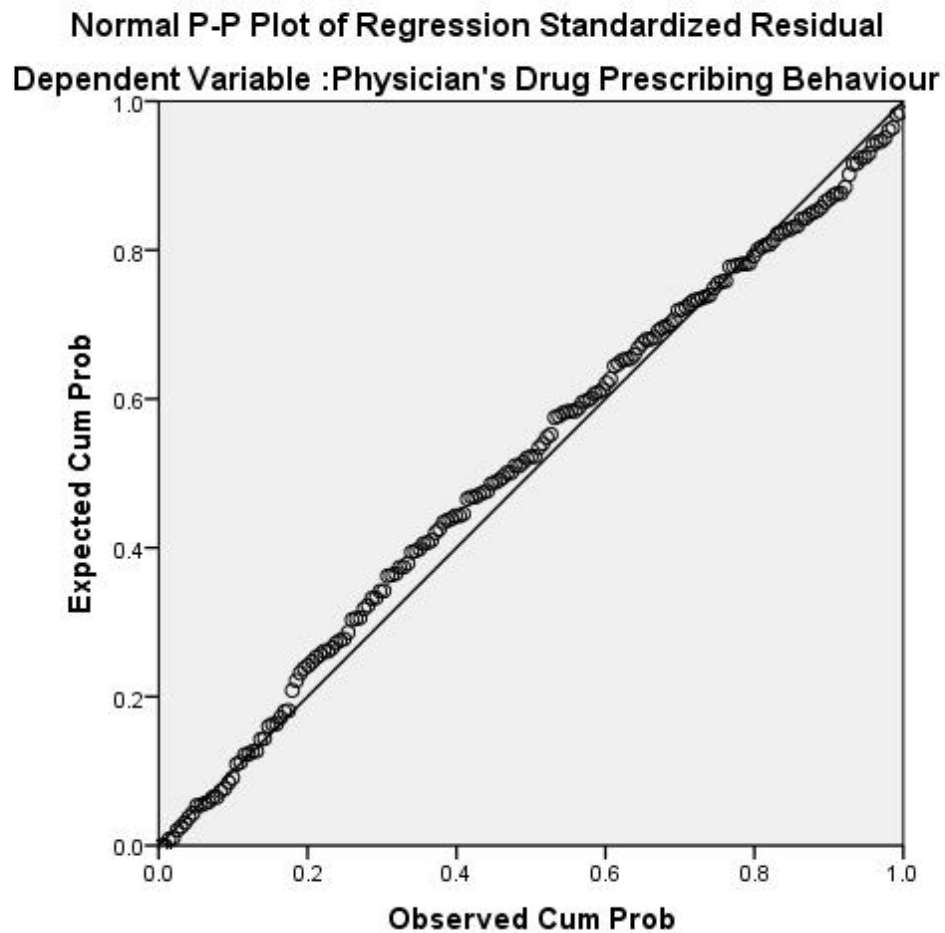


Figure 4.1. Graphical Test of Normality Assumption

Sources: Own survey result ,2018GC

4.3.2.2 Test for Linearity and Homoscedasticity

Multiple linear regression model assumes there is a linear relationship between the independent variable and dependent variables. Homoscedasticity assumption means the range of variance for dependent variable is uniform for all values of the independent variables.

Both assumptions can be checked by scatter plot diagrams stated below.

As we can see from the bellows figure 4.2 ,both assumptions are not serious treat to the study since one can draw one straight line to approximate the observations for all independent variables against the dependent variables , physician prescribing behavior, and also the variance between the upper and lower cases of the observations are reasonably similar.

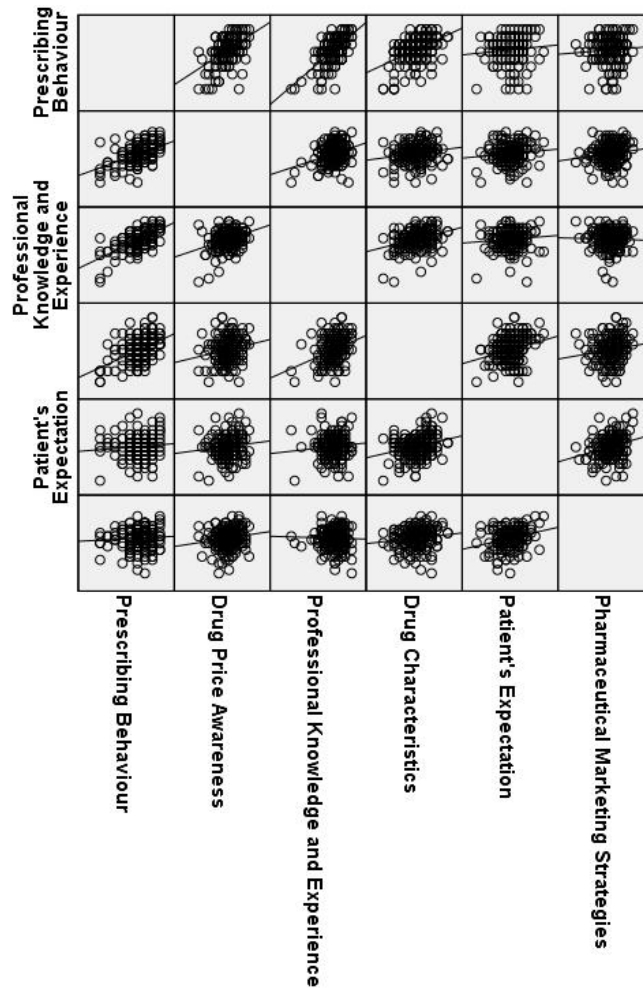


Figure 4.2. Scatter Plot Diagram

Source: Own survey ,2018

4.3.2.3. Test for Multi-collinearity

Another assumption that has to be meet to undertake multiple linear regression model is the assumption of multi-collinearity .It's an indication for a linear relationship between the independent variables. (Gujarati,2004)

Variable Inflation Factor(VIF) technique was used .The VIF is measure of the reciprocal of the complement of the inter-correlation among the predictors:/VIF =1/(1-r²)/

The decision rule is a variable with VIF value of greater than 10 indicates the possible existence of multicollinearity problem. Tolerance(TOL)defined as 1/VIF ,it also used by many researchers to check on the degree of co-linearity .The decision rule for tolerance is a variable whose TOL value is less than 0.1 shows the possible existence of multicollinearity problem. (Gujarati,2004)

Table 4.4. The Variance Inflation factor

Variables	Co-linearity Statistics	
	Tolerance	VIF
Drug Price Awareness	0.860	1.162
Physician’s Knowledge and Experience	0.797	1.254
Drug Characteristics	0.826	1.211
Patient's Expectation	0.882	1.134
Pharmaceutical Marketing Strategies	0.901	1.110

Source: Own survey, 2018

The above table 4.4 shows that VIF values for all variables became less than the tolerable value that mean 10 and tolerance value of all variables also became above 0.1 which indicates that this model is free from multicollinearity problem between the dependent variables

4.3.4.4. Test of Independent of Residuals

Multiple linear regression model assumes the residuals are independent of one another. The Durbin-Watson's statistics is used to test for the presence of serial correlation among the residuals. The value of the Durbin –Watson statistic ranges from 0 to 4. As a general rule ,the residuals are not correlated if the Durbin –Watson statistic is approximately 2,and an acceptable range is 1.50 to 2.50.

As obtained from SPSS out put result of the analysis Durbin-Watson statistics result was 2.04 .From this we can understand that the assumption of the independence of residuals is meet. Generally, the study discussed five major assumptions that must be fulfilled for one to analyze

data using multiple linear regression model. So ,since all the five assumptions were not violated, the researcher examined the data collected by the questionnaires using multiple regression model as follows.

4.3.2.5. Test Result for Significance of the Model

Significance of the model is tested by ANOVA and model summary table .Accordingly ANOVA table 4.6 above the F statistics is significant this mean that the independent variables ,taken together ,have a relationship with the dependent variable. In this case ,the probability of the F statistics for the regression analysis is 0.000,which is less than the level of significance of 0.05,which means the independent variables taken together have statistically significant relationship with the dependent variable under study

Table 4.5. ANOVA Linear Regression for the Model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	32.115	5	6.423	44.592	0.000
	Residual	26.071	181	0.144		
	Total	58.187	186			

Source .Own survey,2018

From the model summary table 4.7 bellow shows the effect of the relationship was identified based on the R statistics, which in a variable regression is the same as the correlation coefficient .in this case the R is 0.743 Or 74.3%, indicating strong relationship. Testing the R square (R^2) statistic tell us the proportion of variance in the dependent variable that is accounted for by the independent variables . In this case the model accounts for 0.552 or 55.2% of the variance in the dependent variable, Physician’s prescribing behavior or in other way 55.2% of the variability of physicians’ prescribing behavior has been explained by the model. The adjusted R square value of this research was found to be 0.54 or 54% ,since adjusted R^2 value always less than or equal to R^2 this means that ;if the model has been fitted when the whole population participates rather than those who responded in the study ,there will be 0.012(0.552-0.54)less variance in the model out come. To test its validity, substituting the value of R^2 suggested by Cohen(1977) and the

commonality established by **Fornell and Larcker(1981)**,one can get the minimum adjustment value of GoF(Good fit)equal to 0.36(**Wetzels, Odekerken-Schroder & Van Oppen,2009**).In this study ,the GoF is equal to 0.743,suggesting that the model showed a good fit compared to the specified minimum. The statistical significance of the structural relations of the model and hypothesis were validated.

Table 4 .6. Model Summary of the Regression result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.743	0.552	0.540	0.37953	2.041

Source: Own survey data , 2018

4.3.3 . Correlation Analysis and Hypothesis Testing.

Pearson correlation test was conducted to check the magnitude of correlation between the dependent variable, physician’s prescribing behavior and the various independent variables of relationship marketing such as Drug price awareness, Physician’s knowledge and Experience, Drug characteristics, Patient’s expectations, and Pharmaceutical marketing Strategies. The researcher also used the same test to prove or disprove the alternative hypothesis. The following measures of association developed by **MacEachron(1982)**was used as a reference to check the magnitude of correlation. MacEachron A.E.(1982).Basic Statistics in the Human Services :an Applied Approach .page132.

Table 4.7. The Measure of Associations and Descriptive Adjectives.

Measure of Association	Descriptive Adjective
>0.00 to 0.20; <-0.00 to -0.20	Very weak or Very low
>0.20 to 0.40; <-0.20 to -0.40	Weak or /Low
>0.40 to 0.60; <-0.40 to -0.60	Moderate
>0.60 to 0.80; <-0.60 to -0.80	Strong or High
>0.80 to 1.0; <-0.80 to -1.0	Very high or Very low

Source: This table is MacEachron,(1982) Basic Statistics in the Human Services: on Applied Approach, page 132.

Table 4.8. Pearson’s Correlation Coefficient

	Prescribing Behavior	Drug Price awareness	Physician’s Knowledge and Experience	Drug Characteristics	Patient's Expectation
Prescribing Behavior	1				
Drug Price awareness	0.485**	1			
Physician’s Knowledge and Experience	0.640**	0.334**	1		
Drug Characteristics	0.461**	0.181*	0.336**	1	
Patient's Expectation	0.091	0.111	0.094	0.257**	1
Pharmaceutical Marketing Strategies	0.066	0.148*	-0.028	0.140	0.259**

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source :Own survey ,2018

From the above correlation matrix ,the researcher found the following results under each constructs, supported with their related empirical evidences:

4.3.3.1. Correlation Analysis Between the Physician's Drug prescribing Behavior and Drug Price Awareness

The result of Pearson correlation test result (table 4.9) between the dependent variable **Physician's drug prescribing behavior** and the independent variable **Drug price awareness** showed that ,there is a positive relationship between the two variables at the significance level of **(R=0.485), (P<0.01)**.according to **MacEachron (1982)** measure of association, the magnitudes of relationship between the two variables are moderate. Compared to other relationship dimensions considered in this study , drug price awareness is ranked second in the magnitude of correlation.

H1:There is a significant positive relationship between drug price awareness and physician's drug prescribing behavior.

Based on the result obtained from Pearson correlation (table 4.9),there is a positive association between the dependent variable Physician's drug prescribing behavior and independent variable drug price awareness. Hence ,we accept the first alternative hypothesis **H1**.

4.3.3.2 .Correlation Analysis Between the Physician's Drug Prescribing Behavior and Physician's Knowledge and Experience.

The result of Pearson correlation test (table 4.9) between the dependent variable **Physician's drug prescribing behavior** and the independent variable **Physician's Knowledge and Experience** showed that ,there is a positive relationship between the two variables at the significance level of **(R=0.640),(P<0.01)**.according to **MacEachron (1982)** measure of association, the magnitudes of relationship between the two variables are strong. Compared to other relationship dimensions considered in this study , Physician's Knowledge and Experience is ranked first in the magnitude of correlation.

H2:There is a significant positive relationship between Physician's Knowledge and Experience and physician's drug prescribing behavior.

Based on the result obtained from Pearson correlation ,there is a positive association between the dependent variable Physician's drug prescribing behavior and independent variable Physician's Knowledge and experience. Hence ,we accept the second alternative hypothesis **H2**.

4.3.3.3. Correlation Analysis Between the Physician's Drug prescribing Behavior and Drug Characteristics

The result of Pearson correlation test (table 4.9) between the dependent variable **Physician's drug prescribing behavior** and the independent variable **drug Characteristics** showed that there is a positive relationship between the two variables at the significance level of **(R=0.461), (P<0.01)**. according to **MacEachron (1982)** measure of association, the magnitudes of relationship between the two variables are moderate. Compared to other relationship dimensions considered in this study, Drug Characteristics is ranked third in the magnitude of correlation.

H3: There is a significant positive relationship between Drug Characteristics and physician's drug prescribing behavior.

Based on the result obtained from Pearson correlation, there is a positive association between the dependent variable Physician's drug prescribing behavior and independent variable drug price awareness. Hence, we accept the first alternative hypothesis **H3**.

4.3.3.4. Correlation Analysis Between the Physician's Drug prescribing Behavior and Patients' Expectation

The result of Pearson correlation test (table 4.9) between the dependent variable **Physician's drug prescribing behavior** and the independent variable **Patients' expectation** showed that there is very low or insignificant positive relationship between the two variables at the significance level of **(R=0.091), (P>0.05)**. according to **MacEachron (1982)** measure of association, the magnitudes of relationship between the two variables are very weak or very low. Compared to other relationship dimensions considered in this study, Patients' expectation is ranked fourth in the magnitude of correlation.

H4: There is a significant positive relationship between Patients' expectation and physician's drug prescribing behavior.

Based on the result obtained from Pearson correlation, there is very low or insignificant positive association between the dependent variable physician's drug prescribing behavior and

independent variable **patients' expectation**. Hence ,we reject the fourth alternative hypothesis **H4**.

4.3.3.5. Correlation Analysis Between the Physician's Drug prescribing Behavior and Pharmaceutical Marketing Strategies.

The result of Pearson correlation test (table 4.9)between the dependent variable **physician's drug prescribing behavior** and the independent variable **pharmaceutical marketing strategies** showed that ,there is very weak positive relationship between the two variables at the significance level of **(R=0.066),(P>0.05)**.According to MacEachron (1982) measure of association, the magnitudes of relationship between the two variables are very weak . Compared to other relationship dimensions considered in this study , Pharmaceutical Marketing Strategies is ranked fifth in the magnitude of correlation.

H5:There is a significant positive relationship between Pharmaceutical Marketing Strategies and physician's drug prescribing behavior.

Based on the result obtained from Pearson correlation ,there is very weak positive association between the dependent variable Physician's drug prescribing behavior and independent variable Pharmaceutical Marketing Strategies. Hence ,we reject the fifth alternative hypothesis **H5**.

4.3.4. Multiple Regression Analysis

Regression analysis is a statistical process for estimating the relationship among variables. It include many techniques for modeling and analyzing several variables ,when the focus is on the relationship between a dependent variable and two or more independent variables. More specifically ,regression analysis helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. In this study regression analysis was used to identify the impact of independent variables; Physician's drug prescribing behavior and the predictor variable, Drug price awareness, Physician's Knowledge and Experience, Drug Characteristics, Patient's Expectation and Pharmaceutical Marketing Strategies on dependent variable; physicians' drug prescribing behavior. Under the regression coefficient (**tabl 10**) ,the researcher was highly emphasized on the value of the **standardized Beta coefficient** in order to figure out

the relative importance of each independent variable, in predicting the dependent variable and on the **un-standardized Beta coefficient** in order to formulate the linear regression equation.

A. Standardized Beta Coefficient

Standardized beta coefficient is sometimes called relative importance weight. More specifically, RIWs are the proportionate contribution from each predictor to R^2 , (i.e. in our case to the $R^2=0.552\%$) after correcting for the effect of the inter-correlations among predictors (Lorenzo-Seva et al., 2010). This method is recommended when the researcher is examining the relative contribution each predictor variable to the dependent variable, **Johnson, (2000, and 2004)**.

from table 4.10 we can infer that, Physician's knowledge and experience is found to be the most important factor affecting Physician's drug prescribing behavior which accounted for 46.1% of the beta coefficient. The second most important factor that contribute most to the positive variation in the dependent variable is drug characteristics accounted for 32.4 % of the beta coefficient, followed by, drug price awareness accounted 29% and the remaining factor which are patient's expectation and pharmaceutical marketing strategies with a beta coefficient accounted only 4.7% % and 1.2 % respectively. That mean both factors; patient's expectation and Pharmaceutical marketing strategies contributed least to the variance in the response variable among the others, moreover both of them are statistically insignificant at p-value greater than alpha ($0.294 > 0.05$ and $0.804 > 0.05$ respectively). However this doesn't mean that patient's expectation and Pharmaceutical marketing strategies has no contribution; rather its contribution was insignificant.

B. Un-standardized Beta Coefficient

This is sometimes called, the Beta Weights according to **Pedhazur (1997)**, a weight coefficient informs us, as to how much change in the criterion variable (I.e. physician's drug prescribing behavior in our case) we might expect with a one unit change in the predictor variables, (drug price awareness, physician's knowledge and experience, drug characteristics, patient's expectation and Pharmaceutical Marketing Strategies) holding all other variables constant

Table 4.9. Regression Coefficient

Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.178	.308		.578	.564
	Drug Price awareness	.290	.054	.287	5.354	.000
	Physician’s Knowledge and Experience	.461	.056	.460	8.248	.000
	Drug Characteristics	.324	.066	.267	4.876	.000
	Patient's Expectation	-.047	.045	-.056	-1.052	.294
	Pharmaceutical Marketing Strategies	.012	.050	.013	.248	.804

Source: Own survey,2018

The linear multiple regression formula for on dependent variable, physician’s drug prescribing behavior and more than one independent variable formulated as bellows.

$$PPB= + 1PAW+ 2PKE+ 3DCX+ 4PEX+ 5PMS+e$$

Where; **PPB** =the dependent variable Physician’s drug prescribing behavior

= Y axis intercept(The constant beta value)

i=The coefficient of the independent variables(weight for each independent variables)

X1=PAW=price awareness

X2=PKE=Physician’s knowledge and experience

X3=DCX=Drug characteristics

X4=PEX=Patient expectation

X5=PMS=Pharmaceutical marketing strategies

e=The error term(0.05 in our case)

Taking into consideration of the un-standardized beta value (in the **table 10**) above ,the regression equation of this particular study to the nearest decimal was written as follows:

$$\text{PPB} = 0.178 + 0.290\text{PAW} + 0.461\text{PKE} + 0.324\text{DCX} - 0.047\text{PEX} + 0.012\text{PMS} + 0.05$$

Findings From the Equation

- ✚ For every unit increase in the value of drug price awareness of resident physicians ,setting all other variables to zero ,the value of response variables physician’s drug prescribing behavior will increase by 29 %
- ✚ For every unit increase in the value of physician’s knowledge and experience of resident physicians ,setting all other variables to zero ,the value of response variables Physician’s drug prescribing behavior will increase by 46.1 %
- ✚ For every unit increase in the value of drug characteristics setting all other variables to zero ,the value of response variables physician’s drug prescribing behavior will increase by 32.4%
- ✚ For every unit increase in the value of patients’ expectation all other variables to zero ,the value of response variables physician’s drug prescribing behavior will decrease by 4.7%
- ✚ For every unit increase in the value of pharmaceutical marketing strategies ,setting all other variables to zero ,the value of response variables physician’s drug prescribing behavior will increase by 1.2 %.

4.3.5. For Open Ended Questionnaire Part- III-section Analysis

For open ended questionnaire ,part III which is ,if there is any other factor which significantly affect your drug prescribing behavior. Most of the respondents were not add additional factors but few respondents were fill and from them most of them answer drug availability in the market or near by pharmacy as a factor which affect physician’s drug prescribing behavior .

4.4. Interpretation of Result

The first thing that must be discussed here should be the overall fitness of the model; this fact has been confirmed by different type of statistical results.

The first way is the ANOVA test that produced a P-value of 0.000 which is below the alpha level i.e .05.that means the overall independent variables have statistically significant relationship with the dependent variable i.e. Physician drug prescribing behavior.

The R(coefficient of correlation)which is simply measure the degree of (linear)association between the dependent variable and the independent variable jointly. It only measures degree of association or co variation between the two variables.(Gujarati,2004).In this case the value of r which is 0.95 means ,there is a very strong relationship between the independent variables as a whole and Physician's drug prescribing behavior or this can also means that the independent variables taken together and Physician's drug prescribing behavior one is by chec95% of the time.

The last one is by checking the adjusted R square(Coefficient of Determination),can be defined as the proportion of the total variation or dispersion in physicians drug prescribing behavior(dependent variable)that explained by the variation in independent variables in the regression. (Gujarati,2004) So with adjusted R square value of 0.54,meaning ,54% of the variation in Physician's drug prescribing behavior is explained by the linear relationship with all the independent variables. The corollary of this is that only 46% of the variation in Physician's drug prescribing behavior is unexplained by the relationship or these percentages of change in Physician's drug prescribing behavior accounts for other variables not mentioned under this study. Thus when adjusted R square is high it means that the independent variables included in the study play an important part in affecting the dependent variable.

Generally speaking ,the regression model developed under the study can be considered as a good fit or predict or predictor of Physician's drug prescribing behavior

The individual effects of the independent variables can be explained by their respective beta coefficients. As per the regression result table 4.10 the Physician's drug prescribing behavior and Physician's Knowledge and Experience have the strongest positive relationship. One unit increase in Physician's Knowledge and Experience can cause about 46.1% change in Physician's drug prescribing behavior .

4.4.1 .The Effect of Drug Price Awareness on Physician’s Drug Prescribing Behavior

As shows in the table 4.10 above the value of Drug price Awareness is 0.290 and the sig.lvel for the variable “Drug price Awareness” is 0.000 ,which is less than our alpha level of 0.05 .In addition ,when we are looking at the B coefficient ,we see that it is positive; this shows there is a direct relationship between the two ,indicating that as Drug price Awareness increases Physician’s behavior to prescribe a drug will also increase .We would expect that for every one unit increase in Drug price Awareness there would be a 0.290 unit increase in Physician’s behavior to prescribe a drug..This supports our research hypothesis (H1:There is statistically significant relationship between drug price awareness and Physician’s drug prescribing behavior).Therefore Drug price Awareness is a significant predictor of Physician’s drug prescribing behavior. According to the study of **Abulhaj ,Abu, Samen and Alabbadi,(2013)**, drug price awareness significantly and positively affects physicians drug prescribing behavior .Also in other study **Forster, (1991), Coleman, et al. (2000) and Ryan, et al. (1990)** ,found that drug cost knowledge, significantly and positively affects physicians drug prescribing behavior. In addition to that in study of **Allan Innes.(2004)**,found that price awareness affect prescribing behavior significantly and positively .

As the result shows the physician’s drug prescribing behavior is positively affected by physician’s Drug price Awareness this shown to play an important role in their drug selection decisions, physicians may be more price-sensitive in their choice of prescription drugs, and drug price was considered an important factor influencing prescribing decision. As a result the pharmaceutical companies should invest on methods which help to increase drug price awareness ,to have drugs with better price and low total cost.

4.4.2 . The Effect of Physician’s Knowledge and Experience on Physician’s Drug Prescribing Behavior

As the table 4.10 above shows the value of Physician’s knowledge and Experience is 0.461 and the sig.lvel for the variable “Physician’s knowledge and Experience is 0.000 ,which is less than” is 0.000 ,which is less than our alpha level of 0.05 .In addition ,when we are looking at the B coefficient ,we see that it is positive; this shows there is a direct relationship between the two ,indicating that as Physician’s knowledge and Experience increases Physician’s behavior to

prescribe a drug will also increase .We would expect that for every one unit increase in Physician's knowledge and Experience , there would be a 0.461 unit increase in Physician's behavior to prescribe a drug. This supports our research hypothesis (H2:There is statistically significant relationship between Physician's knowledge and Experience and Physician's drug prescribing behavior). It is also supported by studies conducted by **Forster, 1991, Coleman, et.al. 2000**, which found that physician knowledge of drugs affects physician prescribing behavior .Moreover In other study find that early experience of using a drug influences future use, so feedback from the first few patients has an impact on whether or not a GP continues using a new drug (Jones et al 2001).

Therefore Physician's knowledge and Experience is a significant predictor of Physician's drug prescribing behavior.

As the result shows the Physician's drug prescribing behavior is directly affected by Physician's knowledge and Experience as a result the pharmaceutical companies should invest on strategies which help to have recent studies based drug profile and also try to have way like publishing books which will be used as reference by medical universities since physicians college knowledge and experience affect drug prescribing behavior and also it is better to avail drugs based on specialty that mean drugs should be avail based on the availability of the specialty type .

4.4.3 .The Effect of Drug Characteristics on Physician's Drug prescribing Behavior

As the table 4.10 above shows the value of Drug Characteristics is 0.324 and the sig.lvel for the variable "Drug Characteristics is 0.000 ,which is less than our alpha level of 0.05 .In addition ,when we are looking at the B coefficient ,we see that it is positive; this shows there is a direct relationship between the two ,indicating that as Drug Characteristics increases Physician's behavior to prescribe a drug will also increase .We would expect that for every one unit increase in Drug Characteristics , there would be a 0.324 unit increase in Physician's behavior to prescribe a drug. This supports our research hypothesis (H2:There is statistically significant relationship between Drug Characteristics and Physician's drug prescribing behavior). This is supported by others study which found that drug characteristic significantly and positively affects physicians drug prescribing behavior (**Schumock et al,2004**).

Therefore drug characteristics is a significant predictor of Physician's drug prescribing behavior.

As the result shows the physician's drug prescribing behavior is directly affected by drug characteristics as a result the pharmaceutical companies should invest on strategies which helps to have drug with a characteristic of better efficacy, patient compliance, dose regimen less side effect and adverse drug reaction moreover neutrally or less important one is being inventor drugs and focusing on drug country of origin .

4.4.4. The Effect of Patient Expectation on Physicians' Drug Prescribing Behavior.

To know the effect of patient expectation on physicians' drug prescribing behavior a researcher include patients' expectations towards drugs efficacy and compliance, drug country of origin ,drug dosage form and discussion with the physicians in the questionnaires. As it is shown in table 4.10 the value of patient expectation is -0.047 and Sig.level for the variable "Pharmaceutical marketing strategy" is 0.294 which is greater than our alpha level of 0.05 .

This finding does not support research hypothesis (H4: There is statistically significant relationship between patient expectation drug prescribing behavior).So , patient expectation is predictor but it is not a significant predictor of physicians' drug prescribing behavior. In contrary to this research finding in other studies ,**Avorn et. al. (1982)**, **Abulhaj et. al.(2013)**, **Avorn et. al (1982) and Abulhaj et .al.(2013)** found that physicians' drug prescribing behavior is significantly associated with patient expectation. This may be because of the reason that in our country direct to patient (consumer)drug promotion is not allowed as a result majority of the patients have no enough knowledge about the drug but in countries like America ,Canada and others direct to the patient drug promotion is allowed because of this reason most of the patients have better knowledge about the available drugs which may help the patient influence the physician to prescribe the preferred drug. In one study it states that excessive and unrealistic demands from the patient are the frequently phenomenon due to media-prompted news which ultimately provokes huge responses from patients (**Carthy,et.al., 2000**) but this is not case in our country since direct to consumer promotion is not allowed.

4.4.5. The Effect of Pharmaceutical Marketing Strategies on Physicians' Drug Prescribing Behavior.

To know the effect of Pharmaceutical Marketing Strategies on physicians drug prescribing behavior a researcher include impact of medical representatives frequent visits, relationship with the physician's, considering them as the physician's information resources , pharmaceutical companies sponsoring medical conferences and educational lectures , giving free medical samples of a drug in the questionnaires.

As it is shown in table 4.10 the value of pharmaceutical marketing strategies is 0.012 and Sig.level for the variable "Pharmaceutical marketing strategy" is 0.804 which is greater than our alpha level of 0.05.As a result this finding does not support research hypothesis (H5: There is statistically significant relationship between : Pharmaceutical marketing strategies and physicians' drug prescribing behavior).So , Pharmaceutical marketing strategies is predictor but it is not a significant predictor of physicians' drug prescribing behavior. In one study found that physicians generally perceived pharmaceutical marketing strategies impact on their drug prescribing behavior to be minor. (Tamara Lotifi, 2016) .In contrast as Abulhajet al.(2013) pharmaceutical marketing strategies have a statistically significant positive effect on physician's' prescribing behavior. Also in other study of Gönül et al. (2001) and Manchanda and Chintagunta (2004) found that marketing efforts by pharmaceutical companies to the physician positively affect prescriptions issued by a physician.

In general through this research pharmaceutical marketing strategy and patients' expectation were found to be not significantly affect resident physician's prescribing behavior. This may be due to the huge impact of medical academic lectures which direct them what criteria's must follow to prescribe drug from the alternative options and also may be due to very less impact of the pharmaceutical companies and their marketing strategies on the academic lecturer physicians to change his prescribing decision in their favor which in turn affect resident physician's such away way to increase the prescription of their brand regardless of drug characteristics and what actually the patient need.

CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter summary of findings, conclusion and recommendations are presented .Based on the purpose of the study and findings conclusion and recommendations are made. The recommendations are mainly related with pharmaceutical manufacturing and importing companies and police makers.

5.1 Summary of Major Findings

The main objective of the study was to analysis the factors that affecting the physician's drug prescribing behavior .In line with this, the study has identified the following findings.

- From **descriptive statistics** result the level of acceptance of the factors affecting physicians' drug prescribing behavior by the physicians is clearly high(mean >3 ,standard deviation <1)
- **Pearson correlation & Multiple regression test** between the dependent called physicians drug prescribing behavior and independent variables drug price awareness showed ,an (**R=0.485**),(**P<0.01**) for the correlation & for multiple regression test (**significance level value =0.00** which is less than our alpha level of **0.05** ,**RIW=0.287**) as a result **H1** was accepted & in level of importance physicians drug price awareness were ranked in second level and also it is moderately correlated with the dependent variable .
- **Pearson correlation & Multiple regression test** between the dependent variable called physicians drug prescribing behavior and independent variables physician's knowledge and experience showed ,an (**R=0.640**),(**P<0.01**) for the correlation & for multiple regression test (**significance level value =0.00** which is less than our alpha level of **0.05** ,**RIW=0.46**) as a result **H2** was accepted & in level of importance physician's knowledge and experience were ranked in first level and also showed strongly correlation with the dependent variable .

- **Pearson correlation & Multiple regression test** between the dependent variable called physicians drug prescribing behavior and independent variables drug characteristics showed ,an (**R=0.461**),(**P<0.01**)for the correlation & for multiple regression test (**significance level value =0.00** which is less than our alpha level of **0.05** ,**RIW=0.267**) as a result **H3** was accepted & in level of importance drug characteristics were ranked in third level and also showed moderately correlation with the dependent variable .
- **Pearson correlation & Multiple regression test** between the dependent variable called physicians drug prescribing behavior and independent variables patients expectation showed ,an (**R=0.091**),(**P>0.05**),for the correlation & for multiple regression test (**significance level value =0.00** which is less than our alpha level of **0.05** ,**RIW=-0.056**) as a result **H4** was rejected & in level of importance patients expectation were ranked in fourth level and also it showed very weak correlation with the dependent variable .
- **Pearson correlation & Multiple regression test** between the dependent variable called physicians drug prescribing behavior and independent variables patients expectation showed ,an (**R=0.066**),(**P>0.05**)for the correlation & for multiple regression test (**significance level value =0.00** which is less than our alpha level of **0.05** ,**RIW=-0.013**) as a result **H5** was rejected & in level of importance pharmaceutical marketing strategies were ranked in fifth level and also showed very weak correlation with the dependent variable .
- As showed in open ended questionnaire finding majority of the respondent who fill the space provided for if other factors ,they were respond that drug availability is the other factor which affects their drug selection behavior.

5.2 Conclusions

- From the finding of the study the researcher conclude that physician's knowledge and experience, drug price awareness, and drug characteristics factors have statistically significant positive effect on physicians' drug prescribing behavior moreover in level of importance they are ranked first ,second and third level respectively .where as patient's expectation and pharmaceutical marketing strategies were not shown to be significant and their level of importance is ranked fourth and fifth level respectively .In addition to that

as it is mentioned in the open ended question part availability of the drug either in the market(Hospital or pharmacy) was mentioned as one of the factor which affects physicians drug prescribing behavior.

5.3 Recommendations

Based on the findings and conclusion of the study the researcher drawn the following recommendations to the pharmaceutical companies, Addis Ababa University Black lion specialized Hospital and suggestion for other researchers.

Recommendation for Pharmaceutical Companies.

- Now a days most pharmaceutical companies invest on sales promotion like giving free medical samples ,in kind and in cash gift and also use event and experience marketing communications, sponsorship but all those strategies were not local study based as a result pharmaceutical companies must be aware about the marketing strategies of their competitors. Moreover to prepare the companies marketing strategies need to consider the significant factors such as drug price awareness, physician's knowledge and experience and drug characteristics as prepare strong marketing strategies which will help them to have better drug sales(prescription) by affecting physicians' prescribing behavior through their way to increase the prescription of their brand . .
- Most of the resident physicians in AAUBLSH affected by their knowledge and experience but most of the pharmaceutical companies not give great emphasize on this factor as a result the researcher recommend for the pharmaceutical companies to prepare continues medical educations by focusing on drug characteristics and drug price awareness using ways to invite key influential senior physicians as an invited presenter in the seminar and also sponsoring reference books which focus on the companies drugs .Those all helps to affect physicians drug prescribing behavior by affecting their knowledge and experience and also by helping them to know better drug characteristic profiles .
- As a strategy all companies may need not be focuses giving emphasize to focus on drug price awareness as a result for those companies who have price competitive advantage it seems important to increase physicians' drug price awareness since respondent were seems price sensitive and those companies who have no price competitive advantage

need to focused on other strategy like product differentiation or drug character advantages .

- Most of the resident physicians were not significantly affected by pharmaceutical marketing strategies as a result to use this strategy the pharmaceutical companies need to train the medical representatives to have better knowledge about constructive physicians experience to be shared , drug characteristics, drug price .Moreover the medical representatives need to have knowledge about how to communicate this knowledge and also how to monitor drug availability in the market.
- Most of the drugs were not available in the market as a result pharmaceutical companies strategies need to focus to make their drug availability in the near by market(hospital or pharmacy) and also add other product port folio which is very demanded but not available the country.

Recommendation for the Hospital

- Black lion specialized hospital resident physicians prescribe drug without having enough information about drug availability and its price which affect treatment out come result also crate burden on the patient either on availability of the drug or drug affordability issue as result to tackle this serious problem the hospital should give more attention to have computerized prescribing system having updated alternative drug choices with their corresponding price so that the physicians prescribe affordable and best option drug for the patient. Moreover it seems important if the Hospital give more attention to educate and influence the resident physicians to consider basic, acceptable and important patient expectations in their treatment protocol.
- Most of the hospital resident physicians not consider the rational and the most important patient expectations on drug dosage form ,ability to afford the drug ,compliance and others but in principle accepting most import and rational patient expectations help to have better treatment out come as result the Addis Ababa black lion specialized hospital concerned police makers , lecturers ,and the hospital drug and therapeutic committee need to give continuous update on importance of considering import and rational patient expectations.

- Because of unavailability of most drugs in the hospital the physicians face challenge to prescribe the rational preferred drug of choice and to have better treatment for their patients as a result to solve this problem either the hospital or the concerned bodies(hospital drug therapeutic committee ,Ethiopian pharmaceutical fund and supply agency etc) need to struggle to solve this problem availing at least very essential drugs informing the physicians to prescribe generic drugs and alternative drug of choices and also structure better drug supply chain system. Moreover design and connect better system to connect other hospitals drug information logistic system which helps to fill gaps by using stocks in other hospital .

Recommendation for Further Research ,

- Although this study did have a favorable response of 187 respondents, it is still not representative with regard to the whole country physicians as a result further research in a larger scale includes both private and government Hospitals is recommended.
- As per the data available and the researcher knowledge in our country there is no research either on this type of topics or on other related topics as a result the researcher recommend to have further similar research which include by adding other factors like pharmacist and pharmaceutical companies sales and marketing managers as cross check modality and also include over the counter drugs.
- In our country their is no as such strong integration or corporation between university business faculty and health faculty on pharmaceutical industry business issues as a result researcher recommend the police makers and universities research departments of both health and business faculties to work jointly on related topics and contribute much more on business pharmaceutical industry business sector.

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APPENDICES

Appendix -A-

Appendix -B-

Appendix .A.

St .Mary's University

School of Graduate Studies MBA Program

Dear Respondent

First I would like to thank you for your willingness to fill out this questioner honestly. This questioner is designed and conducted to assess the factors affecting resident physicians' drug prescribing behavior in Addis Ababa Hospital Black lion specialized Hospital ,Addis Ababa, Ethiopia as part of my academic requirement for pursuing a masters degree in business administration. You are kindly requested to cooperate and you are only expected to share your views since correct and incorrect responses do not exist. Your response will be only used for the stated purpose and will be kept confidential. This questioners consists of two parts, please answer all the questions by ticking () on the space provided or fill on the space left for you. Moreover kindly if you have anything unclear please call with phone number 0966 91 01 71 or 0911 04 80 64 also email address Jahashua6@gmail.com.

Again Thank you in advance for your cooperation!

Mr Hashim Ahmed

St.Mary's University MBA program School of Graduate studies

Part .I .: Personal Information .:

Direction :Please put a tick mark () beside the chosen answer or fill the space provided:

1.1 Gender: 1. Female 2. Male

1.2 Age:

- | | | | |
|-----------------------|--------------------------|-----------------------|--------------------------|
| 1. Less than 25 years | <input type="checkbox"/> | 4. From 46 – 55 years | <input type="checkbox"/> |
| 2. From 25 -35 years | <input type="checkbox"/> | 5. From 56 – 65 years | <input type="checkbox"/> |
| 3. From 36- 45 years | <input type="checkbox"/> | 6. More than 66 years | <input type="checkbox"/> |

1.3 Experience in years

- | | | | | | |
|----------------------|--------------------------|----------------|--------------------------|------------------|--------------------------|
| 1. Less than 5 years | <input type="checkbox"/> | 3. 11–20 years | <input type="checkbox"/> | 5. Over 30 years | <input type="checkbox"/> |
| 2. 5 – 10 years | <input type="checkbox"/> | 4. 21-30 years | <input type="checkbox"/> | | |

1.4 Average number of patients seen per day

- | | | | | | |
|-------------|--------------------------|---------------|--------------------------|-----------------|--------------------------|
| 1. Up to 15 | <input type="checkbox"/> | 2. From 16-30 | <input type="checkbox"/> | 3. More than 30 | <input type="checkbox"/> |
|-------------|--------------------------|---------------|--------------------------|-----------------|--------------------------|

5 Academic level/ specialty

- | | | | |
|-------------------------------|--------------------------|---------------------------------|--------------------------|
| 1. Pediatrics resident | <input type="checkbox"/> | 4. Gynecology resident | <input type="checkbox"/> |
| 2. Orthopedic resident | <input type="checkbox"/> | 5. Dermatology resident | <input type="checkbox"/> |
| 3. Internal medicine resident | <input type="checkbox"/> | 6. If other please specify----- | |
-

Part II : Opinion on Factors affecting Drug Prescribing Behavior .

Factors are:

- Drug price awareness
- Professional knowledge and experience
- Drug Characteristic
- Patient's expectations
- Pharmaceutical marketing Strategies

Direction: next to each statement please put a tick () mark on the best option to indicate your level of agree or disagree. Use a scale of **1 to 5**

where :-1 = Strongly disagree; 2 = Disagree ; 3 = Neutral ; 4 =Agree & 5 =Strongly agree .

2.1 Drug price awareness

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1. The physician's is usually aware of actual drug price.					
2. Drugs prices have effect when choosing a drug.					
3. The physician's has easy access to drug price information					
4. Cost of the drug is considered when choosing a drug.					
5. Awareness drug cost has effect on drug selection decision					

2.2 Professional knowledge and experience

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1. Physician's usually gain the knowledge about the drugs .					
2. Experience with drugs treatment profiles is considered when choosing a drug.					
3. Knowledge and experience of the colleges affect your drug choosing opinion in some cases.					
4. Physician should be updated with recent studies and profile of new drugs.					
5. Specialty type affects your drug treatment strategy.					

2.3 Drug characteristics

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1. When choosing a drug its effectiveness gives consideration					
2. When choosing a drug its compliance and dose regimen gives a high consideration.					
3. Usually originator (inventor) drugs gives preference .					
4. The appearance of adverse drug reactions leads to change the drug.					
5. The drug's country of origin affects its choosing chances.					

2.4 Patient's expectations

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1 Patient's expectations toward drugs' efficacy and compliance considered in choosing a drug.					
2. Mostly drug treatment option is discussed with the patient					
3. Patient's expectation towards drug country of origin is considered in drug choosing decision .					
4. Patient's expectation towards choice of drug dosage form(Injection, tablet, capsule) considered in choosing a drug.					

2.5.Pharmaceutical marketing strategies

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1. Relationship with the medical representative's affects choices of the drugs.					
2. Frequent visits of the medical representative increase the chances of prescribing his drugs.					
3. Pharmaceutical sales representative is one of the physician's information resources.					
4. Sponsoring medical conferences and educational lectures by a pharmaceutical company has a positive impact on choosing its drugs.					
5. Free medical samples of a drug helps to know its efficacy and then prescribing it again.					

2.6 Physicians Prescribing Behaviors

Statements	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree =5
1.The goal of physicians' prescribing behavior is to maximize the effect of the treatment strategy.					
2.Physicians usually evaluate the promoted drugs					
3. The number of cases seen per daily influence the prescribing process.					

Part III

Direction:-please fill in the space provided

If there is any other factor which significantly affect your drug prescribing behavior please specify below?-----

Thank you!

Appendix-B-

TABLE FOR APPROPRIATE SAMPLE SIZE FOR KNOWN POULATION

N	S	N	S	N	S
10	10	220	140	1 200	291
15	14	230	144	1 300	297
25	24	250	152	1 500	306
30	28	260	155	1 600	310
35	32	270	159	1 700	313
40	36	280	162	1 800	317
45	40	290	165	1 900	320
50	44	300	169	2 000	322
55	48	320	175	2 200	327
60	52	340	181	2 400	331
65	56	360	186	2 600	335
70	59	380	191	2 800	338
75	63	400	196	3 000	341
80	66	420	201	3 500	346
85	70	440	205	4 000	351
90	73	460	210	4 500	354
95	76	480	214	5 000	357
100	80	500	217	6 000	361
110	86	550	226	7 000	364
120	92	600	234	8 000	367
130	97	650	242	9 000	368
140	103	700	248	10 000	370
150	108	750	254	15 000	375
160	113	800	260	20 000	377
170	118	850	265	30 000	379
180	123	900	269	40 000	380
190	127	950	274	50 000	381
200	132	1 000	278	75 000	382
210	136	1 100	285	1 000000	384

Source: Krejcie and Morgan (1970); N = Population size S = Recommended sample size

DECLARATION

I ,the undersigned, declare that this thesis is my original work, prepared under the guidance of Asst . Professor Shoa Jemale .All sources of materials used for the thesis have been duly acknowledged , I further confirm that thesis has not been submitted either in part or in full to any other learning institution for the purpose of earning any degree.

Name

St, Mary's University Addis Ababa

Signature

May,2018GC