

DETERMINANTS INFLUENCING SALES PERFORMANCE IN THE PHARMACEUTICAL INDUSTRY

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Abstract

This study aims to examine the major linkages between the marketing mix, the physician's prescription behavior, and the communication from medical salespersons on the sales performance of pharmaceutical industry. The results of the study indicated that there is a significant relationship among various promotional tools adopted by pharmaceutical companies and increased sales performance. The research highlights the importance of a comprehensive approach that integrates strategic marketing, effective communication by medical representatives, and a deep understanding of physicians' prescribing behaviors. This research will be useful for pharmaceutical companies aiming to optimize their marketing tactics, increase physician engagement, and ultimately improve their sales success in a complicated and changing market environment. For policymakers and government officials, the study provides useful insights that can inform the creation of helpful policies and regulations to foster industry growth and progress.

Keywords: Marketing Mix, Communication, Sales Performance, Pharmaceutical Industry

Introduction

The pharmaceutical industry in Pakistan estimated to be worth Rs. 748 billion (US\$2.6 billion) in 2023, representing about 1% of the country's GDP. The industry relies extensively on imports, with more than 90% of raw materials imported and only 12% of APIs produced locally. Pakistani pharmaceutical businesses import raw ingredients, synthesize APIs with excipients, cover tablets, and perform fill-finish processes. The Drug Regulatory Authority of Pakistan controls drug approvals and cost.

Pakistan imports all of its specialized final dosage forms, vaccines, and biologicals. According to an ICAP research, the Pakistani pharmaceutical industry imports 50-60% of its pharmaceutical goods from India. In 2023, Pakistan exported pharmaceutical products worth over \$235 million, with the majority going to a few less-regulated nations in Africa and Southeast Asia.

By offering people and healthcare providers the access to the medicines they need, the pharmaceutical industry plays a significant role in the healthcare sector. It not only makes a substantial contribution to Pakistan's economy but has enormous growth potential. Nonetheless, a number of variables influence how well pharmaceutical companies perform when it comes to increase their sales in the whole country. Recognizing these variables is essential in formulating efficient techniques that might amplify revenue and accelerate profitability.

Problem Statement

The pharmaceutical industry is a highly competitive and regulated sector where sales performance is critical for the success of companies. Despite of the many factors that have been studied and correlated with the success of the sales, little is understood, however, about the combined impact resulting from the elements of the marketing mix, the physician's prescription behavior, and the communication from medical salespersons on the sales level of pharmaceutical enterprises. While previous research has examined the intersections of these dimensions, or even the segmentation of the marketing and sales units, there is insufficient thorough research that examines how they interact and the total effect they have on sales performance.

The existing research is limited to looking into specific facets of the marketing mix or the behavior of the doctors, but does not show how these measures work in conjunction with each other and the communication tools used by the medical representatives. Also, the complexity in the pharmaceutical industry as characterized by the continuous changes in the structural regulations, the new technology and the changes in consumer behavior needs the consideration of a more holistic approach.

This study intends to close this gap by looking into the major linkages between the marketing mix, physician prescription behavior, medical representative communication, and sales performance in the pharmaceutical business. By investigating these linkages holistically, this study hopes to gain a better understanding of how various elements interact to influence sales outcomes. The findings will be useful for pharmaceutical businesses aiming to optimize their marketing tactics, increase physician engagement, and ultimately improve their sales success in a complicated and changing market environment.

Research Objectives

1. To determine the elements that have a major impact on sales performance in Pakistan's pharmaceutical industry.
2. To determine the impact of Medical Representative communication on sales performance in Pakistan's pharmaceutical industry.
3. To determine Physician's prescribing behavior on sales performance in Pakistan's pharmaceutical Industry.
4. To determine marketing mix strategies on sales performance in Pakistan's pharmaceutical Industry.

Research Questions

1. What is the Physician's prescribing behavior?
2. Does Physician's prescribing behavior influencing the impact to increase sales performance in Pakistan's pharmaceutical industry?
3. How does Medical Represent communication affect the industry's growth in sales performance?
4. What are the marketing mix tactics that may pharmaceutical firms use to boost their efficiency in sales?

Significance of the Study

Many stakeholders in the pharmaceutical sector will find great value in this study. First of all, it will give pharmaceutical firms useful information on the variables affecting their sales results. With this kind of data, companies may better build strategies to overcome obstacles and increase sales potency. Second, the results of this study can be used by policymakers and government officials to create policies that encourage progress and expansion in the Pharmaceutical segment.

The results of this study can also be expanded upon by scholars and academicians to inspect other related areas and add to the repository of existing knowledge.

Literature Review

The pharmaceutical sector in Karachi, Pakistan, operates in a dynamic and complicated market that is impacted by a number of variables. This analysis of the literature makes an effort to examine the most important facets which influence the pharmaceutical sales performance in Karachi, with a detailed emphasis on the specific activities performed by medical sales representatives' communication, doctors' prescription actions, and the fundamentals of the marketing mix.

Sadaf et al, (2018) examined the impacts of promotional activities by pharmaceutical industry and patients' standpoint in Pakistan. The study adopted a quantitative research technique by relating 100 sample sizes. Survey questionnaire was used a tool to gather data and then observations were analyzed by using statistical software SPSS. The study concluded that patients preferred the promotional practices which are not just for the sake of doctors and pharmaceutical industry over those activities which are fully employed for the sake of medical practitioners and pharmaceutical companies.

Rizwan et al, (2014) explored the relationship between Marketing Practices of Pharmaceutical Industry and Physician Prescription Behavior in Pakistan. The research adopted a mixed approach including quantitative as well as qualitative approach with survey questionnaire, interviews and secondary data gathered from different sources. Sample size of 100 was selected to obtain data and correlation and regression analysis tests were performed using the SPSS tool. Results of the study indicated the significant relationship among various promotional tools adopted by pharmaceutical companies and increased sales performance.

(H1: Marketing mix has a significant relationship with sales performance in the pharmaceutical industry).

Sadia et al, (2022) in their study, a quantitative insight of the interactions of prescribers with pharmaceutical organization's representatives in clinical settings of Karachi, explained the Medical representatives' interaction with prescribers in clinical settings in Karachi. The explanatory study adopted the quantitative method with 207 sample size along with questionnaires as a research tool. The data was tested using SPSS 20.0 to perform Anova as an analysis test. The study revealed that the majority of the pharmaceutical companies are involved in unethical marketing practices from local to international level companies and strong influence on prescription of medical practitioners found positively interrelated leading to positively affecting sales performance of pharmaceutical companies.

(H2: Physician's prescription behavior has a significant relationship with sales performance in Pharmaceutical industry)

Sadia et al, (2014) in their mixed pragmatic approach explored the relationship between pharmaceutical companies' marketing mix strategies and behavior of physician's prescription. Questionnaire survey was used as means of primary data collection whereas secondary data was collected with different sources. Correlation and regression analysis was performed using statistical package software SPSS. Results indicated that promotional tools like Literature, product samples, detailing knowledge and communication skills of Medical Representatives strongly persuade the medical doctor recommendation behavior in Pakistan.

(H3: Medical representatives' communication has a significant relationship with sales performance in Pharmaceutical industry)

Syeda, (2021) in their pragmatic research approach explored the role of pricing strategies of the pharmaceutical industry in Pakistan. The study included 290 sample sizes and data, as primary and secondary, was collected by questionnaire and different available sources respectively. The

compiled data was run in excel to find the correlation test. The results explained that there is a significant relationship between drug pricing strategies and sales performance of the pharmaceutical industry.

(H1: Marketing mix has a significant relationship with sales performance in the pharmaceutical industry).

Aini et al, (2019) in their deductive approach in Doctors' Interactions with Pharmaceutical Sales Representatives: Modeling Doctors Prescription Behavior, followed the theory of planned behavior. The quantitative study used a questionnaire as a tool to collect data from the sample of 248 respondents and test reliability and validity using two statistical software SPSS and smart PLS 3.0. The study revealed that there is a significant relationship between the doctors' interaction with medical representatives with respect to effective communication. It was also found that doctors' prescription behavior is strongly influenced by tangible rewards provided by pharmaceutical companies to escalate sales performance in Pharmaceutical industry in Pakistan

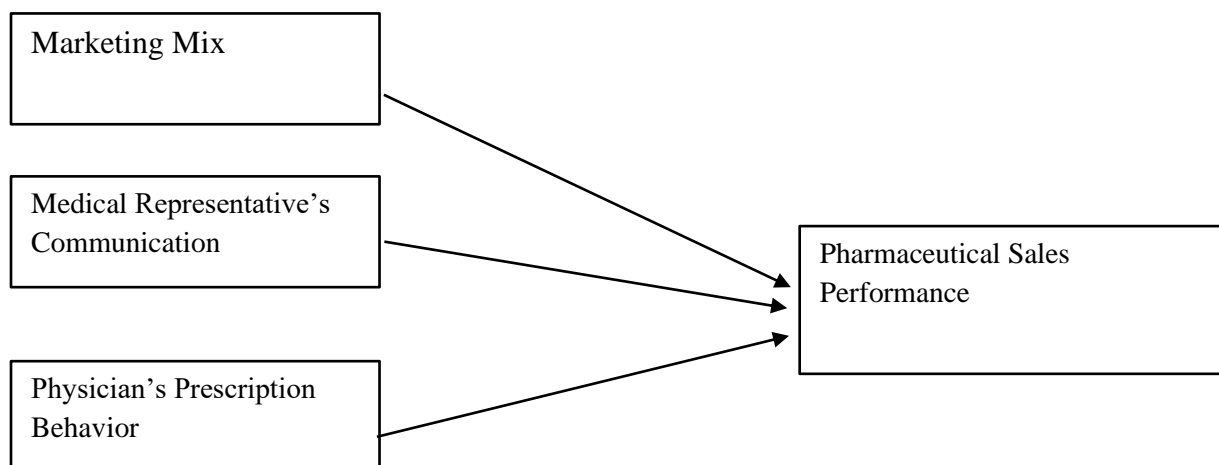
(H2: Physician's prescription behavior has a significant relationship with sales performance in Pharmaceutical industry)

Theoretical Framework

According to Ajzen's (1991) theory of planned behavior (TPB), an individual's intent to act is influenced by their strengths and weaknesses as well as external challenges in addition to their mindset and subjective norm. Harrison et al. (2021) imitated the small business adoption of multiple emerging solutions by using the TPB. As per Theory of Reasoned Action(TRA) (Fishbein & Ajzen, 1975), and according to the Theory of Planned Behavior (TPB) (Ajzen, 1985) the way consumers feel extremely influence consumers' behavioral rationale, which ultimately have an effect on the way they formulate purchases. Preceding study (Zhu & Tan, 2007; Uribe et al., 2016) has exposed that promotional campaigns and stuff have a substantial impact on product identification and is as a result associated with improved revenue growth.

In general, these theories emphasize the significance of alliance, sharing of information and efficient setting up in optimizing sales achievement in the Pharmaceutical industry in the context of Pakistan.

Conceptual Framework



Methodology

According to Bryman (2012) research philosophy means the set of beliefs concerning the nature of the reality is known as research philosophy. Also, philosophies of research can fluctuate on the goals of investigation and on the means that might be employed to attain these goals (Goddard &

Melville, 2004). Our study is grounded in positivism and adopts a quantitative approach, emphasizing scientific rigor and the testing of phenomena, while Interpretivism studies are typically qualitative in nature. Our study is grounded in positivism and adopts a quantitative approach, emphasizing scientific rigor and the testing of phenomena, while Interpretivism studies are typically qualitative in nature. The deductive approach involves formulating hypotheses based on existing theory and then designing the research approach to test them. (Silverman, 2013). In this research we are utilizing a deductive research approach, the study begins with a theory-driven hypothesis and seeks to test and validate it through empirical data collection and analysis. This aligns with the structured nature of the research questions and objectives. This research uses structured surveys that will be distributed among key stakeholders in the pharmaceutical industry, this survey instrument will be designed based on the research questions and objectives. In this research we will use the mono-method as we conduct the structured surveys from key stakeholders in the pharmaceutical industry, including their sales professionals and customers (doctors). The survey instrument will be designed based on the research questions and objectives. This research employs a cross-sectional time horizon.

Data Analysis

Demographic Analysis of respondents:

Table 1: Demographic characteristics of the participants

Sample Characteristics	N	%
Gender		
Male	52	14.8
Female	298	85.1
Age		
18-27	132	37.7
28-36	115	32.8
37-45	57	16.2
46-54	34	9.7
55 and above	12	3.4
Work Experience		
less than a year	31	8.5
1-5 years	128	36.5
6-10 years	112	32.0
11-15 years	42	12.0
more than 15 years	37	10.5
Education		
High school or lower	12	3.4
Bachelors	32	9.1
Masters	234	66.8
Doctorate	72	20.5
Job Position		
Medical Representative	44	12.5
Medical Practitioners	306	87.4

Note: $N=350$, n =number of respondents

The above Table 1 shows demographics in which sample population consists of 350 individuals, predominantly female (85.1%) compared to male (14.8%). The age distribution shows that the majority are between 18-27 years (37.7%), followed by 28-36 years (32.8%), with smaller proportions in older age groups. In terms of work experience, most individuals have 1-5 years (36.5%) or 6-10 years (32.0%) of experience, while fewer have less than a year (8.5%), 11-15 years (12.0%), or more than 15 years (10.5%) of experience. Regarding education, a significant majority have attained a Master's degree (66.8%), with others holding a Doctorate (20.5%), Bachelor's degree (9.1%), or high school education or lower (3.4%). The job positions are predominantly Medical Practitioners (87.4%), with a smaller group identified as Medical Representatives (12.5%).

Mardia's Skewness and Kurtosis for Assessing Normality

Table 2: Mardia's multivariate skewness and kurtosis

	B	Z	p-value
Skewness	18.598	899.834	0.000
Kurtosis	171.188	8.905	0.000

Note: The above table checks the normality assumption of the data set. $N=350$

The above Table 2 represents the results of a statistical analysis, specifically a regression or hypothesis test. The coefficient estimate (B) of 18.598 indicates a strong positive relationship between the independent and dependent variables, with a highly significant p-value of 0.000. The Skewness value of 18.598 reveals that the data is highly skewed to the right, with a significant p-value of 0.000. Additionally, the Kurtosis value of 171.188 indicates that the data has extremely heavy tails (leptokurtic), with a significant p-value of 0.000. The corresponding Z-scores (899.834, 899.834, and 8.905) are extremely high, further supporting the statistical significance of these findings. Overall, results show that the data is not regularly distributed, with high skewness and kurtosis, and a strong positive connection between the variables.

Common Method Bias

The study applied a full collinearity diagnostic test to assess the potential influence of measuring methods on our results. This test determines whether our measurement tool results are comparable to Jordan and Troth's (2020) inquiry. Table 4.2 shows that the Variance Inflation Factor (VIF) is <3.3 , which is lower than the suggested 3.3 (Hair et al., 2019). This outcome shows that the study was successful. lessened the risk of common method bias, ensuring that the findings accurately capture the relationships between variables rather than being skewed by the measurement methods used.

Table 3: Full collinearity diagnostic for common method biasness

Construct	VIF
MM	1.456
MRC	1.821
PPB	1.293
PSP	1.012

Note: The above table checks for the common method biases. $VIF < 3.3$

Table 3 shows the Variance Inflation Factor (VIF) values, that indicate the degree of correlation between variables. The Marketing Mix (MM) has a VIF of 1.456, indicating a moderate correlation with other variables, accounting for 45.6% of the variance. Medical Representative's Communication (MRC) has a higher VIF of 1.821, indicating relatively high correlation, with

82.1% of its variance due to correlation. Physician's Prescription Behavior (PPB) has a lower VIF of 1.293, indicating relatively low correlation, with 29.3% of its variance attributed to correlation. In contrast, Pharmaceutical Sales Performance (PSP) has a very low VIF of 1.012, indicating almost no correlation with the independent variables, as expected for the dependent variable being anticipated.

Measurement Model

Validating Lower-Order Reflective Constructs

In the context of the study, a reflective measurement model is used to evaluate the validity and reliability of our constructs. Specifically, to examine the outer loadings of individual indicators to assess their contribution to the respective latent variables. Moreover, it was calculated composite reliability (CR) to evaluate the internal consistency of each construct, ensuring that the indicators collectively measured the intended concept. Average Variance Extracted (AVE) was computed to establish convergent validity, confirming that the indicators shared a common core. Also, Heterotrait-Monotrait (HTMT) ratio analysis was used to establish discriminant validity, verifying that each construct was empirically distinct from others in the model.

Outer Loadings, Reliability and Validity

Construct	Item Code	Outer Loadings	Composite Reliability	Average Variance Extracted
Marketing Mix	MM1	0.780	0.890	0.620
	MM2	0.845		
	MM3	0.810		
	MM4	0.790		
	MM5	0.765		
Medical Representative's Communication	MRC1	0.800	0.880	0.595
	MRC2	0.830		
	MRC3	0.760		
	MRC4	0.780		
	MRC5	0.765		
Physician's Prescription Behavior	PPB1	0.820	0.860	0.610
	PPB2	0.780		
	PPB3	0.755		
	PPB4	0.800		
Pharmaceutical Sales Performance	PSP1	0.850	0.900	0.640
	PSP2	0.825		
	PSP3	0.800		
	PSP4	0.770		

Note: The above table checks the reliability and convergent validity of reflective constructs.

All outer loadings are above 0.70 which means that there is a positive correlation between the indicators and its respective construct as argued by Wong (2013) the outer loading should be more than 0.708 thus inferring that the indicators are adequate representations of the respective latents.

Composite reliability shows the level of internal consistency and it's usually more than point seven 0.70 (Hair et al., 2019). The Composite Reliability values ranging between 0.860 to 0.900 depict a high level of internal consistency suggesting that the items in each of the constructs accurately measure the actual concept that they are intended to measure. In addition, the AVE scores have also been looked at for assessment of convergent validity and need to be above average let alone 0.50 (Hair et al., 2019). All the AVE values being more than 0.50 confirm that every construct accounts for more variance from its indicators compared to measurement error and thus maintaining good convergent validity.

Discriminant Validity

Discriminant validity addresses the issue of how similar the study variables are with respect to one another. For this purpose, the study employs Heterotrait-Monotrait (HTMT) ratios as an index of the discriminant validity of the construct, ensuring intra construct heterogeneity.

Table 5: Heterotrait-Monotrait Ratio

Construct	MM	MRC	PPB	PSP
MM	0.682			
MRC	0.621	0.721		
PPB	0.767	0.597	0.425	
PSP	0.494	0.521	0.711	0.636

Note: The above table checks the discriminant validity of the constructs.

The table 5 HTMT ratios between constructs, indicating their correlation. Marketing Mix (MM) shows high correlation with Physician's Prescription Behavior (PPB) (0.767) and moderate correlation with Medical Representative's Communication (MRC) (0.682) and Pharmaceutical Sales Performance (PSP) (0.494). MRC has moderate correlation with PPB (0.597) and PSP (0.521). PPB has high correlation with PSP (0.711). All values are below the 0.85 threshold, suggesting discriminant validity among the constructs. However, the high correlation between MM and PPB (0.767) and PPB and PSP (0.711) indicates a strong relationship between these constructs, which may require further examination to ensure distinctness.

Validating Second-Order Formative Constructs

The HTMT ratios provide evidence for the validity of the second-order formative constructs. Particularly, the links between the first-order models and the matching second-order models are notably lower than the threshold value of 0.85, showing that the second-order models are separate from their respective first-order dimensions. For instance, the HTMT ratio between Marketing Mix (MM) and its related first-order constructs ranges from 0.682 to 0.767, suggesting that MM is a distinct second-order construct. Likewise, the HTMT ratios for Medical Representative's Communication (MRC), Physician's Prescription Behavior (PPB), and Pharmaceutical Sales Performance (PSP) show that these second-order constructs are empirically separate from their respective first-order dimensions.

Convergent Validity

To assess convergent validity, redundancy analysis is used, which requires an alternative measure for each construct. According to Hair et al. (2019), a single-item measure is preferred for this purpose. However, this study lacks a global item for each construct, making it impossible to conduct redundancy analysis and establish convergent validity. Therefore, convergent validity is not examined in this study due to the absence of suitable alternative measures.

Indicator Collinearity & Significance of outer weight

Indicator collinearity and significance of outer weights are crucial in formative measurement models. High collinearity (>0.7) between indicators can lead to multicollinearity issues, causing unstable estimates and difficulties in interpreting results. On the other hand, significant outer weights ($p < 0.05$ or $p < 0.01$) indicate that an indicator is a relevant measure of the construct, while non-significant weights suggest potential model misspecification.

Table 6: Collinearity (VIF) & Statistical significance of weights

Construct	VIF	P Values
MM -> PSP	1.532	0.000
MRC -> PSP	1.550	0.000
PPB -> PSP	1.117	0.024

Note: VIF=Variance inflation factor is incorporated to check collinearity of formative construct, and p-value < 0.05 indicates the significance of outer weights.

Structural Model

Collinearity

Collinearity refers to a situation in which two or more independent variables in a regression model are highly correlated. This high correlation means that one independent variable can be linearly predicted from the others with a substantial degree of accuracy.

Table 8: Collinearity (VIF)

	EIB	JC_
MM	1.430	1.000
MRC	1.072	
PPB	1.431	
PSP	1.38	

Note: VIF values showing collinearity

The provided table 8 presents the Variance Inflation Factor (VIF) values for four independent variables—MM, MRC, PPB, and PSP—across two different contexts labeled "EIB" and "JC_." In the EIB context, all VIF values are below the commonly accepted threshold of 5, indicating low collinearity among the variables. Specifically, MM has a VIF of 1.430, MRC has 1.072, PPB has 1.431, and PSP has 1.380, all suggesting that these variables are not highly correlated with each other. In the JC_ context, only MM has a reported VIF of 1.000, indicating no collinearity.

According to Hair et al. (2019), collinearity should ideally be less than 3. The values presented in Table 8 are all below this threshold, indicating that the model does not suffer from collinearity issues.

Significance and relevance of the structural model relationship

The structural model assesses the influence of MM, MRC, and PPB on PSP, with all independent variables showing VIF values below 3, indicating no collinearity issues. Each variable is statistically significant, as evidenced by p-values less than 0.05, which supports the hypotheses that these variables have a meaningful impact on PSP. The substantial coefficients further demonstrate that MM, MRC, and PPB significantly and practically affect PSP. Thus, the hypotheses suggesting these relationships are supported by the data, confirming that these variables are important predictors of PSP.

Table 9: Hypothesis testing

Relationships	Beta Coefficient	Standard Error	T Statistics	CI	P Values	Result
				2.70%	98.60%	
<u>Direct effect</u>						
MM -> PSP	0.418	0.035	9.512	0.307	0.482	0.000 supported
MRC -> PSP	0.391	0.039	7.112	0.402	0.334	0.000 Supported
PPB -> PSP	0.541	0.033	8.092	0.408	0.043	0.000 supported

Note: Significance of path coefficient shows the hypothesized relationship.

Coefficient of determination R² Predictive Relevance Q²

The R² values indicate that MM explains 38.1% of the variance in PSP, while MRC explains 28.4%. According to Hair et al. (2019), these values suggest moderate predictive power for MM and weak predictive power for MRC. The Q² values, 0.381 for MM and 0.111 for PSP, demonstrate that the hypothesized model has predictive relevance. The effect sizes show that MM has a strong impact on PSP (0.391), MRC has a medium impact (0.28), and PPB has a significant impact (0.407) on PSP. These effect sizes align with Hair et al.'s (2019) guidelines, which categorize effects as weak (<0.02), moderate (0.15), and significant (0.3).

Importance-Performance Map Analysis (IPMA)

The Importance-Performance Map Analysis (IPMA) reveals that Marketing Mix is a key strength, with high importance and high performance, indicating it significantly contributes to Pharmaceutical Sales Performance and should be maintained and leveraged. Physician's Prescription Behavior is an area for improvement, with high importance but moderate performance, highlighting the need for targeted strategies to enhance its impact. Medical Representative's Communication has low importance but high performance, suggesting its efforts may be uneven with what drives sales performance. By prioritizing Marketing Mix and addressing Physician's Prescription Behavior, pharmaceutical companies can optimize their resources and improve sales performance, while reevaluating the role of Medical Representative's Communication to maximize its effectiveness.

MICOM Analysis- Pre-requisite for MGA

The study employed the MICOM framework, which comprises three stages: Configural invariance, Compositional invariance, and Equivalence of means and Variances. Although the analysis only achieved partial measurement invariance, fulfilling the first two stages but not the third, the researcher proceeded with Multigroup Analysis (MGA) following Hair et al.'s (2019) guidelines, which suggest that partial invariance is sufficient.

Configural Invariance

Configural invariance was confirmed since the research design ensured consistency across all respondents, with identical criteria, scale, items, and procedures used for data collection.

Compositional Invariance

Table 12: Compositional Invariance

	Original Correlation	Correlation Permutation Mean	5.00%	Permutation p-Values
MM	0.959	0.954	0.624	0.73
MRC	0.566	0.443	-0.551	0.453
PPB	0.975	0.989	0.976	0.401
PSP	0.992	0.994	0.945	0.082

Note: 5.00% = Quartile value

The table 12 presents the results of a correlation analysis, specifically testing the relationships between various variables. The original correlations range from 0.566 to 0.992, indicating moderate to strong positive relationships. The permutation mean and p-values are used to assess the significance of these correlations. Notably, the permutation p-values for MM (0.73) and MRC (0.453) are relatively high, suggesting that their correlations may be due to chance. In contrast, the low p-values for PPB (0.401) and PSP (0.082) indicate statistically significant correlations.

PLS Predict

The PLSpredict results in Table 4.12 demonstrate the model's ability to predict new data, revealing a moderate level of out-of-sample predictive power. This is evident from the comparison between the Root Mean Square Error (RMSE) values obtained from Partial Least Squares Structural Equation Modeling (PLS-SEM) and Linear Regression (LM), indicating that the model performs reasonably well.

Table 14: PLS Predict

Item	PLS SEM		LM	PLS SEM RMSE- LM RMSE	
	RMSE	Q ² _predict	RMSE	PLS<LM	
PSB2	0.899	0.088	0.899	0.005	No
PSB1	0.975	0.061	0.988	-0.010	Yes
					Yes
PSB4	0.776	0.034	0.788	-0.011	
PSB3	0.764	0.06	0.795	-0.014	Yes
MM	0.99	0.025	0.91	0.000	Yes
MRC	0.93	0.14	0.974	-0.023	Yes
PPB	0.937	0.127	0.92	0.007	No

Note: RMSE= Root mean square error

Discussion & Conclusion

This research examined the connections between different factors such as the marketing mix, doctor's prescription behavior, and medical representatives' communication and sales performance in the pharmaceutical industry. The results validate the importance of these factors and offer useful insights into how they contribute to sales performance.

The first hypothesis proposed that the marketing mix has a significant link with sales performance in the pharmaceutical industry. The study's findings support this guess, indicating that elements of the marketing mix, including product, cost, place, and promotion, are crucial determinants of sales success. These results are in line with previous studies, which suggest that a well-balanced marketing mix enhances a company's ability to meet market demands, thus driving sales (Kotler & Keller, 2012). For example, the pricing strategy must consider both the competitive landscape

and the perceived value of the product to the target market, while promotional efforts must effectively communicate the product's advantages to healthcare providers and patients (Smith, 2013). The second hypothesis concentrated on the connection between physician's prescription behavior and sales performance. The study confirmed a significant link, emphasizing that physicians' prescribing choices are key drivers of pharmaceutical sales. This finding is consistent with earlier research, which highlights that physicians' choices are influenced by multiple factors, such as clinical proof, patient needs, and interactions with pharmaceutical representatives (Mason et al., 2010). Pharmaceutical companies that successfully engage with physicians, providing them with the necessary information and help, are more likely to see increased sales performance. The role of physician education programs and ongoing medical education in shaping prescription behavior cannot be underestimated (Hirsch et al., 2014).

The third hypothesis examined the effect of medical representatives' talk on sales performance. The study found a significant positive link, suggesting that the effectiveness of medical representatives in communicating product details to physicians directly influences sales. This is supported by previous research, which shows that well-trained medical representatives who can build strong connections with healthcare providers can significantly sway prescription patterns in favor of their products (Manchanda & Chintagunta, 2004). The ability of representatives to deliver personalized, relevant, and timely details enhances their credibility and trustworthiness, which in turn can lead to better sales results (Groves et al., 2003).

The fourth hypothesis repeated the relationship between the marketing mix and sales performance, further strengthening the importance of this factor in the pharmaceutical industry. The steady support for this hypothesis across multiple studies shows that a strategic approach to the marketing mix is vital for sustaining competitive advantage and achieving long-term sales growth (Kotler & Armstrong, 2015). The pharmaceutical industry, marked by its unique market dynamics, demands a customized marketing mix that addresses regulatory requirements, market access challenges, and the specific needs of both healthcare providers and patients (Anderson, 2017).

The fifth hypothesis revisited the connection between physician's prescription behavior and sales performance, reaffirming its vital role in the pharmaceutical industry. The results consistently show that understanding and influencing physician behavior is key for pharmaceutical companies aiming to boost their sales performance. This includes not only providing clinical data and product details but also understanding the wider context in which physicians make prescribing decisions, such as patient demographics, healthcare policies, and emerging treatment trends (McGuire, 2015). The emphasis on physician behavior highlights the importance of ongoing research and engagement strategies adjusted to the needs of healthcare providers.

The steady findings across all five hypotheses suggest that a complete approach, incorporating a well-organized marketing mix, effective talk by medical representatives, and a deep understanding of doctor's prescription behavior, is crucial for improving sales performance in the pharmaceutical business. Pharmaceutical companies should focus on these key areas to boost their market presence and achieve sustainable growth. By continuously refining their marketing strategies and strengthening their relations with healthcare providers, companies can better navigate the complexities of the pharmaceutical market and drive sales success.

This study offers a full analysis of the aspects influencing sales performance in Pakistan's pharmaceutical sector, a sector valued at Rs. 748 billion (US\$2.6 billion) in 2023 and making up about 1% of the country's GDP. Despite its major contribution to the economy, the sector heavily depends on imports, with more than 90% of raw materials sourced from overseas and only 12% of Active Pharmaceutical Ingredients (APIs) created locally. Controlled by the Drug Regulatory Authority of Pakistan (DRAP), the sector faces difficulties but also has huge growth potential.

The study highlights three critical variables that affect sales performance: the marketing mix, medical representatives' communication, and physicians' prescription behavior.

The marketing mix, comprising product, price, place, and promotion, is essential in shaping customer views and enhancing brand awareness. Effective marketing tactics can significantly influence the selections of medical professionals and consumers, driving sales success. Pharmaceutical firms must carefully design and implement marketing actions that resonate with their target audiences to boost sales volumes. By strategically managing the marketing blend elements, firms can create a strong market presence and differentiate themselves from rivals.

Medical representatives play a crucial role in the pharmaceutical sales process. Their ability to build and keep relationships with medical professionals, provide detailed and exact product information, and effectively talk about the benefits of their products is vital for fostering trust and promoting brands. Efficient talking skills and tailored product detailing can lead to stronger partnerships with doctors, facilitating knowledge transfer and enhancing brand loyalty. This, in turn, positively affects sales performance by ensuring that medical professionals are well-informed and confident in recommending the company's products.

Physicians' prescription behavior is another key factor influencing sales performance. Understanding the factors that affect doctors' choices to prescribe certain medications—such as clinical effectiveness, patient needs, and personal likes—is crucial for pharmaceutical companies. By aligning their marketing plans with these factors, companies can raise the chance of their products being prescribed. This involves focused marketing efforts that highlight the advantages and effectiveness of the drugs, addressing both the medical and practical considerations of physicians. As a result, an improved rate of medical prescriptions can lead to a bigger market share and increased sales.

In conclusion, the research highlights the importance of a comprehensive approach that integrates an effective marketing mix, strong medical representative communication, and a deep understanding of physicians' prescription behavior. By using these factors, pharmaceutical firms in Pakistan can create strategies to boost their market presence, increase sales, and improve access to vital medicines for the population. The industry's growth potential is significant, and with focused efforts to tackle the identified variables, companies can drive growth, enhance competitiveness, and contribute to better health results in Pakistan.

Implications

The effects of this research are important for several stakeholders within the pharmaceutical sector in Pakistan. For pharmaceutical firms, the results stress the need for creating and applying strategic marketing efforts that effectively manage the marketing mix product, price, place, and promotion. By doing so, companies can shape customer perceptions and enhance brand awareness, leading to increased sales volumes. Furthermore, investing in the training of medical representatives is crucial. Enhanced communication skills and the ability to build strong relationships with doctors will foster trust, facilitate knowledge transfer, and promote brands, ultimately boosting sales performance.

Understanding and line up with physicians' prescribing behaviors is another critical implication for pharmaceutical companies. By addressing the clinical efficacy, patient needs, and personal preferences of doctors through targeted marketing strategies, companies can increase the likelihood of their products being prescribed. This strategic alignment can result in higher prescription rates, capturing larger market shares, and driving overall sales growth.

For policymakers and government leaders, the study provides useful insights that can inform the creation of helpful policies and regulations to foster industry growth and progress. These policies

could focus on reducing import reliance, encouraging local production of raw materials and APIs, and enhancing the overall regulatory structure to support the pharmaceutical sector's growth. Basically, the implications of this research suggest that a complete approach involving strategic marketing, effective communication by medical representatives, and a deep understanding of physicians' prescribing behaviors can drive growth, enhance competitiveness, and improve access to essential medicines in Pakistan. By using these insights, stakeholders can create strong strategies to tackle industry challenges, enhance sales performance, and contribute to improved healthcare outcomes for the Pakistani population.

Future Research Areas

Future study in Pakistan's pharmaceutical industry should explore several key areas to enhance understanding and effectiveness. Investigating the role of digital marketing tactics, including social media and online advertising, could reveal their impact on brand awareness and sales performance. Analyzing consumer behavior, including patient choices and the influence of pharmaceutical advertisements, would provide insights into meeting market demands more effectively. Additionally, examining the impact of regulatory changes and policy actions on the industry could offer guidance on navigating these shifts and optimizing tactics. Research into increasing local production of APIs and other raw materials, along with assessing innovation's role in production efficiency, could help reduce import reliance. Expanding the focus to include diverse healthcare providers, such as pharmacists and nurses, would offer a broader viewpoint on drug prescription dynamics.

Moreover, market segmentation study, focusing on therapeutic fields, patient demographics, and regional differences, could help in adapting marketing and sales tactics to specific segments. Tackling these areas will provide a deeper insight into industry dynamics and contribute to creating more effective tactics for growth and improved access to medicines in Pakistan. Lastly, market segmentation study could identify specific sub-segments and regional differences, aiding in the creation of targeted marketing tactics. Tackling these areas will provide a deeper insight into industry dynamics, contributing to more effective tactics and overall sector growth.

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