MEASURING THE CHANGE IN PRESCRIBING BEHAVIOR OF DOCTORS BY USING PHARMACEUTICAL INDUSTRY PROMOTIONAL TOOLS

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ABSTRACT:*The research was conducted to measure the effect of various Promotional Tools (PT) on Prescribing Behavior (PB) of Doctors. Information was collected through a questionnaire and cross-sectional, survey was performed among 300 doctors working in various Private /Government Hospital/ Pharmaceutical sectors. Research suggests there is a significant effect of different promotional tools on prescribing behavior of Doctors; individual significant and positive relationship was found for Sponsorship, Scientific PTs and Common PTs however, significant but negative relationship was found for personal touch PTs and personal selling PTs on Prescribing Behavior. This study would provide the right direction for Pharmaceutical companies in determining promotional budgets and setting promotional strategies for Doctors.*

KEYWORDS:*Drug Promotion, Pharmaceutical Industry, Promotional Tools, Prescribing Behavior,Medical Representatives, Sponsorship*

INTRODUCTION

Pharmaceutical companies are using many promotional tools like drug samples, CME, Free Conferences, literatures, gifts, launch, birthday greetings, travel expense, sponsorship etc. which influence the drug prescription behavior of Doctors. Worldwide Drug promotion increases day by day [1] that's the worry all over the world also here in Pakistan. Many authors believe that the basic reason is the lack of objective data on physicians prescribing behaviors [2]. The pharmaceutical industry growth rate in developing country like Pakistan is very high. The number of total register drugs in 1990s is less than 20,000 but in 2004 it reaches to 35,000 [3]. Ministry of health registered more than 30,000 drugs throughout the last 30 years [4].

The Medical industry is the most profitable industry in Pakistan from the last few decades [5]. Pharmaceutical Marketing is unique and different because buying decision of medicine is not exclusively in the hand of Patients it also depends on Doctors. That's why Pharma companies try to influence Doctors somewhat than Patients and medical stores. Onlya few studies available to measure the impact of pharmaceutical promotional tools on Doctor's prescription behavior. In the pharmaceutical sector competitive marketing practices are used widely.

Numerous remote Studies demonstrate that Pharmaceutical advertising is changes the specialist's attitude, as well as their endorsing practices and along these lines conduct is impacted by industry promotion and gift giving [6]. The connection between physicians and pharmaceutical industry base on a number of typically shares attraction, however market only considering commercial benefits [7]. Drug companies devote large sum of monies each year on Doctors. Evidence shows that sponsorships provided by pharmaceutical companies alter the prescribing activities of doctors and they prescribe that company products 4.5 to 10 times more[2]. Pharmaceutical companies using several kinds of promotional tools like free samples, gifts and sponsorships, CME, etc. try to influence doctors in favor of their brands [8].

Medical companies directly paid the expenses for travel, stay and even local tourism the Doctor. The expenses of doctors and their family are also enduring by the pharmaceutical companies [9].

Pharmaceutical marketing used many promotional tools and strategies which alter the prescribing behavior of Doctors. Pharmaceuticals sector spends more money on Promotional activities rather than on Research and Development [10].

Gonul et al, 2001[11]described in his study that personal detailing to physicians and providing them with free samples affect the physician's choice behavior. A company must take some strategic decisions to safeguard consistent improvement in sales and profitability like training the staff, develop appropriate communication, enhance knowledge input,promotional contributions, other sales promotion undertakings, gifts and bribes, free drug samples, sponsorships, free disease detection camps, CME's, visits, launch new products, ensure product availability, etc.

Taneja *et al.* [12] done exploratory research inthe pharmaceutical industrythe study revealed that the sponsorship considered the most influencing category, whereasa scientific promotional tool which helps in creating awareness had been perceived second most important category. Personal promotional tools perceived to be better as compared to common promotional tools. The study accompanied only one specialty of doctors. The behavior, not measured directly, butdemographic information was used to measure the influence of PT.

Similarly, Siddiqi *et al.* [13] conducted a study in the Rawalpindi division through cross sectional investigation for the period of January 2010 to June 2010. The study investigated only demographic variables and its relevant influence on promotional tools. No direct relationship was measured between Prescribing Behavior and Promotional Tools.A few health professionals only prescribed time tested drugs [14]. On the other hand Doctors get new drug information from the drug industry through its Medical sales rep, brochures, banners etc. [15]. In medical perspective receiving a gift from pharmaceutical company is unethical which put the gift at too great a price [16].

In Pharmaceutical marketing interaction with Medical representatives was found essential to affect the prescribing practices of doctors and GPs[17]. Therefore Pharmaceuticals companies used many promotion techniques to boost up their sales growth [18].

Prescribingpatterns of physicians were changed on receiving gifts and sponsorships [20].

Pharmaceutical products are very specialized one therefore all sales promotion is based on the interaction with Doctors. Unlikely in Pakistan at hand was no such kind of study which throws light in this type of relationship amongst pharmaceutical promotion and Doctors. Only few efforts were made like Ahmad and Jalees in 2008[24] and Siddiqi et al in2011 [13]. So, in a nutshell, it is clear that pharmaceutical promotion has deep impact on healthcare professionals.

There is always remaining intense competition in the Pakistani pharmaceutical industry regarding the usage of promotional tools for doctors so; there was an esteem need of continuous study of doctors prescribing behavior to stay alive in the competition. The present study will help in determining the effect of various marketing tools on the prescribing behavior of doctors. Pharmaceutical companies have used many promotional tools to change the drug prescription habits of Doctors. This study will be a step forward to highlight the direct effect of promotional tools on Doctor's product prescribing behavior.

Now the question arises in the minds of pharmaceutical companies is that,

Which Promotional Tool is more effective in changing drug Prescribing Behaviour of Doctors?

MATERIALS AND METHODS

The objective of the study was to examine the effect of different promotional tools on prescribing behavior of Doctors. Target Population was doctors from all specializations in Lahore, Bahawalpur, Rahim Yar Khan and Multan cities. Non probability purposive (judgmental) sampling method was used to gather data. It was not easy to collect data from all the doctors (due to difficulties related to data collection, confidentiality issues and so forth) of 4 cities. A research structure was created to scrutinize this exploration work. In this research model Personal Touch PT, Sponsorship PT, Common PT, Personal Selling PT and Scientific PT wereindependent variables while Prescribing Behavior was dependent variable.

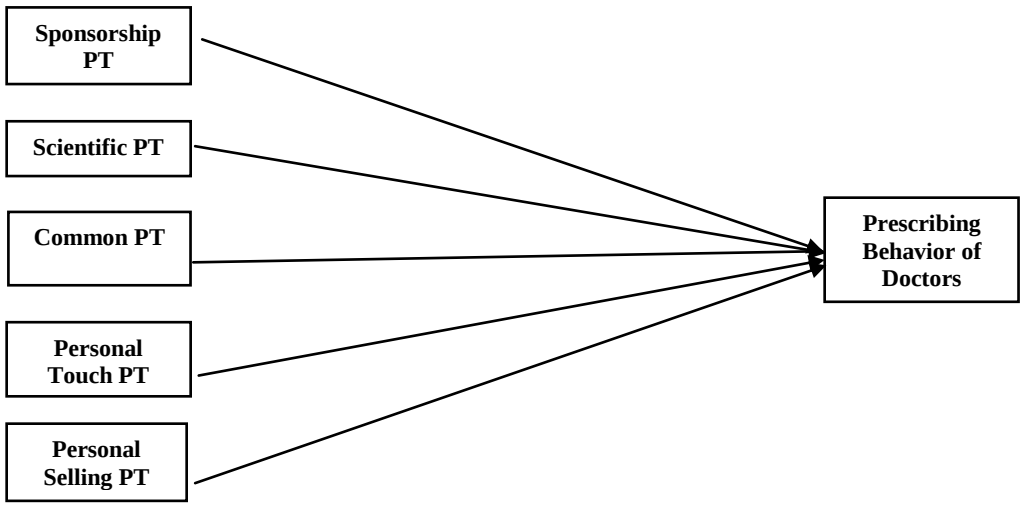

Figure1.1 below shows the research framework

To carry out this research few hypotheses have been constructed:

Hypotheses for the Research:

H1: There is a significant effect of Promotional Tools on Prescribing Behavior of Doctors.

H2: There is a significant and positive effect of Sponsorship PTs on PB of Doctors.

H3: There is a significant and positive effect of Scientific PTs on PB of Doctors.

H4: There is a significant and positive effect of Common PTs on PB of Doctors.

H5: There is a significant and positive effect of Personal Touch PTs on PB of Doctors.

H6: There is a significant and positive effect of Personal Selling PTs on PB of Doctors.

Primary data were collected through well-structured questionnaire from physicians of 4 main cities of Pakistan. A sample of 300 Doctors was taken (N=300) from different Government / Private Hospitals and clinics of Pakistan. The Part A and B of questionnaire was adapted from previous research done by Taneja et al. [22].Questionnaire encompasses almost all promotional tools used by Pakistani Pharmaceutical industry. The questionnaire comprised of three parts. 1st part was intended to acquire demographic info, 2nd part containeda list of 21 promotional tools which used by utmost Pharmaceutical Companies and 3rd part was covering the items of prescribing behavior of Doctors. Responses from different doctors was measured by using 5-point Likert scale in which Promotional tools Always, Mostly, Sometimes, Rarely and Never shows 1, 2,3,4,5 ratings respectively, and part C prescribing behavior range from 1 ("strongly agree") to 5 ("strongly disagree"). Then again a lower score demonstrates that the specific promotional tool is more influenced as compared to promotional tools with higher score. Quantitative approach was used to explore the effect of promotional tools for decision of doctors while prescribing a product. SPSS 21 statistical software package was used to analyze the primary

data. The collected data were analyzed using different statistical tools and techniques that include: Demographic analysis, reliability analysis, Pearson correlation, Regression analysis and Factor analysis.

RESULTS&DISCUSSIONS

The prime study objective was to analyze the information obtained through primary sources. The collected data were analyzed using different statistical tools and techniques that include Demographic analysis, reliability analysis, Pearson correlation and regression analysis and factor analysis. Research Respondents by Cities in form of percentage shown in table 2. Value of cronbach's alpha was 0.78 (Ref table 3) and very close to the ideal value. Reliability of each scale was computed using Cronbach's Alpha (Ref table 4). Each of the scales showed good reliability. All these values can be reflected highly reliable. According to the (Cortina, 1993) internal consistency is better if $0.7 \leq \alpha < 0.9$ and excellent when $\alpha \geq 0.9$. Here all qualities could be referred to as dependable as all fall in the class of good great reliability values. All the scales for independent variables were adapted from previously validated studies. The prescribing behavior of Doctor Part C of questionnaire was self-developed. The scale was tested for construct validity using factor analysis so, measure the responses delivered by respondents. Factor analysis is a good method to examine the correlation b/w variables and limit the numbers into fewer factors which explained the whole data precisely [23].

By Measure of Sampling Adequacy like Bartlett's test of spherecity and KMO (.789) values (Ref table 5) obviously demonstrated that the information was sufficiently fit for element examination. Factors extracted through Principal Component Analysis and only one factor was takendependent on eigenvalues and total variance explained. Eigenvalues exemplify (Ref table 6) the total variance described by each item. The factor with eigenvalue of 1 or more should be extracted. In table no.5 Scree plot clearly showed that there was only 1 factor having eigenvalue more than 1. Thus, only 1 factor has been extracted. Then Factor component matrix (Table no 6) was used to identify the factors that were associated with original variables. The factor matrix provides us high loadings under 1 factor and total variance explained by one factor was 64.027%. The outcomesattained through orthogonal rotation with varimax and consider the factors with loading greater than 0.4 were taken so, (in table no 8) two items (1 & 3) were removed from the construct. The rest of the items were included in the study, and loaded onto a single factor demonstrating construct validity (Ref table 9).

Factor analysis was done for the six variables and after that 1 factors was extracted according to fisher's criterion with the eigenvalue >1. One factor was selected for analysis because the point of inflexion was very clear on the scree plot so that's why only one factor was selected. Four questions were loaded on the factor one. The table 7 clearly showed that factor 1 (Prescribing Behavior) is a linear mixture of variables no 2, 4, 5, and 6.

To test hypotheses initially correlation analysis was executed to identify the relationship b/w promotional tools and prescribing behavior of Doctor. The correlation analysis (Ref table 10) revealed an overall significant relationship between the different promotional tools and doctors prescribing Behavior. The results indicate that Sponsorship, Scientific and Common promotional tools had a significant positive relationship with the prescribing behavior, however the relationship of Personal Touch and Personal Selling Promotional Tools was found to be negative.

Further discussions on research hypothesis were given as under. It was obvious from research that there exists a significant relationship among prescribing behavior and promotional tools.

H1 "There is a significant effect of Promotional Tools on Prescribing Behavior of Doctors." results of Model summary supported that H1 is extremely significant because p<.01 that is (p=.000) so H1 is accepted, also proof from literature as well. Hypothesis H2: The relationship between behavior and Sponsorship was weak and significant (r =.250, p <.01), this showed that with the increase in the Sponsorship drug prescribing behavior of doctor's also increasedso H2 is also accepted.. H3: the relationship between behavior and Scientific promotional tools was close to moderately positive and significant (r =.469, p <.01), this showed that with the increase in Scientific PTs drug prescribing behavior of doctor's also increased. So H3 accepted, P values are helped to ruminate this hypothesis true as p<.01 that is .000 (sig). Previous researches exhibited that sponsorship is considered vital for Doctors whether for personal or professional purposes [2] and [8]. Hypothesis H4the relationship between behavior and Common promotional tools, moderately positive and significant (r =.476, p <.01). This showed that with the increase in Common PTs drug prescribing behavior of doctor's also increased it had proved from results as (r=. 476) it revealed us that the relationship is moderately and significantly positive. So H4 was accepted. and H5: The relationship between behavior and Personal touch was close to moderately negative and significant (r = -.499, p < .01). It's showed that with the increase in Personal Touch PT, level of Drug Prescription will decrease so H5 was rejected, it showed the relationship is negative and moderate but significant H6: The relationship between behavior and Personal Selling was negligibly negative, but significant (r = -. 220, p <.01), this showed that with the increase in personal selling prescribing behavior of doctor's decreased. H6 was rejected. The hypotheses H6 result is inconsistent with [22].

The results of the study seek to investigate the influence of different promotional tools on Doctors drug prescribing behavior. Regression analysis was performed in order to evaluate how much variation in the Dependent variable (Doctors Behavior) is being explicated by the independent variable (Promotional Tools). The results (Ref table 11) revealed a significant influence of promotional tools on prescribing behavior, F (6, 203) = 39.737, p < .001, regression analysis showed that 44.9% (R - Square) of the change in the prescribing behavior is being accounted by promotional tools. The result from regression analysis substantiates the study that promotional tools have a significant influence on prescribing behavior.

Table 1: Case Processing Summary

		N	%
Cases	Valid	300	100.0
	Excluded[a]	0	.0
	Total	300	100.0

a. Listwise deletion based on all variables in the procedure.

Table 2: Distribution of Respondents by Cities

Cities	No. of Doctors	Percentage
Lahore	87	29%
Multan	85	28.3%
Bahawalpur	56	18.7%
Rahim Yar Khan	72	24%
Total	**300**	**100%**

Table 3: Reliability Analysis of Data

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.799	.789	33

aa. based on correlation

Reliability Statistics

Table 4: Reliability Statistics of each variables

Sr. No	Promotional Tools Sub-Dimensions	Cronbach's Alpha Based on Standardized Items	N of Items
1	Sponsorship PT	**.78**	**5**
2	Personal Selling PT	**.81**	**6**
3	Scientific PT	**.81**	**3**
4	Personal Touch PT	**.78**	**3**
5	Education PT	**.71**	**4**
6	Prescribing Behavior	**.81**	**4**

Table 5:KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.789
Bartlett's Test of Sphericity	Approx. Chi-Square	649.594
	Df	15
	Sig.	.000

Table 6: Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.668	64.027	64.027	3.668	64.027	64.027
2	.705	12.301	76.328			
3	.518	9.034	85.363			
4	.368	6.423	91.786			
5	.250	4.367	96.153			
6	.220	3.847	100.000			

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

Table 7: Scree Plot

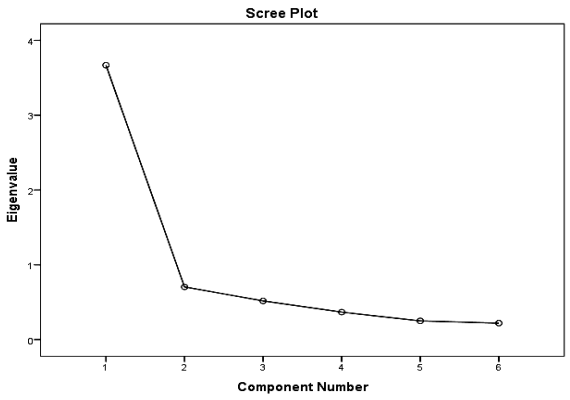

Table 8: Factor Component Matrix[a]

Sr. No	Scale Items	Component 1
1	Medicine is prescribed after making sure that it has proven clinical effectiveness.	.061
2	Medicines are not just prescribed on the basis of meetings with medical representatives.	.714
3	The buying power of the patient is considered when prescribing medicines.	-.306
4	Different sources are taken into account while writing prescription.	.919
5	The therapeutic quality of the drug is given due consideration while prescribing medication.	.614
6	Prescription of Branded/Research medicines are more preferable as compared to Generic medicines	.930

Extraction Method: Principal Component Analysis.
a. 1 component extracted.
b. Rotation Method: Varimax with Kaiser Normalization.

Table 9: Naming of Factor

Factor	Name of Dimension	Item No.	Scale Items	Factor Loadings
F	Prescribing Behavior	2	Medicines are not just prescribed on the basis of meetings with medical representatives.	**.714**
		4	Different sources are taken into account while writing prescription.	**.919**
		5	The therapeutic quality of the drug is given due consideration while prescribing medication.	**.614**
		6	Prescription of Branded/Research medicines are more preferable as compared to Generic medicines	**.930**
		Extraction Method: Principal Component Analysis.		
a. 1 component extracted.				

Table 10: Correlation analysis

	Scientific PT	Sponsorship	Personal Touch	Personal Selling	Educational	Prescribing beh.
Scientific PT	1					
Sponsorship	-.077	1				
Personal Touch	.737**	-.143*	1			
Personal Selling	.456**	.113	.298**	1		
Educational	-.176**	.778**	-.226**	.005	1	
Prescribing behavior	.469**	.250**	-.499**	-.220**	.476**	1

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

Table 11: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	F	Sig.
1	.670	.449	.437	39.737	.000[b]

a. Predictors: (Constant),Educational_PT, Sponsorship,Personal_Touch_PT, Scientific_Pt, Personal_selling_

CONCLUSION AND FUTURE RECOMMENDATIONS

The research demonstrated that the information was sufficiently fit for element examination on the drug prescribing behavior of Doctors. Data was collected from physicians and consultants located in different cities of Pakistan through Judgment Sampling method. Overall the results indicate a significant influence of different promotional tools, individually positive significant influence was found for Scientific PTs, Sponsorship, and Educations PTs;however, there was a significant but negative relationship found for Personal Selling and PersonalTouch PTs.The results suggest that in Pakistan Scientific Promotional Tools were considered most influencing to change drug prescription behavior of doctors.On the other hand CommonPromotional Tools considered have second most significant and positive effect on the prescribing behavior of doctors as compared to other Promotional Tools. According to [13] Scientific PTS was the most important factor, over study showed same results.

This study will provide help to the pharmaceutical sector that which promotional tools is best meeting the expectation of the Doctors. The results of this study provide the right direction to product managers and CEOs while assigning promotional budgets and developing promotional mix strategies, to achieve maximum sales.On the other hand many doctors were hesitant to show their intents and first choice regarding promotional tools. Subsequently, there were odds of controls of reactions to wind up great before respondents.Hence drug regulatory and Government authorities should consider the benefit of patients regarding quality products and also control the unethical promotional practices in market which manipulate the drug prescription choice of doctors.The pharmaceutical market is dynamic and also constantly varying, so the genuine results are not essentially generalized for anextensive period of time. Sample test size can be expanded to build the generalizability of results.

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