

LITERATURE REVIEW OF PROFESSIONAL FACTORS INFLUENCING MEDICINE PRESCRIPTION BEHAVIOR OF DOCTORS

Kiran Bala,

Assistant Professor, Deptt. Of Commerce,

Delhi School of Economics,

University of Delhi

INTRODUCTION

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.

PROFESSIONAL FACTORS

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).

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 (Lieberman, 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 (Lieberman, 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.

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).

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.

CONCLUSION

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. This conclusion is also supported by Nielsen/HCI’s study focused 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)

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. 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.

Advertisement in medical journals has also begun to show positive return on investment due to its strong ability to influence prescribing decisions. The most frequent resources used in case of any problem in prescribing and selection process of drug are medical text books and academic journals. Thus, on the basis of past studies on pharmaceutical marketing, advertisement in medical journals is identified the key role of other marketing tools such as the relationship of pharmaceutical sales representatives with doctors, marketing research, public relations, and distribution on physicians' prescription behavior.

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