

## **Mystery Written on Prescription Pads: Exploring Marketing Factors Influencing Prescription Behaviour using the AHP Approach**

H. Bamoriya

**Hemant Bamoriya**

Faculty of Management Studies, Acropolis Institute of Technology &  
Research, Indore, India

### **Abstract**

The Indian Pharma market is highly fragmented & nature of competition is intense. Further, in modern times influencing doctors' prescription decision has become very complex as there is little systematic knowledge about factors affecting the doctors' prescription behaviour and the weight of individual factor. This study aims to demystify this complex prescription behaviour of doctors, through examining the above mentioned factors. For this purpose, a focus group study will be followed by a quantitative study using the Analytic Hierarchy Process (AHP) approach. The findings of the study will have important implications for the marketers in order to do proper allocation of their resources, to improve their promotional efficiency.

**Keywords:** behaviour, doctors, English, marketing, pharma, prescription.

### **Introduction**

The Indian pharmaceutical market is a US\$ 9 billion opportunity and ranks 4th globally in terms of volume. In terms of value it produces 20-24 per cent of the world's generic drugs. India is also one of the top five active pharmaceutical ingredients producers, volume wise with a share of about 6.5 % (Anonymous, 2011). In the last decade, after a

period of sustained growth, the domestic market began to decelerate since the beginning of Q3-FY11 largely prompted by intense competition. Further, the growth rates slipped quite sharply in H1-FY12 on back of spill over of pricing pressure even to the chronic segments (Ghosh et al., 2012).

But, endorsing the strong future growth signals of the Indian Pharma industry, Goldman Sachs report predicts that India will be the 5<sup>th</sup> largest Pharma market in the world by 2020, with sales of \$43 billion (Roy, 2007). Many experts opine that the Indian Pharma industry is a sunrise industry where structural demand drivers include rising household income levels, increasing prevalence of lifestyle related diseases, improving healthcare delivery systems in smaller towns and rural areas. Coupled with some multimillion \$ pharma brands going off patent in USA & Western Europe in near future, markets like India is would keep on gaining attention of MNCs.

The competitive pressure in the Indian Pharma market has been rising steadily for some time now (Ghosh et al., 2012). The Indian Pharma market is having approx 20,000 registered manufacturers and over 70,000 brands; reflecting brand clutter (Chiplunkar, 2009). However, competitive pressures in the Indian market are likely to sustain as MNCs become aggressive and domestic companies leverage on their expanded field force. This is the reason why despite of increasing consolidation, the market continues to remain highly fragmented with top ten Pharma companies accounting for only 35-40% of the market (Ghosh et al., 2012).

Further, pharma market is typical in the sense that the doctors are the one who decides therapy and drugs for the consumers (patients). So, marketers promote their products directly to doctors to influence favorable prescription generation by them. Prescription behavior of doctors further increases peculiarity as doctors' choice is more logical for choosing a therapy & drug molecule but when it comes to selecting a particular brand their decision may be more inclined towards emotional and less rational (Blackett, 2001).

Due to this fierce competition and peculiar nature of the Indian Pharma market, promotional expenditure averages 20-35% of sales turnover of the industry mainly targeted at influencing the prescription behavior of Doctors (PharmaBiz, 2007). Here, personal selling is the most widely employed method in pharma marketing in India. Although very costly in nature, it touches the essence of pharma marketing i.e.

prescription generation. Indian Pharma companies are spending a huge and ever-increasing budget on doctors' visits (sales calls by pharmaceutical representatives) for this purpose.

At the same time, promotional budget has further undergone many fold increase due to sampling, symposiums, incentives etc. Yet marketers are in a great dilemma about what drives the doctors towards a particular prescription behavior. Of these factors influencing prescription behavior, some could be manipulated by the marketers say sampling, frequency of medical representative's visits (referred in the study as marketing factors); while others may not be like doctor-patient interaction, peer influence etc.

If various factors related to marketing activities affecting doctors' prescription behavior can be identified and weighted, then this insight could contribute greatly in resolving the controversy on how marketing efforts of pharmaceutical firms affect prescription behavior. Further, such insights could help marketers in maneuvering relevant factors for favorable prescription generation.

In today's highly competitive pharmaceutical market, marketers are increasingly concentrating on studying the prescription trends and the prescribing behavior of physicians (Chaganti, 2005; Bhardwaj & Jadeja, 2009). In this context, current research attempts to examine the select marketing factors which influence doctors' prescribing decisions and to analyze the complex interactions of such factors.

### **Literature review**

Existing related literature suggest conflicting views on effectiveness of promotional efforts in terms of influencing doctors' prescription behaviour. Gönül et al. (2001) suggested that firms' marketing efforts may have a positive effect on prescription behaviour, as detailing visits and symposium meetings provide valuable information to the doctor on efficacy and side effects of the particular drug. Further elaborating on the same, Manchanda & Chintagunta (2006) suggested that a Pharma companies marketing efforts may actually have both an informative role (e.g. reducing cognitive uncertainty) and a persuasive role (e.g. inducing positive affect towards a drug).

On the other hand, Mizik & Jacobson (2007) reported that marketing efforts by pharmaceutical companies to the doctor positively affect new prescriptions issued by a doctor, but the effect size was

found to be modest. They cast doubt about a strong and positive effect of marketing efforts on doctor prescription behaviour as evidenced in their study using aggregate and individual-level data. Similarly, Narayanan and Chintagunta (2004) found that marketing efforts by pharmaceutical companies to the doctor positively affect prescriptions issued by a doctor, but there are diminishing returns to detailing. McKinsey Report (2002) also suggested that the nowadays Doctors' Visits give lower return on marketing investment due to increasing numbers of medical representatives. Thus it has not much influence on Doctors' prescription behaviour. Further, Venkatraman & Stremerch (2007) reported that doctors' prescription behaviour is quite unresponsive to marketing efforts by pharmaceutical firms and even sales calls may even have a negative effect.

The related literature also suggest several possible factors if manoeuvre properly may have a role in influencing the prescribing behaviour of doctors (Howie 1976; Schumock et al., 2004). Ingole & Dube (2010) explored how physician's drug prescribing is influenced by drug promotion done by medical representatives. Study revealed that the sales representatives of different Pharma companies are the commonest source of information and latest updates on drug developments. The information provided by the medical representatives is brief and can be considered for initial information but should further clarify with other reliable source of information. Majority of the physicians opined that the medical representatives actually provide newer and latest updates on medicines which influence their prescriptions. At last, they concluded that sales promotion and incentive strategies could influence physician's decision making while selecting a pharma brand.

Further, Sharma (2012) elaborated that it is vital that sales professionals become involved in the process doctors must go through in order to change their clinical behaviours and prescribing habits. If the information a representative has to offer is presented to the physician as an opportunity for learning and improving the problem-solving process, everyone benefits – the doctor, the patients and the representative. He suggested that Pharma companies should provide training to representative so as to make it possible for them to contribute to that learning process and meet their goals more quickly. More specifically, Manchanda, Rossi & Chintagunta (2004) reported that medical

representatives' detailing positively affects doctors' prescription behaviour, but that high-volume doctors, while being detailed more, are less responsive to detailing as compared to low-volume doctors. Narayanan (2006) found that while detailing influenced doctors positively in an overwhelming number of cases, there was significant heterogeneity in doctor responsiveness to detailing. But, Rosenthal et al. (2003) did not find any robust and significant effects for the detailing at the individual brand level.

In context of sampling as promotional exercise, Chew et al. (2000); Duffy & Clark (2003) suggested the motives doctors have when dispensing free samples to their patients are financial savings for patients; convenience; initiating therapy immediately; demonstrating the appropriate use to patients; adjusting prescribed doses before the full prescription is purchased and evaluating early effectiveness or adversity. Thus samples provided by the Pharma companies tend to serve some decent purposes of the doctors. Neslin & Scott (2001) argued that a doctor may financially subsidize low-income or low-coverage patients through sample dispensing, in which case a drug prescription usually comes with a free sample. In such cases sampling may have strong positive influence on their prescription behaviour. Symm et al. (2006) also reported that family physicians who distribute free drug sample medications are more likely to prescribe these medications than those who do not. Their study revealed that the free drug samples distributed for medications is for 3 reasons i.e. to reduce the cost of high cost medications as a service to the patients, to immediate beginning of therapy to the patients and to evaluate the tolerance dose for the patients and also to adjust the dose therapeutically suitable for the patients. They concluded in their study some family physicians have influence of free drug sample distribution strategy of Pharma companies on their prescriptions.

Vakratsas & Kalyanaram (2010) studied the price sensitivity of physicians for select drugs in and attempted to distinguish between probability and frequency of prescription effects. They reported that physicians are price sensitive with respect to frequency but not probability of prescription. In other words, they would not exclude a drug from prescription due to its higher price, but would prescribe it at a lower frequency. Thus, physicians are selectively price sensitive, which we interpret as an effort to balance quality and cost considerations. But, some authors reported insignificant effect of price of a drug on doctors'

prescription behaviour (Kolassa, 1995; Iizuka & Jin, 2005). The prevailing view is that physicians possess limited information about the distribution of prices of prescription drugs and are generally focused on the effectiveness of the drug than its cost. Further, Vakratsas & Kalyanaram (2010) reported that the extent of influence of the price of the drug is subject to doctors' specialization and length of practice.

Further, many authors reported miscellaneous factors which would influence doctors' prescription choice of drug and the brand. Talgeri & Chiplunkar (2002) reported that easy and extensive availability of a particular product of a Pharma company has a strong positive influence over prescription behaviour towards that particular product. Gönül et al. (2001) suggested that the doctors while prescribing medicine brand for a specific disease, consider the regular visits from the medical representatives very important. Bansal & Das (2005) stated that many of doctors do not consider accepting small gifts as unethical and these types of inputs influence their prescription pattern. They reported doctors' opinion on incentives that these types of expensive gifts and financial support activities are the aggressive marketing strategies of Pharma companies and since they are getting benefited then they should also give benefits to Pharma companies in return.

On the basis of extensive literature reviews following research questions were designed:

RQ1 - What are the significant marketing factors influencing doctors' particular prescription behaviour and how doctors prioritize these factors according to their importance?

RQ2 - What is the effect of doctors' length of practice on their response towards marketing activities while controlling the effect of doctors' specialization?

RQ3 - What is the effect of doctors' patient volume on their response towards marketing activities while controlling the effect of doctors' specialization?

### **Methodology**

In the study, both qualitative (focus group study) and quantitative (survey) studies were involved to explore the research questions.

### **Focus group**

A key-informant focus group method was used in this research to explore the opinions & perceptions of participating doctors about marketing activities of pharma companies and its impact on their prescription behaviour. Key-informants were the doctors from heterogeneous background in terms of specializations & experience, who had knowledge on the subject. This method was used because its effectiveness in identifying & in-depth exploration of the participants' attitudes, experiences and reactions (Jarvenpaa et al., 2005).

### ***Planning and Conducting Focus Group***

Participants of focus group, 8 to 10 in numbers were selected from a heterogeneous pool. Discussion session was planned for 1.5 hours and consisted of 2 sections. Session started with an overview of the research objectives.

In 1<sup>st</sup> section participants were provided with closed-ended questions to answer briefly. Section 2 consists of free discussion about the given talk points and open-end questions were used to extract activities, anecdotal stories, evaluations, and emotions related to prescription practices and behaviour. The whole discussion was recorded by video-tape and note-taking.

Same procedure was repeated with 4 more focus group until theoretical saturation was achieved. Coding took place concurrently with data collection. For instance, a focus group, once conducted, was transcribed and analysed immediately, prior to conducting the next focus group. Then, data from the second group were compared with the emerging theory so that new avenues could become evident.

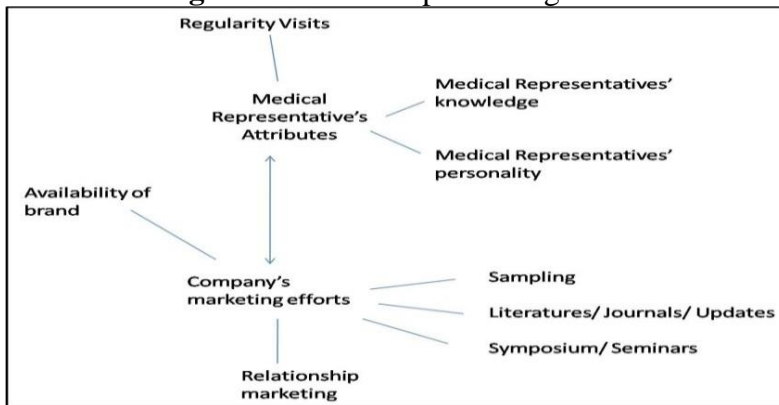
### ***Findings of Focus Group***

Focus group discussion led to an important point that the doctors' specialization (e.g. general practitioner, cardiologist, endocrinologist etc.) may affect the way a doctor would respond to some promotional efforts. Secondly, influence of doctors' length of practice and patient volume may have influence on doctors' response to promotional activities.

Further, extensive analysis (focus coding, constant comparison) of outcomes of focus group study led to identification of 8 marketing factors and subsequently to the conceptual integration (Figure 1). This

conceptual integration potentially explaining influence of specific variables on prescription behaviour of the doctors formed the basis of further quantitative study.

**Figure no. 1. Conceptual Integration**



**Survey**

For the purpose of quantitative study, an Analytic Hierarchy Process (AHP) approach was adopted. The AHP was proposed by Saaty in 1980 for individual as well as group decision making. AHP approach has been proposed in literature as a highly effective approach to dynamic and complex real world multi-criteria decision making problems (Albayrakoglu, 1996; Carlsson & Walden, 1995). And, obviously a doctor’s prescription choice is a complex decision making problem. To add further complexity choosing which brand for particular drug molecule becomes more critical and is influenced by multiple factors.

In the AHP process, data on decision makers’ judgments, called pair-wise comparisons are aggregated and the degree of importance of each alternative is quantified reflecting rationale behind selecting & prioritizing alternatives (Sato, 2004). This procedure identifies not only the most important alternative, but also the preference for all alternatives. Therefore, by applying the AHP to survey research questionnaires, respondents’ perceptions can be clarified more precisely than by traditional methods (Sato, 2001).

**Measurement & Scale Design**

On the basis of literature review & findings of the focus group, questionnaire was designed using AHP- paired comparison scale asking



how much important is one factor in prescription decision making than the other factor (Table 1). Part I of questionnaire asked respondents to make pairwise comparison of total 8 marketing factors influencing prescription behaviour. Part II of questionnaire dealt with demographics questions along with information on specialization of practice (specialty vs. non-specialty; using prevailing industry norms), length of practice in terms of number of years and patient volume (no. of patients seen in an average day).

**Table no. 1.** Pairwise Comparison Scale

Intensity	Definition	Description
1	Equal importance	Two factor contribute equally to prescription decision making
3	Moderate importance over other	Experience and judgment favor one factor over the other in prescription decision making
5	Strong importance over other	Experience and judgment strongly favor one factor over the other in prescription decision making
7	Very Strong importance over other	Experience and judgment very strongly favor one factor over the other in prescription decision making
9	Extreme importance over other	The evidence of favoring one factor over the other is of the highest possible order of affirmation in the prescription decision making
<i>2, 4, 6, 8 Intermediate values when compromise is needed</i>		

### ***Data collection & Screening***

Purposive sampling technique was used and questionnaire was administered personally for data collection. Total 879 questionnaires were returned (69.5% response rate). 56 responses were not suitable for analysis either due to large amount of missing values (subject to case wise deletion) or due to presence of outliers ( $|z| > 3$ ; Kline 2005).

Further, data was tested for normality using skewness and kurtosis indices. Here, data was regarded as univariate normal as the skew index ranged from -.62 to .75 and kurtosis index ranged from -.76 to .51.

**Analysis and findings**

**AHP Pairwise Comparison Matrix Estimation**

Respondents’ judgments obtained using the AHP scales were subject to AHP\_input spread sheet analysis, using geometric means of pairwise comparisons reported by all respondents.  $F_{ij}$  ( $i, j = 1, \dots, 8$ ) denoted the relative weight of factor  $i$  to  $j$ , where  $F_{ji} = 1/F_{ij}$ . For example if some respondent judged sampling ( $i$ ) to be moderately important over relationship marketing ( $j$ ) then  $F_{ij} = 3$ . Here, the results of all pairwise comparisons were summarized as an  $8 \times 8$  reciprocal pairwise comparison matrix, where  $a_{ii} = 1$  for all  $i = 1, \dots, 8$ . This resulting output produced composite priorities/ weights for factors (Table 2); answering the 1<sup>st</sup> research question.

Availability of a brand (.268) was the highest weighted factor which doctors perceived to be influencing their prescription behaviour, followed by relationship marketing (.179), sampling (.175). On the other hand, symposium/seminars (.024) and literature/journals/updates (.029) were perceived to be least important factors.

**Table no. 2.** Composite Priorities of Marketing Factors

Factors ( $n = 8$ )	Composite Priorities	Eigenvalue ( $EgV$ )
Availability of Brand	.268	8.0089 ideal value= $n = 8$
Relationship marketing	.179	
Sampling	.175	
Regularity of visits	.162	
MR’s Product Knowledge	.129	
MR’s personality	.033	
Literature/Journals/ Updates	.029	
Symposium/Seminars	.024	

As expected, pairwise comparison matrix didn’t satisfy transitivity criteria (i.e. for arbitrary  $i, j$  and  $k, a_{ik} * a_{kj} = a_{ij}$  ( $i, j, k = 1, \dots, 8$ ) because high degree of complexity & subjectivity involved in prescription decision making. So its Frobenius root was not equal to number of factors ( $n = 8$ ) suggesting natural judgmental inconsistency. Statistically, this level of inconsistency was estimated through Consistency Ratio, for which first Consistency Index ( $CI, .00128$ ) was estimated using eigenvalue ( $EgV$ ) for  $n= 8$ , as

$$CI = \frac{EgV - n}{n - 1}$$

Subsequently, using Consistency Index (*CI*) referring Random Index Value (*RIV*= 1.41, for *n*= 8) Consistency Ratio (*CR*, .091) was calculated as

$$CR = \left( \frac{CI}{RIV} \right) * 100$$

Estimated Consistency Ratio (*CR*= .091; < .01) suggested that respondents clearly understood the differences in choices presented & thus there was a satisfactory consistency level in respondents' judgment of relative importance of factors (Saaty, 1980).

#### **ANCOVCA**

To answer the research questions 2 & 3 related to effect of doctors' length of practice & doctors' patient volume on their response towards marketing activities (select factors understudy) while controlling the effect of doctors' specialization, an ANCOVA analysis was conducted using composite scores of factors. The covariate was included in the analysis to control for the differences on the independent variable.

First, Length of practice was taken as dependent variable and specialization of doctor as covariate. Preliminary analysis of interaction suggests that interaction is not significant;  $F = .645$ ,  $p = .587$ , so further analysis was done. Results of ANCOVA suggested significant influence of length of practice on doctors' response towards marketing factors when effect of doctors' specialization is controlled; as evidenced by  $F = 41.12$ ,  $p < .05$ .

Same process was conducted for doctors' patient volume as independent variable. Results of ANCOVA suggested significant influence of patient volume on doctors' response towards marketing factors when effect of doctors' specialization is controlled; as evidenced by  $F = 32.42$ ,  $p < .01$ .

### **Discussions and implications**

AHP suggested availability of a brand to be most influencing marketing factor for the doctors. Reason could be that now a days doctors are attending patients from broad territories and across cities so they would be inclined to prescribe brands which as easily available across places. Pharma companies must insure that the brands being promoted are available easily across the medical stores and across places.

Further, relationship marketing was another significant factor influencing prescription generation. Even focus group findings also suggested that activities like greeting on birthdays, Anniversaries etc. influence doctors' prescription behaviour.

Sampling efforts seems to have great potential for favourable prescription generation. So, Pharma companies should use sampling as prescription generation tool by managing cost-value trade off (as sampling has usually high cost associated for the company).

Visits to a particular doctor should be carefully scheduled to ensure regularity as suggested by survey findings. Further, there should be with proper gaps between 2 visits as focus group suggested that doctors generally discourage frequent visits. This case is especially true for doctors with longer medical practice.

In focus group many respondents expressed that they consider medical representatives an important source of information on pharmaceutical brands. Further, survey findings also suggested medical representatives' knowledge (but not their personality) has reasonable influence prescription behaviour. In that way, Pharma companies should invest substantially in proper training of medical representatives. Companies should also motivate medical representatives to be prepared thoroughly for in-chamber-detailing.

Surprisingly, influence of symposium/seminars & literature/journals/updates is almost non-existing on doctors' prescription behaviour. Reason could be that in today's IT era information is just click away offering copious sources of detailed information. That's why marketers should use such marketing tools mainly for informative/educational purpose rather than as active prescription generation tool.

At last, lengths of practice & patient volume have significant influence on doctors' perception towards marketing factors.

### **Conclusion**

There are multiple factors pertaining to marketing field, which influence doctors' prescription behaviour, and interaction of these multiple factors is very complex. Marketers must understand these relevant marketing factors viz. availability of brand, relationship marketing, sampling, regular visits, medical representatives' knowledge & personality and their relative importance perceived by the doctors in prescription decision-making. Especially, marketers should focus on improving brand availability to gain competitive advantage. Further, marketers should manoeuvre their marketing tactics & efforts at macro-level depending on specialization of doctor, length of practice and volume of patients attended in order to enjoy favourable prescription generation.

### **Limitations**

First limitation of the study lies in questionnaire administration. The use of self-reports to collect data from doctors may lead to the common method variance, a situation where true associations between variables are inflated specially in case of socially desirable behaviour. Same could be an issue in the current study.

Secondly, some possibly relevant marketing factors for example incentives, image of the company were left out in the study.

### **Scope for further research**

First, future research could study the relevant marketing factors using an experimental design. Such study could involve manipulation of factors like sampling, no. of visits per month, offering literatures/updates in a case-control setting. And, subsequently measure impact of such factors in-terms of actual prescription behaviour of doctors leading to more reliable findings.

Second, a future extension of this study can include the perception of the pharma marketers (sales managers & brand managers) on the same factors and then suggestions can be made to marketers on the basis of any difference found in the opinions & perceptions of the marketers and the doctors.

Third, future study could incorporate some more marketing factors like incentives, gifts, image of company, corporate communication etc. for studying prescription behaviour.

## **Bibliography**

- Anonymous, (2011). *Current facts of Indian Pharma*. Knowledge Base, Retrieved from <http://hosted.comm100.com/knowledgebase/article.aspx?siteid=95439&id=12>
- Azoulay, P. (2002). *Do Pharmaceutical Sales Respond to Scientific Evidence?* *Journal of Economics and Management Strategy*, 11 (4): 551-594.
- Bansal, R.K., Das, S. (2005). *Unethical Relationship between Doctors and Drug Companies*. *JIAFM*, 27(1): 40-42.
- Bhardwaj, P., Jadeja, J. (2009). *Buying Behavioural Pattern of Ethical and Generic Drugs in Western India: An Empirical Investigation*. Retrieved from [www.inderscience.com/info/inarticle.php?artid=37258](http://www.inderscience.com/info/inarticle.php?artid=37258)
- Blackett, T. (2001). *Brand Medicine: Use and Future Potential of Branding in Pharmaceutical Markets*. *International Journal of Medical Marketing*: 45-61.
- Chaganti, S. R. (2005). *Pharmaceutical Marketing in India*, 1st ed: 39-46.
- Chew, Lisa D., Theresa, S. O'Young, Thomas, K. Hazlet, Katharine, A. Bradley, Charles M., Daniel, S. Lessler (2000). *A Physician Survey of the Effect of Drug Sample Availability on Physicians' Behavior*. *Journal of General Internal Medicine*, 15 (July): 478-483.
- Chiplunkar, S. S. (2009). *Indian Pharma Market: Feature*. Retrieved from <http://www.pharmabiz.com/features>
- Duffy, C.M., Clark, M. (2003). *Who Receives Free Sample Medications?* *Journal of General Internal Medicine*, 18 (April): 205-218.
- Ghosh, A., Ray, S., Dewan, S., Shahani, K. (2012). *Indian Pharmaceutical Sector*. *Industry Update*, (March).
- Gönül, F. F., Franklin, C., Petrova, E., Kannan, S. (2001). *Promotion of Prescription Drugs and Its Impact on Doctors' Choice Behavior*. *Journal of Marketing*, July: 79-90
- Iizuka, T., Jin, G. Z. (2005). *Direct to Consumer Advertising and Prescription Choice*. Working Paper Series, Vanderbilt University.
- Jarvenpaa, S. L., Lang, K. R. (2005). *Managing the Paradoxes of Mobile Technology*. *Information Systems Management*, 22(4): 7-23.
- Kline, Rex B. (2005). *Principles and Practice of Structural Equation Modeling*, 2nd Ed., NY: Guilford Press.

- Kravitz, L., Michael, S., Robert, A. Bell (2000). *Direct-to-Consumer Prescription Drug Advertising: Trends, Impact and Implications*. Health Affairs, 19 (2): 110-128.
- Manchanda, P., Chintagunta, P. K. (2006). *Responsiveness of Doctor Prescription Behavior to Salesforce Effort: An Individual Level Analysis*. Marketing Letters, 15 (2): 129-145.
- Manchanda, P., Rossi, P. E., Chintagunta, P. K. (2004). *Response Modeling with Nonrandom Marketing-Mix Variables*. Journal of Marketing Research, 41 (November): 467-478.
- Mckinsey Report (2002). Retrieved from [www.healthbanks.com/PatientPortal/Public/.../PMT\\_Robinson.pdf](http://www.healthbanks.com/PatientPortal/Public/.../PMT_Robinson.pdf)
- Mizik, N., Jacobson, R. (2004). *Are Doctors 'Easy Marks'? Quantifying the Effects of Detailing and Sampling on New Prescriptions*. Management Science, 50 (12): 1704-1715.
- Narayanan, S (2006). *The Role of Free Samples in the Pharmaceutical Industry: An Empirical Analysis*. Retrieved from [www.publishing.eur.nl/ir/repub/asset/12340/ERS-2008-026-MKT.pdf](http://www.publishing.eur.nl/ir/repub/asset/12340/ERS-2008-026-MKT.pdf)
- Narayanan, S., Ramarao, D., Chintagunta, P. K. (2004). *Return on Investment Implications for Pharmaceutical Promotional Expenditures: The Role of Marketing-Mix interactions*. Journal of Marketing, 68 (October): 90-105.
- Neslin, S., Scott, K. (2001). *ROI Analysis of Pharmaceutical Promotion*. Retrieved from <http://www.rappstudy.org>.
- PharmaBiz (2007). *NHS of Britain to make Huge Investments in Indian Healthcare Sector*. PharmaBiz - DetNews, Mumbai.
- Rosenthal, M. B., Ernst, R., Berndt, J., Donohue, M., Arnold, M. Epstein, R. (2003). *Demand Effects of Recent Changes in Prescription Drug Information*. Retrieved from <http://www.erim.eur.nl/>
- Roy, C. V. (2007). *India's Booming Pharma Market*. Retrieved from [www.expresspharmaonline.com/.../cphlworldwide05.shtml](http://www.expresspharmaonline.com/.../cphlworldwide05.shtml)
- Sato, J. (2004). *Comparison between Multiple-Choice and Analytic Hierarchy Process: Measuring Human Perception*. International Transactions in Operational Research, 11: 77-86.
- Sato, Y. (2001). *The Impact on Scaling on the pair-wise comparison of the Analytic Hierarchy Process*. Proceeding on the 6<sup>th</sup> International Symposium on AHP: 421-430.
- Schumock, G.T., Walton, S.M., Park, H.Y., Nutescu, E.A., Blackburn, J.C., Finley, J.M., Lewis, R.K. (2004). *Factors that influence*

*prescribing decisions, Annals Pharmacotherapy*, Retrieved from [www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&cmd=prlinks&retmode=ref&id=14966259](http://www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&cmd=prlinks&retmode=ref&id=14966259)

Shahu, I., Amol, D. (2010). *Influence of Drug Promotion by Medical Representatives on Physicians Prescribing Pattern*. Indian Journal of Public Health Research and Development, 1, Issue-2: 46-60.

Sharma, L. (2012). *A Behavioral Study of Physicians Perception towards Marketing of Pharmaceutical Products in Indian Market*. Zenith International Journal of Business Economics & Management Research, Retrieved from <http://zenithresearch.org.in/>

Talgeri, N., Chiplunkar, S. S. (2002). *Marketing and Distribution of Pharma Goods*. Retrieved from [www.Pharmabiz.com/Chronicles](http://www.Pharmabiz.com/Chronicles)

Vakratsas, D., Kalyanaram, G. (2010). *Price Effects on Physician Prescription Behavior and the Role of HMO Orientation*. Retrieved from <http://nmims.edu/wp-content/uploads/2012/w3/SPTM/>

Venkatraman, S., Stremerch, S. (2007). *The Debate on Influencing Doctors' Decisions: Are Drug Characteristics the Missing link*. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=10](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=10)