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Promotion of Prescription Drugs and Its Impact on Physician's Choice Behavior

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Abstract

Purpose: Aims to determine the most effective promotional tools putatively influencing physicians' prescription behavior by examining five commonly-used promotional tools: sales promotions; advertising; public relations; direct marketing; and personal selling. Specifically aims to evaluate which medical practitioners' demographic factors influence the relationship between the various promotional tools and physicians' prescription behavior.

Design/methodology/approach: A cross-sectional research design is proposed, based on the stimulus-organism-response (S-O-R) paradigm, in which the data is to be collected through questionnaires completed by physicians in Sudan, using a five-point Likert scale. Structural equation modeling, using AMOS statistical software, is proposed to analyze the data.

Findings: A detailed literature review reveals that most previous research has largely ignored demographic factors when studying the effectiveness of the promotional tools used by pharmaceutical companies. Therefore, a novel methodology is proposed to incorporate these factors into future research.

Practical implications: The anticipated results will help pharmaceutical companies formulate better strategies regarding the use of promotional tools to maximize their investment.

Originality/value: Inadequate knowledge of factors and tools that are likely to influence the sale of drugs negatively affects the success of the company and its market share. Undertaking the current study, and using the same methodology in other regions, especially developing countries, will add to the current literature on pharmaceutical marketing. Unlike most previous research, the methodology proposed in this paper includes demographic factors that influence the effectiveness of these promotional tools.

Keywords: Pharmaceutical companies; Physicians' prescribing patterns; Promotional tools; Marketing tools; Effectiveness; Demographic factors; Sudan

Introduction

The global pharmaceutical industry is one of the most important driving forces of, and dominant players in the global modern economy, securing approximately one trillion US dollars in revenues every year. According to the International Trade Administration (2016), in the past decade, the pharmaceutical market has consolidated its position as one of the fastest growing markets in the world, with the US, China, and Japan ranked as the first, second, and third largest pharmaceutical markets in the world, respectively. However, as noted by competition in this large pharmaceutical market is intense [1]. Therefore, most pharmaceutical companies spend more than one-third of their sales revenues on marketing, which is approximately double the amount they spend on research and development, in an attempt to retain and maximize their market share. Pharmaceutical marketing is unique and diverse compared to other forms of general marketing, since the focus is on the physicians as opposed to the patients. As [1,2] have acknowledged, market strategies in non-pharmaceutical sectors are easier to study and understand, as it is the clients who decide on the product they wish to purchase. The pharmaceutical industry, however, is faced with a complex situation in which the customer is not the client. Physicians, therefore, are the chief players in pharmaceutical marketing since they specify the prescriptions to be used by the patients. As a result, pharmaceutical organizations understand that it is crucial to influence the prescription behavior of physicians by utilizing different types of promotional tools, such as sales promotion, public relations, direct marketing, personal selling, and advertising [3]. Although there are several information resources available to physicians, growing evidence from the literature indicates that pharmaceutical companies often attempt to influence the information that reaches physicians. For instance, [4] argued that promotions to physicians by pharmaceutical companies have a direct influence on drug choices and prescriptions issued for a particular drug. Hence, physicians do not seem to widely use alternative information resources such as medical journals and formularies. Instead, information is mainly obtained from promotional packages, company medical representatives (MRs), and sponsored workshops. This trend has been observed to be particularly true in less developed and developing countries, where representatives from pharmaceutical companies are the only source of information on the latest developments in medication and therapeutics [5,6] have also pointed out that most promotional activities undertaken by pharmaceutical corporations are crucial sources of information for care providers. As a result, the availability of regular and up-to-date information has enormous educational value for physicians in ensuring that optimal care is delivered.

However, the same sources of information have been criticized

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by several scholars as biased, and some can compromise the integrity of care providers [7,8]. In some cases, researchers, such as [9] have reported potential ethical and integrity issues that are likely to emerge from promotional messages sponsored by pharmaceutical companies. For their part, pharmaceutical companies argue that their promotions are used to improve both their product development and medical research [10,11] have also pointed out that pharmaceutical promotions are often correlated with the growth of global competition for product sales and market share in the healthcare industry [12]. As a result of this growing competition, the survival of pharmaceutical companies' business operations largely relies on the quick adaptation to changing business practices, process management, and regular product promotions. Therefore, the primary corollary is that, as the size of pharmaceutical market increases following the introduction of new products, companies must continuously adopt new techniques and tools to retain their market share and survive fierce competition [13].

Since the main customers of pharmaceutical industries are physicians and other medical practitioners, these care providers are perceived by pharmaceutical companies as the ultimate decision makers regarding which drugs should be prescribed to patients [12].

Pharmaceutical companies have, therefore, used different marketing tools to draw physicians' attention to pharmaceutical products and influence the decisions made regarding adopting and using these products [14]. Some of the traditional marketing tools that pharmaceutical companies have used include product promotions, price, differentiation, and other incentives [15]. Some of the promotional techniques that pharmaceutical companies have used to maximize their profit margins are informed by two factors: the need to promote specific drugs; and the need to enhance company reputation through stronger relations with physicians [16]. However, a pharmaceutical company that improves its reputation is likely to sell more drugs, while a company that enhances the sale of specific drugs will also have improved chances of acquiring a positive reputation [17]. As an effective way of promoting specific drugs, companies use drug advertisements mainly in formularies and medical journals. Other promotional tools used include presentation on new drugs at workshops and conferences, sending direct mails to physicians, sending MRs, and giving physicians free samples to distribute to patients [15]. One of the common approaches is the use of MRs, with the largest portion of the pharmaceutical budget for drug promotions being spent on this [18]. In part, MRs give detailed information about the new medications to care providers and also act as a support team in answering their queries. Besides the information provided orally by the MRs, they also give expensive gifts, such as buying dinners or lunches when they visit, or even more exclusive and lucrative gifts, such as event tickets, electronic devices, sponsored travel, meals and vacations for families, educational seminars, honorariums to promote the product at events, and funding for research projects [19]. Compared to investment in research and development, pharmaceutical companies place a high value on product promotion and marketing techniques [15]. In most cases, these companies spend a large proportion of their resources targeting physicians to increase their market share and profitability. These elevated costs for marketing are ascribed to the fact that most companies are not quite sure of the marketing technique that works best for them, therefore employing several methods, some of which are ineffective though costly [1]. In Sudan, pharmaceutical companies have been investing in numerous promotional tools to raise their market share and make more profits. As a result, most of these companies allocate large budgets for the various promotion tools as they seek to gain popularity and expand their market base. Indeed, as noted [1] although in a different context, most pharmaceutical companies appear to be employing trialand- error marketing strategies that leave them open to various risks, including inadvertently raising the profile of the competition, missed opportunities, failing to clearly understand the target market, and wasting valuable time and resources. Clearly, investing in a variety of marketing and promotional tools, some of which are ineffective, increases the costs borne by the company and reduces profitability.

Research Gaps and Objectives

The primary purpose of this study is to assess how promotional tools influence physicians' prescription patterns and behaviours. Marketing tools are considered to be key determinants in influencing a doctor's choice for a specific pharmaceutical brand [20]. Reported that physicians' decisions regarding the use of a specific drug could be influenced by the distribution of free drug samples by MRs or during conferences sponsored by companies. However, the study failed to elaborate on how demographic factors such as gender, age, and area of medical specialization by physicians influence their choice for a specific drug. Instead, the authors only used demographic factors to present sampling strategies and descriptive statistics of the participants that took part in the research. Recently, a cross-sectional study by [21] was performed to assess the influence that MRs have on prescription practices among physicians in Northern Ethiopia. The study enrolled physicians from the Mekelle region, both from the public and the private health sectors. The researchers found that 48.2% of the enrolled physicians believe that their decisions regarding prescribing specific drugs are influenced by regular hospital visits by MRs. Moreover, it was noted that physicians who accepted gifts from MRs were six times more likely to prescribe the recommended drugs than physicians who turned down these gifts [21]. The study found that incentives that were reported to influence physicians' prescription decisions were the availability of free drug samples (54.2%) and gifts, such as stationery materials (35.4%) from MRs. However, added that another approach that was commonly used to influence physicians' prescription decisions was the use of face-to-face meetings with MRs. During these meetings, the study reported that 39.0% of MRs gave negative reviews of their competitors' drugs. Despite the elaborate cross sectional research, the authors did not detail how gender, age, and specialty of the assessed physicians were factors in influencing the prescription decision for specific recommended drugs. The authors limited their study to MR visits, gifts (including stationery materials), drug samples, and face-to-face meetings, and failed to establish a correlation between demographic factors and physicians' motivation to alter prescription decisions. Similar to these studies [17,20,21] have also investigated pharmaceutical marketing tools likely to influence physicians' prescription decisions, noting that companies promote their drugs using four main approaches: gifts; printed information about the product; use of MRs; and providing free drug samples to enhance product acceptability among physicians [22]. A similar trend was observed by [23], who found that most physicians were given coffee mugs, notepads, and pens to act as reminders of the targeted drugs. Other scholars agree that the interaction between companies and physicians goes beyond financial support for the facilitation of medical research and education [24,25]. However, these studies also limited their research focus to material incentives provided by the companies to physicians in investigating the relationship between promotional tools and the prescription decision. There was little focus on understanding how the age of participants, their gender, or career specialization informed their prescription patterns based on pharmaceutical marketing tools. In Massachusetts, [18] investigated

factors that impact physicians' prescription behavior and concluded that communication by MRs regarding the product, access to and availability of the product itself, as well as the price of the drug influence decisions and prescription patterns. The physicians who took part in this study pointed out that the name of the pharmaceutical company, and novel drugs, including new combinations and formulations, also motivated physicians' choice during prescription. Further analysis [26], argued that pharmaceutical sponsorships, in the form of free medical camps, conferences, sponsored meals, research and education, and free drug samples also influence decision making regarding prescriptions. The shortcomings of the studies were that they were only confined to promotional incentives and tools used by pharmaceutical companies, while physicians' demographic factors, and how these affected prescription decisions were not analyzed [27]. Performed a survey in Germany and found that free lunches, pharmaceutical samples, and gifts, such as office stationery, were commonly used to promote drugs. They noted that pharmaceutical industries employ diverse strategies to persuade and motivate physicians to choose a specific drug [28,29]. However, the authors noted that physicians appear to ignore such external influence from pharmaceutical companies. However, it is apparent from the literature survey that MRs exert growing influence on the physicians' selection of particular drugs. For example, the location of medical practice have also been reported to influence how physicians perceive pharmaceutical marketing, thus affecting drug choices and future prescriptions [30]. Further, both private and public medical facilities have been reported to be potentially influenced by marketing tools employed by pharmaceutical companies, such as MR visits and face-to-face meetings [31,32]. However, again, demographic factors were neglected in these studies, with the focus exclusively on promotional strategies. Further, Datta and Dave [4], reviewed prescriptions based on a free sample and found that physicians tend to use the same drug in subsequent prescriptions [30] meanwhile, reviewed the behavior among care beneficiaries that have financially-capped drug prescriptions. The authors found that availability of free drug samples from pharmaceutical companies influences the behavior of medical beneficiaries and decisions for specific medications. In most cases, doctors appear not to consider accepting gifts like pens, notepads, or sponsored dinners as unethical practices, and tend to assume that drug companies do not influence prescription decisions [7,8]. Instead, physicians tend to note that such incentives from pharmaceutical companies serve as indirect requirements in their educational programs and drug-prescription processes [33]. However, a gap in the literature still exists regarding the demographic data of the surveyed physicians. The shortcomings of these studies highlight the need to study how demographic factors motivate physicians' prescription behavior. The current paper, conceptual in nature, aims to provide a framework for achieving this. Without considering demographic factors, it is difficult to assess the effectiveness of strategies, if indeed any "strategies" are employed, that pharmaceutical companies and MRs employ regarding promotional tools and targeting physicians.

The objectives of this research are, therefore, to answer the following questions:

- What are the most effective promotional tools that influence physicians' prescription behavior regarding the choice of drug?
- What is the effect of demographic characteristics (area of specialty, age, and gender of physician) on the effectiveness of various promotional tools?

Conceptual Framework and Hypotheses Development

The conceptual framework of this study, based on the stimulus-organism response (S-O-R) paradigm, is presented in Figure 1. The S-O-R model was initially proposed [34] and the model has subsequently been widely applied in the relevant literature to understand how customers make their buying decisions [35,36] According to Spies et al., when consumer purchase patterns are interpreted through the S-O-R model, the responsible stimulus is an external one. The current study defines independent variables as the stimuli from pharmaceutical companies (sales promotion, personal selling, direct marketing, advertising, and public relations), since they potentially influence the emotional responses of the physicians. Organisms involved in the S-O-R system possess intrinsic structures and processes that intervene between the external stimulus and the generated response(s), reaction(s), and/or action(s) [35], elaborated that intervening structures and processes include feelings, physiological activities, perceptions, and cognitive processes. The study postulates that age, gender, and the physician's specialty are moderating factors in the outcome, or dependent variable, of the S-O-R model. These moderating variables are likely to inform the decisions and strategies of pharmaceutical companies with regard to which marketing tools to adopt; arguably, effective tools are meant to evoke positive feelings among physicians and influence their prescription decisions. Responses in the S-O-R model (i.e. the actual outcomes, in this case the final decisions by the consumer) can be either acceptance or avoidance/rejection [37,38]. Physicians' prescriptions represent, in this conceptual paper, the dependent variable that is influenced by external stimuli.

Effectiveness of pharmaceutical companies' promotional tools in influencing physicians' prescription behavior

Physicians are the main decision makers regarding drug prescription. This motivates pharmaceutical companies to employ various promotional strategies to influencing physicians' prescribing behaviour [39,40]. Doctors, on the other hand, are bound by professional ethics that apply to their relationships with pharmaceutical companies, patients, and the drug to prescribe. Consequently, different studies have investigated the influence of pharmaceutical promotional tools on the prescription behavior of physicians [39-43].

In some of these studies, physicians have denied being influenced by promotional activities in their prescription behavior, asserting that they abide by professional ethics and institutional policies when prescribing any drug to their patients. In support of their arguments, these physicians have indicated that pharmaceutical promotional activities have negligible effects on prescription behavior since companies develop different brand names for a similar drug and, therefore, doctors prescribe drugs depending on their affordability for the patient. Other studies [40-43], have, however, linked pharmaceutical promotional activities with the inflation of drug prices, thus negatively affecting their consumption by primary consumers (patients). Regarding the effectiveness of various promotional tools/strategies in influencing physicians' prescription behavior, various studies report different findings depending on the region in which they were conducted. According to Narendran and Narendranathan [39], conducting a study in India is not easy since physicians are unaware that promotional activities are potentially affecting their practice, or are sometimes unwilling to report whether these activities affect their professional activity. In their study, Narendran and Narendranathan [39], identified five promotional strategies and assessed their effectiveness using a seven-point Likert scale to assess their influence on the prescription behavior of 103 physicians using a self-filled questionnaire: advertising; public relations; personal selling; direct marketing; and sales promotion. The results established that public

relations was rated as the most effective tool for influencing drug prescription behavior, while direct marketing was the least effective. Among the remaining promotional tools, sales promotion, personal selling, and advertising were rated second, third, and fourth most effective, respectively. Public relations included launch meetings, organizing seminars and physician conferences to promote companies' products, and establishing a good relationship with physicians. Direct marketing involved sending information about the product via post, telephone, and email. Based on these findings, the authors concluded that physicians who heavily rely on promotion by pharmaceutical companies were more likely to adopt new drugs more quickly than colleagues who do not follow promotional strategies. Also, physicians' perceptions on product quality, cost, and reputation of the company, brand name, and first market appearance were identified as critical factors in influencing physicians' prescription behavior. Other studies also supported this last observation. For instance, Biswas and Ferdousy [36], also identified public-relations efforts by pharmaceutical companies as a key factor in influencing physicians' prescription behavior, followed by sales promotion, and personal selling, respectively. In contrast, this study found that direct marketing was second to last and advertising the least effective promotion tool. The authors also noted that, besides effective public-relations efforts, pharmaceutical companies must be reputable and produce high-quality drugs to influence physicians. Another study, conducted by Onah [23] on doctors in six major hospitals in Enugu, Nigeria, established that most doctors believed that attending drug presentation/launches significantly influences drug prescription behavior. The findings in this study are similar to those of Narendran and Narendranathan [41], despite being conducted on a different study group and in a different country. These authors further noted that Nigerian pharmaceutical companies employ various promotional strategies to increase their market share in this highly competitive market. One of these is the placement of stickers on the walls and doors of hospitals and consultation centers. However, the promotional tools/factors assessed in this study were different from those of Narendran and Narendranathan [41], and, therefore, it is not always possible to compare results. Physicians have also described pharmaceutical promotional tools and strategies as significant sources of information on new drugs or new developments in the field [44]. Some of the promotional tools highlighted in this latter study include MRs, seminars, medical magazines, the Internet, and media advertisements. The authors also assessed what they called "reminder methods/tools" that make a physician think of a particular brand when writing a prescription. The study established that the most effective reminder methods are leaflets and frequent visits by pharmaceutical sales representatives. Other reminder methods highlighted in this study include product samples, brochures, and products, such as pens and notebooks with company's logo. However, unlike Onah [23] and Narendran and Narendranathan [39], who indicated sales representatives as the most effective promotional tool, the study by Ibrahim and Bélanger highlighted advertising as the most effective promotional tool for influencing physicians' prescription behavior, with sales representatives as close second. In a recently conducted cross-sectional research in Addis Ababa, Ethiopia, researchers established that sales promotion was the most effective factor in influencing physician prescription behavior, followed by personal selling and advertising, respectively. Direct marketing was the second least effective tool, while public relations was the least effective. Negash and Adamu investigated a set of promotional tools similar to those of Narendran and Narendranathan and assessed their influence on prescription behavior. However, a comparison of the results of these two studies does not show any similarity whatsoever. For example, Negash and Adamu found public relations to be the least effective tool, while Narendran and Narendranathan found it to be the most effective. Both studies utilized similar research designs, i.e. a cross-sectional research design with a self-administered survey questionnaire, but were conducted in different geographical locations. However, the findings reported in Negash and Adamu are similar to those of [44], both of which identified the use of MRs by pharmaceutical companies as the most influential tool regarding physicians' prescription decisions. Another study, performed by Mohammed and Kheder, in Sudan, concluded that continuous medical education (CME) and authentic information are critical determinants of physicians' prescription behavior. Advertisement and direct marketing were identified as the third most effective tool, while free samples (sales promotion) and public relations were reported as the fourth and fifth most effective promotional strategies, respectively. In both Negash and Adamu and Mohammed and Kheder (2017), public-relations efforts were identified as ineffective in influencing drug-prescription behavior. However, contrary to Negash and Adamu [43] and Shamimulhaq [45], Mohammed and Kheder [35], established that sales representatives least influenced physicians' prescription patterns. Similarly, research by Ibrahim [46] on pharmaceutical companies' representatives established that promotional strategies such as free samples, brochures, and gifts contributed most significantly to influencing the prescription behaviors of physicians in Khartoum, Sudan. In particular, this study established that free drug samples (sales promotion) were the most effective tool in influencing doctors to prescribe their products. Also, this study established that the majority of pharmaceutical representatives in Sudan do not observe ethical standards but were, rather, motivated by financial benefits for their companies. It needs to be noted that one of the weaknesses of the above-mentioned studies relates to the participants. These studies recruited physicians and pharmacists as the main respondents. These respondents could refuse to provide information that they felt could prove detrimental to their professional, ethical, reputation. Therefore, responses might have been biased or compromised.

Based on the conceptual framework (Figure 1), the above arguments, this conceptual paper hypothesizes that:

- *H1.* The effectiveness of pharmaceutical companies' promotional tools varies regarding influencing the prescription behavior of physicians.

Effects of demographic factors on the effectiveness of various promotion tools

The question of whether physicians' demographic factors, such as age, gender, and specialization, moderate the effectiveness of promotional tools regarding their prescription behavior has not been thoroughly investigated to date. Although most of the studies have included demographic information in their results, they have rarely established a relationship between these demographic factors and effectiveness of promotional tools in influencing prescription behavior. Based on the arguments and observations above, it is imperative to establish whether these demographic factors have any impact on the effectiveness of promotional tools in influencing physicians' prescription behavior. In Onah et al. study, 69% of respondents were male, while 31% were female. The respondents' specialties were doctors in residency, doctors in training, and consultants. This study did not include age. In Negash and Adamu's [43] study, 71% were males and 29% females. Most respondents were aged below 35 years (62.9%) and specialized

as General Practitioners (GPs) and specialists. In this study, sales promotion was found to be the most effective promotional tool, while public relations was the least effective. Narendran and Narendranathan did not include gender and age characteristics; however, the respondents were doctors (GPs, consultants, and specialists) and sales personnel of pharmaceutical companies (field staff and managers). In Ibrahim and Bélanger's [46] study, 82.1% of respondents were males and 17.9% were females. Most of the respondents (59%) were aged over 40 years. Most respondents specialized in cardiology, surgery, and family medicine. This study established advertising and sales representatives as the most effective promotional tool. In Mohammed and Kheder's [35] study, there were more female respondents (72%) than males (18%). Out of the 200 participants surveyed, 38.5% were physicians and 61.5 % were pharmacists. The age of the respondents was not mentioned. These authors established that CME and authentic information are the most effective promotional tools, while public relations were the least effective.

Based on these findings, there is no clear relationship between the effect of age, gender, and specialization on the influence of promotional tools on the physician's prescription behavior. However, Mohammed and Kheder [35] reported that physicians' gender seems to influence the perception of the promotional tool on the prescription behavior. Being the only study with more female participants than males, from this study, it can be deduced that female physicians are less likely to be influenced by promotional activities in their prescription behaviors than their male counterparts. Instead, they seem to mostly rely on professional development through CME and authenticity of information on the product and the manufacturer. The study also determined that specialization significantly determines the choice of promotional tool by the pharmaceutical company. Mohammed and Kheder [35], for example, reported that pharmacists are mostly concerned with the quality and authenticity of the drug manufacturer when prescribing any drug. This is the reason why most of them indicated CME and authentic information as key determinants of their prescription behavior. Furthermore, according to the findings by Negash and Adamu [43], physicians and clinics (GPs and specialists) are more likely to be influenced by sales-promotion tools, such as free samples, when giving any prescription, presumably because they gain a direct financial benefit in the form of gifts.

Based on the conceptual framework (Figure 1), the above arguments and this conceptual paper hypothesizes that:

- **H2**. Physicians' age, gender, and specialization moderates the relationship between various promotion tools and their prescription behavior.

Methodology

Research design

This is a conceptual paper outlining a new research methodology particularly applicable to developing countries. The research has yet to be performed; however, a follow-up paper discussing the results is planned. Given the potential significance of this methodology for pharmaceutical companies, however, the author(s) wishes to outline this novel approach so that other researchers may evaluate and use this methodology. The research design proposed is a quantitative-research approach, in which a cross-sectional study will be used during data collection. Cross-sectional studies are effective in capturing information based on data collected for a specific period. The information collected will be from a pool of Sudanese physicians in Khartoum with different

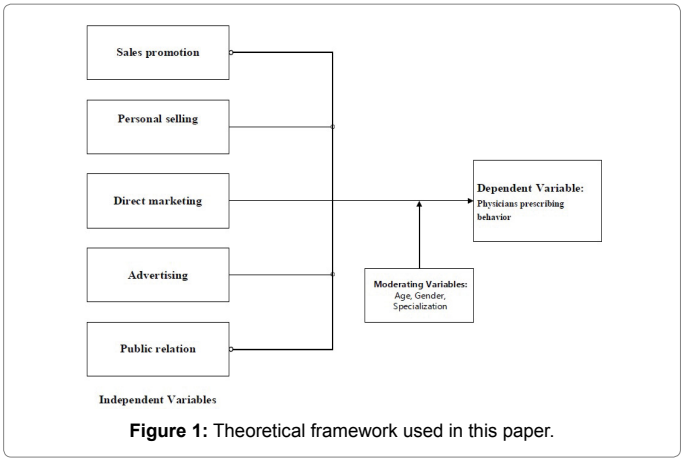

Figure 1: Theoretical framework used in this paper.

demographic characteristics. Gender, age, education, and field of specialization will be the key variables assessed in the study; these will be used to determine if, and how, they moderate the relationship between promotional tools and physician's prescription behavior.

Target population and sampling

The research will exclusively include medical personnel working in public and private healthcare facilities in Khartoum, Sudan. However, the population will be composed of a heterogeneous sample comprising physicians with different specializations. Considering that the study population is heterogeneous, participant selection will be made using a stratified sampling technique to obtain a representative sample from Khartoum-based doctors. The use of stratified sampling technique is more effective than simple random sampling because it will reduce selection bias and also ensure that some segments of the participant population are not underrepresented or overrepresented [46-49]. In this regard, the Khartoum physician population will be stratified in line with their field of specializations to generate different homogenous groups.

Specifically, the population will be grouped into six strata, namely:

- Internal medicine
- Cardiology
- Gastroenterology
- Obstetrics and Gynecology
- Urology
- Dermatology

This results in a sample of 286 physicians (based on Solvin's formula). The proportion of physicians from each different specialization will be as follows: 86 (ca. 30%) from internal medicine; 29 (ca. 10%) from cardiology; 57 (ca. 20%) from gastroenterology; 72 (ca. 25%) from obstetrics and gynecology; 23 (ca. 8%) from urology; and 20 (ca. 7%) from dermatology.

Questionnaire design

The questionnaire will be divided into two sections. The first section will include demographic information of the participants. In this section, information such as the age, gender, and the specialization of the physician will be included. This information will be critical in analysing the relationship between the demographic information and

the effectiveness of the promotional tools in influencing prescription behavior. This information will be used to test *H2* and establish whether physicians' demographic information has any effect on their prescription behavior. The second section will comprise questions aimed at assessing the effectiveness of pharmaceutical promotional tools in influencing the prescription behaviours of physicians. In this section, a five-point Likert scale will be used to measure the effect of each promotional tool on prescription behavior, ranging from 1 = not effective at all to 5 = very effective. The promotional tools to be investigated in this study are operationalized from studies including Narendran and Narendranathan, Negash and Adamu, Mohammed and Kheder, and Ibrahim and Bélanger. Promotional tools are broadly classified into five groups/variables: advertisements; sales promotion; public relations; personal selling; and direct marketing (Figure 1). The second section will also assess non-promotional factors that play a significant role in influencing prescription behavior, including the patient's financial situation, CME, the health institution's policy and management, and the influence of colleagues on physicians' decisions/behavior. For these factors, a five-point Likert scale will also be used to assess how the participants agree with the effectiveness of these factors/tools in influencing their prescription behavior, ranging from 1 = strongly disagree to 5=strongly agree.

Data collection

Data collection will be performed through face-to-face interviews with sample participants, using a closed-ended questionnaire. Personal administration of the survey will help to answer any questions the respondents may have, as well as allowing for any relevant personal observations regarding the environment in which the physicians work. Some of the observations include establishing whether there are posters on the walls regarding pharmaceutical products, whether the doctors are using pens, notebooks, or other tools that are branded with pharmaceutical companies' names, etc.

Data analysis

Data collected in the proposed research will be analyzed using structural equation modeling, a technique widely applied in statistical modeling to assess consumer behavior. The model is a combination of path analysis, or regression analysis, and factor analysis. In the current study, the choice of structural modeling was informed by the need to assess the relationship between promotional tools and prescription behavior. The model will help to establish a causal relationship between promotional tools and physicians' prescription behavior and to test the causal model using linear equation systems. Further, SEM will help to establish how demographic factors moderate the relationship, if any, between promotional tools and prescription behavior. Therefore, SEM will be crucial in validating or rejecting the formulated hypotheses.

Ethical considerations

Before conducting the study, the respondents will be presented with an informed consent form that each respondent participating in the study will be expected to read, understand (in particular with regard to the purpose of the study and their roles and responsibilities during the study), and sign. Each respondent will be assigned a unique identifier to conceal their identities during the study, thus allowing anonymous answers. The questionnaire will also be subjected to peer review by relevant experts to ascertain its effectiveness in obtaining the desired data for the proposes of the study. Also, the researcher will seek approval from relevant bodies and authority before undertaking the study.

Expected Outcomes

Growth and financial revenue of pharmaceutical companies strongly depend on the type of promotional tools they use to promote their products. Identifying tailored promotional tools that guarantee effective drug distribution and sale ensures the business continuity and profitability of pharmaceutical companies. However, inadequate knowledge of factors and tools that are likely to influence the sale of drugs negatively affects the success of the company and its market share. Undertaking the current study is vital to the current literature on pharmaceutical marketing as the study attempts to identify the most successful promotional tools that pharmaceutical companies can use to ensure a healthy market access and growth in an (inter) nationally competitive industry. The research plan outlined in this conceptual paper anticipates establishing variations in how physicians are influenced by different marketing tools. Hence, the anticipated results will help pharmaceutical companies formulate better planning on promotional tools to maximize their investment.

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