Original Research Article

Do Demographic Factors Influence Physicians' Perceptions of the Effectiveness of Pharmaceutical Marketing Strategies?

ABSTRACT

Pharmaceutical companies employ a variety of marketing strategies to influence physicians' prescribing practices in favour of their drugs. The main driver of marketing strategy effectiveness has been identified as their informational role. Thus, the study aimed to determine whether physicians' demographic characteristics influence their perceptions of the effectiveness of marketing strategies. A structured questionnaire was used to collect primary data from a sample of 425 physicians. The study found that physicians' perceptions of the effectiveness of medical representatives and ads in medical journals were unaffected by their gender. Demographic variables such as age and experience significantly affected the effectiveness perceptions of physicians. However, only medical representatives were found to be significantly affected by physicians' areas of practice. According to the findings of this study, the older and more experienced the physicians are, the more they perceive marketing strategies are effective in influencing their prescribing behaviour. In addition, general physicians perceived medical representatives as more effective than specialists.

Keywords: Ads in medical journals, Effectiveness, Medical representatives, Perception, Pharmaceutical marketing strategies, Physician.

1. INTRODUCTION

The Pharmaceutical Industry (PI) has a key role in the world economy along with ascertaining and maintaining the health and welfare of people at large. Globally, the pharmaceutical industry is one of the rapidly growing industries. As of end-2018, the global pharmaceutical market was valued at about $1.2 trillion and is set to exceed $1.5 trillion by 2023, growing at a 3–6% compound annual growth rate over the next five years. The key drivers of growth will continue to be the United States and pharmerging markets (like India, China, Brazil etc) with 4–7% and 5–8% compound annual growth, respectively [1]. The Indian pharmaceutical industry is also a rapidly growing industry in the world and it is the third-largest pharmaceutical market in Asia. The Indian

pharmaceutical sector is expected to grow to US$ 100 billion by 2025. Indian drugs are exported to more than 200 countries in the world with the US as a key market. India is the world's largest provider of generic medicines as the country's generic drugs account for 20 per cent of global generic drug exports [2]. The share of exported drugs is expected to increase continuously, owing to the policy support provided by the Indian government to the pharmaceutical industry in the form of pharma vision 2020, reduction in approval time for new facilities, single-window clearance, support for technology upgrades and FDIs like initiatives.

The nature of the pharmaceutical sector is unique, given the fact that the chooser is not the user. Hence, the marketing strategies used in the pharmaceutical sector are also at variance with those used in other sectors [3]. Mostly, the drugs consumed by patients (users) are decided by physicians (choosers), and as a result, the major chunk of the marketing budget of pharmaceutical companies is expended in the direction of changing and influencing the physician prescribing behaviour to stimulate sales [4]. The dominant role played by physicians in the pharmaceutical sector can be comprehended by the fact that the worldwide sales of prescription drugs from 2010 through 2018 grew at a CAGR of +2.3%, and for that reason, the expenditure of pharmaceutical companies on marketing activities is ironically more than double they expend on research and development of new drugs [2].

Although there is rich literature which has sought to measure the marketing relationship between physicians and the pharmaceutical industry, the perspective of physicians regarding the effectiveness of marketing strategies has been rarely studied [5]. According to previous research studies, the nexus between pharmaceutical companies and physicians has not been adequately studied in third-world nations [6], [7]. To address the identified gaps in the existing literature, the current study attempts to develop a framework for determining the role of specific demographic variables in affecting physicians' perceptions of the effectiveness of pharmaceutical marketing strategies.

2. LITERATURE REVIEW AND HYPOTHESES

Drug prescribing behaviour of physicians is a complex decision-making process affected by diverse factors such as marketing, pharmacists, contextual factors and so on [8]. A significant number of past studies have argued that the marketing strategies of pharmaceutical companies are one of the most influential factors [9]–[11]. The most commonly studied marketing strategies such as medical representatives, ads in medical

journals, the brand of the drug, free drug samples, promotional gifts etc., are effective in swaying the prescribing decisions of physicians [10], [12]–[14]. Murshid and Mohaidin have reported that a medical representative is a primary source of drug information for physicians, especially in the third-world nation [3]. The lack of sufficient and reliable sources of information in developing countries has been reported as the main reason for the influential role of medical representatives in such countries [3]. The knowledge of medical representatives about their drugs' efficacy, side effects, dosage etc., increases the importance of medical representatives in such poor resource countries by manifolds. Similarly, Waheed et al. and Al-Areefi et al. discovered that, in developing countries such as India and Yemen, MRs are considered to be an important source of information for physicians [15], [16]. Further, the direct face-to-face interaction between medical representatives and physicians also enables them to effectively influence the prescribing decisions of physicians in favour of their drugs [11].

Drug advertisements in leading medical journals are another important marketing strategy of pharmaceutical companies to sway the prescribing decisions of physicians in favour of their drugs [17], [18]. ascertained that promotional literature such as ads in medical journals and drug brochures successfully influenced the prescribing decisions of physicians [19]. Similarly, Sharma et al. were of the view that drug promotional literature serves as an important marketing strategy to promote new drugs to physicians [20]. However, physicians for whom drug promotional literature is a primary source of information were found to indulge in irrational prescribing of drugs. Srivastava and Bodkhe in their research study established that the proven clinical effectiveness of drugs is an important criterion for physicians to choose a drug [21]. Thus, physicians trust the publication in medical journals as it gives them adequate information about side effects, results of clinical trials, dosage etc.

Previous research studies have attempted to decipher whether the perception of the physician toward pharmaceutical marketing activities is based on the physician's demographic profile [19], [22], [23]. The objective of the study conducted by Taneja was to test whether physicians' age, gender, area of practice and income affect their perception of the effectiveness of pharmaceutical marketing [7]. The study ascertained that only area of practice influence the attitude of physicians towards pharmaceutical marketing strategies, especially medical representatives. Similarly, another study revealed that on the basis of hospital kind there exists a significant difference in the perceptions of physicians.

However, other demographic characteristics of doctors such as gender, age, experience and speciality did not make any significant difference in the perceptions of doctors [19]. The existing literature has highlighted the need to understand the phenomenon of how the influence of marketing strategies varies from physician to physician [5]. Thus, it would be of great importance for pharmaceutical marketing managers to understand the role of demographic characteristics of physicians and develop customized marketing strategies for successfully influencing prescribing decisions in favour of their drugs. The current study sought to test the following stated hypotheses.

H1: Gender has a significant impact on medical representatives.

H2: Gender has a significant impact on ads in medical journals.

H3: Physicians' age has a significant effect on medical representatives.

H4: Physicians' age has a significant effect on ads in medical journals.

H5: Physicians'experience has a significant effect on medical representatives.

H6: Physicians'experience has a significant effect on ads in medical journals.

H7: Physicians'area of practice has a significant effect on medical representatives.

H8: Physicians'area of practice has a significant effect on ads in medical journals.

The conceptual framework

Based on the above discussion of findings from extant literature, the conceptual framework presented in Figure – 1 is proposed as the tool for understanding the existence of different direct and indirect relationships between independent variables. Socio-demographic characteristics such as gender, age, experience and area of practice have been taken as independent (dummy) variables. Pharmaceutical marketing strategies viz. medical representatives and ads in medical journals were taken as dependent variables. Researchers believed demographic factors are very crucial in influencing the perceptions of physicians towards the effectiveness of marketing strategies.

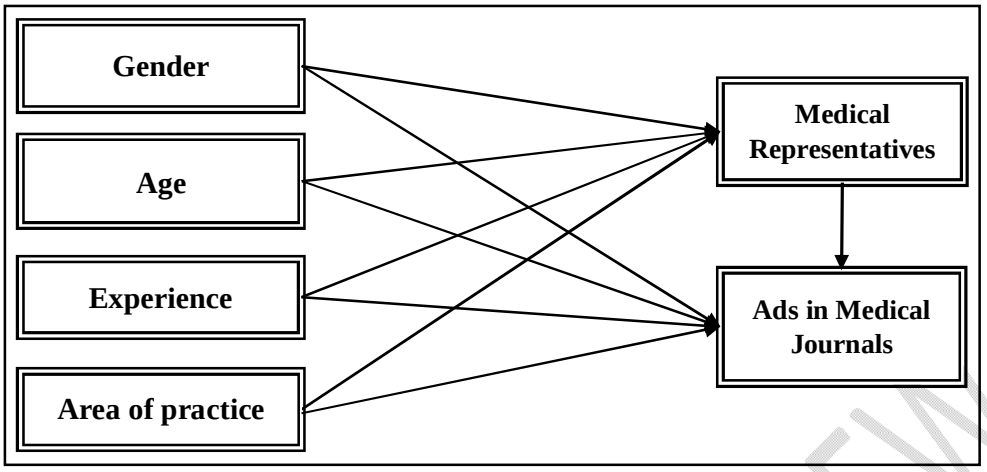

Figure 1. Conceptual Framework

3. RESEARCH METHODOLOGY

3.1. Study design and Sample

A descriptive cross-sectional survey design was used. The survey was anonymous, and the information was treated confidentially. The current study was carried out in the union territory of Jammu and Kashmir (J&K) and the collection of data was done between March and May 2022. The sample for the study was taken from the target population of physicians working in various district hospitals, sub-district hospitals and community health centres across J&K. The probability sampling technique i.e., two-stage cluster sampling was used to select the respondents of the study. A total of 486 questionnaires were distributed out of which only 427 were received back. On the visual inspection of the received responses, two were identified as having significant missing values. After removing the responses with missing values, the total number of questionnaires that were complete and valid was 425. Thus, the response rate amounted to 87.44. The sample of 425 was determined significant for testing hypothesized relationships because the 10 times criteria for sample size was satisfied [24].

3.2. Measures

The six-point scale anchored from 1=strongly disagrees to 6=strongly agree, was utilized to acquire primary data from respondents. The demographic information of respondents such as gender, age, experience and area of practice (specialization) were collected in the first section of the questionnaire. This was followed by a section in which respondents were instructed to score their level of agreement or disagreement with the effectiveness of marketing strategies such as medical representatives and ads in medical journals.

There is a serious lack of suitable standardised instruments in the drug prescribing literature for assessing the influence of marketing factors on prescribing behaviour [25]. The studies reviewed were mostly descriptive in nature, relied on panel data from physicians via interviews or focus group discussions and assessed marketing factors using a single factor with a single item. With an aim to fill this void an instrument was developed and validated to analyse the model of the study. A sample of 72 respondents was used for pilot testing. The Cronbach's alpha of two constructs viz. medical representatives and ads in medical journals were assessed first. The alpha values of medical representatives and ads in the medical journal were 0.84 and 0.86, respectively, and were above the acceptable cut-off value of 0.70 [26]. In the next step, exploratory factor analysis was conducted to test the factors. IBM SPSS (version 25) software was used to perform principal component analysis (PCA) along with varimax rotation on a total of 10 items. One item from each factor (medical representatives and ads in medical journals) did not load significantly on their respective factors and therefore was removed from the overall model. After removing problematic items, we obtained a clean factor matrix consisting of two factors and 8 items.

Gender was operationalized as a categorical variable consisting of two response categories such as male and female. Age was operationalized as an ordinal variable with three mutually exclusive response categories such as; up to 35 years, 36-55 and more than 55 years. An ordinal scale consisting of three response categories was used to measure the practicing experience of the participants. Finally, area of practice (specialization) was operationalized as a categorical variable consisting of two response categories such as general physician and specialist.

3.3. Tools of Analysis

The exploratory factor analysis (EFA)/ pilot testing was carried out using the IBM Statistical Package for the Social Sciences (SPSS) version 25. The measurement and structural equation models were evaluated using the Partial Least Square Structural Equation Model (PLS-SEM) in SmartPLS version 3.3.3 [27]. PLS-SEM is a second-generation regression technique for complicated causal modelling, commonly known as variance-based structural equation modelling [28], [29]. PLS-SEM has become a well-established approach in marketing and business research. It also has numerous notable advantages over conventional regression techniques that were applicable to the current research study.

4. RESULTS

4.1. Demographic characteristics of respondents

The total number of respondents who took part in this study was 425 respondents from Jammu and Kashmir, India. There were 58.6% males and 41.4% females in the study. 25.4% of all respondents were up to the age of 35years, 67.1% were between the ages of 36 and 55 years, and 5.4% were beyond 55 years. In relation to the overall number of participants, 44.2% reported their practicing experience of up to 10 years, 44.9% had an experience of 11 to 20 years and 10.8% were having experience above 55 years. This study also collected information about respondents' specialization; 30.8% declared that they were general physicians and 69.2% were specialists.

4.2. Valuation of the measurement model

The model must be tested for reliability and validity before examining hypothesized relationships. Table 1 displays the extracted “factor loadings, Cronbach's alpha (α), Composite reliability, and average variance extracted (AVE)” score of the variables. Cronbach's alpha (α), composite reliability (CR), and factor loadings greater than 0.70 are considered reliable [28]. The convergent validity of the indicators has been established with AVE exceeding the 0.50 threshold value [30]. The current study's alpha values ranged from 0.821 to 0.913, confirming the scale's reliability.

Table 1: Reliability and Validity results

Construct	Items	Loadings	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)

Medical Representatives (MRE)	MRE1	0.764	0.821	0.875	0.584
	MRE2	0.802			
	MRE3	0.791			
	MRE4	0.811			
Ads in Medical Journals (AMJ)	AMJ1	0.809	0.913	0.933	0.698
	AMJ2	0.873			
	AMJ3	0.864			
	AMJ4	0.867			

The discriminant validity was determined by utilising the Heterotriat-Monotrait correlation (HTMT). The HTMT values shown in Table 2 are less than the cut-off of 0.85 [30]. As a result, the measurement model exhibits discriminant validity, and the model's constructs are all distinct from one another.

Table 2: Discriminant Validity Results

	Medical Representatives	Ads in Medical Journals
Medical Representatives		
Ads in Medical Journals	0.589	

4.3. Regression results

Collinearity between the constructs should also be verified while evaluating the structural model. Inner VIF scores were examined to check issues of multicollinearity among items. The presence of multicollinearity among the items can cause serious doubts about the robustness of the results of regression analysis [31]. According to James et al., VIF values of 0.5 or higher indicate the presence of problematic multicollinearity. In the current study, all the VIF scores were less than the cut-off value and thus, there was no issue of multicollinearity in the model [32].

Table 3 presents the regression results of the hypothesized relationships. The study’s empirical results show that gender had no significant impact on both variables (medical representatives and ads in medical journals). Thus, there is no significant difference in the perception of physicians regarding the effectiveness of pharmaceutical marketing strategies. These results substantiate the findings of the previous studies of Handa et al.

[19] and Taneja [7]. These studies discovered that only specialization and hospital type (public or private) influenced the perceptions of physicians regarding the effectiveness of marketing strategies.

Table 3. Hypotheses testing results

Hypotheses	Relationships		Path coefficient
H1	Gender --> MRE	Male -> MRE	0.006
		Female -> MRE	0.013
H2	Gender --> AMJ	Male -> AMJ	-0.041
		Female -> AMJ	0.09
H3	Age --> MRE	Up to 35 years -> MRE	-0.501**
		36 to 55years -> MRE	-0.463**
		More than 55 -> MRE	0.182**
H4	Age --> AMJ	Up to 35 years -> AMJ	-0.565**
		36 to 55 years -> AMJ	-0.458**
		More than 55 -> AMJ	0.178*
H5	Experience --> MRE	Up to 10 -> MRE	-0.235**
		11 to 20 -> MRE	0.384**
		More than 20 -> MRE	0.409**
H6	Experience--> AMJ	Up to 10 -> AMJ	0.225
		11 to 20 -> AMJ	0.310*
		More than 20 -> AMJ	-0.138
H7	Area of practice --> MRE	General physician -> MRE	0.162*
		Specialists -> MRE	-0.139*
H8	Area of practice --> AMJ	General physician -> AMJ	0.105
		Specialists -> AMJ	-0.047

*Note: *P<0.05; **P<0.001: MRE=Medical Representatives; AMJ=Ads in Medical Journals*

In terms of the impact age of respondents, a considerable impact on both variables was observed. Thus, hypotheses H3 and H4 were supported by the empirical results of the study. These findings are in line with the study of Khazzaka which ascertained that the perception of the effectiveness of pharmaceutical marketing among physicians significantly tends to differ on the basis of age [22]. Hypotheses H5 and H6 predicted that the experience of physicians has a significant impact on medical representatives and ads in medical journals. Only H5 was supported by the results of the study. These findings indicated that the more experienced the physicians are, the more effective they perceive medical representatives to be. Further, the final set of hypotheses (H7 and H8) anticipated that the area of practice (general physicians or specialists) exerts a significant influence on the effectiveness perception of physicians. The study's findings supported only H7, indicating that general physicians believe medical representatives are quite effective in influencing their prescribing decisions. Medical representatives, on the other hand, were

deemed ineffective by specialists. These findings were discovered to be consistent with the previous literature [33].

5. DISCUSSION

The study adds to the existing body of pharmaceutical marketing literature by investigating the role of physicians' socio-demographic characteristics in influencing their perception of marketing strategies. This study compares the scores of physicians' perceptions of drug promotion across socio-demographic groups of physicians. This was accomplished by investigating the relationships between physicians' perceptions of the effectiveness of marketing strategies and demographic and occupational characteristics. Although similar studies have been conducted in other countries, with the exception of two studies conducted in Japan [34] and Yemen [5], those studies did not use factor analysis to validate measurements of perception towards drug promotion strategies.

It was discovered that physicians' perceptions of the effectiveness of medical representatives and ads in medical journals in influencing their prescribing behaviour are influenced by demographic factors such as age, experience, and area of practice. The study's findings revealed that as physicians age, their perceptions toward medical representatives and ads in medical journals improve. In other words, younger physicians were found to be less influenced by pharmaceutical marketing strategies as compared to older physicians. Furthermore, it was ascertained that the working experience of physicians also plays an important role in the relationship between the effectiveness of pharmaceutical marketing strategies and drug prescribing behaviour. Physicians with more than 20 years of experience rated medical representatives as more effective than physicians with 11 to 20 years of experience. Therefore, as experience grows, physicians' perceptions of the effectiveness of medical representatives improve. However, in terms of the effectiveness of ads in medical journals, only physicians with moderate experience (11 to 20 years) believed ads in medical journals were effective in influencing prescribing behaviour.

The impact of the demographic factor viz. area of practice (specialization) was observed to be statistically significant. The perceptions of general physicians about the effectiveness of medical representatives were found significantly different than specialists. In other words, general physicians deemed the marketing strategy of medical representatives to be effective in influencing their prescribing decisions. Our empirical

research into physicians' perceptions and conclusions will aid in the betterment of the pharmaceutical industry's marketing strategies. Pharmaceutical managers should use the right promotional strategy and target the group of physicians who are more influenced than others because of the fact that once prescribing habits are formed, it may be challenging to change them [22]. As a result, the pharmaceutical company will be able to outperform its competitors in terms of marketing expense optimization and increasing sales while spending less on promotions.

6. CONCLUSION

This paper is a novel study on physicians' perceptions of the effectiveness of medical representatives and ads in medical journals in affecting their prescribing behaviour. The perceptions of physicians towards marketing strategies were found to differ in relation to demographic variables such as age, experience and area of practice. Both medical representatives and advertisements in medical journals were deemed effective by older physicians in influencing their prescribing behaviour. Physicians' perceptions of effectiveness were discovered to be gender-independent. General practitioners rated medical representatives as being more effective, and physicians with more experience tend to perceive marketing tactics are more successful in influencing their prescribing decisions. In pharmaceutical marketing, physicians play an important role. Thus, influencing the physician is critical to pharmaceutical sales, and by using appropriate promotional tools, a pharmaceutical company can increase sales while spending less on marketing.

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