

PHARMACEUTICAL MARKETING AND MEDICINE PRESCRIPTION BEHAVIOR

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In India same drug molecules are sold under different brand names by different pharmaceuticals. To cite an example: there are over hundred and forty brands of omeprazole, proton pump inhibitor, available in India. How does a doctor select a brand? What are the factors that influence the prescription behavior of the doctor? What is the influence of pharmaceutical marketing on prescription behavior? Knowledge of prescribing behavior of physicians is a prerequisite for successful marketing of pharmaceutical products. Therefore, this study is aimed to explore the pattern of prescription behavior and major factors influencing physicians' drug prescription behavior in India with focus on General Physicians and Specialists. To persuade the physicians to prescribe their brands pharmaceuticals engage in marketing techniques like giving samples, gifts, sponsoring travel etc. This study explores the influence of pharmaceutical marketing on the prescription practices of doctors in India. In the last few years the relations between the physicians and pharmaceutical companies have received considerable attention (Moynihan, 1996).

Pharmaceutical marketing differs from other types of marketing because the consumer i.e. the patients are not the target audience, whereas the physicians are the key customers for this industry. Companies are using marketing tools to draw the attention of physicians for prescribing the brands. Marketing strategies related to 4Ps influence the physician prescription behavior in this study (Greene, 2000). The competition between pharmaceutical companies in selling their products in domestic and international markets has caused huge investment in developing marketing strategies with direct focus on physicians (Zivin, 2013). On the other hand, understanding effects of different effective factors can be useful to optimize promotion activities. Giving away gifts, free lunches, sponsoring education and holidays have all been criticized as inducements which compel a doctor to prescribe without scientific basis (Gonul et al., 2001).

On average, pharmaceutical companies expend over \$20,000 annually per physician on marketing efforts that include contact visits, gifts, samples, meals, travel, consultancy fees, and related spending (Weiss, 2010). Hence, product detailing and free sampling, which are both complementary direct marketing efforts to providers, constitute the bulk of the pharmaceutical promotional budget, comprising about 83% in 2011 (SK&A 2012). A study from Canada showed that the association with pharmaceuticals leads to less than appropriate prescribing behavior by the doctor (Lexchin, 1997). Many physicians, however, do not feel that their prescriptions are influenced by gifts and other incentives provided by pharmaceuticals (Liu, 1995). Studies in China and Australia showed that sales personnel do not significantly affect a doctor's prescription behavior.

FACTORS AFFECTING MEDICINE PRESCRIPTION BEHAVIOR

Dey et al. (1999) studied pharmaceutical marketing in India and suggested that the point of differentiation (competitive advantage) lies with medical representatives and their relationship with doctors. Furthermore, they identified other marketing tools such as advertising, marketing research, public relations and distribution. Mizik & Jacobson (2004) assessed the role of two central components of pharmaceutical marketing practices (namely, detailing and sampling) on physician prescribing behavior and found that detailing and free drug samples have positive and statistically significant effects on the number of new prescriptions issued by a physician.

There are many factors such as sales representatives, advertising, price of the product to the patient, trade fairs and symposia and journals, prior experience and education, opinion leader influence, recommendations by colleagues, patient demands that influence physician prescription behavior. But this paper focuses on the factors which have dominant or strong influence on medicine prescription behavior. These factors are categorized into marketing factors and professional factors. Marketing factors include tangible rewards, sales representatives, detailing, e-detailing and samples and professional factors include advertising in journals and conferences that influence physician prescription behavior.

1.1 Tangible Rewards

The pharmaceutical companies provide tangible rewards in the form of free samples and gifts that include financing for domestic and international conference participation, travel and accommodation, medical education, meals, honoraria and small gifts like pens (Wazana, 2000; Madhavan et al., 1997; Brett et al., 2003). However, it cannot be stated that doctors prescribe only based on the rewards that they receive from the company, but the rewards certainly help doctors to remember the company brands and to prescribe them regularly (Wazana, 2000).

A study conducted in Turkey showed precisely how important rewards are for physicians' prescriptions. Most of the medical representatives in their study reported that physicians are commonly influenced by non-medical considerations during their interactions and request gifts other than medical products (Tengilimoglu et al., 2004).

In 1992, the American Medical Association (AMA) developed guidance on gifts for its physician members. It stated: "Gifts to physicians from pharmaceutical and medical device companies primarily should entail a benefit to patients and should not be of substantial value". In April of 2002, the Executive Committee of the Pharmaceutical Research and Manufacturers of America (PhRMA) adopted its own, similar view on the subject. The voluntary code states that modest amounts may be spent by pharmaceutical representatives on physicians (but not on spouses or guests), only if "the interactions of company sales representatives with healthcare professionals are to benefit patients and enhance the practice of medicine". Following that, the Office of the

Inspector General (OIG) for the Department of Health and Human Services (HHS) released guidelines for the promotion of pharmaceuticals, published in the Federal Register. Most pertinent, gifts and gratuities were listed as questionable activities. The OIG guidance gives credence to the PhRMA code. As a health care source observes, the industry code "provides useful and practical

advice and adherence to the code will help to demonstrate a good faith effort to comply with the applicable federal health program requirements”. As a result, under all guidelines, substantial gifts should no longer be a significant promotional activity for pharmaceutical companies and are expected to be greatly reduced.

The issue of gift giving has become so sensitive to some lawmakers that in 2002, Vermont became the first state to mandate the reporting by physicians of the receipt of gifts that are valued at \$25 or more. The definition of gifts includes meals, trips or consulting fees, but it excludes drug samples. Promotional items or gifts of relatively insignificant monetary value have been distributed by pharmaceutical representatives under the auspices that these items might be of some benefit in the delivery of health care. The real intent of leaving gifts of nominal value is to attempt to capture “mindshare” of the prescriber by having some presence of a product beyond the sales call or in exchange for the physician’s time spent with the pharmaceutical representative (Vermont,2002). What amount of money defines the boundary between “significant” and “insignificant” with regard to gift giving? Aside from the arbitrary limits set by some lawmakers, this issue can be explored by examining social science research on the nature of influence. It has been reported that physicians overwhelmingly believe that the acceptance of gifts has little or no impact on their prescribing decisions. Murray (2002) reported the results of a survey: “71% of physicians do not think that accepting gifts, trips, and hospitality from pharmaceutical companies diminishes their objectivity”. This finding was confirmed among a sample of radiation oncologists: “74% felt that they should be free to accept gifts of small value” (Halperin et al., 2004). This second study has an interesting and statistically significant finding. Physicians overwhelmingly believe that gifts influence their peers prescribing more than they influence their own prescribing.

Gibbons (1998) compare the attitudes of physicians and patients toward gifts (mostly of nominal value) from the pharmaceutical industry. Patients felt that gifts might influence prescribing and were inappropriate. Physicians believed that “knowledge of guidelines” best predicted prescribing. The study illustrates the differences that can exist between patient and physician on the importance and appropriateness of gifts to the medical profession. Physician awareness of patients feelings on this subject creates a social desirability bias among studies on gifts.

Katz et al. (2003) present the issues regarding size of gifts and potential impact in their review in the American Journal of Bioethics. Their argument is that gifts, regardless of value, create a sense of obligation in the recipient, even if there is no awareness of this feeling of indebtedness. This exchange dynamic is not related to the size of the gift; in fact, it is true even if the gift is unwanted or refused. “Regardless of the size of the gift,” the article states, “it is widely considered distasteful or bad form to take but make no effort to give in return”. Finally, physicians are limited in the way that they may express their reciprocity, most often in the form of product support. If physicians contend that pharmaceutical representatives are a valuable source of information and that gifts are “the cost of doing business,” then gifts are an unnecessary expense, given that the information exchange would take place anyway. The authors conclude that based upon the influence of gifts, regardless of monetary value, “there is no level below which it is guaranteed that marketing wares

have no effect on the recipient.” Landon et al.(2001) also argues that financial incentives play a major role for the physicians specially who are in solo practice.

2. Medical Representative's Personality

Medical Representative's Personality refers to the physician's assessment that a particular medical representative is friendly, nice and pleasant to be around. Psychological research generally finds a positive relationship between a person's likability and the extent to which the person is trusted by others. Doney & Cannon (1997) also found that salesperson likability positively influences buyer trust. While the likable medical representatives were found to be trustworthy, physicians tend to continuously prescribe the drugs of the particular medical representative's firm. Medical Representatives are considered one of the important sources of information for physicians in making their prescription decisions (Wazana, 2000; Alkhateeb et al., 2009). Unless physician's perceptions are positive about a particular medical representative in terms of professional values, they may not trust those medical representatives and may not prescribe that medical representative company's drugs (Wright & Lundstrom, 2004). When physicians perceive a particular medical representative as having high professional values, it enhances the trustworthiness of the medical representative that translates into the continuous prescription of the company's drugs (Doney & Cannon, 1997).

According to Henry (2002) In US the number of pharmaceutical sales representatives increased from about 30,000 to over 80,000 from 1994 to 2002. Representatives have increased as a percentage of office-based physicians from 10% in 1994 to over 20% in 2002. A comprehensive overview of physician perspectives on prescription drugs developed by this study. This study focused on interactions with representatives, drug advertising, and physician interactions with patients. A total of 2,608 actively practicing doctors responded to a mail survey. The sample was racially and ethnically weighted to be representative of the total physician population. The survey revealed that almost three quarters of physicians rate information from pharmaceutical representatives as either “very” or “somewhat” useful. An even higher number, 80%, believe that the information they receive from representatives is “very” or “somewhat” accurate. In this survey, 60% of physicians are aware that pharmaceutical companies possess data on individual prescribing, but less than a third believe this practice is unacceptable.

As of 2012, approximately 72,000 pharmaceutical sales representatives were employed in the United States (Jonathan, 2012).

Accenture (2003) study shows primary care physicians regard pharmaceutical representatives as being more influential upon their prescribing decisions than even their own peers. Peer-reviewed clinical journals (80%) and industry association meetings (34%) were rated higher than sales representatives (30%), with colleagues (27%) and the Internet (16%) lagging behind. Although the study was limited in size (n = 100), the respondents did indicate that “approximately one-third of sales visits are helpful.” Physicians want more current, comparative and clinical information, based upon objective sources of information. Constraints upon their time and availability were limitations on how much time physicians can give to pharmaceutical representatives. Physicians wished to see the representative because of the value of samples and because of their interest in new products and drug-specific information.

The data were from the years 2001 and 2002, and it detailed sales force effectiveness by physician specialty, by drug therapeutic class and by promotional activity. The report found that 85% of all pharmaceutical representatives who entered a medical office with the intent to sell actually engaged someone in the office. The other 15% left without such engagement, most likely because of too many patients or too many other representatives. Of the 85% who attempted to sell, 5% were turned away by a receptionist, 15% left samples at the front desk, 61% actually got to the sample closet and obtained a signature from a prescriber at that venue, and 20% got to sit down with a physician to deliver a sales call. In this study, physicians responded strongest to three components of an effective sales call: well-utilized resources, solid message content, and clear message delivery. The most appreciated resources were sales aids and reprints of significant articles. The components of the sales message that were essential to physicians were dosing, side effects, efficacy, and competitive data. Clear message delivery was helped by dialogue with interesting questions. Health Strategies Group tracked physicians who received sales calls that contained one, two, or all of these key components. Only 5% of all calls contained all 4 key tactics, and these calls were the only ones that led to a change in physician prescribing behavior. This study explored the connection between pharmaceutical representative interaction and formulary requests showed that the two are positively correlated. A group of physicians who had requested formulary additions was compared to a group who had not and assessed according to physicians' self-reported associations with drug company representatives. The first group was more likely to have spoken for or performed research for drug companies. "Moreover, physicians were more likely to have requested formulary additions made by the companies whose pharmaceutical representatives they had met" (Health Strategies Group, 2003) A retrospective literature review authored by Wazana (2000) attempted to identify the meaning of physician-pharmaceutical representative interactions. In this article, a total of 29 studies were taken and mostly focused on family medicine, internal medicine, and resident physicians. The results were reported with regard to the effects of interactions with pharmaceutical representatives, gifts, samples, industry-paid meals, funding for travel to attend educational symposia, pharmaceutical representative speakers, continuing medical education sponsorship, and physician honoraria. The author stated that "interactions with pharmaceutical representatives were found to impact the prescribing practice of residents and physicians in terms of prescribing cost, non-rational prescribing, awareness, preference and rapid prescribing of new drugs, and decreased prescribing of generic drugs". The analysis of this study was more comprehensive as it included larger numbers of respondents from multiple articles and covered a longer period of time. The Wazana article included studies published from 1982-1998 with a total sample population across 29 studies of 8,122 physicians and residents. The author suggested that interactions guidelines, practical training, academic detailing and industry-independent drug information mailings may mitigate the influences that representatives have on physician prescribing. A finding from the Wazana article that elicits interest is that most physicians and residents denied that gifts were an influence upon their behavior. There were mixed reactions over interactions with the pharmaceutical industry and the extent of the influence upon prescribing behavior. The three factors identified in this review that applied the greatest influence on physician behavior were samples, CME, and conference travel funding.

Mizik & Jacobson (2004) study is the most comprehensive assessments of pharmaceutical representative influence on physician prescribing. They used econometric analyses to quantify the persistence in physician prescribing accounting for “own-growth” and competitive stealing” effects. The study also assesses the diminishing effects over time and controls for spurious correlations (practice size, others) of physician-related factors. The authors contended that the data treatment overcomes limitations of previous studies and includes approximately 74,000 physicians over 2 years, for a total of over 2 million observations.

If pharmaceutical sales representatives influence physician prescribing, what is the mechanism by which they exert this influence? One study shows that pharmaceutical representatives influence upon physician prescribing is directly correlated with the level of credibility they have with a physician. Almost five hundred primary care physicians in a study assessed the costs of prescribing and the credibility of pharmaceutical representatives. A positive correlation was found between representative activity and credibility and the costs of prescribing, especially for those physicians practicing in nonacademic settings (Caudill et al., 1996).

Physicians stated they value representatives who have extensive knowledge of their drug and the correlating disease state and of physician needs and time constraints. The survey covered almost 2,000 physicians about information that would convince them to prescribe more of a certain product. The results showed that “objective information about the product is the most convincing item a sales representative can offer.” (Scott, 2003)

Therefore, regular follow-ups means doing something special or unique by pharmaceutical companies which will make the doctor to remind the product or conducting the activity that will continuously hammer the product in the doctor's mind. Regular follow-up mainly include sending a reminder card to the doctors to request the doctor to prescribe the product. Sending reminder cards also include drafting & sending a thanks-giving note to the doctor for extending their prescription support to the doctor. Company always give emphasis on importance of regular follow up.

1.3 Detailing

Dolovich et al. (1999) investigated the impact that pharmaceutical representatives may have on physician prescribing in Ontario, Canada. The study tracked antibiotic prescriptions written by 641 physicians in the active group against 574 in the control group. The intent of the study was to determine if industry salespeople could effect a change in physician prescribing habits by delivering evidence-based detailing. The results indicate that “the intervention did not result in major antibiotic market share changes for most of the targeted antibiotics.” Interestingly, there were differences in outcomes based upon prescribers’ gender as well as the number of years since graduation. Female physicians showed a slightly greater propensity to adhere to the intervention objectives than male physicians, and the more recent graduates were more likely to prescribe newer agents. The study, limited in size, demonstrates the lack of impact of academic detailing by pharmaceutical industry representatives upon physician prescribing behavior.

Detailing Minutes refers to time taken by sales representatives during a visit. Our study will indicate where detailing minutes has influence on medicine prescription behavior of doctors or not. According to the study of Gonul et al. (2001) there is positive effect of the length of a detailing visit in the category on the number of new prescriptions in the category. Narayanan and Manchanda (2009) study examined physician learning over time when exposed to information by pharmaceutical sales representatives and derive conclusions that detailing minutes has positive effect on medicine prescription behavior of doctors.

1.4 Electronic detailing

Electronic detailing (e detailing) means that information is available round the clock through web-based tools using digital technology: internet, video conferencing, and interactive voice response. Doctors can now find clear and interesting product information whenever they have time during their busy schedules. They can also choose to select to read only the content that is most pertinent and interesting to them. In the past, a medical representative had to wait for hours outside the doctor's chamber to be offered a brief window for detailing the brands. Now, with electronic detailing, pharmaceutical firms can establish brand awareness, increase familiarity and facilitate sales that do not always require a face-to-face meeting. A study conducted by Marianne Anderson, marketing manager for Pfizer showed that "97% of physicians felt that the e-detail was superior to paper-based details for explaining complex issues" (Anderson, 2006). A report by IBM (2009) outlines the key success factors for electronic detailing the most important is 'trust'. Pharmaceutical firms provide the data when and where doctors requires it and doctors value and trust this drug information which helps them in providing better care. Pharmaceutical Companies also conduct "post-marketing surveillance" programmes to monitor doctor's support and based on that they facilitate the doctors. E-detailing is widely used to reach "no see physicians"; approximately 23% of primary care physicians and 28% of specialists prefer computer-based e-detailing. Physicians Interactive, based in Marlborough, claims to have developed "the largest network of online and mobile healthcare professional relationships in the United States, reaching more than 875,000 physicians, nurses, and allied health professionals in all major specialties" (American Medical Association, 2011). Physicians Interactive serves its pharma clients through development of mobile and online clinical resources for healthcare professionals. Sermo, a free online MD-only community, claims 115,000 members, or 20 percent of all U.S. physicians. Daniel Palestrant, MD, the site's founder and CEO, says 10 of the top 12 pharmaceutical companies are Sermo clients who "are engaging physicians through our social media offerings built specifically to increase brand awareness." Sponsoring companies are able to follow physician discussions such as their reactions to different components of the health reform law, promote their brand and engage with physician members, according to Sermo (Stone, 2009).

1.5 Drug Samples

Free samples would be useful in the short run as a reminder of new drug trials (Campo et al. , 2005) and it may help physicians to provide these free samples to their patients who are poor. In India, around 70 percent of households use their own savings for healthcare expenditures, as direct and indirect governmental support is minimal and health insurance is a very nascent industry (Sujatha et

al., 2005). When patients find that their physicians provide free sample drugs, they feel positive about the physicians and therefore they spread positive word of mouth about them that supports and fosters the physicians' private medical practice in the long run. However, in the US Gonul (2001) found that providing free samples beyond a particular limit would be counterproductive, as physicians tend to perceive the pharmaceutical company as desperate and too aggressive. They also found that providing free samples would be ineffective with respect to prescription, when patients are covered by insurance. Another study on Insurance Coverage and Agency Problems in doctor prescriptions uses a randomized field experiment to demonstrate that doctors prescribe drugs that are more expensive to insured patients (Fangwen, 2011). The prescriptions to insured patients cost more than 43% of those to uninsured patients on average. However, if the doctor does not have this financial incentive, the prescriptions are similar for insured and uninsured patients. In such situations, the company may rather consider providing free conference participation, as this too influences drug choice by physicians (Campo et al., 2005)

A comprehensive review of literature on drug samples can be found in Groves et al. (2003), sorted by study design since 1986. Samples can provide pharmaceutical representatives with access to physician offices. Physicians may use these samples to offset, partially or totally, the cost to the patient of filling a prescription and samples can be a strong influence on physician prescribing. In 1999, pharmaceutical companies distributed a total of \$7.2 billion in free samples. In the Kaiser Foundation survey, 92% of physicians reported having received free drug samples (Henry, 2002).

In one study, published in the Journal of General Internal Medicine, physicians were tracked to measure the effects of samples on their prescribing decisions. A total of 154 physicians self-reported their decision criteria for a single diagnosis. The study reported that physicians often dispensed and prescribed "drugs that differ from their preferred drug choice". Physicians indicated that they used samples to help reduce the cost of filling a prescription. Perhaps not surprisingly, the study found that "younger physicians were independently associated with drug sample use" (Chew et al., 2000).

In another study that looked specifically at family practice residents' and faculty's prescribing habits in the antihypertensive market, samples were found to have a substantial effect. The authors reviewed first-line (generic) versus second-line (branded) prescribing during two time periods one when samples were provided and one when samples were prohibited. The study found that "following prohibition of sample distribution, there was an increase in first-line antihypertensive use from 38% to 61%." (Boltri et al., 2002)

Accel Healthcare Communications conducted an online survey of 150 high-volume primary care physicians that clarified the reasons why doctors see sales representatives. Ninety-two percent of physicians stated that they wanted drug samples, the top-rated response. Samples proved so valuable to physicians in this study that 63% of respondents said they would stop meeting representatives if samples were discontinued. Physicians are looking for objective and meaningful data in addition to samples. Accel recommends that sales representatives use samples to access physicians and then deliver new information regarding treatment with their specific product. Groves et al. (2003) reported the impact of drug samples on the quality use of medicines in the Journal of Clinical

Pharmacy and Therapeutics in 2003. This Canadian paper summarizes the findings of 16 original research studies on the influence of samples; many of the studies were done in the US. Samples are distributed mostly for branded products, making more available to the physician and patient at mostly higher product costs. This has a decided impact on the overall costs of drugs. Pharmaceutical companies use samples for many different reasons: to launch a new product, to compete with another drug, to change the image of a product, or to enhance demand and familiarity. Despite calling for more research on the quantitative impact of samples, we can conclude that “sampling is a critical driver in the promotion and adoption of new products”.

2. PROFESSIONAL FACTORS

2.1 Industry-Sponsored Educational Programs/Continuing Medical Education (CME)

Doctors attend conferences, seminars and workshops where they are advised to prescribe a particular company's drugs. The doctors also meet their peers and interact with them about their experiences. Furthermore, they may have observed senior doctors prescribing a particular company's drugs. These influences are not directed by the company, but have the potential to affect the doctor's prescriptions. Doctors might also believe that something, which is successful based on other physician's experiences could also apply to their treatments. Nair et al. (2010) quantified the impact of social interactions, peer effects in the context of doctor's prescription choices and found that prescription behavior is influenced significantly by the behavior of active research specialists or “opinion leaders,” in the doctor's reference group. Therefore, physicians can be categorized as influencers or imitators where influencers are largely comprised of specialists. Two studies Glass and Rosenthal (2004), Carter and Chitturi (2009) find that specialists are likely to be heavy prescribers. On the other hand Hartzema and Christensen (1983) find that older physicians tend to be heavy prescribers.

Educational programs are effective in reaching small groups of physicians. Vicciardo (1995) surveyed 18,400 physicians who attended a pharmaceutical industry sponsored meeting about prescribing changes. More than 60% indicated that they would start or increase their subsequent prescribing of the promoted product as a result of their attendance. Another study assessed physician-prescribing changes resulting from attendance at pharmaceutical-paid symposia on a specific product. Use patterns were tracked for almost two years prior to and about a year and a half after the conference. Although the interviewed physicians did not think the symposia would affect their prescribing, significant increases in the use of the promoted products occurred after the meetings. The increased use varied significantly from overall national use patterns (Orlowski & Wateska, 1992). These specific types of promotion are now discouraged by PhRMA, HHS, and AMA guidelines. It is interesting to note, however, that general industry-sponsored education programs can exert strong influences on physician prescribing.

In 2002 \$1.6 billion was spent on continuing medical education and spending on CME has been rising, ostensibly due to restrictions on other promotional activities. This study reported that CME used as a promotional tool by the pharmaceutical industry (Accreditation Council for Continuing Medical Education, 2002).

According to Wazana (2000) study 10 out of the 29 assessed studies discussed CME as an interaction. In the assessment, CME was found to exert more influence upon physician behavior. A commentary published in another study asserts that “CME is now so closely linked with the marketing of pharmaceuticals that its integrity and credibility are being questioned”. This study claims that pharmaceutical companies link financial support to content, speaker lists, actual materials, and specific attendees. On the other hand this study also states that “The professional educators in CME programs who deal with pharmaceutical products are failing to do what the medical profession and society at large expect of them” (Relman, 2001).

PhRMA has included CME in its Code on Interactions with Healthcare Professionals, choosing to delineate what types of funding are acceptable. Therefore, any subsidy that may be viewed as inappropriate, including direct payments to a health care professional, should instead be given to the conference’s educational sponsor. This study applauds that CME increase sales of pharmaceutical companies (Holmer, 2001).

CME has become big business. More and more, education is going online. Internet CME courses allow the physician to complete courses with less effort and at less cost. One source has observed that “the emergence of online CME also presents an opportunity to pharmaceutical companies”. The pharmaceutical companies themselves have funded Pri-Med, a provider of CME, to develop industry-supported presentations. In a crowded or competitive market and with restrictions on promotional activities, CME is emerging as an arena where investment by pharmaceutical companies is paying off (Haddad, 2002).

2.2 Medical Journal Advertising

The effectiveness of advertisements in journals serve to capture a physician's interest in learning more about a medication. Participation of doctors in research studies has considerable effect on medicine prescription behavior of doctors. In the recent review of the impact of formal continuing medical education, Davis et al. (1999) identified 14 randomized controlled trials in which at least 50% of the participants were practicing physicians. Three of these trials focused on the effect of lectures and the result was lectures had no influence on physician prescription behavior. We find here physician’s sensitivity to select information journals, scientific papers and research articles in prescribing medicines about the product efficacy, side effects and about prices of alternative products in prescribing medicines.

Advertising pharmaceutical products directly to health care professionals in medical journals spent \$278.9 million in 1999, a slight decrease from the amount spent in 1992. The number of pages of ads has decreased, partially offset by rising space rates. By 2002, however, the industry’s total journal ad spending had increased to over \$752 million. In general, journal ads perform a dual role: they both inform and influence. By informing they help to speed the adoption of novel therapies (thereby benefiting consumers), and they influence through increased brand recognition (thereby reducing physicians’ decision costs). Advertising has been shown to be pro-competitive, reducing product price following entry of a new product (Liebman, 2000).

PERQ/HCI Research, a pharmaceutical promotion research firm, has studied the effectiveness of journal advertising and has concluded that the right message and execution determine product acceptance more than advertising spending. The firm reports that journal ads provide positive return on investment, especially in conjunction with pharmaceutical detailing (Liebman, 1997) Rizzo (1999) tracked 46 drugs with annual data between 1988 and 1993 and found that “advertising decreases the price elasticity of demand in the pharmaceutical industry.” He concludes that “given the inverse relationship between elasticity of demand and price, it is likely that consumers pay higher prices as a result of the advertising that occurs in this industry”. A significant part of the effect was accounted for by detailing efforts, however, and his study may have neglected to account for physician-specific effects.

Wilkes et al. (1992) assessed the accuracy of journal ads. This study had specialist physicians and pharmacists who compared actual ads to FDA standards to assess accuracy. More than half of the ads were judged by two or more reviewers to have little or no educational value. Because some of the value of journal advertising as a motivator of prescribing is linked to the message and execution, most ads then have likely not delivered the expected returns.

In the USA, the pharmaceutical industry spent \$20.5 billion in 2008 to promote its products to physicians and consumers. According to industry sources, traditional detailing represents the largest percentage of total promotion, and in 2008 it cost more than \$12 billion. The number of sales representatives (reps) in the field declined, however, from 101,634 reps, pursuing nearly 830,000 medicine prescribers in 2006, to 98,755 reps in the third quarter of 2007, pursuing the same number of prescribers. E-detailing, a less expensive form of detailing that uses the Internet, currently comprises one to two percent of total promotional dollars but is expected to grow rapidly in the near future, provided the synergy between the two types of detailing can be improved (Gonul and Carter, 2010). Given the time and effort involved in cultivating each target, it is critical that sales reps be able to predict whether a physician will become a worthwhile prescriber or a non-prescriber. In a 2004 report, the Board of Trustees of the American Medical Association notes that pharmaceutical companies believe they would struggle without data about the prescription-writing behavior of physicians (Steinbrook, 2006). For example, if that data were unavailable, physicians could see an increase in the number of sales calls, could receive less targeted educational information, and could be offered fewer or less relevant drug samples.

Two studies, both funded by the Association of Medical Publications (AMP), used vast databases to assess the effects of detailing, DTC advertising, medical journal advertising, and physician meetings and events on financial returns. These four tools comprise most of the review conducted already in this paper, are mechanisms by which pharmaceutical companies attempt to influence physician prescribing, and are combined neatly in these two studies in a comprehensive manner.

Neslin (2001) conducted the first study on ROI (Return on Investment) Analysis of Pharmaceutical Promotion (RAPP). Data from 391 brands, inclusive of all with greater than \$25 million in revenues in 1999, were analyzed using ordinary least squares regression to determine how each of the 4

factors affected ROI and to determine how the ROIs varied according to 3 categories of brand size. Three time periods were used, with brands assigned according to date of launch: pre-1993, 1994-1996, and 1997-1999. For the median brand, ROIs (with 95% CIs) were highest for journal advertisements ($\$5.00 \pm \0.88) and for meetings and events ($\$3.56 \pm \1.92). Pharmaceutical representative's detailing yielded positive returns as well ($\$1.72 \pm \0.19). DTC advertisements, however, showed a low ROI ($\$0.19 \pm \0.52), with a 95% confidence interval that spanned zero, making inferences questionable. This provides support to the Narayanan et al. (2009) study mentioned previously in that DTCA (Direct to consumer advertising) affects class effects more than brand share effects. Perhaps DTCA is still too new (only since 1995) for research to provide conclusive evidence on its effects of patient demand upon physician prescribing. The RAPP results also demonstrate that larger and newer brands benefit most from all four types of promotion. ROI for journal spending decreased directionally across all three time periods for all three brand sizes. These results seem to correlate with the overall findings from the review of journal advertising in that this promotional tool can produce desired effects only if the message is clear and credible and during the years studied in RAPP, journal advertising total spending had stagnated. These findings are similar with the findings in Mizik and Jacobson (2004) study where newer and larger brands commanded the most attention from physicians and the best returns on effort.

Wittink (2002) conducted the second study on Analysis of ROI for Pharmaceutical Promotion (ARPP) He used the same data as the RAPP study, augmented with 1 additional brand, for a total of 392, and with 1 more year of data (includes 2000). Results match RAPP results in many ways, including the confirmation "that all four promotional tactics work." Moreover, DTCA spending has not provided ROIs as robust as other tools. The maturation of DTC, however, may be revealing its power. The addition of one year of data shows that ROI (for the largest brands only) finally breaks the threshold for underutilization ($\$1.00$). Nonetheless, the author generally concludes that "there is overspending on DTC advertising." In the ARPP analysis, detailing continues to show strong ROI, especially for the largest brands launched most recently.

One caveat with both the RAPP study and the ARPP study is with the conclusions on pharmaceutical detailing. For the largest brands launched most recently, marginal ROI was reported to be $\$10.29$ in the RAPP study and $\$11.60$ in the ARPP study. These returns are far greater than any of those reported for most of the other marketing resources and greater than those reported for any other size brand or for any other time period. Based upon these results, both authors recommended that firms considered diverting resources away from lower ROI tools toward pharmaceutical detailing. This reveals the potential weakness of the methodology: it predicts only of a linear relationship when, in fact, a curvilinear relationship might instead exist. There may be a point at which it is no longer advisable to invest in detailing, as the ROI plateaus and then begins to decline. An inverted U-shaped effect was shown in two studies: one an analysis of insurance coverage, detailing, sample activity, and price upon physician prescribing, Another study of individual physician-level responsiveness to detailing and samples. The first's findings on detailing included "too little or too much cumulative personal selling is suboptimal and that any repetitive detailing or free sample activity must be done with caution." The second echoed the same

conclusion: “There are diminishing effects of detailing on prescription behavior” (Gonul et al., 2001; Manchanda and Chintagunta, 2004).

It is estimated that \$30 billion was spent on promotion and marketing by pharmaceutical companies in 2003, including \$5.8 billion on sales representatives and \$11.5 billion on drug samples. Between 1996 and 2000, “the proportion of drug revenues spent on all promotional efforts remained fairly constant,” although the mix of spending was gradually changing. In 2000, Harvard researchers found, nearly \$2.5 billion was spent on direct-to-consumer advertising (DTCA) alone, “rising from 9 percent in 1996 to about 16 percent in 2000”. In 2001, DTCA spending totaled \$2.8 billion. Currently, however, the vast majority of promotional spending by pharmaceutical companies has been on sales representatives and samples. (Friedman, 2003)

AC Nielsen/HCI’s study on important sources of medical information rated 24 different factors that influence prescribers. The study report included responses from 2,200 office-based high prescribers (17). The top 3 factors, conferences/symposia, continuing medical education (CME) courses, and medical journals, each had responses in excess of 70%. The next three, all around 50%, were colleagues, dinner meetings, and pharmaceutical representatives (Nielsen, 2003)

The impact of promotions on physician’s choices of prescriptions has also been well investigated in the literature (Berndt et al., 1997; Gonul et al., 2001; Manchanda and Chintagunta, 2004; Narayanan et al., 2004; Mizik and Jacobson, 2004; Kissan and Mantrala, 2009; Ching and Ishihara, 2010) and the conclusion is the strong positive influence of free samples and detailing on physician’s prescribing habits.

Mizik and Jacobson (2004) also assessed the effects of drug samples on prescribing behavior. Once again, the extensive analysis of their large database revealed a small but statistically significant effect size of drug samples on prescriptions. The maximum effect was tied to the “rising star” drug, a possible indication that physicians were more responsive to information about a drug of interest.

3. DISCUSSIONS AND IMPLICATIONS

The first major finding of the study is about tangible rewards leading to prescription loyalty. Although several prescription behavior studies have suggested that physicians consider rewards in their prescription decisions (Wazana, 2000; Madhavan et al., 1997; Brett et al., 2003), we found that tangible rewards are a significant factor in physicians’ continuity in prescribing the same company drug. By this result, we understand that physicians are committed in prescribing a particular company’s drugs on the basis of the recognition shown by the pharmaceutical company for continuous patronage. The finding is not surprising. Janakiraman et al.’s (2008) study, which analyzed a panel data set for the anti-depressant therapeutic drug in the UK, indirectly suggested that tangible rewards seem to impact persistence in prescription. They found that the persistent physicians were responsive to “symposium meetings”, which are a form of reward provided by the pharmaceutical company to the physicians for their patronage. A study conducted by Tengilimoglu et al. (2004) in Turkey among Medical Representative, showed precisely how important rewards are for physicians’ prescriptions. Most of the Medical Representatives in their study reported that

physicians are commonly influenced by non-medical considerations during their interactions and request gifts other than medical products. When the Medical Representatives of competing pharmaceutical companies approach physicians to prescribe their company's drugs, and when other considerations like drug quality, corporate reputation etc., from competing pharmaceutical companies appears similar to physicians, they are normally influenced by something different and valuable to them in the context of continuous patronage. From a relationship marketing point-of-view, there is nothing necessarily wrong with pharmaceutical companies providing tangible rewards for prescription loyalty to their physicians (customers). Rewards are provided to physicians by the pharmaceutical companies in recognition of the on going relationship with the companies. It is a known fact in marketing that relationship-based customers have to be respected and recognized, by providing some form of reward for their continued relationships. This is also practiced in many service industries such as air travel, credit cards and various branches of retailing. The finding implies that pharmaceutical companies in India should focus their efforts on providing tangible rewards to physicians for their prescription loyalty. However, companies must be careful as to how and what kind of rewards would be effective in the short- and long-term. Free samples would be useful in the short run as a reminder of new drug trials (Campo et al., 2005) and it may also help physicians to provide these free samples to their patients who are poor. In India, around 70 percent of households use their own savings for healthcare expenditures, as direct and indirect governmental support is minimal and health insurance is a very nascent industry (Sujatha et al., 2005). When patients find that their physicians provide free sample drugs, they feel positive about the physicians and therefore they spread positive word of mouth about them, which in a way, supports and fosters the physicians' private medical practice in the long run. However, in the US, Gonul et al. (2001) found that providing free samples beyond a particular limit would be counterproductive, as physicians tend to perceive the pharmaceutical company as desperate and too aggressive. They also found that providing free samples would be ineffective with respect to prescription, when patients are covered by insurance. In such situations, the company may rather consider providing free conference participation, as this too influences drug choice by physicians (Campo et al., 2005). The point of concern would be whether the physician remains loyal or committed to the drugs of a particular company, due to the tangible rewards, even though the drugs are ineffective and of poor quality.

Although, physicians consider drug quality as a "point of parity" factor, there would still be chances that some physicians who are highly influenced by tangible rewards may be tempted to prescribe wrong drugs. In such a situation, the role of drug control authorities and governmental agencies is very important. These agencies should be vigilant and monitor tangible rewards as they have the potential to promote unethical and fraudulent practices by both physicians and pharmaceutical companies. In a country like India, companies providing free samples are welcomed as they help poor people obtain medicines from physicians free of cost. Financing symposiums and conferences as recognition for physician patronage also helps companies achieve prescription loyalty. From a public policy perspective, these measures should arguably be subjected to the vigilance of governmental agencies. The basic argument in favor of the symposium meetings and conferences, is that these forums provide opportunities to physicians to interact with fellow physicians and learn about new drugs and techniques. However, according to our findings, it seems that physicians are

negatively influenced for prescription loyalty through these professional interactions. Accordingly, the basic question would be as to why physicians participate in symposiums and conferences. To answer this, we have to understand how these symposium meetings and conferences are perceived by physicians, given that most of these events are held at popular tourist destinations (Anand, 2011). It does indeed seem that physicians combine a degree of work with vacation and leisure travel (Anand, 2011). It is not fundamentally wrong for pharmaceutical companies to finance conference participation, but physicians should not be unduly influenced by such practices. Hence, government agencies should realize that these activities often extend far beyond mere education and development. Therefore, due vigilance on the financing of symposiums and conference participation by the pharmaceutical companies for physicians, is clearly necessary.

Government agencies should also monitor potentially unscrupulous activities in terms of providing gifts in other forms. The popular UK newspaper, The Guardian, reported the findings of "Consumers International" that the developing world is an easy target for multinationals and states: An unnamed Indian doctor told researchers: "Gifting" of air conditioners, washing machines, microwaves, cameras, televisions, and expensive crystals is an accepted norm now a days. So are frequent pampering in the form of CMEs (continuing medical education meetings) and lectures in star hotels followed by lavish dinners and cocktails (Boseley, 2007).Considering the severity of the problem, the Medical Council of India has recently introduced regulations that restrict physicians with respect to, "accepting gifts, travel facilities and hospitality from pharmaceutical companies in lieu of promoting their products" (Dhar, 2010). The enforcement of these regulations has to be strictly followed.

The second major finding of our study is that Medical Representative personality impact significantly on the prescription loyalty behavior of physicians. This is an important result for the pharmaceutical companies in terms of adopting and nurturing the professional values of their Medical Representative. This is even more important, due to the fact that most of the countries have brought in strong regulations relating to physicians accepting tangible rewards. If providing tangible rewards (which is found to be a significant factor for prescription loyalty) seems more difficult, companies need to understand that tangible rewards can no longer be a "point of difference" due to government agency intervention, so that they have to focus far more on Medical Representative. This will remain a "point of difference" and generate physician trust and consequently prescription loyalty in the long run. Medical Representative training programs should therefore concentrate on training values and ethics in guiding and detailing drugs to physicians.

On the other hand Marketing consultant Richard Meyer observes that the role of the traditional sales rep who constantly seeks face time with doctors is "fading." Meyer and other industry watchers say pharmas need to re-tool their marketing efforts and bring more "medical communication specialists" on staff to engage with physicians online. These medical communicators could provide value-added services that help physicians sort through information clutter while facilitating links with clinical trials, journals, and knowledge opinion leaders.

Therefore, the pharmaceutical industry have a profound effect on a physician's prescribing. The extant literature suggests that as the industry has increased its promotional activity, including direct sales efforts, physician prescribing has been affected. To conclude, industry-sponsored education programs also exert strong influences upon physician prescribing. Pharmaceutical samples have a

strong influence upon prescribing patterns and are also being used by health care administrators to increase use of generic and preferred brands of pharmaceuticals. Academic detailing has begun to show positive return on investment due to its strong ability to influence prescribing decisions, but it is limited in use by its relatively large expense. Pricing as a factor needs to be studied further as this factor is not covered here.

3.1 Limitations and future research

This study is based on secondary sources of information to draw the generalized applications. It need to be further supported by empirical investigation. The present study pharmaceutical marketing and medicine prescription behavior dealt with studying medicine prescription behavior in journal. However the behavior may differ across physician's specialty, practicing in different set ups, private or public hospitals. Despite its shortcomings, this paper is intended to facilitate a discussion of the importance of understanding factors that influence physician prescribing and to identify potential avenues for further research. This paper serves as a literature review of some of the factors that may influence prescribing behavior and subsequently develops a theoretical framework based upon these factors. Certainly, more research is needed to further identify the correlation of factors and their interactions upon actual physician prescribing of pharmaceutical products. This paper provides a different perspective to prescription behavior research and should contribute to the growing body of knowledge on the role of prescription loyalty behavior of physicians, thus broadening the scope of further research on prescription loyalty. Further research might be directed toward determining the influence of each factor upon physician prescribing and testing the overall model and interactions among its individual components.

4. Bibliography

1. "Accreditation Council for Continuing Medical Education. Standards for commercial support". (2005) Retrieved Feb 23, 2005, from www.accme.org/dir_docs/doc_upload/68b2902a-fb73-44d1-8725-80a1504e520c_uploaddocument.pdf.
2. Anon. *PhRMA adopts new marketing code (press release)*. (2002). Retrieved from www.phrma.org/media room/press/releases/19.04.2002.390.cfm (accessed 2003 Aug 8).
3. " Study finds problems in M.D.-sales rep relationship" *Pharm Representative*. (2003, Aug 6). Retrieved Feb 23, 2003, from Annon: [pharmrep.adv100.com/pharmrep/ article/articleDetail.jsp?id=118398](http://pharmrep.adv100.com/pharmrep/article/articleDetail.jsp?id=118398)
4. *Health Strategies Group, Inc. PharmaSFE.*, v. 3.2. (2003). Retrieved Aug 18, 2003, from www.healthstrategies.com/products/sfe_reports.html.
5. (5th may 2003). *OIG compliance program guidance for pharmaceutical manufacturers*. Federal Registe , pp. 68-86 :23731.
6. Abratt, R., & Lanteigne, J. (2000). "Factors influencing general practitioners in the prescription of medicines". *South African Journal of Business Management*, Vol. 31 No. 3, pp. 91-7.
7. Accenture. (2003, July 16). "Physicians seek more detailed, comparative and customized information from pharmaceutical representatives". Retrieved September 16 2003, from accenture.com/xd/xd.asp?it=enweb&xd=_dyn\dynamicpressrelease_630.xml.

8. Alkhateeb, F. M., Khanfarb, N. M., & Clauson, K. A. (2009). "Characteristics of physicians who frequently see pharmaceutical sales representatives". *Journal of hospital Marketing and Public Relations, Vol. 19 No. 1*, pp. 2-14.
9. Anand, V. C. (2011). "Professional conferences, unprofessional conduct". *Medical Journal Armed Forces of India, Vol. 67 (1)*, pp. 2-6.
10. Anderson, M. (2006). "Maximizing sales effectiveness with e-detailing". *Eye for pharma's 5th Annual Marketing ROI for Pharma Congress*. Amsterdam.
11. Bednarik, J. (2005). "Does brand differentiate pharmaceuticals?". *Neuroendocrinology Letters, Vol. 26(No. 6)*, pp. 635-52.
12. Berblinger, J. (1996). Marktakzeptanz des Ratings durch Qualität, in Buschgen und Everling: Handbuch Rating Wiesbaden: pp. 21-110.
13. Berndt, E. R., Bui, L. T., Reiley, D. H., & Urban, G. L. (1997). "The roles of marketing, product quality and price competition in the growth and composition of the US antiulcer industry". In *The Economics of New Goods*. Chicago: University of Chicago Press.
14. Boltri, J., Gordon, E., & Vogel, R. (2002). "Effect of antihypertensive samples on physician prescribing patterns". *Fam Med., Vol. 34*, pp 729-31.
15. Boseley, S. (2007). "Drug firms try to bribe doctors with cars". Retrieved June 22, 2011, from The Guardian: www.guardian.co.uk/world/2007/oct/31/international.mainsection1
16. Brett, A. S., Burr, W., & Moloo, J. (2003). "Are gifts from pharmaceutical companies ethically problematic? A survey of physicians". *Archives of internal Medicine, Vol. 163 No. 18*, pp. 2213-2218.
17. Campo, K., De Staebel, O., Gijsbrechts, E., & Van Waterschoot, W. (2005). "Physicians' decision process for drug prescription and the impact of pharmaceutical marketing mix instruments". *Health Marketing Quarterly, Vol. 22 No. 4*, pp. 73-107.
18. Carter, F. J., & Chitturi, R. (2009). "Segmentation based on physician behavior: implications for sales forecasting and marketing mix strategy". *Journal of Personal Selling and sales management, Vol. 29 No.1*, pp. 81-95.
19. Caudill, T., Johnson, M., Rich, E., & McKinney, W. (1996). "Physicians, pharmaceutical representatives and the cost of prescribing". *Arch Fam Med., 5(4)*: pp. 201-6.
20. Chew, L., O'Young, T., Hazlet, T., Bradley, K., Maynar, C., & Lessler, D. (2000). "A physician survey of the effect of drug sample availability on physicians' behavior". *J Gen Intern Med., 15*:478.
21. Ching, A., & Ishihara, M. (2010). "The effects of detailing on prescribing decisions under quality uncertainty". In *Quantitative Marketing and Economics* (Vol. 8 No. 2, pp. 123-165).
22. Collier, J., & Iheanacho, I. (2012). "The Pharmaceutical industry as an informant". In *The Lancet* (Vol. 360 No. 11, pp. 1405-9).
23. Cosceilli, A., & Shum, M. (2004). "An Empirical Model of Learning and Patient Spillovers in New Drug Entry". *Journal of Econometrics, Vol. 122*, pp. 213-246.
24. Cutting Edge Information. (2004). "Pharmaceutical Thought Leaders: Brand Strategies and Product Positioning".
25. Davis, D., O'Brien, M., Freemantle, N., Wolf, F., Mazmanian, P., & Taylor-Vaisey, A. (1999). "Impact of formal continuing medical education: do conferences, workshops, rounds and other

- continuing education activities change physician behavior or health outcomes". *Journal of the American Medical Association*, Vol. 282, pp. 867-74.
26. Denig, P., Haaijer-Ruskamp, F. M., & Zijsling, D. H. (1988). "How physicians choose Drugs?". *Social Science and Medicine*, Vol. 27 No. 12, pp. 1381-1386.
 27. Dey, A., Raj, U. K., & Chandra, A. (1999). "Pharmaceutical marketing in India: a macroscopic view". *Paper presented at Conference of South Western Marketing Association*. Houston, TX.
 28. Dhar, A. (2010). "MCI quantifies punishments for doctors accepting gifts". Retrieved June 22, 2011, from The Hindu: www.thehindu.com/news/national/article244361.ece
 29. Dolovich, L., Levine, M., Tarajos, R., & Duku, E. (1999). "Promoting optimal antibiotic therapy for otitis media using commercially sponsored evidence-based detailing: A prospective controlled trial". *Drug Information Journal*, Vol. 33, pp. 1067-77.
 30. Donaldson, T. (1982). "Corporation and Mortality". *Prentice-Hall, Englewood Cliffs*. NJ.
 31. Doney, P. M., & Cannon, J. P. (1997). "An Examination of the nature of trust in buyer-seller relationships". *Journal of Marketing*, Vol. 61, pp. 35-51.
 32. Economic Times. (June 2010, June 8). "Pharma to topple IT as big paymaster".
 33. Ellison, S., Cockburn, I., Griliches, Z., & Hausman, J. (1997). "Characteristics of demand for pharmaceutical products: an examination of four cephalosporins". *RAND journal of Economics*, Vol. 28 No. 3, pp. 426-46.
 34. Fangwen, L. U. (2011). "Experiments on Health and Education in Developing Economies". Retrieved from Education Resources Information center: <http://www.proquest.com/en-US/products/dissertations/individuals.shtml>
 35. FDA. (2002). "Consumer directed broadcast advertisements". Retrieved August 12, 2012, from www.fda.gov/RegulatoryInformation/Guidances/ucm125039.htm
 36. Fidler, H., Lockyer, J., Toews, J., & Violato, C. (1999). "Changing physicians' practices: the effect of individual feedback". *Journal of American Medical Association*, Vol. 74, pp. 702-14.
 37. Fombrun, C. J., & Van Riel, C. (1999). "The reputational landscape". *Corporate Reputation Review*, Vol. 1, pp. 5-12.
 38. Friedman, J. (Aug 2003). "Pharmaceutical trends: Marketing key topic at conference. Incentive". . ., 177 11).
 39. Fugh, A. B., & Ahari, S. (2007). "How Drug Reps Make Friends and Influence Doctors". Public Library of Science.
 40. Gibbons, R. (1998). "A comparison of physicians' and patients' attitudes toward pharmaceutical industry gifts". *J Gen Intern Med.*, 13(3) pp. 151-4.
 41. Glass, H. E., & Poli, L. G. (2009). "Pressure points' on pharmaceutical industry executives: what lies Ahead?". *International Journal of Pharmaceutical and Healthcare Marketing*, Vol. 3 No. 1, pp. 74-83.
 42. Glass, H. E., & Rosenthal, B. (2004). "Demographics, practices, and prescribing characteristics of physicians who are early adopters of new drugs". In *Pharmacy and Therapeutics* (Vol. 29 No. 1, pp. 699-708).
 43. Gönül, F. F., & Carter, J. F. (2010, June 13). "Impact Of e-Detailing on the Number of New Prescriptions". *Health Care Management Science*, 13 June (2), Vol. 2, pp.101- 111.

44. Gonul, F. F., Carter, F., Petrova, E., & Srinivasan, K. (2001). "Promotion Of Prescription Drugs and its impact on physicians' choice behavior". *Journal of Marketing, Vol. 65*, pp. 79-90.
45. Groves , K., Sketris , I., & Tett , S. (2003). "*Prescription drug samples–Does this marketing strategy counteract policies for quality use of medicines?* ". Retrieved from *J Clin Pharm Ther.*,28(4)pp. 259-71.
46. Haddad, J. (2002). "The pharmaceutical industry's influence on physician behavior and health care costs". *San Francisco Medicine, 75*(6).
47. Halperin, E., Hutchison , P., & Barrier, R. (2004). A population based study of the prevalence and influence of gifts to radiation oncologists from pharmaceutical companies medical equipment manufacturers. *Int J Radiat Oncol Biol Phys, 59*:1477-83.
48. Hartzema, A. G., & Christensen, D. B. (1983). "Nonmedical factors associated with the prescribing volume among family practitioners in an HMO". *Medical Care, Vol.21*, pp. 990-1000.
49. Henry, J. (2002, March). "National Survey of Physicians : Doctors and Prescription Drugs". *Kaiser Family Foundation*.
50. Holmer , A. (2001). "Industry strongly supports continuing medical education" *JAMA. 285*:2012-14.
51. IMS Health. (2009). "*IMS forecasts global pharmaceutical market growth of 4-6 percent in 2010; predicts 4-7 percent expansion through 2013*". Retrieved March 16, 2010, from www.imshealth.com: <http://www.imshealth.com>
52. Janakiraman, R., Dutta, S., Sismeiro, C., & Stern, P. (2008). "Physicians ' persistence and its implications for their response to promotion of prescription drugs". *Management Science, Vol. 54 No. 6*, pp. 1080-1093.
53. Jonathon, D. R. (2012, Jan 10). "Drug Reps Soften Their Sales Pitches". *Wall Street Journal*.
54. Katz, D., Caplan, A., & Merz, J. (2003). "All gifts large and small" . *Am J Bioethics.*, 2(3), pp.39-46.
55. Kennedy, M. S., Ferrel, L., & LeClair, D. T. (2001). "Consumers' trust of salesperson and manufacturer: an empirical study". *Journal of Business Research, Vol. 51 No. 1*, pp. 73-86.
56. Kissan, J., & Mantrala, M. (2009). "A model of the role of free drug samples in physicians' prescription decisions". In *Marketing Letters* (Vol. 20 No. 1, pp. 15-29).
57. Landefeld CS , C., & Steinman , M. (2009, January). "The Neurontin legacy--marketing through misinformation and manipulation". *J. Med. , 360* (2), pp. 103-6.
58. Landon, B. E., Reschovsky, J., Reed, M., & Blumenthal, D. (2001). "Personal ,organizational and market level influences on physicians' practice patterns". In *Medical Care* (Vol. 39 No. 8, pp. 889-905).
59. Leffler, K. B. (1981). "Persuasion or information? The economics of prescription drug advertising". *Journal of Law And Economics, Vol. 24 No. 1*, pp. 45-74.
60. Liebman, M. (1997). "Hard facts about a soft spend: How print advertising pays off". *Med Marketing Media, 32*(4):66-74.
61. Liebman, M. (2000). Listen up, publishers say–journal advertising sells! *Med Marketing Media, 35*(3):89-94.

62. Madhavan, S., Amonkar, M. M., Elliott, D., Burke, K., & Gore, P. (1997). "The gift relationship between pharmaceutical companies and physicians: an exploratory survey of physicians". *Journal of Clinical Pharmacy and Therapeutics*, Vol 22 No. 3, pp. 207-215.
63. Maignan, I., & Ferrell, O. C. (2001). "Corporate citizenship as a marketing instrument". *European Journal of Marketing*, Vol. 35 Nos 3/4, pp. 457-484.
64. Manchanda, P., & Chintagunta, P. K. (2004). "Responsiveness of physician prescription behavior to sales force effort: an individual level analysis". In *Marketing Letters* (Vols. 15 Nos 2-3, pp. 129-145).
65. Miles, M. P., & Covin, J. G. (2000). "Environment marketing : a source of reputational competitive and financial advantage". *Journal of Business Ethics*, Vol. 23 No. 3, pp. 299-311.
66. Miles, M. P., & Manilla, L. S. (2004). "The Potential impact of social accountability certification on marketing: a short note". *Journal Of Business Ethics*, Vol.50 No. 1, pp. 1-11.
67. Mizik, N., & Jacobson, R. (2004). "Are Physicians 'Easy Marks'? Quantifying the Effects of Detailing and Sampling on New Prescriptions". In *Management Science* (Vol. 50 No.12, pp. 1704 -1715).
68. Mohr, L. A., Webb, D. J., & Harris, K. E. (2001). "Do consumers expect companies to be socially responsible? The impact of corporate social responsibility on buying behavior". *Journal of Consumer Affairs*, Vol. 35 No. 1, pp. 45-73.
69. Mukherjee, A., & Bhavsar, U. (2009). "Antecedents and consequences of corporate reputation: stakeholder perceptions towards Big Pharma ". *Society for Marketing Advances Annual Conference*. New Orleans, USA.
70. Murray, D. (2002). " Gifts: What's all the fuss about?". *Med Econ.*, 79(19) pp. 119-20.
71. Nair, H. S., Manchanda, P., & Bhatia, T. (2010). "Asymmetric social interactions in physician prescription behavior: the role of opinion leaders". *Journal of Marketing Research*, Vol. 47 No. 5, pp. 883-95.
72. Narayanan, S., & Manchanda, P. (2009). "Heterogeneous learning and the targeting of marketing communication for new products". *Marketing Science*, Vol. 28 No. 3, pp. 424-41.
73. Narayanan, S., Desiraju, R., & Chintagunta, P. K. (2004). "Return on investment implications for pharmaceutical promotional expenditures: The role of marketing-mix interaction". *Journal of Marketing*, Vol. 68 No. 4, pp. 90-105.
74. Narayanan, Sridhar, Manchanda, P., & Pradeep. (2005, August). "Temporal Differences in the Role of Marketing Communication in New Products Categories". *Journal of Marketing Research*, Vol. 42, pp.278-290.
75. Neslin, S. (2001, May). "ROI analysis for pharmaceutical promotion (RAPP): An independent study". *Association of Medical Publications*.
76. Nielsen, A. C. (2003, June). " Important sources of medical information ". Retrieved Dec 10, 2003, from www.perq-hci.com/News/research/important_sources.pdf.
77. Orłowski, J., & Wateska, L. (1992). The effects of pharmaceutical firm enticements on physician prescribing patterns: There's no such thing as a free lunch. *Chest*, 102(1):270-3.
78. Pearl, D., & Stecklow, S. (2012, August 16). "Drug firms' incentives fuel abuse by pharmacists in India". *The Wall Street Journal*.

79. Prabhu, D., Kline, S., & Dai, Y. (2005). "Corporate social responsibility practices, corporate identity and purchase intention: a dual-process model". *Journal of Public Relations Research*, Vol. 17 No. 3, pp. 291-313.
80. Rao, P. M. (2008). "The emergence of the pharmaceutical industry in the developing world and its implications for multinational enterprise strategies". *International Journal of Pharmaceutical and Healthcare Marketing*, Vol. 2 No. 2, pp. 103- 116.
81. Relman, A. (2001). "Separating continuing medical education from pharmaceutical marketing". *JAMA*, 285(2009-12).
82. Rizzo, J. A. (1999). "Advertising and competition in the ethical pharmaceutical industry: the case of antihypertensive drugs". *Journal of Law and Economics*, Vol. 42 No. 1, pp. 89-113.
83. Robertson, D. C., & Nicholom, N. (1996). "Expressions of corporate social responsibility in UK firms". *Journal of Business Ethics*, Vol. 15 No. 10, pp. 1095-106.
84. Roy, N., & Pai, S. A. (2013). "Drug promotional practices in Mumbai: a qualitative study". *Indian Journal of medical ethics*, Vol. 10 No. 3.
85. Ryan, M., Yule, B., Bond, C., & Taylor, R. J. (n.d.). "Do physicians' perceptions of drug costs influence their prescribing?". In *PharmacoEconomics* (Vol. 9 No. 4, pp. 321-331).
86. Scherer, F. M. (1993). "Pricing, profits and technological progress in the pharmaceutical industry". *Journal of Economic Perspectives*, Vol. 7 No. 3, pp. 97-115.
87. Scott, J. (2003, Aug 10). *Docs want to hear from knowledgeable reps..* Retrieved from Pharm Representative: Available at: pharmrep.adv100.com/pharmrep/article/articleDetail.jsp?id=118400.
88. Shah, N. (2004). " Pharmaceutical supply chains: key issues and strategies for optimisation". In *Computers and Chemical Engineering* (Vol. 28, pp. 929-941).
89. Sillup, G. P., & Porth, G. P. (2008). "Ethical issues in the Pharmaceutical industry: an analysis of US newspapers". *International Journal of Pharmaceutical and Healthcare Marketing*, Vol. 2 No. 3, pp. 163- 180.
90. Snider, J., Hill, R. P., & Martin, D. (2003). "Corporate social responsibility in the 21 century: a view from the world's most successful firms". *Journal of Business Ethics*, Vol. 48 No. 2, pp. 175-187.
91. Steinbrook, R. (2006). "For Sale: Physicians' Prescribing Data". *The New England Journal of Medicine*, 354 (26), pp. 2745-2747.
92. Stone, K. (2009). *About.com Pharma ,What Strategies Can a Pharma Marketer Use to Reach Doctors ?* Retrieved from http://pharma.about.com/od/Sales_and_Marketing/a/What-Strategies-Can-A-Pharma-Marketer-Use-To-Reach-Doctors.htm.
93. Sufrin, C., & Ross , J. (September 2008). "Pharmaceutical industry marketing: understanding its impact on women's health". *Obstet Gynecol Surv* 63 (9). pp. 585-596.
94. Sujatha, R., Selvaraju, S., Nagpal, S., & Sakthivel, S. (2005). " *Financing and Delivery of health care services in India*". New Delhi.
95. Talias, M. (2007). "Optimal decision indices for R&D project evaluation in the pharmaceutical industry: Pearson index versus Gittins index". *European Journal of Operational Research*, Vol. 177, pp. 1105-12.

96. Tan, R. S. (2003). "Physician executives as opinion leaders in biotechnology and pharmaceuticals". In *Physician Executive* (Vol. 29 No.3, p. 26).
97. Temin, P. (1980). *"Taking your Medicine: Drug Regulation in the United States"*. Cambridge, MA: Harvard University Press.
98. Tengilmoglu, D., Kisa, A., & Ekiyor, A. (2004). "The pharmaceutical sales rep/physician relationship in Turkey: ethical issues in an international context". *Health Marketing Quarterly*, Vol. 22 No. 1, pp. 21-39.
99. TNS Health Press Release. (2009). *"Physicians in Europe rate Novartis #1 on service delivery, while Merck earns top honors in the US"*. Retrieved June 22, 2011, from [www.tnsglobal.com](http://www.tnsglobal.com/new/news-AB84EC66A4C4450CABB3254471EBF901.aspx): <http://www.tnsglobal.com/new/news-AB84EC66A4C4450CABB3254471EBF901.aspx>
100. Torres, I. M., Sierra, J. J., & Heiser, R. S. (2007). "The effects of warning-label placement in print ads: a social contract perspective". *Journal of Advertising*, Vol. 36 No. 2, pp. 49-62.
101. Vermont, A. (2002). "Reporting of gifts to physicians". *Med Marketing Media*, 37(7):6.
102. Vicciardo, L. (1995, Aug 30). *The secret weapon in marketing intelligence: "Meetings and events analysis is a powerful new tool in researching marketing strategy and success"*. Retrieved Dec 7, 2003, from www.cpsnet.com/reprints/1995/08/secret.html (accessed 2003 Dec 7).
103. Walker, H. (1971). *"Market Power and Price Levels in the Ethical Drug Industry"*. Bloomington, IN: Indiana University Press.
104. Wang, A. (2009). "Advertising disclosure and CSR practices of credit card issues". *Management Research News*, Vol. 32 No. 12, pp. 1177-1191.
105. Watts, D. J., & Dodds, P. S. (2007). "Influentials, Networks, and Public Opinion Formation". *Journal of Consumer Research*, Vol. 34.
106. Wazana, A. (2000). "Physicians and the pharmaceutical industry: is a gift ever just a gift?". *Journal of the American Medical Association*, Vol. 283 No. 3, pp. 373-80.
107. WHO. (2007, March 4). *"Drug promotion: What we know, what we have yet to learn"*. Retrieved from [www.who.int](http://www.who.int/medicines/areas/rational_use/drug_promodhai.pdf): http://www.who.int/medicines/areas/rational_use/drug_promodhai.pdf
108. WHO. (2009). *World Health Statistics-2009*. Retrieved December 15, 2009, from [www.who.int](http://www.who.int/entity/whosis/whostat/EN_WHS09_Full.pdf): www.who.int/entity/whosis/whostat/EN_WHS09_Full.pdf
109. Wilkes, M., Doblin, B., & Shapiro, M. (1992). "Pharmaceutical advertisements in leading medical journals: Experts' assessments. d. 1992; 116:912-9". *Ann Intern Med*, Vol. 116, pp. 912-9.
110. Wilson, D. (October 2, 2010). *Duff Wilson "Side Effects May Include Lawsuits"*. New York Times.
111. Wittink, D. (September 2002). "Analysis of ROI for pharmaceutical promotion (ARPP): A second independent study". *Presentation to the healthcare industry*.
112. World-Self Medication Industry. (1999). "Guiding Principles in Self Medication". London, UK.
113. Wright, R. F., & Lundstrom, W. J. (2004). "Physicians' perceptions of pharmaceutical sales representatives: a model for analyzing the customer relationship". *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing*, Vol. 4 No. 1, pp. 29-38.

