

Impact of Pharmaceutical Companies' Promotional Efforts on the Drug Choices Made by Doctors in the Egyptian Market

Mohamed Atwy

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Tomas Bata University in Zlín
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- Compile a literature review for pharmaceutical marketing.

II. Practical Part

- Analyse the influence of promotional practices on doctors' choices in selecting drugs.
- Propose recommendations to pharmaceutical companies for enhancing marketing practices within the healthcare industry based on the analysis.
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Dean

doc. Ing. Petr Novák, Ph.D.
study programme guarantor

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ABSTRAKT

Farmaceutický byznys je založen na interakci mezi lékaři, lékařskými zástupci a pacienty. Tato studie se snaží prozkoumat skutečný vliv taktiky propagace léčiv na volbu léků lékařů v Egyptě a zahrnuje řadu propagačních nástrojů používaných společnostmi. Studie využívala strukturované dotazníky, které shromažďovaly data od lékařů, lékařských zástupců a pacientů. Ke zkoumání dopadu farmaceutických propagačních praktik byl použit kvantitativní výzkumný přístup využívající deskriptivní design průzkumu. Sběr dat se opíral o dotazník, který si sami zadali, shromažďování informací o demografii, propagačních nástrojích používaných farmaceutickými společnostmi a vnímání lékařů jejich vlivu. K analýze dat byly použity statistické analýzy, včetně Wilcoxon Signed-Rank testu, One-Sample T test, Chi-Square testu.

Výsledky studie zdůrazňují důležitost etických a informativních marketingových strategií v egyptském farmaceutickém prostředí. Zatímco lékařští zástupci jsou dobře vzdělaní a často komunikují s lékaři, na rozhodnutí o předepisování mají největší vliv vzdělávací materiály a praktické předměty, nikoli finanční pobídky. Vnímání farmaceutické propagace veřejností je utvářeno různými mediálními zdroji, přičemž demografie pacientů ovlivňuje účinnost konkrétních propagačních nástrojů.

Tato studie končí praktickými doporučeními pro farmaceutické společnosti, které se snaží zlepšit své marketingové postupy eticky a efektivně. Tato doporučení zahrnují interní strategie, jako je tvorba vzdělávacího obsahu, etické postupy a iniciativy v oblasti transparentnosti, stejně jako externí strategie, jako je vývoj chytrých mobilních aplikací pro zapojení lékařů a cílené komunikační strategie navržené pro osobní interakce s lékaři. Tato zjištění poskytují farmaceutickému sektoru užitečné vodítko při vývoji budoucích marketingových strategií a příležitostí.

Klíčová Slova: Egyptský Trh, Lékaři, Pacienti, Farmaceutický Marketing, Propagační Nástroje, Preskripční Chování.

ABSTRACT

The pharmaceutical business is founded on the interaction between doctors, medical representatives, and patients. This study seeks to investigate the true influence of pharmaceutical promotional tactics on doctors' drug choice in Egypt covering an array of promotional tools used by companies. The study utilized structured questionnaires, collecting data from doctors, medical representatives, and patients. A quantitative research approach was employed using a descriptive survey design to investigate the impact of pharmaceutical promotional practices. Data collection relied on a self-administered questionnaire, gathering information on demographics, promotional tools used by pharmaceutical companies, and doctors' perceptions of their influence. Statistical analyses, including the Wilcoxon Signed-Rank test, One-Sample T test, Chi-Square test, were used to analyze the data.

The study findings highlight the importance of ethical and informative marketing strategies within the Egyptian pharmaceutical landscape. While medical representatives are well-educated and interact frequently with doctors, educational materials and practical items, not financial incentives, hold the most impact over prescribing decisions. Public perception of pharmaceutical promotion is shaped by diverse media sources, with patient demographics influencing the effectiveness of specific promotional tools.

This study ends with practical recommendations for pharmaceutical companies seeking to enhance their marketing practices ethically and effectively. These recommendations include internal strategies such as educational content creation, ethical practices, and transparency initiatives, as well as external strategies such as the development of smart mobile apps for doctor engagement and targeted communication strategies designed for in-person interactions with doctors. These findings provide useful guidance to the pharmaceutical sector in developing future marketing strategies and opportunities.

Keywords: Egyptian Market, Doctors, Patients, Pharmaceutical Marketing, Promotional Tools, Prescription Behavior.

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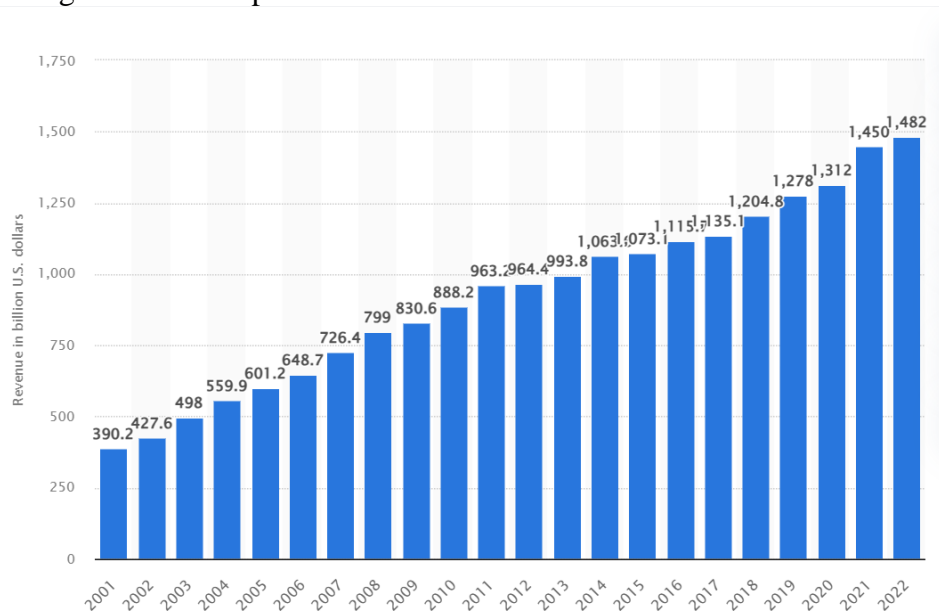
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1 INTRODUCTION

The worldwide pharmaceutical sector has seen notable expansion in the past few years. In 2022, the overall global pharmaceutical market was approximated to be worth 1.48 trillion U.S. dollars, indicating a slight increase from its 2021 value of 1.42 trillion US dollars. This market significantly influences both the accessibility and cost of medications for individuals. Nonetheless, it's important to note that certain markets are more favorable for pharmaceutical enterprises than others (Mikulic , 2023).

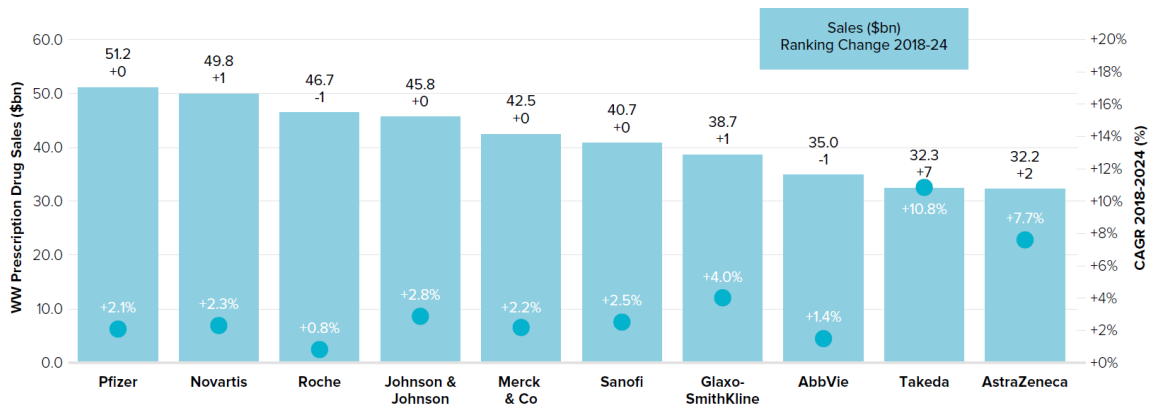
Figure 1: Global pharmaceutical market revenue from 2001 to 2022



Source: Statista, 2023

The graph clearly demonstrates a consistent and significant increase in the worldwide pharmaceutical market's revenue over time. Revenue shows a steady upward trend, starting at about \$390 billion in 2001 and reaching \$1,482 billion by 2022—nearly quadrupling over the course of the 21-year period. The United States has risen as the dominant player in the global pharmaceutical market, closely trailed by emerging markets. These emerging markets include middle-income and lower-income countries like Brazil, India, Colombia, and Egypt. Despite the upward trend in revenues at the global level, the Latin American region contributes the smallest portion to the overall revenues of the global pharmaceutical market (Mikulic, 2023).

Figure 2: Top prescription drug sales in 2024

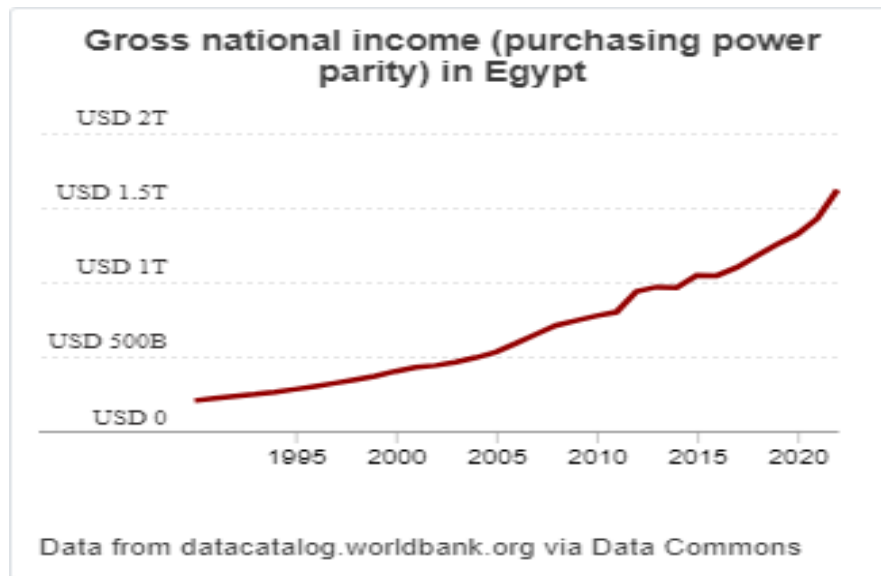


Source: EvaluatePharma, “World Preview 2018, Outlook to 2024,” 2018.

With 51.2 billion USD in sales, Pfizer leads the global prescription sales market; a 2.1% compound annual growth rate is anticipated from 2018 to 2024. At a 2.3% CAGR, Novartis is expected to overtake Roche with 49.8 billion USD in sales. Roche projected a 0.8% CAGR and a third-place finish. AstraZeneca, AbbVie, Takeda, Johnson & Johnson, Merck & Co., Sanofi, and GlaxoSmithKline are among the other ten multinational corporations. With a combined valuation of 414.9 billion USD, the top ten companies represent roughly 33% of the global pharmaceutical market.

Egypt ranked 31st in the world in terms of GDP (current US dollars), 59th in terms of total exports, 44th in terms of total imports, and 117th in terms of GDP per capita (current US dollars) in 2022. The Egyptian healthcare financing heavily relies on out-of-pocket payments, with a recent WHO report indicating that health expenditures were 4.6% of GDP (Youssef & Amin, 2023).

Figure 3 Gross national income in Egypt.

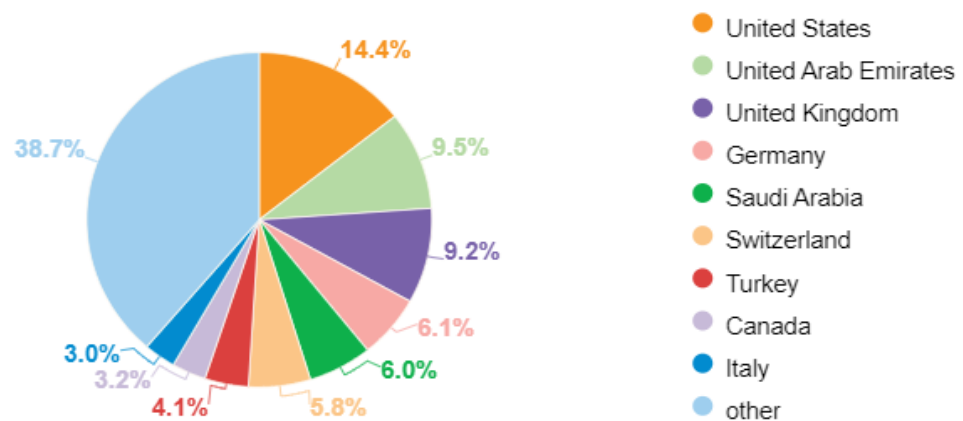


Source: Worldbank, 2020

The chart shows a steady increase in Egypt's GNI purchasing power parity (PPP) over the 25-year period. Egypt's GNI (PPP) in 1995 was around USD 500 billion. By 2020, this number had more than tripled to over USD 1.5 trillion.

In general, the value of Egypt's exports is approximately one tenth of the country's gross domestic product, while the value of Egypt's imports is approximately one third. It is anticipated that the total value of exports will amount to 58.339 billion dollars in the year 2021 (CIA World Factbook, 2024). Its most significant exports consist of petroleum and products derived from petroleum, followed by textiles and raw cotton. Other types of goods that are exported include raw materials, mineral and chemical products, and capital goods.

Figure 4 : Egypt’s main export destinations 2021-2022



¹Excluding petroleum.

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Source: Encyclopedia Britannica, 2022

It can be observed from this chart that the United States is the largest export destination for Egyptian goods, accounting for 38.7% of total exports.

The Egyptian pharmaceutical market is the second largest in the Middle East and Africa (MEA) region. It has experienced significant growth in recent years due to various factors, including a population of over 100 million people with a high demand for pharmaceutical products. The Egyptian pharmaceutical market size was \$3.0 billion in 2022.

A report that was recently published by Statista indicates that the pharmaceuticals market in Egypt is anticipated to achieve a revenue of \$1,449.00 million in the year 2024. When looking to the future, it is anticipated that the market will experience a consistent annual growth rate (CAGR 2024-2028) of 7.68% on average. This is due to various factors:

- **Customer preferences:** Egypt has a population of over 100 million people, with a high demand for pharmaceutical products. Most Egyptians prefer to buy branded medications, with an emphasis on foreign brands. This is a result of the belief that medications produced abroad are of higher quality than those produced domestically.
- **Market trends:** The Egyptian government has established in place several initiatives to boost the country's pharmaceutical sector, including raising expenditure on research and development and offering financial support for domestic manufacturing. As a result, there is an increase in the production of generic drugs locally, which are less expensive than branded drugs.
- **Local conditions:** the country has large populations and a high rate of chronic illnesses like diabetes, hypertension, and cardiovascular disease. The demand for pharmaceutical products has increased as a result, especially for those that treat these chronic diseases. The nation's sizable aging population has also aided in the expansion of the pharmaceutical industry.
- **Macroeconomic factors:** Egypt's economy has been expanding gradually in recent years with an emphasis on economic diversification and drawing in foreign capital. A few economic reforms that the government has put into place, like raising taxes and cutting subsidies, have improved the government's revenue. This has made it possible for the government to increase its spending in the pharmaceutical industry and the healthcare sector. Pharmaceutical companies seeking to expand their operations in the MEA region find the country to be an appealing market due to its strategic location (Statista, 2024).

The relationship between pharmaceutical firms and healthcare providers, particularly physicians, has long been a subject of concern for its potential influence on medical decision-making. Promotional practices employed by pharmaceutical companies, ranging from direct marketing to sponsored events and gifts, have raised concerns about their impact on doctor's prescription behavior. While these practices aim to educate doctors about new medications and their potential benefits, there are concerns about their impact on objective decision-making and potential conflicts of interest (Haider, 2023). Understanding the nuances of this relationship is crucial, as it directly affects patient care, healthcare costs, and the integrity of medical practice (Offor, 2022). The study of the complex relationship that exists between pharmaceutical companies and doctors is a relatively recent and controversial issue, especially in regions like the Middle East where limited research has been conducted on this issue.

Prescription behavior is a complex process influenced by various factors, including scientific evidence, clinical guidelines, patient preferences, and cost considerations. However, the influence of pharmaceutical marketing practices on this decision-making process is frequently questioned, as it may lead to biased prescribing practices that put corporate interests ahead of the health of the patient (Sharifnia et al., 2018)

Recent studies emphasized investigating the impact of pharmaceutical marketing techniques on the prescription behavior of physicians, with a specific focus on the ethical considerations and the role of demographic factors. Some Findings show marketing strategies positively influence doctors' prescription behavior (Aqif and Mumtaz, 2023) (Offour et al., 2022). Physicians in (Al Thabbah , 2022) study demonstrated moderate to high influence from marketing elements. Another study focused on conflicts between prescribers and medical sales representatives in as well as unethical drug promotion practices and their impact on patient care (Naqvi et al., 2019).

This study seeks to shed light on the impact of various promotional practices employed by pharmaceutical companies on doctors' prescription behavior. By evaluating the effectiveness of these strategies, The purpose of the research is to offer insightful information into the extent to which these practices influence prescription patterns and whether they align with ethical and evidence-based medical practices.

While previous studies, such as (Mostafa & Metawie, p.83-108, 2013) have explored the ethical considerations and influence of pharmaceutical promotions on doctors' prescription behavior in Egypt, there is a crucial need for further research. The study focuses specifically

on the impact of pharmaceutical promotions on Egyptian physicians, which may limit the generalizability of the findings to other contexts.

The research addresses a gap in the literature by examining the specific impact of pharmaceutical promotions on Egyptian physicians, however it focuses specifically on the impact of promotions on physicians, which may limit the generalizability of the findings to other contexts. Therefore, additional research is required to investigate the ethical considerations that are involved in the promotion of pharmaceuticals in a variety of cultural and healthcare settings in order to ensure that a more comprehensive understanding of the subject matter is achieved. Additional research could make use of mixed-method approaches, which involve conducting qualitative interviews with doctors in addition to quantitative surveys, in order to acquire a more in-depth comprehension of the influence that pharmaceutical promotions have on the prescribing behavior of physicians and the outcomes for their patients. This research gap statement suggests that while the cited paper investigated the ethical aspects and overall impact of pharmaceutical promotions on Egyptian physicians, my research could delve deeper into studying the effects of diverse promotional strategies used by drug companies on doctors' prescription behavior, potentially across multiple levels in the healthcare value chain. This would contribute to expanding the available knowledge in this specific area.

The findings of this research have broad impacts on patients, medical professionals, government agencies, and the pharmaceutical sector itself. It can add to the continuing discussion about the need for maintaining the integrity of the doctor-patient relationship and the responsible marketing of pharmaceutical products. Moreover, it could provide guidance for industry standards and policy decisions to guarantee that patient safety, transparency, and ethical conduct are prioritized first in promotional activities.

Research Questions

The impact of pharmaceutical advertising on doctors' prescription practices is examined in this study. To understand how promotional activities affect prescription decisions, we investigate the perspectives and behaviors of doctors as well as medical representatives.

RQ1.1: To what extent do medical representatives prioritize providing doctors with updated knowledge about drugs compared to simply promoting brands?

RQ1.2: Is there a significant difference in how medical representatives view the importance of knowledge sharing versus brand promotion in their activities?

H1: Medical representatives prioritize providing doctors with updated knowledge about drugs over simply promoting brands.

RQ2.1: How do medical representatives perceive the effectiveness of different promotional methods (face-to-face talking, brochures, free samples) in influencing doctors' prescribing decisions?

RQ2.2: Does the chosen primary focus of medical promotions (selling points, scientific background, etc.) influence the perceived effectiveness of face-to-face talking compared to other methods?

H2: Face-to-face talking is a more effective promotional method than using brochures or free samples.

RQ3: Is there a significant correlation between the frequency of visits by medical representatives and reliance on them as a primary source of information?

H3: A significant relationship exists between the visits of medical representatives and physicians' reliance on medical representative.

RQ4: What are the perceptions of physicians regarding the acceptability and justifiability of receiving gifts from pharmaceutical companies?

H4: Physicians view receiving gifts from pharmaceutical companies as acceptable and justifiable.

RQ5: How do demographic factors like age and gender relate to public perception towards pharmaceutical promotions?

H5: Demographic factors are associated with more critical views of pharmaceutical advertising claims.

OBJECTIVES AND METHODS OF MASTER THESIS

The main objective of this thesis is to comprehensively examine the influence of pharmaceutical companies' promotional efforts on the drug choices of doctors within the Egyptian market. This investigation is essential because it has significant implications for patient treatment efficacy, healthcare costs, and the probability of overprescribing specific pharmaceuticals. To address this critical issue, the study endeavors to achieve several key aims: assess both the extent and nature of pharmaceutical promotional practices prevalent in the Egyptian context, explore doctors' levels of awareness and perception regarding these promotional activities, evaluate the degree to which promotional efforts influence the drug selection practices of physicians, identify and examine any ethical concerns arising from the interactions between doctors and pharmaceutical companies, and examine the impact and effectiveness of various promotional tools utilized within this setting.

The specific research questions will look into medical representatives' objectives and perceived effectiveness, the relationship between the frequency of promotional interactions and physicians' dependence on medical representatives, and how demographic characteristics influence public perceptions of pharmaceutical advertising.

This research aims to give essential insights into the dynamics of pharmaceutical advertising in this unique market by methodically analyzing data obtained from doctors, medical professionals, and patients throughout Egypt. By contributing new knowledge to the academic literature, this research aims to not only shed light on the complexities of pharmaceutical marketing but also to offer practical recommendations for the development of ethical and impactful promotional strategies within the pharmaceutical sector.

Through these efforts, the study seeks to facilitate informed decision-making among stakeholders and contribute to the enhancement of healthcare practices in Egypt and beyond.

Methodological approaches

- Preparation of critical literature review concerning pharmaceutical marketing with the focus on promotional tools and doctor's prescription studies.
- Development of a structured questionnaire collect data from a representative sample in the Egyptian pharmaceutical market. There were distributed three separate questionnaires, each to specific target group (doctors, patients and medical representatives).
- Distribution of the questionnaire will be distributed through channels such as email, social media, and direct contact with medical representatives, doctors and patients to ensure a representative sample of the target group across different specialties, practice settings, and demographic characteristics.
- Collection and monitoring responses in real-time as participants fill out the form.
- Analysis of quantitative data using statistical software, employing techniques like descriptive statistics, Wilcoxon Signed-Rank test, Chi-Square test, Cronbach's alpha reliability test and One-sample t test to identify significant relationships and trends.
- For a clear understanding of the Egyptian pharmaceutical market SWOT analysis was done.

Several significant parts of the studied literature assisted achieve this research procedure. (Al Thabbah et al., 2022),(Gupta et al., 2016) (Khazzaka, 2019), (Vishavadia, 2017), (Ali et al., 2022), (Semin et. al,206)

I. THEORY

2 LITERATURE REVIEW

This chapter reviews the current literature on the influence of promotion on physicians' medication prescription behavior in order to provide readers with an enhanced understanding of the subject. The chapter includes a theoretical and empirical examination, as well as pharmaceutical business conceptual frameworks.

2.1 Pharmaceutical marketing

Marketing in the pharmaceutical industry plays a pivotal role in the life cycle of medicines, as outlined by Hill and Rang (2013). They describe the traditional role of marketing and compare that with its continually dynamic function in a rapidly evolving environment. They examine the transitional shift from the product-centric focus of the 20th century to the customer-centric focus of this century.

Marketing is a big part of how things like medicines get from the companies that make them to the people who need them. Numerous factors impact pharmaceutical demand, including health awareness and treatment quality provided. The pharmaceutical industry participates extensively in medicinal product promotion activities all over the world. These activities are designed to influence the prescribing practices of medical professionals and encourage patients to self-administer their medications. Competitiveness is a highly critical survival requirement for service and product suppliers (Al Thabbah et al., 2022).

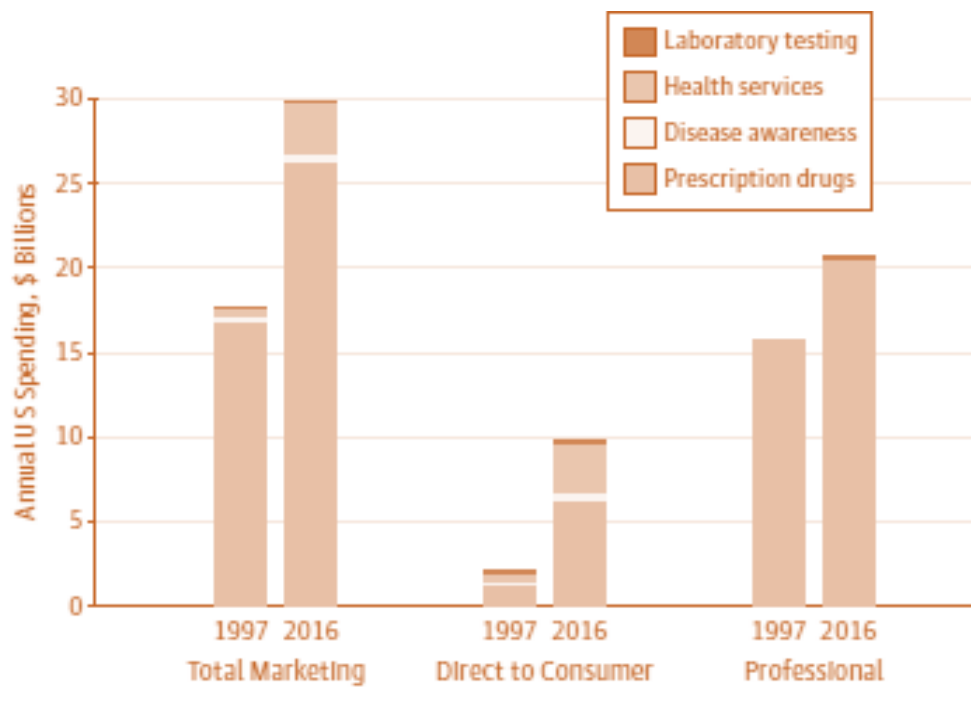
To do this job well, a pharmaceutical marketer needs to understand different factors in the world outside their company. These factors include things like the economy, rules and regulations, competition, what people think, technology, and the environment. They pay attention to things like how well the economy is doing, how much money people are making, how prices are changing, interest rates, and how different industries are growing. All of these things can affect whether people want to buy medicines, so they matter a lot to pharmaceutical companies (Pestun and Mnushko, 2017).

Within the pharmaceutical market landscape, it is important to distinguish between two key stakeholders: the customer and the client. The customer part is about figuring out if people will like new medicines and comparing our medicines to what others are selling. Pharmaceutical companies want doctors to prescribe their medicines, so they use different ways of advertising to influence those choices (Bala and Karma, 2020).

They spend a lot of money on advertising, even more than they spend on creating new medicines, to make sure they stay successful in the market (Alowi and Kani, 2019.).

In the United States, a recent study found that pharmaceutical companies have increased their spending on medical advertising by 69% in the past 20 years. From 1997 to 2016, the amount of money they put into promoting information about diseases, promoting prescription drugs, lab tests, and health services has gone up from \$17.7 billion to \$29.9 billion. Out of that, 68% of the money is used for promoting prescription drugs (Schwartz and Woloshin, 2019.)

Figure 5: Medical Marketing 1997 vs 2016 in the US.



Source: Schwartz, and Woloshin. 2019."Medical Marketing in the United States"

This graph shows that there is a steeper increase in direct-to-consumer marketing spending compared to professional marketing spending over the same period suggesting a shift in marketing strategies by pharmaceutical companies.

2.2 Perception towards promotion of pharmaceuticals

Many variables that affect the health of the primary beneficiaries of health services, patients, influence the marketing, prescription, and dispensing of healthcare services. The optimum course of action for treating the patient must be determined by the medical representative, the doctor, and the pharmacist.

The perfect harmony of the three parties should ensure that the recipient receives the most comfortable solution: proper medical care, the most efficient means to obtain it, and the best price for it. However, the pharmaceutical industry is a business, whereas pharmacy is a profession, consequently targets are obviously different. According to Sztankovszky's research, the interaction between doctors and pharmacists appears to impact the sale of drugs. doctors are more regularly exposed to accept gifts and informal sponsorship from pharmaceutical representatives, and the partnership is more supportive of doctors' continued education.. (Sztankovszky et al., 2015).

There is a common lack of regulation and oversight of promotional activities in developing countries that are associated with the promotion of pharmaceuticals. Not much is known about the promotional activities of pharmaceutical companies, despite the fact that Egypt has the highest population and the highest per capita use of medicines among Arabic countries. According to the findings of Kamal's research, the majority of Egyptian pharmacists and nurses admitted to having been exposed to advertisements for pharmaceutical products. Interaction with the pharmaceutical industry was widely believed to be essential, and both the risks and benefits associated with such interaction were acknowledged. (2015) According to Kamal et al.

Ahmad et al. (2021), on the other hand, came to the conclusion that pharmaceutical companies have, to a certain extent, taken control of the entire health system in Pakistan due to the presence of pharmaceutical representatives. When it comes to persuading physicians to provide benefits to their companies, the companies have representatives who have been trained in such a way. Moreover, they give the physicians a wide range of presents, such as samples of various medications, lunches, trips, accessories, and decorations for their houses or clinics, among other things.

Table 1: A summary of the highlights of included studies (author, participants, constructs, research design, and major conclusions) organized by method.

Author, Year, Country	Participants	Promotional Tools	Design and Sampling Method	Main Findings
Workneh et al. (2016), Ethiopia	90 doctors working in public and private places	Face-to-face interaction; brochures and pamphlets; free medical sample; electronic materials; new product launching; meeting	Cross-sectional	48.2% of the doctors said that MR visits had an impact on their choices.

<p>Aqif & Mumtaz. (2023), Pakistan</p>	<p>93 doctors in governmental and private facilities</p>	<p>Advertisements, personal selling, and direct to consumer marketing (DTC)</p>	<p>Cross-sectional SAQ</p>	<p>Pharmaceutical marketing techniques had a positive impact on prescription behavior</p>
<p>Scheffer (2014), Brazil</p>	<p>300 Physicians in Sao Paolo</p>	<p>Educational resources; Visits from sales promoters and sales representatives; Inexpensive objects for the doctor's office; continuing education courses and events; Scientific journals published by the laboratories</p>	<p>Interview (Structured)</p>	<p>Antiretroviral medication prescriptions by doctors were either marginally or highly impacted by the actions of pharmaceutical companies.</p>
<p>Ibrahim et al. (2015), Saudi Arabia</p>	<p>106 physicians</p>	<p>Representatives; Conferences, Seminars; Medical Journals; Websites; Media Advertisements</p>	<p>CSS, SAQ</p>	<p>The two most significant factors are media advertising and the regular visits of pharmaceutical sales representatives.</p>
<p>Gupta et al. (2016), India</p>	<p>81 doctors</p>	<p>Visits from medical representatives (MR) and promotional materials (textbooks, drug samples, journals, and stationery items)</p>	<p>Cross-sectional survey</p>	<p>69.1% doctors think MR overestimate benefits and downplay risks</p>
<p>Khazzaka (2019), Lebanon</p>	<p>282 practicing physicians</p>	<p>Medical representatives' visits, drug samples, attendance at conferences for continuing medical education, and financial support for conference travel, personal tours, and conference expenses</p>	<p>CSS</p>	<p>Participating in conferences; drug samples (34.8%) and visits from medical representatives (34.8%) were the most effective means of encouraging doctors to recommend advertised medications.</p>

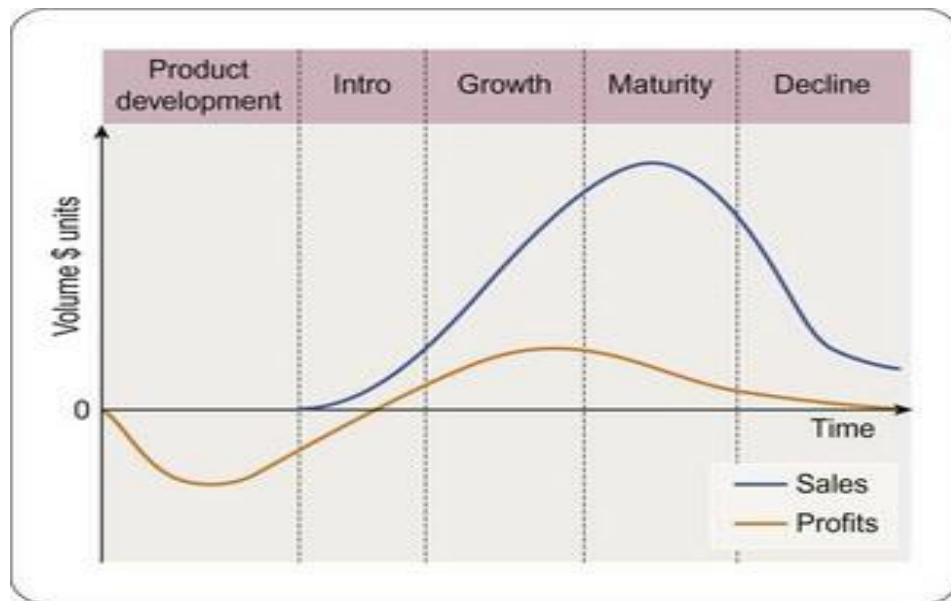
Al Thabbah et al. (2021), Jordan	315 practicing physicians	Promotional tools, pricing, product, place (distribution), and personal selling strategies	Cross-sectional survey	Overall, lowest influence was for promotional tools (69.3%), highest for pricing strategy (83.3%);
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Source: own processing based on (Alowi & Kani, 2019)

2.3 Drug discovery and development

In their book on the process of drug discovery and development, Hill and Rang (2013) emphasized the significant time and financial commitment required to bring a novel drug to market. It is critical to consider the marketing process in the context of the whole product life cycle, from initial research to genericization at the conclusion of the product patent. The following diagram illustrates a typical product life cycle from discovery to decline.

Figure 6: Phases of product life cycle.



Source:(Hill and Range.,2013)

The product’s life cycle period generally consists of five major phases (Hill & Range.,2013):

- Product development
- Introduction
- Growth
- Maturity
- Decline.

Occasionally, a customer may come to find medicines that were first introduced on the global market several decades ago and appear to have reached immortality (aspirin, penicillin, and cisplatin). There are two explanations for the seeming lifespan of these chemicals. Either the pharmaceuticals were huge therapeutic breakthroughs at the time of launch and are now regarded reference drugs, or there have been no substantial therapeutic advancements in their particular indications, and they are still viable treatment options today.

This in no manner implies the original manufacturer's long-term success since he or she may have abandoned the therapeutic field entirely due to the competitive pressures of an abundance of similar products. (Bhambere et al., 2021)

According to Bhambere et al. (2021) , generic pharmaceutical business in the developed world that wants to launch an equivalent generic to an innovator's patented medicine employs a substantially less expensive and more rapid process known as the Abbreviated New Drug Application (ANDA). It is important to recognize that the generic producer is relying on the safety and effectiveness data supplied previously by the innovator.

He only has to demonstrate to the product licensing authorities that his product is technically identical to the trademarked product. In Quiegly's book, the author suggests reforms to encourage the development and use of generic and biosimilar drugs, which can significantly improve affordability and access to essential medicines (Quiegly, 2017). The pharmaceutical landscape has been continually evolving, adapting to the modern technological advancements of the 21st century.

The 21st century has brought about constant change in the pharmaceutical industry as it has adapted to new technological advancements. Among these developments, big data and artificial intelligence (AI) have become revolutionary instruments that are changing the course of drug discovery procedures and enhancing creativity, efficiency, and precision (Ashiwaju et al., 2023).

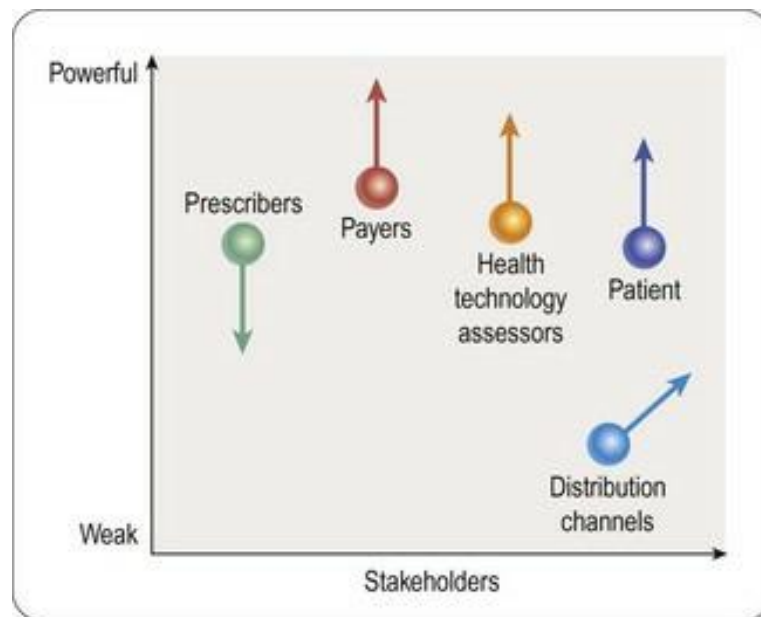
As the industry adapts to these technological advancements, the dynamics of pharmaceutical marketing similarly undergo a continuous evolution, with marketers tasked with implementing strategies that respond effectively to competition and changing market conditions. The process is constantly dynamic.

Market results and changes must be followed continually, and choices should be re-evaluated as needed. At the beginning of the project, the product manager creates a market map based on the original market definition. Market experience frequently involves redrawing areas of the map based on opportunities and barriers to entrance.

A pre-launch client image will need to be re-evaluated based on market experience.

The shifting environment is recognizing new clients and stakeholders that are usually not involved in the marketing process, including non-prescribers, such as payers and patients (Hill and Range, 2013).

Figure 7: Market Power shift graph.



Source: (Hill and Range,2013)

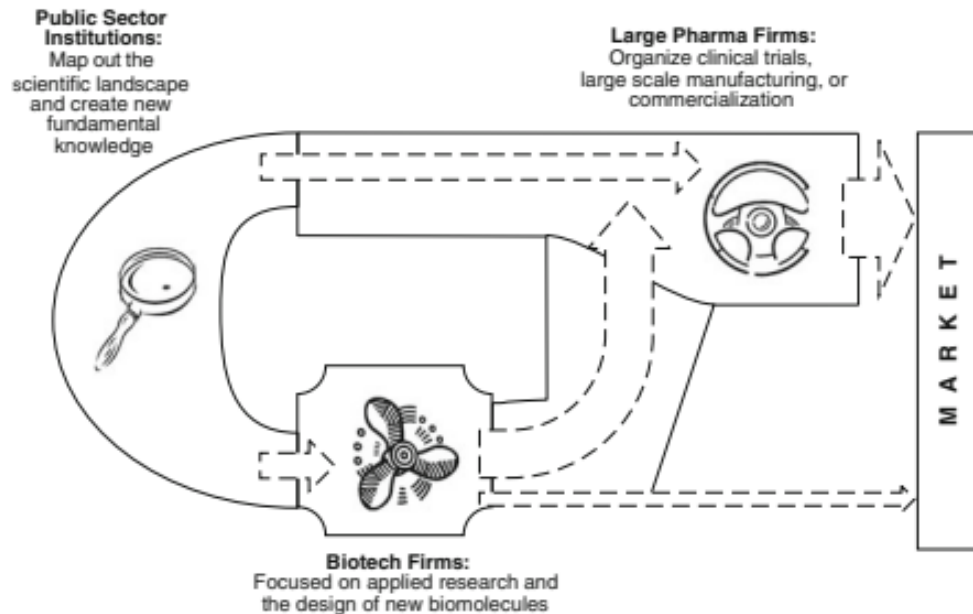
Hill and Rang (2013) emphasize that the success of a drug depends not only on its efficacy and safety but also on pharmaceutical corporations' capacity to persuade medical experts of these vital characteristics. This thorough analysis highlights the significant risks associated with pharmaceutical marketing and emphasizes the need for promotional efforts to accurately depict the therapeutic advantages and medication development process in order to support morally and based on science prescription decisions.

2.4 Innovations and Pharmaceutical Marketing Management

Three organizational tiers are involved in pharmaceutical innovation: large pharmaceutical firms, which are ambidextrous and multifunctional, are particularly skilled at acting as a vehicle for advancing scores of drugs; small biotech firms function as a true innovation engine, conducting cutting-edge research and providing novel biomolecules; and public

sector organizations provide the fundamental science that essentially maps out the landscape for subsequent innovations (Ding et al., 2014).

Figure 8: The Innovative Trifecta model in the pharmaceutical industry.



Source: (Ding et al.,2014)

These three organizational models complement each other's capabilities and can work in collaboration to improve biomedical research in a trifecta model of innovation.

Innovations play a crucial role in pharmaceutical marketing management, as highlighted in various research contexts. The pharmaceutical industry's focus on maximizing profits has led to aggressive marketing practices, with significant spending on marketing over research and development (Jacob , 2018). In order to propose reforms, Quigley argues in his book for a shift in the industry's priorities, where the primary focus is on developing and distributing safe, effective, and affordable medicines to meet the healthcare needs of all patients, rather than maximizing profits (Quigley, 2017).

The tactical aspects of pharmaceutical marketing are examined by Bhambere et al. (2021), who highlighted on the strategic planning and implementation of marketing campaigns. They emphasize how important it is to conduct market research, segment, and target audiences in order to create advertising messages that appeal to healthcare professionals. The writers also clarified the moral conundrums that face marketers, including the difficulty of balancing pushy sales tactics with the necessity of ensuring patients' well-being. This investigation is essential to comprehending the business strategies

pharmaceutical companies use to morally and successfully sway physicians' prescription practices in the complex interplay between patient care concerns and market competitiveness.

A 2014 book by Ding, Eliashberg, and Stremersch explores the crucial connection between pharmaceutical innovation and marketing tactics intended to affect physicians' prescription practices. By classifying innovations as "radical" or "incremental," they draw attention to the different marketing strategies needed for new medications in comparison to those that are already available.

Creating this distinction is crucial to creating marketing strategies that successfully promote medical science and uphold moral values. Their research highlights how important it is to have a deep understanding of product innovation in order to create marketing plans that positively affect prescription behavior and uphold the moral standards of promoting medical advances (Ding et al., 2014).

The pharmaceutical industry is experiencing an evolution driven by a shift towards patient-centric approaches and the integration of innovative technologies (Bala & Sharma, 2020).

As pharmaceutical companies increasingly prioritize patient engagement, they are expanding their initiatives beyond traditional pharmaceuticals to offer comprehensive support programs aimed at enhancing patient health and catering to specific demographic needs (Alowi & Kani, 2019). This emphasis on patient-centricity underscores a broader trend within the industry towards improving overall healthcare outcomes and promoting recovery.

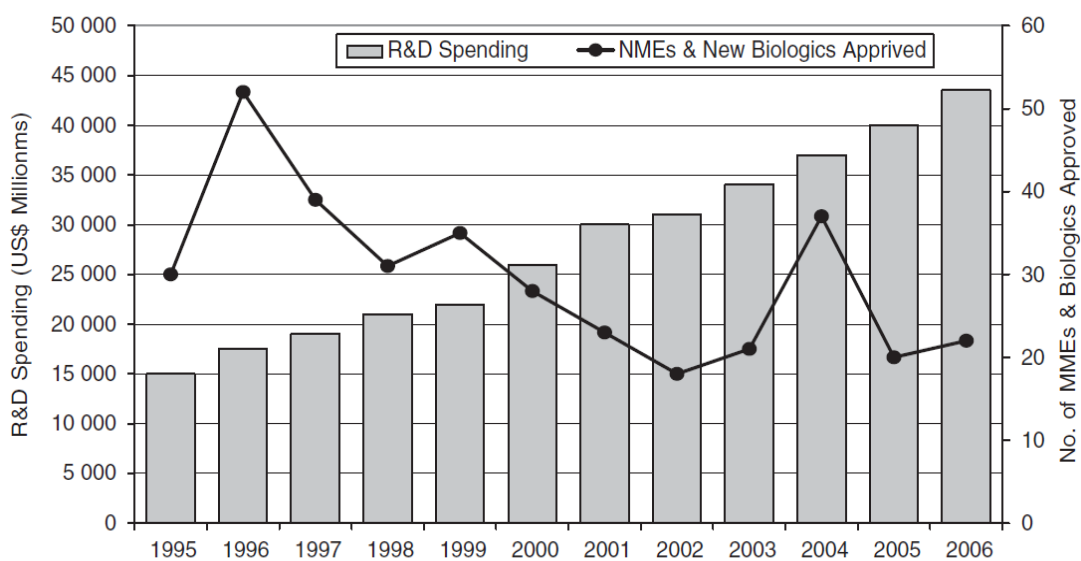
Furthermore, the pharmaceutical industry is being changed by the confluence of technology and healthcare. Notably, big global technology businesses like Google and Amazon are entering the healthcare market, employing modern technologies to provide innovative healthcare services.

Google, for example, employs artificial intelligence to optimize healthcare delivery and improve patient outcomes, whereas Amazon relies on cloud technology to increase the efficiency and accessibility of healthcare.

This collaboration of IT technology developers and pharmaceutical companies further enhances the capacity to develop novel and effective treatment strategies, with significant benefits for patients and healthcare systems alike. (Makin, 2019).

Most biopharmaceuticals represent novel treatment techniques; therefore, replication enterprises may have limited scope. Almost half of all new launches are organic medical items.

Figure 9: FDA approvals & R&D spending: 1995 – 2006



Source: Terblanche, N. S. (2008). New pharmaceutical product development: Barriers to overcome and opportunities to exploit.

As shown in the figure, research & development expenses and production timeframes have steadily increased over time, from the discovery of a new molecule to the market, impeding the release of the new molecule or biopharmaceutical (Terblanche, 2008). On a side note, the author Quigley argues that the pharmaceutical industry has successfully infiltrated and influenced regulatory bodies, such as (FDA), through revolving-door policies and lobbying efforts (Quigley, 2017).

One important part of this change is the rise of prescription digital therapies, which represent a novel approach to pharmaceutical products. These revolutionary solutions enable alternate therapy alternatives and personalized indications, and efficacy claims on prescription labels, catering to individual medical situations. The area of digital medicines

is seeing an increase in mobile app submissions to regulatory authorities such as the FDA, seeking approval.

These programs target a wide range of topics, including cognitive functioning, behavioral issues, and mental health diseases including ADHD, severe depression, and schizophrenia. Collaborations between IT technology developers and pharmaceutical businesses significantly boost the ability to develop unique and successful treatment options, demonstrating the revolutionary potential of modern digital therapies (Makin, 2019)

2.5 Ethical Considerations in Pharmaceutical Promotions

In the competitive realm of pharmaceutical industry, business process management not only facilitates the optimization of operations but also ensures that marketing strategies are in sync with regulatory requirements and the anticipations of healthcare professionals. Pharmaceutical companies who aim to influence physicians' prescribing practices in an ethical and efficient manner will find this integration essential.

According to Guido et al. (2014), BPM's strategic integration into pharmaceutical operations goes beyond simple operational effectiveness to establish it as a vital pillar of healthcare providers' ethical impact and engagement. Pharmaceutical companies can effectively navigate the healthcare landscape by carefully aligning their marketing strategies with ethical standards and regulatory expectations. This ensures that their promotional activities not only meet commercial goals but also uphold the highest standards of ethical responsibility and patient care.

Pharmaceutical promotions raise ethical considerations due to the potential influence they have on prescribing behavior and the image of the industry. The pharmaceutical industry utilizes various promotional tools, such as samples, gifts, advertising, and hospitality, to promote their products to healthcare professionals (Brown & Kaplan, 2014).

A study found that physicians' ethical standards play an important part in their prescription decisions, leading them to adopt individual ethical norms while prescribing drugs where physicians with low ethical standards may be strongly impacted by companies' marketing and promotional efforts (Aqif & Mumtaz, 2023). However, these practices have been criticized for their potential to lead to unethical behavior, such as misleading messaging and tactics to hinder competition (Bhambere et al, 2021). A recent research in Pakistan highlights not only the significant impact of promotional activities on physician behavior, but also the importance of upholding ethical values and standards when developing

pharmaceutical marketing campaigns. The authors research emphasize the need for aligning such strategies with moral principles to safeguard patient interests and maintain public trust in the medical profession (Naqvi et al., 2023).

Conflict of interest that may arise in pharmaceutical marketing, which occurs when the goals of the pharmaceutical company do not line with those of the patient, which can possibly lead to biases in the presentation of information. It brings to light the fact that ads for pharmaceuticals often try to increase sales and profits, which may be in direct opposition to the objective of assisting customers in making decisions that are both educated and independent. (Bélisle-Pipon, 2021)

When asked what they believed to be appropriate gifts or ethical promotion strategies, doctors in Egypt responded that it was ethical to promote things that advanced science and increased doctors' general knowledge. However, anything that could endanger patients was viewed as unethical (Kamal et al., 2015). According to the findings of another research, Egyptian medical professionals do not consider it immoral to receive promotional materials from pharmaceutical firms. These things include gifts, paid speakers from the business, and financial support to attend conferences. On the other hand, it is up to the physician to choose whether things are appropriate from an ethical standpoint. (Mostafa & Metawie, 2013).

A significant factor that contributes to the continuing debate over the legality and justification of direct-to-consumer communications (DtCC) is the absence of established ethical guidelines for pharmaceutical marketers inside the industry. The paper aims to guide marketing professionals towards ethical conduct in DtCC practices through an oath and duty based approaches (Bélisle-Pipon, 2021).

Aqif and Mumtaz (2023) explored the role of ethical ideologies and tested the hypothesis if marketing strategies are moderated by ethical ideologies like relativism and idealism. It was found that relationship between marketing strategies and prescription behavior of doctors gets weakened with high values of ethical idealism. Their study also found that relativism plays a moderating role and can strengthen the relationship between pharmaceutical marketing techniques and the prescription behavior of physicians.

3 METHODOLOGY

The goal of this chapter is to outline the methodology, which includes the research design and methods, demographic data identification, sample design, and a summary of the procedures and methods for collecting data. Lastly, it addresses ethical considerations, data analysis methods, and validity and reliability difficulties related to this research. This study employs a quantitative approach to investigate the impact of various promotional practices employed by pharmaceutical companies on behavior of doctors' prescription. A descriptive survey research design will be utilized to gather data through a well-structured questionnaire. The purpose of the questionnaire is to get primary data from physicians and to investigate, assess, and gather their opinions regarding promotional techniques used by pharmaceutical companies. A Volunteer sampling technique will be implemented to select a representative sample of doctors from the target population. The structured questionnaire will then be administered to collect the primary data. After data collection, thorough analysis will be conducted with expert guidance, ensuring reliable interpretation of the findings. The results will be presented in a clear and concise manner, aiming to contribute valuable insights to the understanding of how pharmaceutical promotional activities influence doctor's prescribing behavior.

3.1 Research Design

Pharmaceutical items are designed to sustain good health, thus marketing strategies that are consistent with this goal would be different from others used in other businesses. Pharmaceuticals are directly promoted to physicians using a variety of promotional techniques in all countries. Like in most other nations, In Egypt pharmaceuticals are promoted directly to doctors. Therefore, the study population for the planned study consisted of physicians, medical representatives, and patients in Egypt. Promotion has an impact on doctors' prescribing practices and drug choice. Therefore, to adopt promotion techniques associated with desired physician prescription behavior, it is vital to determine the extent to which promotion tactics and tools influence physicians' decisions and behavior. We used a deductive research analysis method to test theories. To assess how pharmaceutical promotional strategies affect doctors' prescribing behaviors, we chose a quantitative approach. A statistical analysis can be carried out thanks to the large quantity of data used in this quantitative study. One of the tools most employed in quantitative research is online survey, which has gained a lot of popularity as the main source of data.

3.2 Population and sample design

This study targeted medical professionals (Doctors and medical representative) and patients in Egypt as the population of interest. Due to practical limitations and resource constraints, surveying all Egyptian medical professionals wouldn't be feasible. Therefore, a purposive sampling method was employed. This convenience sampling method involves selecting a sample that is representative of a specific subgroup within the larger population. In this case, we aimed for a sample that reflects doctors, medical representatives and patients who were readily available in Egypt. We distributed three questionnaires to understand the impact of pharmaceutical companies' promotional efforts on the drug choices made by doctors in the Egyptian market. The target groups are doctors, medical representatives and patients. Data collected from 121 doctors, 165 medical representatives and 155 patients for sample size adequacy.

Doctors' questionnaire: this part shows and explains doctors' attitude and behaviors for pharmaceutical market. It contains some questions for example getting new information about new drugs, Prescribing Practices, Impact of conferences and seminars on prescribing behaviors and ethical norms in physician-pharma industry interactions.

Medical representatives: This questionnaire have some questions like priorities in promotions, opinion on pharmaceutical advertisement, information priority during promotion activities which have impact of Pharmaceutical companies' promotional and drug choices by doctors in the market.

Patients: questionnaire for patients focusing on patients' responses and the influence of surrounding environment on their choices. It includes some questions like effect of drugs advertisements on TV, Radio, internet and effectiveness of family and friends on patient choices.

3.3 Data collection procedure

Data was collected by administering a self-administered three questionnaires for doctors, medical representatives and patients for helping to understand the impact of pharmaceutical companies' promotional on the Drug choices by doctors in the Egyptian market, The sample based on literature and prior research studies (Al Thabbah et al., 2022) (Gupta et al., 2016) (Khazzaka, 2019), (Vishavadia, 2017). A well-structured program was created for carrying out this investigation. The first section was intended to include demographic information regarding the respondent's age, gender, educational qualification, and marital status. The

second section included a list of promotional tools/approaches employed by most pharmaceutical corporations. Respondents just select one response to each sentence using a 5-point Likert scale. This also allows respondents to indicate how much they agree or disagree with claims about the effectiveness of various advertising tactics. This technique will provide a more clear understanding of how doctors comprehend and respond to various promotional strategies.

3.4 Ethical Considerations

The ethical concerns that could come from this kind of research were carefully considered during the study's conduct. This study has no risks associated with it: non-psychological, social, or physical. Each participant is also cordially asked to fill out the questionnaire; however, they have the choice to refuse the request. Additionally, the researcher gave the responders the assurance that their identities would be kept private and would not appear in any section of the project's report.

3.5 Statistical methods

The classification and analysis of the data that was acquired was done with the goal of the study being taken into mind the whole time. A Wilcoxon A signed-rank test was used in order to compare responses on the subject of medical representatives prioritizing the sharing of knowledge above the advertising of the brand. The Chi-Square test was used in order to investigate the relationship between the major emphasis of medical advertising and the perceived success of the face-to-face talking promotional strategy. After that, the same test was used to determine whether there are any significant variations in perceptions and preferences. These differences were determined by the demographic data of the respondents, which included gender and age. To determine the degree to which the scale is internally consistent, a Cronbach's alpha reliability test was performed on the survey items. In order to determine how closely linked a collection of things are to one another, Cronbach's alpha is used. The acceptable range is more than 0.7. Every single statistical analysis was carried out with the the Statistical Package for Social Science Software (SPSS) version 25, which was utilized. When attempting to portray the importance of the data, a confidence interval of 95% ($p \leq 0.05$) was used. It was determined that P values < 0.05 were regarded to be significant. A confidence interval of 95% ($p \leq 0.05$) was applied to represent the significance of the results where P values ≤ 0.05 were considered significant.

II. ANALYSIS

4 RESEARCH ANALYSIS

There are two primary sections in this chapter. In the first section, the results are discussed and descriptive statistics about the respondents based on their demographic variables are presented. In order to answer the research questions and test hypotheses, the second section presents the correlation analysis results in tables and goes into extensive detail about the data analysis findings.

4.1 Outcomes from the questionnaire

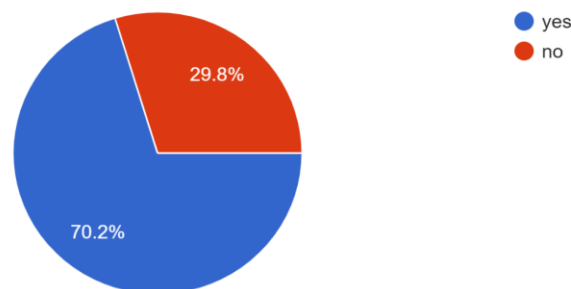
This section summarizes the key insights obtained from the questionnaires completed by doctors (4.1.1), pharmaceutical representatives (4.1.2), and patients (4.1.3).

4.1.1 Doctors

this part showing the outcomes from doctors' questionnaire by charts and graphs and explaining their attitude and behaviors for some questions for example getting new information about new drugs, Prescribing Practices, Impact of conferences and seminars on prescribing behaviors and ethical norms in physician-pharma industry interactions also medical representatives' knowledge.

Figure 10: Medical representatives as sole information source

2.Do you think that medical representatives visit is the only way to learn about new drugs ?
121 responses



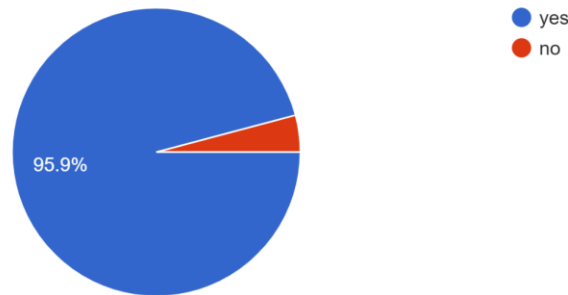
Source: (Own Processing)

A significant majority, exceeding 70%, agree with the statement indicating that most doctors surveyed rely on medical representatives to learn about new medications. It would be valuable to explore the reasons behind this and understand the information landscape for new medications.

Figure11: Impact of medical representatives’ discussion on doctor prescribing.

3.Do you think that discussions with medical representatives have an impact on your prescribing ?

121 responses



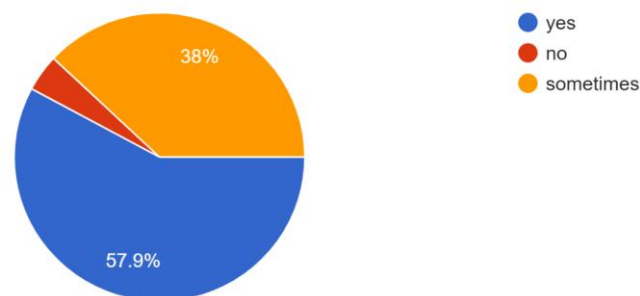
Source: (Own Processing)

The data suggests that a very high percentage of doctors (potentially exceeding 95.9%) believe discussions with medical representatives influence their prescribing decisions to some degree. This indicates a widespread recognition of the potential influence of medical representatives’ interactions in the Egyptian market. However, a more detailed qualitative analysis and interviews with doctors are needed to better understand the nature of this impact.

Figure12: Impact of Generic Drug Availability on Prescribing Practices.

11.Does the availability of generic drug options change your prescribing practices?

121 responses



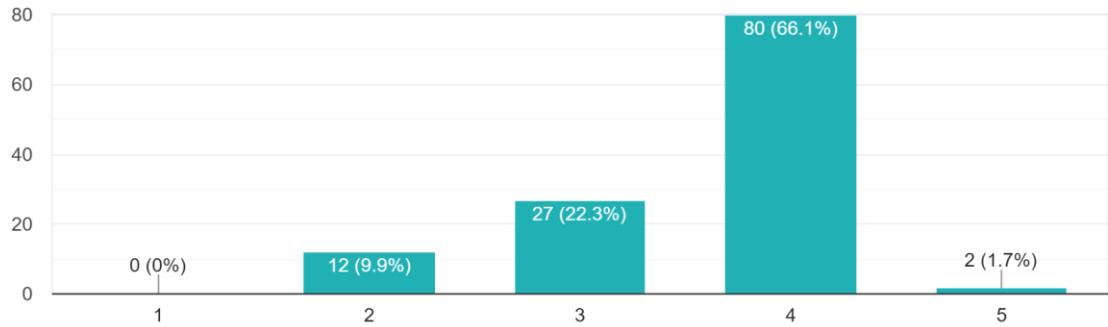
Source: (Own Processing)

This highlights that the availability of generic drug options is an important factor that affects the prescribing practices of more than half of Egyptian doctors, though there is still a notable proportion for whom it does not significantly influence their prescribing decisions.

Figure13: Impact of conferences and seminars on prescribing behaviors.

12.How impactful are conferences and seminars on your prescribing behaviors? (0-strongly disagree, 5- strongly agree)

121 responses



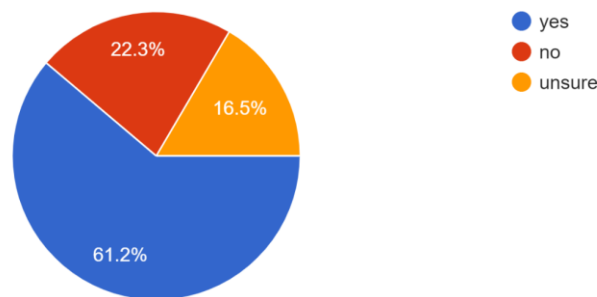
Source: (Own Processing)

The data indicates that conferences and seminars have a strong positive impact on the prescribing behaviors of most respondents. The majority (66.1%) answered 4 or 5, indicating that they strongly agree that conferences and seminars significantly influence their prescribing practices.

Figure14: Need for stronger ethical norms in physician-pharma industry interactions

14.Is there a need for stronger ethical norms in interactions between physicians and the pharmaceutical industry?

121 responses



Source: (Own Processing)

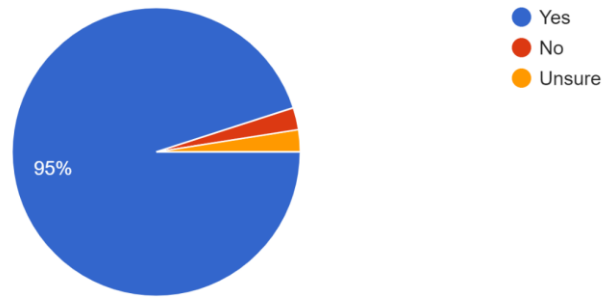
The chart shows that most doctors surveyed believe there is a need for stronger ethical guidelines governing the interactions between physicians and the pharmaceutical industry.

This suggests a perception that the current ethical norms may be insufficient and that tighter ethical standards should be implemented.

Figure15: Need for certification of medical representatives.

15.Should medical representatives be certified to ensure they provide accurate and beneficial information?

121 responses



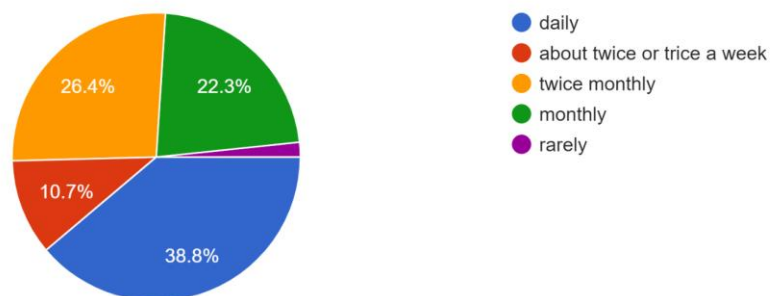
Source: (Own Processing)

The data clearly demonstrates that the vast majority surveyed believe there should be a certification process to verify the accuracy and reliability of the information provided by medical representatives. This suggests a desire for greater monitoring and accountability in the interactions between doctors and medical representatives.

Figure16: Frequency of doctor interaction with medical representatives

1.How often do you interact with medical representatives of pharma companies ?

121 responses



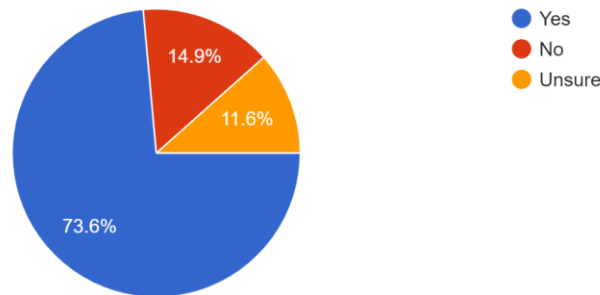
Source: (Own Processing)

The data reveals a variety of doctor interaction with medical representatives. A significant portion (22%) engage daily, suggesting frequent exposure to drug information and potential influence on prescribing habits. Conversely, nearly 39% rarely interact, possibly specialists

see fewer new medications or doctors with strong established preferences. The remaining doctors (26.4%) interact moderately, likely seeking updates on new medications.

Figure17: Opinions on regulating medical representative visits.

16. Do you believe the frequency of visits by pharmaceutical representatives should be regulated?
121 responses

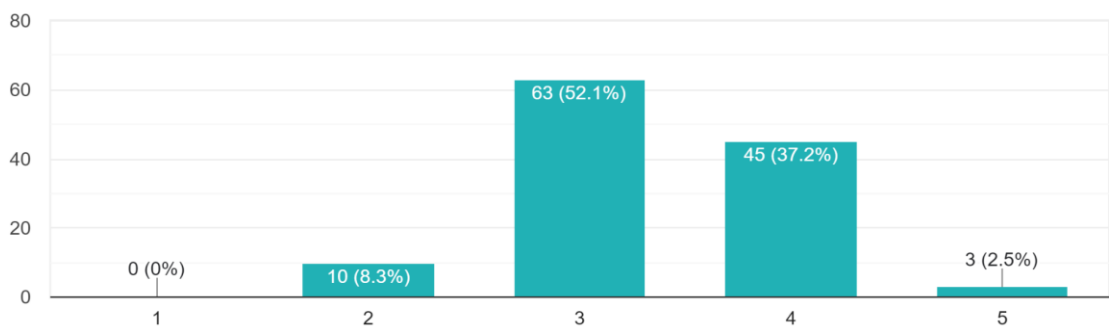


Source: (Own Processing)

The key takeaway here is that most Egyptian doctors (73.6%) favor regulating the frequency of visits by medical representatives, however there is still a considerable portion that is either opposed to it or uncertain about the need for it. There is lack of consensus and ongoing debate on this topic (Al Thabbah, 2022).

Figure18: Opinions on doctor prescription influence by promotional tools

8. Do you think that promotional prices or free samples may change your prescription behavior?
(0-strongly disagree, 5- strongly agree)
121 responses

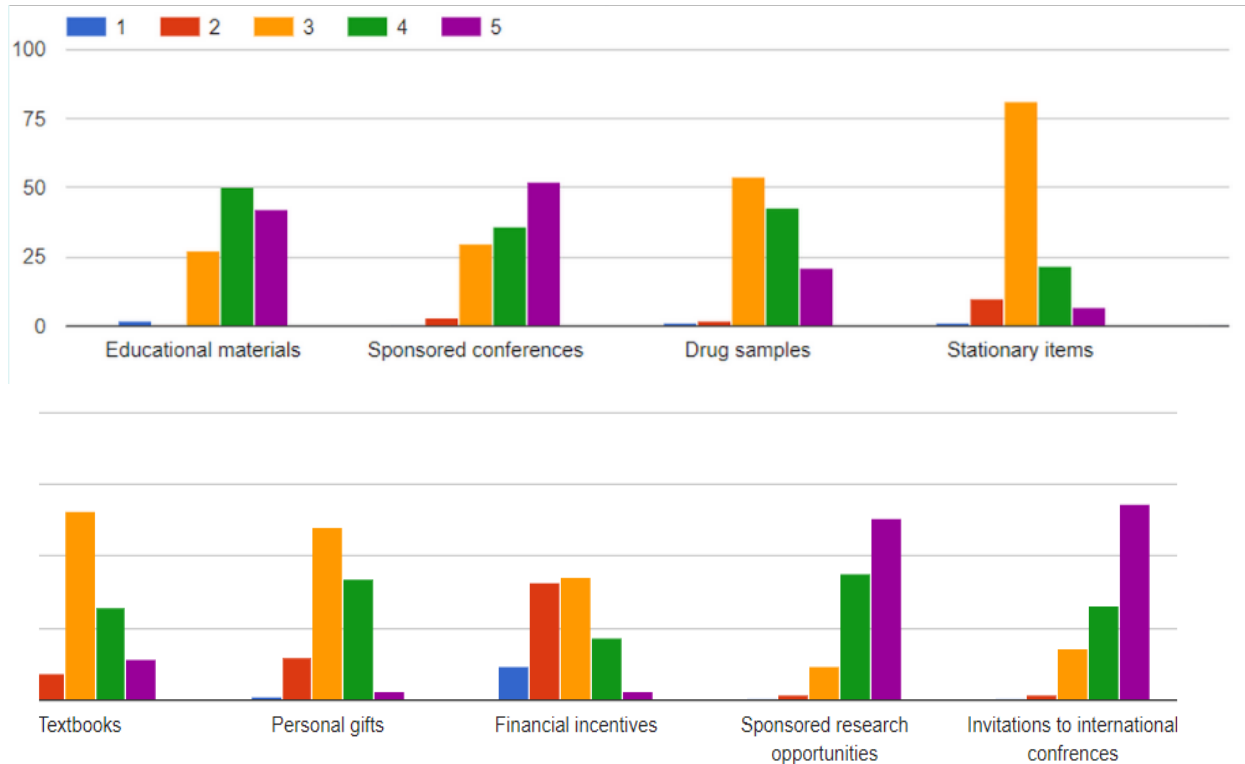


Source: (Own Processing)

The survey results show that nearly half (52.1%) of the respondents were neutral on the topic whether promotional prices or free samples influencing prescription behavior. A significant portion (37.2%) agreed that these factors can influence prescriptions, while none strongly

disagreed. This suggests that there is no clear consensus on the issue. More research may be needed to determine the extent to which promotional prices and free samples influence doctor prescription behavior.

Figure 19: Different promotional tools motivational impact on doctors' prescription.



Source: (Own Processing)

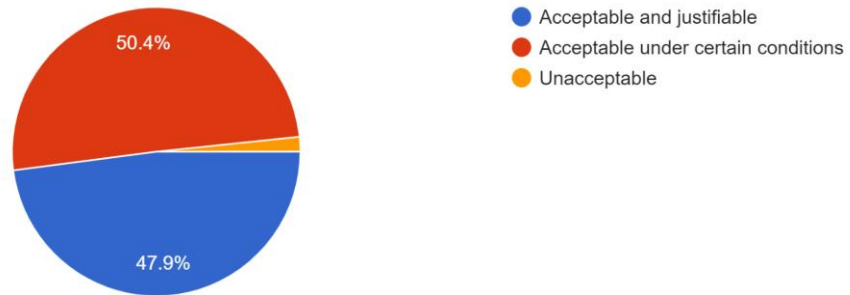
The survey data collected from doctors suggests that specific promotional strategies are more impactful than others in influencing medication choices.

The majority of doctors (60%) consider invitations to conferences, sponsored research and educational materials the most influential promotional tools. International conferences are rated the most motivating factor, with nearly half of the doctors reporting that they are “always motivated” to prescribe a certain drug. It appears that doctors value resources that allow them to learn more about a medication before prescribing it to patients. This suggests that doctors prioritize evidence-based medicine and want to be confident in the medications they prescribe.

Financial incentives and personal gifts are the least motivating factors according to the survey since they may raise ethical concerns about conflicts of interest. Still, a small portion of doctors do report that they are motivated by these factors at least some of the time.

Figure 20: Views on the acceptability of receiving gifts from pharmaceutical companies.

13. Views on the acceptability and justifiability of receiving gifts from pharmaceutical companies:
121 responses



Source: (Own Processing)

Of the 121 doctors, slightly more than half (50.4%) said that it is acceptable under certain conditions. Nearly half (47.9%) said that receiving gifts from pharmaceutical companies is unacceptable. Some doctors may believe that small gifts, such as pens or notebooks, are acceptable, while others may believe that any gift is considered a conflict of interest.

Figure 21: Views on doctors' invitation to international congresses.

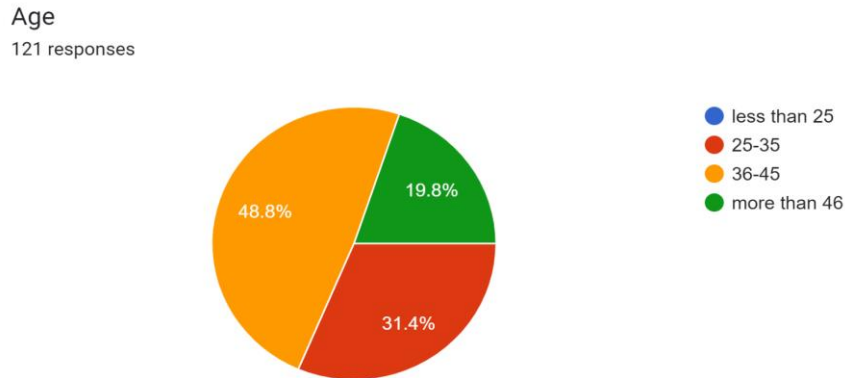
17. What are your views on doctors being invited to international congresses by pharmaceutical companies?
119 responses



Source: (Own Processing)

The results here indicate that there is a clear divide among doctors about the ethics of pharmaceutical companies funding their attendance at international conferences. 44.5% believe it is ethical and beneficial considering it as an opportunity to learn about the new research and developments in the field, while 54.6% believe it is conditional since some doctors worry that these conferences could be biased in favor of the sponsoring companies.

Figure 22: Age distribution of doctors.



Source: (Own Processing)

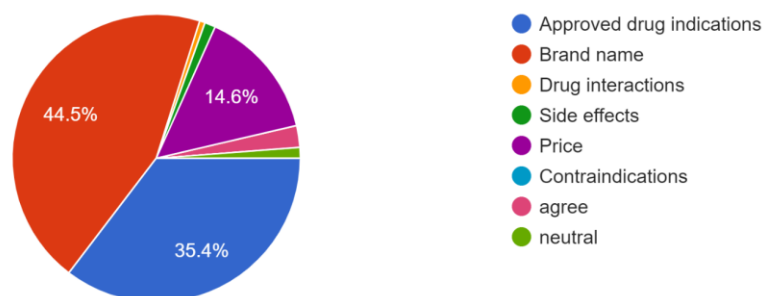
With the largest portion of the respondents being between 36 and 45, it suggests this survey might be targeted towards a middle-aged audience. This could be due to the way it was conducted. While some doctors might prefer traditional methods like in-person sales reps, the younger generation (25-35) is likely comfortable with digital channels. Utilizing a multi-channel marketing approach that includes online resources and educational content would be a recommended for pharmaceutical companies to enhance their marketing practices.

4.1.2 Medical representatives

This part focuses on medical representatives' questioner which have some questions like priorities in promotions and opinion on pharmaceutical advertisement benefit to patients and information priority during promotion activities.

Figure 23: Drug information priority.

What type of information do you prioritize during your medical promotion activities? (Select all that apply)
164 responses

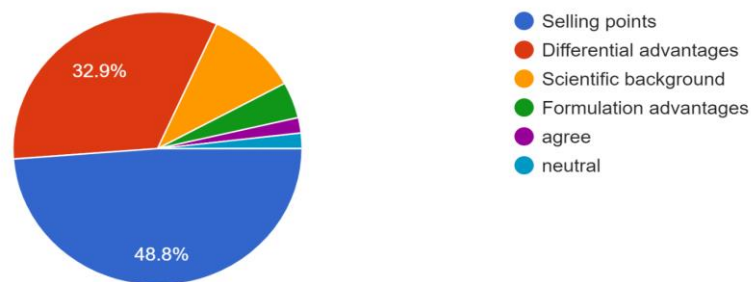


Source: (Own Processing)

The pie chart shows how Egyptian medical representatives prioritize different types of information during medical promotion activities. Among the top two answer choices, Brand name was the most important at 44.5%. This could indicate the potential influence of brand recognition on prescribing decisions. Drug indications, which specify the conditions the medication is proven to treat safely and effectively, followed at 35.4%. This highlights the need for stricter regulations and educational initiatives for medical representatives.

Figure 24: Medical representative priorities in promotions.

What is the primary focus of your medical promotions? (Select one)
164 responses

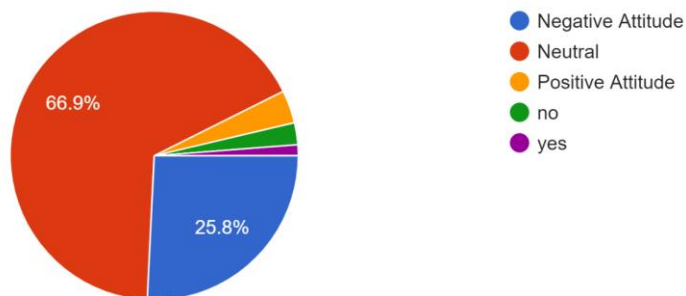


Source: (Own processing)

Nearly half (48.8%) of the medical representatives indicated that selling points are their primary focus during medical promotions. Scientific background (16.4%) is considerably less important than selling points according to this data. This might suggest a focus on marketing over purely scientific information during medical rep interactions.

Figure25: How medical representatives present other competitor products.

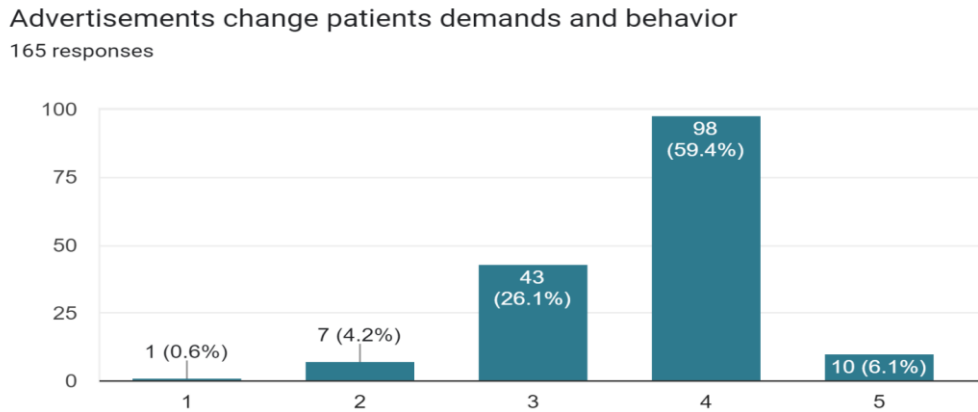
How do you typically present competitors' products during your promotions?
163 responses



Source: (Own processing)

This pie chart reveals an interesting approach by medical representatives when presenting competitor products during promotions. A significant portion (66.9%) reported taking a neutral stance. Further research would be needed to understand the reasons behind this.

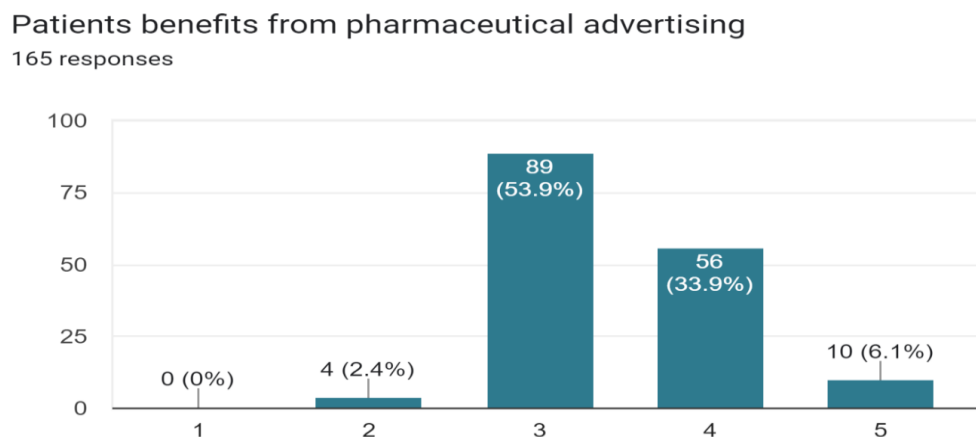
Figure26: Medical representatives’ perception on pharmaceutical advertisement.



Source: (Own processing)

A noteworthy finding is that a significant portion of doctors (59.4%) believe advertisements are somewhat likely (scored 4) to make patients request specific medications or treatments. This highlights a concern that advertisements can influence patient decisions.

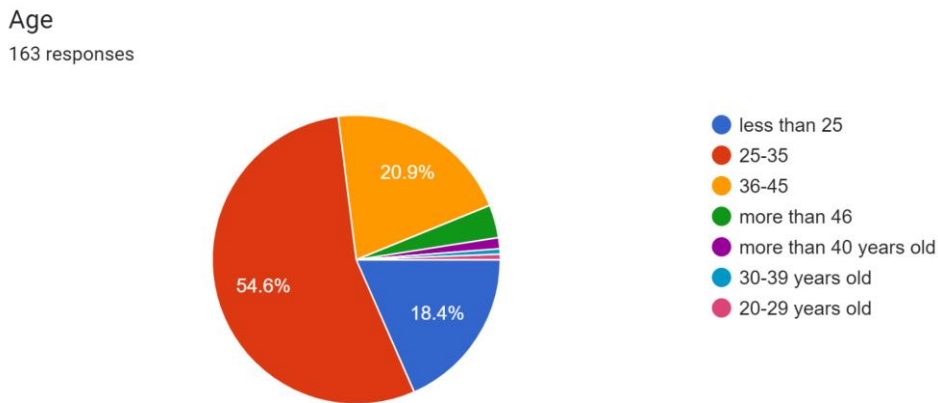
Figure27: Medical representatives’ opinion on pharmaceutical ads benefit to patients.



Source: (Own processing)

This indicates that over half of medical representatives' express neutrality on this issue while the other substantial portion agree that pharmaceutical advertisements are beneficial to patients.

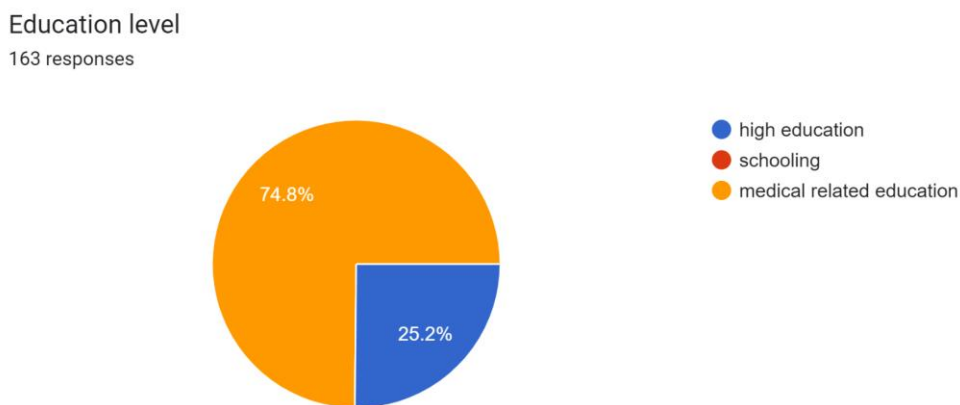
Figure 28: Age distribution of medical representatives.



Source: (Own processing)

The pie chart shows that the majority of medical representative surveyed (54.6%) were in the 25-35 years age group, while the older age groups make up smaller portions.

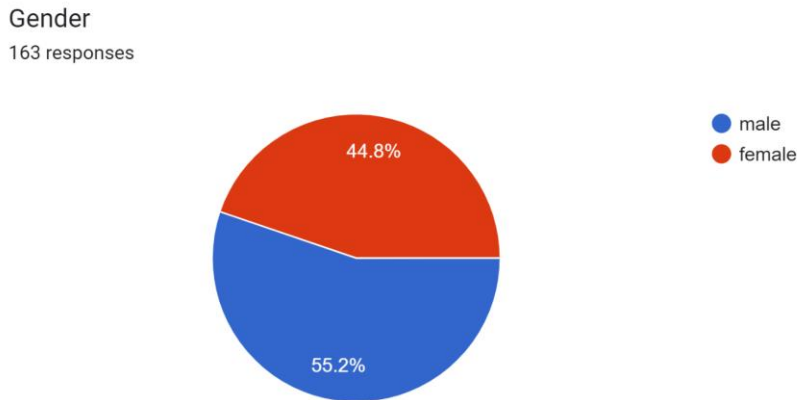
Figure 29: Medical representative education level distribution.



Source: (Own processing)

According to the pie chart, 74.8% of the medical representatives reported having a higher education, which includes medical related education. Only 25.2% reported having schooling only.

Figure 30: Gender distribution of medical representatives.



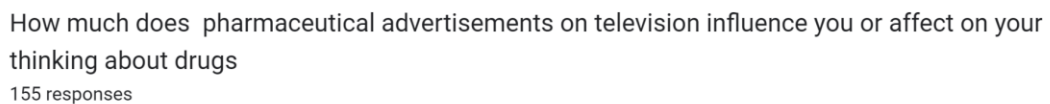
Source: (Own processing)

The pie chart suggests that the gender distribution of medical reps in this survey is nearly equal.

4.1.3 Patients

This part focus on outcomes of patient’s questionnaire which including some questions like effect of drugs advertisements on TV, Radio, internet and effectiveness of family on patient.

Figure31: Influence of TV pharmaceutical ads on patients.



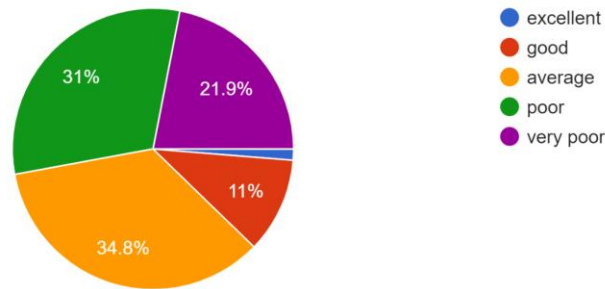
Source: (Own processing)

The chart indicates that most patients surveyed view pharmaceutical television advertisements as having a positive impact on their thinking about drugs, with over half considering the influence to be excellent or good. A smaller portion sees the impact as average, and only a minority perceive the advertisements as having a negative influence. This suggests that Some people may be more receptive to advertising than others. Also,

people who are already interested in a particular medication may be more likely to respond to a survey about pharmaceutical advertisements.

Figure32: Effectiveness of radio pharmaceutical advertisement.

What do you think of the effectiveness of medicines or pharma products advertisement on radio
155 responses

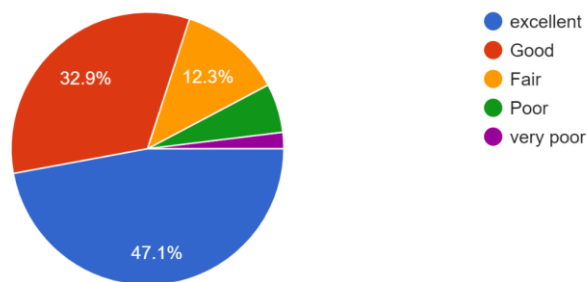


Source: (Own processing)

This suggests that most of respondents (65.8%) find radio advertisements for pharmaceuticals to be ineffective.

Figure33 Influence of internet pharmaceutical ads on patients.

How much do you think that drugs or pharmaceutical products advertisements on the internet / social media/ youtube effective
155 responses

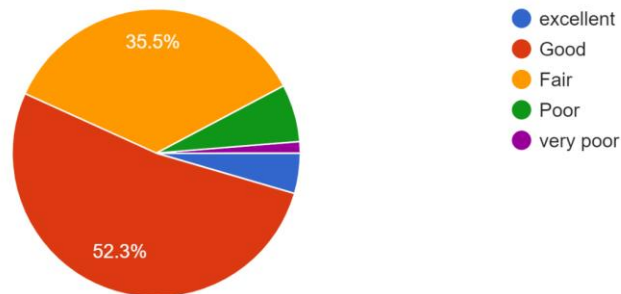


Source: (Own processing)

Nearly half, 47.1%, of respondents rated these ads as excellent or good. This suggests that a significant portion of the population finds online pharmaceutical advertising effective. We should keep in consideration that People who are already looking for medication may be more likely to influenced by such targeted advertisements, which could skew the results.

Figure 34: Perceived effectiveness of family & friend in suggesting medication.

How much are family members or friends effective when they try to suggest some medicine
155 responses

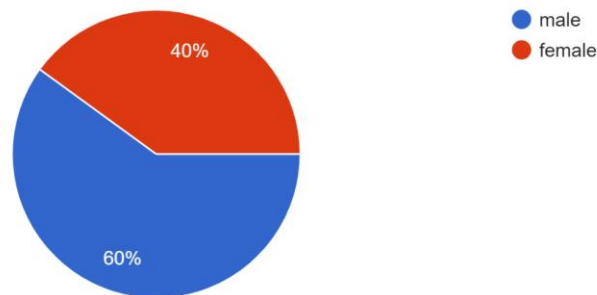


Source: (Own processing)

Based on this survey, it seems most respondents (87.8%) find their family or friends to be effective at suggesting medications.

Figure34: Patient gender distribution.

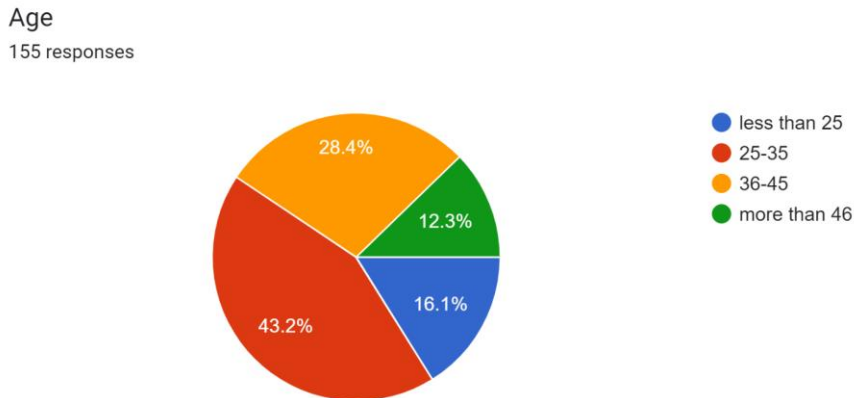
Gender
155 responses



Source: (Own processing)

This pie chart displays the gender breakdown of the survey participants. 60% identified as male, and 40% identified as female. It's important to note that this data only reflects the gender of survey respondents and may not necessarily represent the overall patient population served.

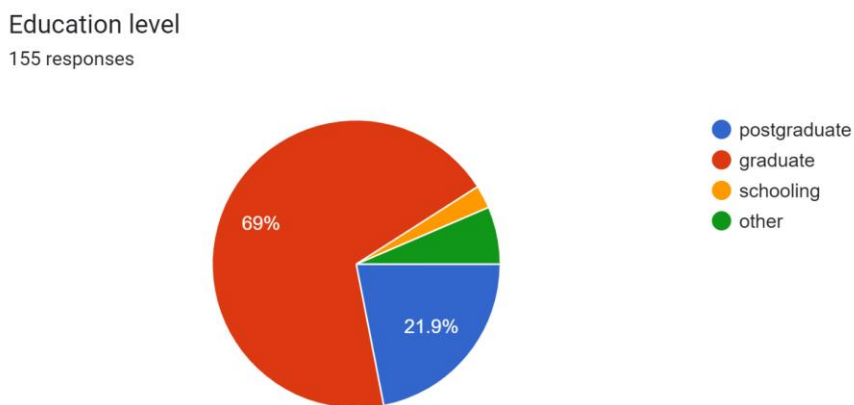
Figure36: Patient age distribution.



Source: (Own processing)

Among 155 respondents, the largest group is individuals less than 25 years old, comprising 43.2% of the total. The second largest group is those aged 25-35, making up 28.4% of the respondents. The 36-45 age group accounts for 16.1% of the responses, and the smallest group is those over 46 years old, representing 12.3% of the total. The age distribution in general skews towards the younger end, with over 71% of respondents being under 35 years old.

Figure:37 Patient education distribution.



Source: (Own processing)

The results show a very high percentage (90.9%) of university graduates and postgraduates. This allows for a more technical approach in patient promotional materials and that the audience is likely comfortable with complex medical information.

Key Outcomes

The survey results provide valuable insights into the pharmaceutical landscape in Egypt, highlighting several critical aspects that require attention and potential improvements for pharmaceutical companies' practices.

- The data indicates that a significant majority (over 70%) of doctors rely on medical representatives as their primary source of information about new medications. This heavy reliance suggests that pharmaceutical companies should carefully evaluate the information and messaging provided by their representatives to ensure accuracy and balance. There is a need for more comprehensive and unbiased educational resources for healthcare professionals to supplement the information received from medical representatives.
- The survey results reveal that a very high percentage of doctors (potentially exceeding 95.9%) believe discussions with medical representatives influence their prescribing decisions to some degree. This highlights the potential impact of pharmaceutical marketing activities on the prescription decisions made by doctors. This influence addresses the need for stronger ethical guidelines and oversight to ensure that prescribing practices are based on objective medical evidence and patient-centered considerations, rather than solely on promotional activities.
- The data suggests that the availability of generic drug options and attendance at conferences and seminars significantly impact the prescribing practices of more than half of the surveyed Egyptian doctors. This emphasizes the importance of promoting generic drug alternatives and providing healthcare professionals with access to high-quality, unbiased educational opportunities to enhance their knowledge and decision-making.
- The survey results indicate that most doctors believe there is a need for stronger ethical guidelines governing the interactions between physicians and the pharmaceutical industry. Additionally, the majority of respondents favor regulating the frequency of medical representative visits and believe there should be a certification process to verify the accuracy and reliability of the information provided

by these representatives. These findings suggest a perceived lack of transparency and accountability in the current physician-pharma industry interactions.

- The survey data highlights the potential impact of pharmaceutical advertisements on patient behavior, with a significant portion of respondents perceiving these advertisements as having a positive influence on patient thinking about medications. However, the effectiveness of different advertising channels, such as television, radio, and the internet, varies. Understanding the impact of various advertising channels can enhance pharmaceutical companies’ practices and conduct more targeted and effective patient-oriented marketing activities.
- The age and education distribution of the survey participants suggest that there is skewness towards younger age groups and highly educated individuals. Considering demographic factors when designing and implementing pharmaceutical marketing strategies.

4.2 Descriptive Analysis

The distribution of respondents by age, gender, and level of education is reported in this section along with descriptive statistics. The demographic details of the patients and medical representatives are displayed in the following tables, which are followed by succinct analyses of the findings.

Table 2: Distribution of medical representatives by age in Cairo, Egypt, March 2024.

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
20-29 years old	1	.6	.6	.6
25-35	89	54.9	54.9	55.6
30-39 years old	1	.6	.6	56.2
36-45	34	21.0	21.0	77.2
less than 25	30	18.5	18.5	95.7
more than 40 years old	1	.6	.6	96.3
more than 46	6	3.7	3.7	100.0
Total	162	100.0	100.0	

Source: (Own Processing)

It is apparent from Table 2 that over half of the medical representatives (54.9%) fall within the 25–35-year-old category. This is followed by a notable presence in the 36–45-year-old

range (21.0%). The remaining representatives are scattered across younger (<25 years old) and older (>40 years old) age groups.

Table 3: Distribution of medical representatives by education in Cairo, Egypt, March 2024.

Qualification	Frequency	Percent	Valid Percent	Cumulative Percent
Schooling	30	18.9	18.9	18.9
High Edu	89	56.0	56.0	74.8
Medical Edu	40	25.2	25.2	100.0
Total	159	100.0	100.0	

Source: (Own Processing)

The data in table 3 suggests that your medical representative team has a relatively well-educated background. Over three-quarters (81.2%) hold at least a bachelor's degree. This suggests that the majority of them are qualified and received proper education.

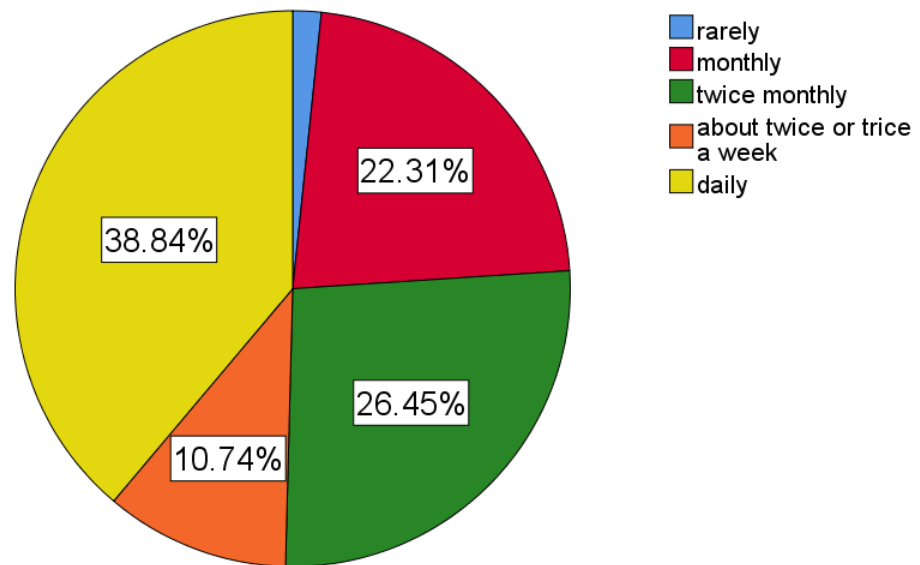
Table 4: Patient demographics in Egypt, March 2024

Demographic Characteristics	Respondent Number	Percentage
Gender		
Male	63	58.3%
Female	45	41.7%
Age		
Less than 25	20	18.5%
25-35	49	45.4%
36-45	25	23.1%
More than 46	14	13.0%
Education Level		
Postgraduate	32	29.6%
Graduate	63	58.3%
Schooling	5	4.6%
Other	8	7.4%
Marital Status		
Single	37	34.3%
Married	59	54.6%
Divorced/Widow	12	11.1%

Source: (Own Processing)

This demographic analysis reveals a medical representative workforce with a diverse range of ages, educational backgrounds, and marital statuses. While there's a slight female majority, the gender distribution is relatively balanced. The high percentage of representatives with postgraduate or graduate degrees suggests a well-educated group.

Figure 38: Survey results on pharmaceutical representatives visit frequency.



Source: (Own processing)

The data shows an even spread of medical representatives visiting frequencies to doctors, with no overwhelming majority. This is consistent with a survey conducted in India showing similar visit frequency (Dhonden et al.,2020)

Table 5: Doctors’ evaluation of the motivational effect of each promotional tool.

Promotional Tool	5 (Always)	4 (Often)	3 (Sometimes)	2 (Rarely)	1 (Never)
Invitations to international conferences	89.2%	3.3%	3.3%	2.5%	1.7%
Sponsored research opportunities	42.1%	28.1%	20.7%	8.3%	0.8%
Financial incentives	20.7%	33.1%	32.2%	10.7%	3.3%
Personal gifts	0%	11.6%	44.6%	25.6%	18.2%
Textbooks	0%	39.7%	46.3%	12.4%	1.7%
Stationary Items	5.8%	13.2%	75.2%	2.5%	3.3%

Promotional Tool	5 (Always)	4 (Often)	3 (Sometimes)	2 (Rarely)	1 (Never)
Drug samples	33.1%	43.8%	18.2%	2.5%	2.5%
Sponsored conferences	40.5%	31.4%	22.3%	3.3%	2.5%
Educational materials	41.3%	36.4%	19.8%	2.5%	0%

Source: (Own Processing)

The study of physician reactions to various promotional tools reveals some remarkable tendencies. When choosing what to prescribe, doctors emphasize instructional materials. Textbooks (86% motivated "often" or "always") and educational materials (78% motivated "sometimes" or more) are valuable. Remarkably, practical items like stationery (75% motivated "sometimes") score high, indicating a potentially cost-effective method. Financial incentives (33% motivated "often" with a significant portion finding them ineffective) and personal gifts appear less influential. While sponsored conferences (72% motivated "sometimes" or more) and research opportunities (almost 70% motivated to some degree) have some motivational effect, they might be more effective when combined with other tools. In Sudan, however, the outcomes were different, with public relations considered the most successful tool, followed by sales promotion, personal selling, and advertising. (Allowi & Kani, 2021). On the other hand, the same survey (Khazzaka, 2019) showed different results in Lebanon. It was found that Lebanese doctors were motivated most by visits of medical representatives (34.8%), drug samples (34.8%) and participation medical education conferences (31.6%). It was also reported that demographic characteristics such as age, gender, and specialization also influence the impact of promotional activities on physicians. For example, female physicians may rely more on professional development and actual data than on promotional activities (Jacob, 2018)

Table 6: Public patient perception of different promotional tools.

Promotional Tool	1 (Least Frequent)	2	3	4	5 (Most Frequent)
TV	3.2%	7.7%	31.6%	35.5%	21.9%
Radio	21.9%	31.0%	34.8%	11.0%	1.3%
Journal	2.6%	15.5%	34.2%	38.1%	9.7%
Internet	1.9%	5.8%	12.3%	32.9%	47.1%

Promotional Tool	1 (Least Frequent)	2	3	4	5 (Most Frequent)
Pamphlet	0.6%	13.5%	13.5%	23.9%	48.4%
Family	1.3%	6.5%	35.5%	52.3%	4.5%

Source:(own processing)

We can observe from this table that Internet and pamphlets are perceived as the most frequently used promotional tools, with the highest percentages in the "5-Most Frequent" category. TV and family are also seen as frequent promotional tools, with a larger proportion of responses in the "4" and "5" categories. Radio and journal advertisements are viewed as less frequently used.

4.3 Inferential statistics

This part of the analysis attempts to the research questions outlined in preceding chapters. First, Wilcoxon Signed-Rank test has been conducted to know to what extent do medical representatives prioritize providing doctors with updated knowledge about drugs compared to simply promoting brands. Correlation analysis has been conducted on the responses provided to see correlation between the frequency of visits by medical representatives and reliance on them as a primary source of information. Also to investigate relationships between patient demographics (gender) and their perception of effectiveness for each promotional tool. The reliability of data was assessed using Cronbach’s Alpha.

Wilcoxon Signed-Rank test

Table 7: Wilcoxon Signed-Rank test results

		Ranks		
		N	Mean Rank	Sum of Ranks
Updated knowledge-Brand promotion	Negative Ranks	77 ^a	62.36	4802.00
	Positive Ranks	36 ^b	45.53	1639.00
Ties		46 ^c		
Total		159		

Test Statistics^a

Updated knowledge- Brand promotion	
Z	-4.623 ^b
Asymp. Sig. (2-tailed)	.000

Source: (own processing)

The Wilcoxon Signed-Rank test findings show a statistically significant difference in scores for Medical representatives prioritize providing doctors with updated knowledge about drugs and Manufacturers promote brands or some medications only to make profit ($p < 0.001$). The negative Z-value and greater number of negative ratings indicate that medical representatives prefer to provide doctors with drug information over simply promoting brands or medications for profit. This validates hypothesis H1, which states that medical representatives prioritize information exchange above brand marketing in their activities.

Correlation analysis

Table 8: Correlation Between Doctor-Rep Visits and Belief in Reps as Sole Information Source.

		Q1.visits	Q2.doctor belief
Q1	Pearson Correlation	1	-.093
	Sig. (2-tailed)		.312
	N	121	121
Q2	Pearson Correlation	-.093	1
	Sig. (2-tailed)	.312	
	N	121	121

Source: (Own processing)

The observed negative correlation between doctor-rep visits and belief in representatives as sole information source is weak and there is essentially no statistically significant relationship between the frequency of doctor-rep interactions (Question 1) and a doctor's belief about the sole importance of representatives for learning about new drugs (Question 2). The hypothesis H3 ("A significant relationship exists between the visits of medical representatives and physicians' reliance on medical representatives") is not supported by the data. In contrast, it was found in one study that frequent visits byt representatives and managers leave a great impression on the doctors (Dohnden et al.,2018).

Table 9: Correlation Between Doctor-Rep Visits and Perceived Impact.

		q1.visits	Impact
Q1. visits	Pearson Correlation	1	.271**
	Sig. (2-tailed)		.003
	N	121	121
Q3. impact	Pearson Correlation	.271**	1
	Sig. (2-tailed)	.003	
	N	121	121

Source (Own processing)

The positive correlation signifies that as the frequency of interactions with representatives increases (Question 1.visits scores), the perceived influence on prescribing impact scores (Question 3) also tends to increase. In simpler terms, doctors who see representatives more often also tend to report a slightly greater impact of these discussions on their prescribing decisions.However, the strength of the correlation (0.271) is weak. This suggests that the link between interaction frequency and perceived impact is not very strong. Other factors likely play a more significant role in shaping doctors' prescribing behavior.

Table 10 Association Between Promotional Focus and Agreement on Face-to-Face Effectiveness.

Chi-Square Tests					
	Value	Df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	22.975 ^a	8	.003	.014	
Likelihood Ratio	23.506	8	.003	.002	
Fisher's Exact Test	19.196			.007	
Linear-by-Linear Association	.324 ^b	1	.569	.584	.314
N of Valid Cases	159				

a. 11 cells (73.3%) have expected count less than 5. The minimum expected count is .10.

b. The standardized statistic is .569.

Source: (Own Processing)

Based on the obtained p-value of (0.007) from Fisher's Exact Test , the results indicate that there is a statistically significant association between the chosen primary focus of medical promotions (Q3) and the agreement level on the effectiveness of face-to-face talking (Q1).

The data suggests that the primary focus of medical promotions (e.g., selling points, scientific background) is significantly related to how medical representatives perceive the effectiveness of face-to-face talking as a promotional method, compared to other methods like using brochures or free samples.

This supports the hypothesis H2: "Face-to-face talking is a more effective promotional method than using brochures or free samples."

Table 11: Patient Gender and Perception of Promotional tools.

		Patient Gender Correlations								
		Age	edu	Gender	TV	radio	journal	internet	Pamphlet	family
Age	Pearson Correlation	1	-.147	.133	-.169*	-.052	-.029	-.042	.080	.063
	Sig. (2-tailed)		.068	.099	.036	.517	.724	.600	.320	.436
	N	155	155	155	155	155	155	155	155	155
Edu	Pearson Correlation	-.147	1	-.063	.075	.027	.147	.013	-.082	-.085
	Sig. (2-tailed)	.068		.440	.352	.735	.067	.869	.308	.295
	N	155	155	155	155	155	155	155	155	155
Gender	Pearson Correlation	.133	-.063	1	-.047	-.134	-.059	-.016	-.148	-.225**
	Sig. (2-tailed)	.099	.440		.561	.098	.469	.843	.066	.005
	N	155	155	155	155	155	155	155	155	155
TV	Pearson Correlation	-.169*	.075	-.047	1	.259**	.332**	.614**	.105	.193*
	Sig. (2-tailed)	.036	.352	.561		.001	.000	.000	.192	.016
	N	155	155	155	155	155	155	155	155	155
Radio	Pearson Correlation	-.052	.027	-.134	.259**	1	.499**	.083	.240**	.271**
	Sig. (2-tailed)	.517	.735	.098	.001		.000	.302	.003	.001
	N	155	155	155	155	155	155	155	155	155
Journal	Pearson Correlation	-.029	.147	-.059	.332**	.499**	1	.424**	.531**	.261**
	Sig. (2-tailed)	.724	.067	.469	.000	.000		.000	.000	.001
	N	155	155	155	155	155	155	155	155	155
Internet	Pearson Correlation	-.042	.013	-.016	.614**	.083	.424**	1	.430**	.212**
	Sig. (2-tailed)	.600	.869	.843	.000	.302	.000		.000	.008
	N	155	155	155	155	155	155	155	155	155
Pamphlet	Pearson Correlation	.080	-.082	-.148	.105	.240**	.531**	.430**	1	.359**
	Sig. (2-tailed)	.320	.308	.066	.192	.003	.000	.000		.000
	N	155	155	155	155	155	155	155	155	155
Family	Pearson Correlation	.063	-.085	-.225**	.193*	.271**	.261**	.212**	.359**	1
	Sig. (2-tailed)	.436	.295	.005	.016	.001	.001	.008	.000	
	N	155	155	155	155	155	155	155	155	155

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

source: (own processing)

In this table, the most important association between patient demographics and perception of pharmaceutical promotional materials is patient gender and family recommendations. There is a strong negative relationship between gender and impression of family suggestions ($r = -0.225$, $p = 0.005$). This means that perceptions of gender influence family advice. We can accept the hypothesis (H5) that the perception of patients towards family recommendation can be dependent on their gender, with females potentially finding them more influential.

Table 12: Patient Age and Perception of Promotional tools.

		Patient Age Correlations						
		age	TV	radio	Journal	internet	pamphlet	family
Age	Pearson Correlation	1	-.169*	-.052	-.029	-.042	.080	.063
	Sig. (1-tailed)		.018	.259	.362	.300	.160	.218
	N	155	155	155	155	155	155	155
TV	Pearson Correlation	-.169*	1	.259**	.332**	.614**	.105	.193**
	Sig. (1-tailed)	.018		.001	.000	.000	.096	.008
	N	155	155	155	155	155	155	155
Radio	Pearson Correlation	-.052	.259**	1	.499**	.083	.240**	.271**
	Sig. (1-tailed)	.259	.001		.000	.151	.001	.000
	N	155	155	155	155	155	155	155
journal	Pearson Correlation	-.029	.332**	.499**	1	.424**	.531**	.261**
	Sig. (1-tailed)	.362	.000	.000		.000	.000	.001
	N	155	155	155	155	155	155	155
internet	Pearson Correlation	-.042	.614**	.083	.424**	1	.430**	.212**
	Sig. (1-tailed)	.300	.000	.151	.000		.000	.004
	N	155	155	155	155	155	155	155
pamphlet	Pearson Correlation	.080	.105	.240**	.531**	.430**	1	.359**
	Sig. (1-tailed)	.160	.096	.001	.000	.000		.000
	N	155	155	155	155	155	155	155
Family	Pearson Correlation	.063	.193**	.271**	.261**	.212**	.359**	1
	Sig. (1-tailed)	.218	.008	.000	.001	.004	.000	
	N	155	155	155	155	155	155	155

*. Correlation is significant at the 0.05 level (1-tailed). **. Correlation is significant at the 0.01 level (1-tailed).
Source: (Own processing)

This correlation table shows a weak positive correlation between age and watching television ($r = 0.105$, $\text{sig} = .192$). This means that as the age of patients increases, watching television tends to slightly increase.

One-Sample T Test

Table 13: Physicians perception of receiving gifts from pharmaceutical companies

Question	Acceptable and justifiable (%)	Acceptable under certain conditions (%)	Unacceptable (%)	p-value
Views on the acceptability and justifiability of receiving gifts from pharmaceutical companies	44.2	53.3	2.5	0

	T	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Q13acceptability	9.553	120	.000	.46281	.3669	.5587

Source: Own Processing

One sample t-test between was used to compare responses < 0.05 were considered to indicate statistical significance. The test results, which showed a statistically significant difference between the observed mean and the hypothesized value of 2, provide support for our hypothesis (H4).

This indicates that physicians' views on the acceptability of receiving gifts from pharmaceutical companies are more complex and varied than a simple "Acceptable and justifiable". This implies that, on average, people find gifts from pharmaceutical companies more acceptable than a value of 2 on the scale (where 3 represents "acceptable and justifiable", 2 represents "acceptable under certain conditions" and 1 represents "unacceptable").

According to the findings of another study, 58% of doctors believe that accepting gifts from the pharmaceutical industry or its representatives is unethical, while 42% of doctors believe that it is ethical. (Gupta et al., 2016).

Reliability test

Table 14. Reliability test results for doctors, MRs & patient survey items

Survey	Cronbach's Alpha	N of Items
Doctor Survey	0.721	13
Medical Representative Survey	0.822	10
Patient Survey	0.739	6

Source: (Own Processing)

The table presents Cronbach’s alpha values and the number of items for the reliability tests conducted on the doctor, medical representative, and patient survey data. These results (Cronbach’s values greater than 0.7) suggest that the survey instruments used to collect data from doctors, medical representatives, and patients have satisfactory to good levels of reliability, supporting the internal consistency of the measures. Therefore, our results suggest the consistency of the data.

4.4 Summary of Outcomes

Combining comprehensive analysis of the survey data with the statistical results, provides valuable insights into various aspects of pharmaceutical marketing practices in Egypt. The key outcomes from this study are as follows:

- The Wilcoxon Signed-Rank test revealed a statistically significant difference in scores, indicating that medical representatives prioritize providing doctors with updated knowledge about drugs over simply promoting brands or medications for profit. This validates the hypothesis that medical representatives prioritize information exchange over brand marketing in their activities.
- The correlation analysis showed that there is essentially no statistically significant relationship between the frequency of doctor-medical representative interactions and a doctor's belief about the sole importance of representatives for learning about new drugs. However, a weak positive correlation was found between the frequency of interactions and the perceived impact on prescribing decisions, suggesting that while

interaction frequency plays a role, other factors likely have a more significant influence on doctors' prescribing behaviors.

- The results of the chi-square analysis showed that there is a statistically significant connection between the major emphasis of medical promotions (such as selling points and scientific basis) and the perceived efficacy of face-to-face talking as a promotional approach. This gives support to the hypothesis that face-to-face contact is a more efficient technique of marketing than the distribution of pamphlets or the provision of free samples.
- The gender of the patient has a considerable effect on how they perceive family recommendations, according to the findings of a correlation study that was conducted between patient demographics and their perception of promotional tools for pharmaceuticals. It is important to note that there is a significant inverse association between gender and the perceived efficacy of family suggestions. This suggests that female patients may regard family recommendations to be more impactful than male patients.
- The results of a one-sample t-test on the opinions of doctors about the acceptability of accepting gifts from pharmaceutical firms revealed that their perspectives are more nuanced and diverse than a straightforward "acceptable and justifiable" or "unacceptable" posture. The fact that this is the case shows that there is a need for more stringent ethical norms and regulation in order to address the perceived lack of transparency in the interactions between the pharmaceutical sector and physicians.
- It was determined that the Cronbach's alpha values for the survey instruments that were used to gather data from medical professionals, medical representatives, and patients were more than 0.7, which indicates that the levels of reliability were adequate to excellent. The data that was acquired for this research is supported by this, demonstrating that it is trustworthy and consistent within itself.

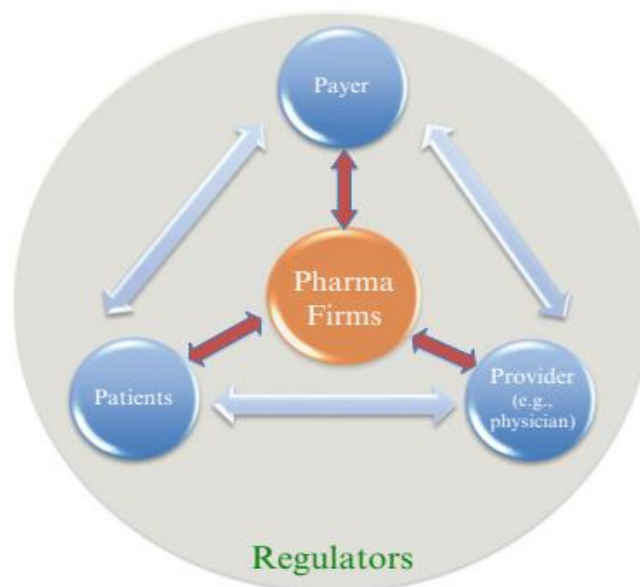
5 ANALYSES OF PROJECT PROPOSAL

This chapter provides an in-depth analysis of our study proposal. We'll explore the idea from different perspectives, including the time necessary for execution, related costs and expenses, and possible risks involved. Finally, based on these analyses, we will make specific recommendations for pharmaceutical companies, policy makers and doctors.

5.1 Introduction

The pharmaceutical market in Egypt is forecasted to achieve a revenue of USD 1,449.00 million in 2024. As of the most recent data, Egypt had 91,454 professional physicians in the governmental healthcare sector. This number has seen a gradual increase over the years (Statista, 2024). Healthcare System Reach: Egypt has an elaborate network with 95% of the population living within a 5 km distance from a nearby health facility (WHO Global health workforce statistics, 2019) which is crucial for the delivery of healthcare services to patients. Pharmaceutical companies must consider two conflicting characteristics/attributes of drugs in order to maximize the value of their innovations. This mission needs attentive management of the firm's relationships with three important players: patient, provider (e.g., physician), and payer, as well as their interactions within an environment governed by regulators. The user (patient) and the gatekeeper (physician) make a collaborative choice when purchasing pharmaceutical drugs. (Ding et al.,2014).

Figure 39: Key Players in the pharmaceutical market.

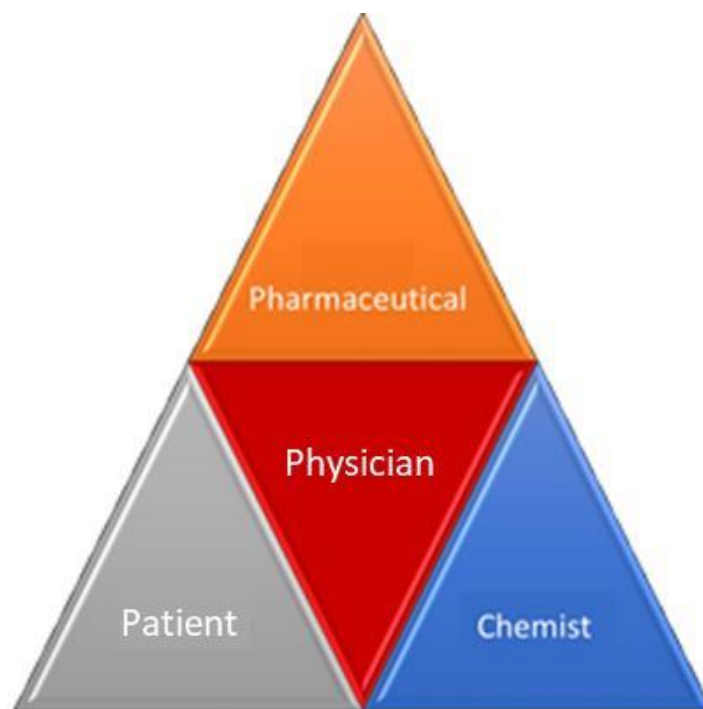


Source: Ding et al., 2014. Innovation and Marketing in the Pharmaceutical Industry

Here Egyptian pharmaceutical companies must carefully balance the opposing features of their medicinal products. On the one hand, they must fulfill the medical needs and expectations of the patients. On the other hand, they must consider the prescription preferences and ethical concerns of physicians, who function as gatekeepers in the healthcare system.

The most effective way to explain the interaction that exists between pharmaceuticals, physicians, patients, and chemists is through the use of a triangle hypothesis. As shown in Figure 38, the physician occupies the central position of the triangle and maintains active communication with all three aspects of the healthcare system. As a result of their position as the most influential members of the healthcare system, physicians are the primary target audience for all pharmaceutical businesses (Vishavadia, 2017)

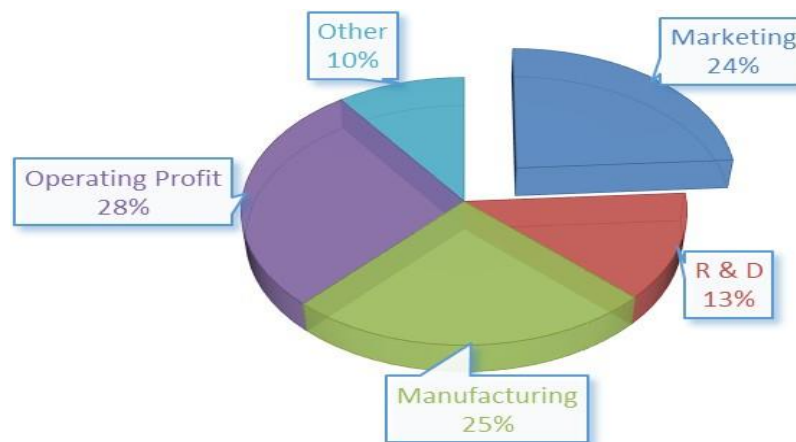
Figure 40: Pharmaceutical industry triangle theory.



Source: (Vishavadia,2017)

Our goal here is to provide actionable recommendations to leverage the triangle theory to foster stronger relationships, enhance communication, and deliver better health outcomes for patients in the Egyptian pharmaceutical market.

Figure 41: Expenditure spread of large pharmaceutical company.



Source: (Vishavadia,2017)

This pie chart suggests that a large company is focused on manufacturing and selling products, and that they invest a significant amount of money in marketing and R&D to support these activities. However, the relatively lower proportion R&D (13%) compared to manufacturing and marketing indicates that the industry's priorities might be oriented more towards commercialization rather than prioritizing research and innovation.

The Egyptian market, like numerous others, must balance drug development incentives with larger public health goals rather than only concentrating on commercial interests. To address this, Quigley advocates for the establishment of nonprofit, publicly funded research and development organizations to reduce the industry's reliance on profit-driven models. This is proposed to address the fundamental issues in the current profit-driven pharmaceutical industry and align the incentives of drug development more closely with the public benefit (Quigley, 2017). This could be a viable approach for the Egyptian pharmaceutical sector and could be implemented among other governmental health initiatives.

The SWOT analysis is considered to be a valuable tool in business management which offers a comprehensive assessment of the main strengths, weaknesses, opportunities, and threats in a business case. This analysis provides valuable insights that can guide us in giving recommendations as well as proposing solutions to enhance marketing practices in the Egyptian pharmaceutical sector.

Table 15: SWOT of Egyptian Pharmaceutical Market.

<u>Strengths</u>	<u>Weakness</u>
<ul style="list-style-type: none"> • Egypt has a well-established pharmaceutical manufacturing industry with low production and logistics costs compared to many other countries. • The expansion of the healthcare system and increasing per capita income in Egypt have created a growing demand for pharmaceutical products. • Providing opportunities for innovation by investing in digital transformation (Developing smart digital applications and platforms to enhance patient engagement and data driven decision making) • Egyptian strategic geographic location facilitates international trade and access to markets • Strong government support and policy initiatives to promote the growth of the pharmaceutical industry, such as tax incentives and investment subsidies. 	<ul style="list-style-type: none"> • Egypt faces deficiencies in its overall infrastructure, including transportation, electricity, and water supply, which can hamper the efficient operations of the pharmaceutical industry. • Lack of financial resources and incentives to invest heavily in advanced research and development activities. • Quality issues of some pharmaceutical products in the Egyptian market, undermining consumer confidence. • Limited access to skilled labor and expertise in biotechnology and pharmaceutical drug development • Fragmented regulatory framework and pose challenges for compliance with international quality standards • Inadequate healthcare infrastructure and limited access to medical facilities in rural and underserved areas, restricting the reach of pharmaceutical products.

<u>Opportunities</u>	<u>Threats</u>
<ul style="list-style-type: none">• Public-Private sector collaborations create opportunities and drive innovation in the pharmaceutical industry.• The developing number of patents on several drugs presents significant opportunities for the expansion of the generic drug market in Egypt.• Egypt's cost-effective manufacturing capabilities and geographic location make it an attractive destination for pharmaceutical exports to other African and Middle Eastern markets.• The growing population, increasing prevalence of chronic diseases, and governmental health programs increase further demand for pharmaceutical products	<ul style="list-style-type: none">• The Drug Price Control Order in Egypt can limit the pricing flexibility and competitiveness of pharmaceutical companies, affecting their profitability.• The regulatory framework and product approvals in Egypt can impose challenges for both local and international players.• Competition from Multinational companies putting pressure on local manufacturers.• Rising labor costs in the Egyptian market can reduce the cost-effectiveness of local pharmaceutical production

Source: (Own processing)

5.2 RECOMMENDATIONS

Even though preliminary research on physician behavior and pharmaceutical marketing may not always produce conclusive findings, However, this study's findings and observations can still be a viable tool to present actionable recommendations for pharmaceutical companies to enhance their marketing practices and improve promotion in an ethical manner.

Recommendations for pharmaceutical companies

This analysis dissects the findings of our study, differentiating between two key types of recommendations for pharmaceutical companies: internal recommendations which focus on controllable aspects within the company and external recommendations, on the other hand, which target aspects outside the company's direct control.

5.2.1 Internal recommendations

We can focus on three points first point educational content creation, second point ethical practices and third point transparency and data sharing.

Educational content creation

My study findings highlight those Egyptian doctors value educational content and receiving updated knowledge. By shifting promotional efforts towards providing valuable educational materials and medical education programs for doctors, pharmaceutical companies can establish themselves as a trusted source of knowledge and position themselves smartly among competition in addition to building positive relationships with doctors.

Ethical practices

According to my results, the weak correlation between frequency of Doctor-Rep visits and prescribing decisions suggests that doctors are wary of being influenced by marketing tactics. Therefore, companies should avoid misleading marketing tactics and focus on promoting medications based on their scientific merit and clinical efficacy.

Transparency and data sharing

Pharmaceutical companies, research institutions, and healthcare professionals should collaborate to facilitate data sharing for a better understanding of medication use and its impact on patient outcomes to achieve broad public health outcomes.

5.2.2 External recommendations

I am focusing on two points, smart mobile applications and targeted communications.

Smart mobile application for doctor engagement

Medical apps are defined as a subgroup of health apps that are capable of being used on mobile devices and have the same technological functions as health apps, which are the processing of data relevant to their users' health. A number of different user groups, including but not limited to health professionals, patients, and family caregivers, are the primary targeted user groups. Mobile apps are among the most advanced digital communication tools, and they can have a strong impact in the pharmaceutical industry regarding physicians' cognitive aspects and behavior. Since my results mainly focus on education, transparency, and ethical communication, a smart mobile application for doctors' engagement with Egyptian pharmaceutical companies can be a powerful tool. I suggest a mobile application prototype to facilitate two-way communication between doctors and medical representatives. The app can also offer interactive educational features like drug dosage calculators and real case studies. This initiative can create a more engaging learning experience compared to traditional promotional materials.

Targeted communication

It is important for pharmaceutical corporations to come up with methods of focused marketing and communication that are specifically designed for face-to-face encounters with medical professionals. It is possible that this may mean putting more of an emphasis on data-driven presentations, case studies, and product demos. Based on the fact that medical professionals place a high value on human connection, it is possible that interactive training events or webinars that are conducted by medical experts might prove to be a successful approach.

5.2.3 Recommendations for policymakers

I focused on regulating medical representative interactions and Encouraging transparency.

Regulating medical representative interactions

Politicians might set certain criteria for how these representatives interact with doctors. These guidelines may govern the content of their talks and restrict the frequency of their visits. For example, a doctor may be limited to a particular number of visits by representatives pushing a certain medicine within a given term. Some, like Quigley (2017),

seek more comprehensive steps to limit the industry's overall impact on policy. These might include curbs on pharmaceutical firms' political donations and direct consumer advertising of prescription medications. By establishing explicit boundaries and perhaps lowering the industry's overall influence, these laws attempt to guarantee that physicians' prescription decisions are largely based on a patient's requirements and the most recent medical evidence.

Encouraging transparency

Transparency is essential for building confidence in the interaction between physicians, pharmaceutical corporations, and the public. One approach to do this is to require pharmaceutical firms to report all gifts and promotional costs given to physicians. Mandatory reporting requirements or the establishment of a centralized public database might help to facilitate this disclosure. This idea is consistent with the openness and accountability procedures argued for in Quigley's book, "Prescription for the People"(2017). Making this information widely available allows clinicians and patients to obtain a better awareness of potential biases and make more educated decisions. Furthermore, public inspection of such data might encourage pharmaceutical companies to concentrate their efforts on creating and marketing novel and important treatments. Supporting patient educational initiatives by increasing funding for independent medical education programs for doctors. This can help ensure doctors stay updated on the latest advancements without relying solely on pharmaceutical company information.

Recommendations for Healthcare Professionals

Maintaining professional integrity and prioritizing patient well-being should always be the primary concern for doctors when evaluating new pharmaceuticals. Doctors should be careful of information that pharmaceutical reps provide. For unbiased information about new pharmaceuticals, doctors should seek knowledge from professional medical societies and independent research. In addition to this, doctors must maintain clear boundaries with sales representatives. Doctors can limit the frequency of meetings with pharmaceutical representatives and focus discussions on specific medical queries rather than general product promotion and branding.

5.3 Cost Analysis

Table 16: Cost Analysis for Smart Mobile Health App (1 year plan 2024-2025).

Category	Description	Estimated Cost
App Development	Turning your idea into a user-friendly app for doctors by one year	~\$150,000
	Includes: Planning & Design, Features & Content, Development	
	Ongoing Costs (2024-2025) for one year	~\$50,000
	Includes: Maintenance & Updates for one year	
Social Media Marketing	Attracting doctors through social media channels for one year	~\$50,000
	Content Creation (developing engaging social media posts by year	Included
	Paid Advertising (targeted ads to reach relevant doctors) for one year	Varies
	Community Management (interacting with doctors on social media) for one year	Included
Total		\$250,000

Source: (Own Processing)

To optimize our budget allocation, we can look for ways to reduce costs while retaining the usefulness and value of the smart mobile health app for physician interaction. One way is to prioritize the development of core features that directly contribute to improving doctors' experience and satisfaction with the app while keeping additional features after gathering user feedback. We can speed up the development process and better allocate resources by focusing on critical functionalities that fit with doctors' demands and preferences. Furthermore, using open-source software tools might provide a cost-effective solution for

certain parts of app development, such as backend infrastructure or data management systems. Open-source solutions not only lower license costs, but also give you access to a community-driven ecosystem of developers and contributors, which promotes innovation and cooperation. Furthermore, rather than depending entirely on sponsored social media advertising, we can investigate organic marketing tactics to boost the app's visibility and attract users from the medical community. Organic marketing strategies, like content marketing, search engine optimization (SEO), and community interaction, can help us build a devoted user base while reducing advertising costs. By generating valuable and relevant material that appeals to doctors' interests and concerns, we can establish the app as a reliable resource in the healthcare business. Engaging with medical professionals via online forums, professional networks, and industry events can also result in word-of-mouth referrals and organic development.

Cost savings to pharmaceutical companies

The smart mobile health app for doctor engagement has significant potential to bring cost savings and financial benefits for the pharmaceutical companies. First the app can replace traditional marketing methods like sending out sales representatives or hosting physical conferences for doctors. This can lead to significant cost savings on travel expenses and promotional materials. Secondly, by providing quality educational content directly to doctors on their smartphones (which is in alignment with our study findings), the app can improve the efficiency of sales process and make the medical representatives interaction with doctors more efficient and focused compared to basic promotional information dissemination. Lastly, by providing doctors with up-to-date information and potentially promoting scientific evidence, the app can contribute to improved patient outcomes. This can also potentially translate into increased credibility and brand reputation for the pharmaceutical company in the long run.

5.4 Time Analysis

This timeline provides a general framework for the research project, allowing for sufficient time to thoroughly review the literature, design the study, collect, and analyze the data, and effectively communicate the study findings.

Table 17: Proposed timeline for the project proposal.

Time Period	Activities
Month 1	Perform an extensive review of the current state of literature on prescribing behavior-influencing factors, physician-industry relationships, and pharmaceutical marketing. Complete the research questions, hypotheses, and objectives.
Month 2	Design the survey instrument and data collection methodology. Obtain necessary approvals and ethical clearances.
Month 3-5	Identify and recruit the target sample of physicians practicing in the Egyptian market. Distribute the survey questionnaire. Monitor the data collection process and ensure a high response rate.
Month 6-7	Export the survey data and prepare it for statistical analysis. Conduct descriptive analyses and perform inferential statistical tests to examine relationships between variables and test hypotheses
Month 8-10	Organize the research findings and insights into a well-structured report. Develop recommendations for pharmaceutical companies, policymakers, and healthcare professionals based on the study's conclusions. Prepare a presentation and disseminate the research findings through academic channels (e.g., conferences, peer-reviewed publications).
Month 11-15	Begin development of the smart mobile app for doctor engagement. Conceptualize features, design, and user interface. Conduct iterative development and refinement based on user feedback, including physicians and medical representatives.
Month 16-20	Perform usability testing and analyze testing results and refine the app based on feedback and performance metrics. Finalize features for launch.

<p>Month 20-24</p>	<p>Launch the smart app in the Egyptian market. Develop marketing strategies to promote among physicians and medical representatives while constantly monitoring app performance and collecting user feedback</p>
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Source: Own Processing

The time already invested in survey development, data collection, and initial analysis represents a significant commitment. While further analysis of the existing data might be tempting, it's crucial to weigh the potential benefits against the time investment.

A more strategic approach would be to leverage the learnings from the initial study to design a new investigation with a clear timeline keeping into consideration that utilizing online survey platforms can be an efficient tool to streamline data collection and increase response rates. Moreover, collaboration with other experts and researchers can be immensely valuable when developing a robust survey. Since both doctor and medical rep time is invested in these interactions, this strategy can be less time-consuming for doctors freeing up valuable time for patient care.

5.5 Risk Analysis

To grow their market share and profits, pharmaceutical companies in Egypt are investing in a range of marketing initiatives. Because of this, the majority of these businesses allocate large sums of money to a range of advertising techniques in an effort to increase brand awareness and grow the customer base. In a different context, however, as (Alowi & Kani, 2018) notes, the majority of pharmaceutical companies seem to be utilizing trial-and-error marketing strategies that expose them to a range of risks. To address this issue, the following marketing risk analysis and management plan provides a comprehensive framework for the Egyptian pharmaceutical sector.

Table 18: Risk management plan for pharmaceutical company.

Risk Type	Description	Likelihood	Impact	Mitigation Strategies
Health Risk	Patients receiving prescriptions influenced by promotional tools rather than effectiveness, leading to adverse health outcomes.	High	High	<ul style="list-style-type: none"> - Promote the company's commitment to patient-centric values. - Monitor prescription patterns for any abnormalities and take corrective actions. - Conduct post-marketing surveillance and report any adverse events. - Prioritize product safety and efficacy over promotional efforts.
Financial risks	Ineffective promotional tools or excessive investment in a marketing campaign can lead to reduced profitability and wasted resources.	High	High	<ul style="list-style-type: none"> - Conduct market research to understand target segment - Optimize marketing mix elements. - Use Data driven approach: for example, calculate the (ROI) of each promotional tool. - Diversify promotional channels to mitigate over-reliance on any single approach.

Risk Type	Description	Likelihood	Impact	Mitigation Strategies
Unethical Marketing Practices	Pharmaceutical companies using aggressive marketing tactics like offering gifts, samples, and incentives to influence physician prescription behavior.	High	High	<ul style="list-style-type: none"> - Follow code of conduct for pharmaceutical marketing practices. - Provide training to medical representatives on ethical behavior. - Regulate and monitor marketing interactions between companies' representatives and physicians. - Educate physicians on identifying and resisting biased influence from marketing tactics.
Competition Risk	Promotional tools fail to differentiate company's products and compete with other brands.	Medium	Medium	<ul style="list-style-type: none"> - Conduct competitive analysis. - Monitor market trends and customer behavior. - Invest in innovation and value proposition. - Develop a unique selling proposition and brand image.
Loss of Physician Trust	Physicians becoming distrustful of marketing information and develop a negative image of the company.	High	High	<ul style="list-style-type: none"> - Encourage transparent, evidence-based marketing communication. - Invest in building long-term, collaborative relationships with physicians - Empower physicians to make ethical prescribing

Risk Type	Description	Likelihood	Impact	Mitigation Strategies
				decisions. - Implement feedback mechanisms to address physician concerns.
Technology Risks (Smart App Failure)	Failure or malfunctioning of smart apps designed to support doctor engagement and patient promotion.	Med	High	- Implement robust quality assurance and testing processes for digital tools. - Develop contingency plans and backup systems to mitigate disruptions. - Provide comprehensive user training and support for digital tools. - Continuously monitor and address user feedback and technical issues

Source: own processing based on (Youssef & Amin, 2023) and (Vishavadia.,2017)

Future Research areas

This study's findings can only be interpreted broadly in terms of understanding the impact of pharmaceutical promotional tools on doctors' prescription choice. The current study focuses on a particular group of doctors. To have a more complete view of how pharmaceutical marketing impacts prescription decisions, the research scope has to be expanded. This might include medical professionals other than physicians, such as dentists, nurses, and physician assistants. Each profession may have unique contacts with pharmaceutical corporations and varying degrees of sensitivity to promotional influence. Furthermore, looking at different medical specialties, such as cardiology, oncology, or pediatrics, might reveal differences in prescribing trends depending on specific treatment areas.

Extending the study to various Egyptian areas can offer a more comprehensive picture of how local characteristics impact doctors' responses to pharmaceutical advertising. Differences in healthcare infrastructure, drug access, and the existence of local

pharmaceutical companies throughout Egypt's regions may influence how doctors perceive and respond to promotional techniques. Conducting the research in a variety of regional contexts around the country would increase the validity of our findings and allow us to draw more strong conclusions regarding the influence of local pharmaceutical advertising on prescription patterns in Egypt.

In order to get a more thorough understanding of the topic at hand, it is necessary to perform an additional stage that involves the implementation of a mixed strategy that combines qualitative approaches (interviews with doctors) and quantitative methods (structured surveys). Including the cultural factor in our research methodology would be another aspect that would be considered in order to uncover the distinctions in consumer behavior that exist between Egypt and other developing countries around the Middle East.

By addressing these limitations and incorporating the suggested next steps, our research has the potential to significantly improve our understanding of how pharmaceutical promotion influences doctors' drug choice and prescribing behavior within the Egyptian context and beyond.

CONCLUSION

Pharmaceutical corporations' promotional activities may influence doctors' drug choices, potentially favoring promotional methods over pure scientific knowledge. It is the purpose of this thesis to study this matter. The most important research question that underlies this study is as follows: To what extent do the advertising activities of pharmaceutical corporations influence the choices that physicians in the Egyptian market make about the medications that they prescribe?

An interesting finding suggests that representatives prioritize providing updated drug information over simply promoting brands, it aligns with the ethical responsibility of the pharmaceutical industry to prioritize clinical knowledge and patient welfare. To further strengthen this orientation, companies should consider implementing robust performance evaluation systems that incentivize representatives based on their ability to enhance doctors' medical knowledge, rather than just sales targets.

There is a lack of a strong correlation between visit frequency and doctors' dependence on representatives as the sole information source which indicates that doctors utilize a more diverse set of resources to stay informed. Therefore, it is recommended that pharmaceutical companies should focus on integrating their representatives' activities within a broader, multi-channel marketing strategy that includes digital and peer-to-peer knowledge-sharing platforms.

Our findings also indicate that Egyptian medical professionals appear to find presents more acceptable than being neutral. This suggests companies should set clear and open standards on proper gift-giving practices that maintain a balance between ethical considerations and professional interactions.

The significant association between representatives' promotional focus and the perceived effectiveness of face-to-face interactions highlights the importance of tailoring the content and delivery of promotional messages to the specific needs and preferences of the target audience. Companies should invest in ongoing market research to understand evolving doctor and patient expectations and empower their representatives to adapt their communication strategies accordingly.

From the patient perspective, the prominence of internet and pamphlets as perceived promotional tools suggests the need for pharmaceutical companies to strengthen their digital and educational marketing efforts. Additionally, the finding that patient gender influences the perceived impact of family recommendations emphasizes the importance of segmenting and tailoring promotional campaigns to address the unique needs and preferences of different patient demographics.

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LIST OF ABBREVIATIONS

ADHD – Attention-deficit hyperactivity disorder

AI - Artificial Intelligence

BPM- Business process management

CSS- Cross sectional survey

DtCC- Direct-to-consumer communications

FAO - Food and Agriculture Organization of the United Nations

GDP - Gross Domestic Product

GNI - Gross National Income

IT - Information Technology

MEA - Middle East and Africa

MR- Medical representative

PPP - Purchasing Power Parity

R&D - Research and Development

SAQ- Self-administered questionnaire

SEO-Search engine optimization

SPSS - Statistical Package for the Social Sciences

WHO - World Health Organization

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APPENDICES

Appendix 1: Questionnaire to identify impact of various promotional practices of pharmaceutical companies on doctors' drug choice

You are invited to participate in a research study about the impact of various promotional practices done by pharmaceutical companies on doctors' prescription behavior. The research is part of my master's research in the department of economics at Tomas Bata University in Zlin. The project aims to assess the promotional practices by pharmaceutical companies, examining doctors' drug choice.

Thank you for your valuable contribution to our research.

1.How often do you interact with medical representatives of pharma companies?

Daily

About twice a week

Twice monthly

Monthly

Rarely

2.Do you think that medical representatives visit is the only way to learn about new drugs?

Yes

No

3.Do you think that discussions with medical representatives have an impact on your prescribing?

Yes

No

4.Do receiving promotional tools impact your decision-making about certain product/brand?

Yes

No

5.How do medical representative gifts (e.g. birthday presents, Christmas presents) affect the attitude towards the company? (1-Do not affect, 5- Effect the highest)

6.Have you anytime read guidelines about interacting with pharmaceutical industry or its representatives?

Yes

No

7. What is your opinion about endorsing any drug or drug product publicly?

(1 Strongly Disagree, 2 Disagree, 3 Neither agree nor disagree, 4 Agree, 5 Strongly Agree)

8. Do you think that promotional prices or free samples may change your prescription behavior?

(1 Strongly Disagree, 2 Disagree, 3 Neither agree nor disagree, 4 Agree, 5 Strongly Agree)

9. State whether you agree or disagree with the following statements:

(1 Strongly Disagree, 2 Disagree, 3 Neither agree nor disagree, 4 Agree, 5 Strongly Agree)

- Free samples are used to help financially weak patients.,
- Free samples are used to try and research the effectiveness of the new drugs.?
- Do patients request prescribing affordable medicines?
- As a doctor, I see that the focus of medical representatives in the promotional area is only selling their product
- As a doctor, what makes me choose between two drugs is basically the advantages of that drug only.
- As a doctor, I need to learn and do complete research about the scientific background of the product before I prescribe it
- Medical representatives are capable of explaining formulation advantages of their drugs to doctors.
- Free samples are used to help financially weak patients.,
- Free samples are used to try and research the effectiveness of the new drugs.?
- Do patients request prescribing affordable medicines?
- As a doctor, I see that the focus of medical representatives in the promotional area is only selling their product
- As a doctor, what makes me choose between two drugs is basically the advantages of that drug only.

- As a doctor, I need to learn and do complete research about the scientific background of the product before I prescribe it
- Medical representatives are capable of explaining formulation advantages of their drugs to doctors.

10. Rate the frequency with which the following promotional tools motivate you to prescribe a certain product:

(Options for each: 5 Always, 4 Often, 3 Sometimes, 2 Rarely, 1 Never)

- Educational materials
- Sponsored conferences
- Drug samples
- Stationary items
- Textbooks
- Personal gifts
- Financial incentives
- Sponsored research opportunities
- Invitations to international conferences
- Other

11. Does the availability of generic drug options change your prescribing practices?

Yes

Sometimes

No

12. How impactful are conferences and seminars on your prescribing behaviors?

(1 Strongly Disagree, 2 disagree, 3 Neither agree nor disagree, 4 agree, 5 Strongly Agree)

13. Views on the acceptability and justifiability of receiving gifts from pharmaceutical companies:

Acceptable and justifiable

Acceptable under certain conditions

Unacceptable

14. Is there a need for stronger ethical norms in interactions between physicians and the pharmaceutical industry?

Yes

No

Unsure

15. Should medical representatives be certified to ensure they provide accurate and beneficial information?

Yes

No

Unsure

16. Do you believe the frequency of visits by pharmaceutical representatives should be regulated?

Yes

No

Unsure

17. What are your views on doctors being invited to international congresses by pharmaceutical companies?

Ethical and beneficial

Conditional upon the nature of the event

Unethical and potentially biased

18. Gender

Male

Female

19. Age

less than 25

25-35

36-45

more than 46

20. Marital status

Single

Married

Divorced /widow

21. Nationality

Egyptian

Other

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Ventola CL. Direct-to-Consumer Pharmaceutical Advertising: Therapeutic or Toxic? *P T*. 2011 Oct;36(10):669-84. PMID: 22346300; PMCID: PMC3278148.

Appendix 2: Questionnaire to identify medical representatives' role in drug promotion

You are invited to participate in a research study about the impact of various promotional practices done by pharmaceutical companies on doctors' prescription behavior.

The research is part of my master's degree research in the department of economics at Tomas Bata University in Zlín. The project aims to assess the promotional practices by pharmaceutical companies, examining doctors' drug choice.

Thank you for your valuable contribution to our research.

1. State whether you agree or disagree with the following statements:

(1 Strongly Disagree, 2 Disagree, 3 Neither agree nor disagree, 4 Agree, 5 Strongly Agree)

- Medical representative updates doctors' knowledge about drugs

- Manufacturers promote brands or some medications only to make profit
- Doctors and other health professionals are aware of which online/offline information channels are used by patients or consumers to learn about medicines, or buy those medicines
- Healthcare campaigns are helpful and successful
- It is good to refer medicine by face-to-face talking
- Referring medicine by using brochures and stickers or other stationeries is helpful
- The best way to promote any new medicine is to give free samples
- Gift acceptance by physicians influences their prescription patterns.
- The best way for referring medicine to someone with the reference of different medical articles or journals helps to promote this medicine
- Referring medicine is participating during new product launching makes it more effective

2.What type of information do you prioritize during your medical promotion activities?
(Select all that apply)

Approved drug indications

Brand name

Drug interactions

Side effects

Price

Contraindications

3.What is the primary focus of your medical promotions? (Select one)

Selling points

Differential advantages

Scientific background

Formulation advantages

4.How do you typically present competitors' products during your promotions?

Negative Attitude

Neutral

Positive Attitude

5.Perceptions on Pharmaceutical Promotions: State whether you agree or disagree with the following statements:

(1 Strongly Disagree, 2 Disagree,3 Neither agree nor disagree,4 Agree,5 Strongly Agree)

- Pharmaceutical marketing promotion and advertisements increase the price of the drug
- Pharmaceutical promotions create some sort of overuse of drugs
- Patients benefit from pharmaceutical advertising
- Advertisements change patients demands and behavior
- Advertisement put pressure on doctors to prescribe advertised medicines
- Pharmaceutical promotions are beneficial for doctors and other healthcare providers
- Do you agree with regulating the number of MRs visits to doctors?
- Do you agree with pharmaceutical companies inviting doctors to international conferences

6.The best way for referring medicine to some person with the reference of different medical articles or journals helps to promote this medicine

(1-strongly disagree, 5- strongly agree)

7.Patients benefits from pharmaceutical advertising

(1-strongly disagree, 5- strongly agree)

8.Advertisements change patients demands and behavior

(1-strongly disagree, 5- strongly agree)

9.Gender

Male

Female

10.Age

less than 25

25-35

36-45

More than 46

11.Nationality

Egyptian

Other

12.Education level

High education

Schooling

Medical related education

13.Marital status

Single

Married

Widow/divorced

14.Profession

Health professional

Medical representative

Other

Ali, K.E., Naser, A.Y., Al-Rousan, R. et al. The attitude and acceptability towards medical promotional tools and their influence on physicians' prescribing practices in Jordan and Iraq: a cross-sectional study. *BMC Health Serv Res* 22, 105 (2022).

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PMID: 27304215; PMCID: PMC4911221.

Appendix 3: Survey form for public

You are invited to participate in a research study about the impact of various promotional practices done by pharmaceutical companies on doctor's prescription behavior. The research is part of my master's degree research in the department of economics in Tomas Bata University in Zlin. The project aims to assess the promotional practices by pharmaceutical companies, examining doctors' drug choice.

Thank you for your valuable contribution to our research

1.How much does pharmaceutical advertisements on television influence you or effect on your thinking about drugs?

Excellent

Good

Average

Poor

Very poor

2.What do you think of the effectiveness of medicines or pharma products advertisement on radio?

Excellent

Good

Average

Poor

Very poor

3.How much do you find drugs or pharmaceutical products advertisement in journals / newspaper /magazines / health related magazines effective?

Excellent

Good

Average

Poor

Very poor

4.How much do you think that drugs or pharmaceutical products advertisements on the internet / social media/ YouTube effective?

Excellent

Good

Average

Poor

Very poor

5.How much do you find medicine pamphlets / leaflets effective *

Excellent

Good

Average

Poor

Very poor

6.How much are family members or friends effective when they try to suggest some medicine?

Excellent

Good

Average

Poor

Very poor

7.State whether you agree or disagree with the following statements:

(1 Strongly Disagree, 2 Disagree,3 Neither agree nor disagree,4 Agree,5 Strongly Agree)

- Medicine or drugs which are shown in advertisement or promoted are better than non-advertised drugs

- Pharmaceutical advertising encourages patient to decide on their choice of drugs without help of a healthcare professional
- The quality of a particular product depends on the frequency of advertising activities
- Pharmaceutical advertising increases drug cost
- Advertisements of pharmaceutical drugs make me have a better discussion with my doctor about my health
- Pharmaceutical advertisements/promotional tools help me in general to gather more knowledge about my health
- Pharmaceutical advertisements make learn more about my health condition and help me to make a better decision about my health
- Pharmaceutical advertisement helps me to know about new drugs available in market.
- I trust brands that are more frequently advertised more than those prescribed by doctors
- Advertisements of pharmaceutical drugs do not give enough information about the possible risks and side effects of using the drug
- I prefer only over the counter drugs (drugs deal with symptoms not disease) advertised to public.
- As a common person the first concern for me when buying drugs is the cost
- I so often ask my doctor to prescribe an advertised or promoted drug
- I will consult another doctor if he is continuously prescribing expensive drugs
- I prefer known brands which I regularly hear about via various modes of promotion despite their high price.
- I will change my current medication to a more frequently advertised medicine
- I will buy pharmaceutical products on sale regardless their expiry date
- I so often buy pharmaceutical drugs advertised without asking my doctor
- I would recommend advertised drugs to my friends and family members

- Drugs advertised are more at risk to be misused unaware of side effects / dose / and medicine interaction possibilities

8. Gender

Male

Female

9. Age

Less than 25

25-35

36-45

More than 46

10. Nationality

Egyptian

Other

11. Education level

Postgraduate

Graduate

Schooling

Other

11. Marital status

Single

Married

Widow/divorced

12. Profession

Medical profession

Other

Semin S, Güldal D, Ozçakar N, Mevsim V. What patients think about promotional activities of pharmaceutical companies in Turkey. *Pharm World Sci.* 2006

Aug;28(4):199-206. doi: 10.1007/s11096-006-9032-8. Epub 2006 Oct 26. PMID: 17066242.

Ventola CL. Direct-to-Consumer Pharmaceutical Advertising: Therapeutic or Toxic? *P T.* 2011 Oct;36(10):669-84. PMID: 22346300; PMCID: PMC

Appendix 4: Smart health app interface



Appendix 5: Smart health app logo



