

THE IMPACT OF PHARMACEUTICAL MARKETING STRATEGIES ON PRESCRIBING PRACTICES AMONG HEALTHCARE PROFESSIONALS IN AFGHANISTAN

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Abstract

This study aimed to examine the association between pharmaceutical marketing strategies and prescribing practices among healthcare professionals in Afghanistan. A quantitative cross-sectional design is used, and data are collected through a structured questionnaire which covered pharmaceutical marketing exposure, perceived influence on prescribing, prescribing factors, attitudes, ethical considerations, and marketing-responsive prescribing practices. Data are analyzed through descriptive statistics, Cronbach's alpha, the Shapiro–Wilk test, Spearman's rank correlation, and robust linear regression. The findings showed that sponsored educational meetings, visits from pharmaceutical representatives, and advertisements in medical related are the most commonly reported marketing strategies, while digital promotions are less common. Clinical effectiveness, previous clinical experience, and clinical guidelines are the most important factors considered when prescribing medicines. Respondents also demonstrated considerable awareness of ethical issues related to gifts, incentives, conflicts of interest, disclosure, and professional judgment. A strong and statistically significant negative association is found between pharmaceutical marketing exposure and marketing-responsive prescribing ($\rho = -0.635$, $p < 0.001$). Robust regression confirmed this relationship ($B = -0.561$, $p < 0.001$), which remained significant after adjustment for selected sociodemographic and professional characteristics ($B = -0.583$, $p < 0.001$). The study concludes that pharmaceutical marketing exposure is significantly associated with prescribing practices, although the relationship is inverse. It is recommended that healthcare institutions strengthen evidence-based prescribing, ethical guidelines, independent medicine information, professional training,

transparency, and regulatory oversight of pharmaceutical promotional activities.

INTRODUCTION

Pharmaceutical marketing has become an important component of the interaction between pharmaceutical companies and healthcare professionals. Companies employ a wide range of promotional strategies, including visits by medical representatives, distribution of promotional materials, provision of free medicine samples, sponsorship of educational meetings and conferences, gifts and incentives, advertisements in medical journals, and digital or social media promotion. These activities are intended to increase awareness of pharmaceutical products and provide information about newly introduced medicines. At the same time, concerns have been raised regarding the extent to which promotional activities may shape prescribing behavior and influence independent clinical decision-making.

Prescribing decisions are expected to be based primarily on clinical effectiveness, medicine safety, scientific evidence, treatment guidelines, patient characteristics, medicine availability, and affordability. However, pharmaceutical marketing may introduce additional commercial influences into the prescribing process. Repeated exposure to specific brands, information provided by pharmaceutical representatives, free samples, sponsored educational activities, and promotional incentives may affect how healthcare professionals perceive medicines and select among therapeutic alternatives. Such interactions have therefore generated continuing debate regarding conflicts of interest, professional autonomy, transparency, and the ethical responsibilities of both pharmaceutical companies and healthcare providers.

Healthcare professionals may also respond differently to pharmaceutical marketing depending on their professional experience, qualifications, clinical workload, access to independent information, and awareness of ethical standards. Some may consider pharmaceutical representatives and sponsored

educational activities useful sources of information, particularly for learning about newly available medicines. Others may question the balance and reliability of promotional information because pharmaceutical marketing is primarily designed to promote commercial products. For this reason, healthcare professionals are increasingly encouraged to critically evaluate promotional claims and compare them with independent scientific evidence and established clinical guidelines.

The relationship between pharmaceutical marketing and prescribing behavior is particularly important in healthcare systems where access to independent drug information and formal regulatory oversight may be limited. In such environments, pharmaceutical representatives and company-sponsored materials may become relatively important sources of information for healthcare providers. At the same time, weak institutional policies regarding gifts, incentives, sponsorship, and disclosure of relationships with pharmaceutical companies may increase ethical concerns. Understanding how healthcare professionals perceive and respond to pharmaceutical marketing is therefore important for promoting rational, evidence-based, and patient-centered prescribing.

In Afghanistan, pharmaceutical companies and their representatives interact with physicians, dentists, pharmacists, and other healthcare professionals through various promotional channels. Despite the potential importance of these interactions, empirical evidence concerning pharmaceutical marketing and prescribing practices in Afghanistan remains limited. In particular, little is known about the level of healthcare professionals' exposure to different promotional strategies, which forms of marketing are most commonly encountered, how professionals perceive the influence of marketing on their prescribing decisions, and what clinical

and non-clinical factors they prioritize when selecting medicines. Evidence is also limited regarding healthcare professionals' attitudes toward gifts, incentives, conflicts of interest, disclosure, and regulation of pharmaceutical promotion.

This evidence gap is important because prescribing practices directly affect medicine utilization, treatment costs, patient safety, and the overall quality of healthcare. If pharmaceutical marketing strongly shapes prescribing decisions, appropriate professional and regulatory safeguards may be necessary to protect independent clinical judgment. Conversely, understanding how healthcare professionals critically respond to pharmaceutical promotion may help identify opportunities for strengthening evidence-based prescribing and ethical engagement with the pharmaceutical industry.

Therefore, this study examines pharmaceutical marketing strategies and prescribing practices among healthcare professionals in Afghanistan. Specifically, it assesses healthcare professionals' exposure to different pharmaceutical marketing strategies, examines their perceptions of the influence of marketing on prescribing decisions, identifies the major factors considered when prescribing medicines, and evaluates attitudes toward pharmaceutical marketing, gifts, incentives, and related ethical considerations. The study further investigates the relationship between pharmaceutical marketing exposure and marketing-responsive prescribing practices and determines whether this association remains significant after accounting for selected sociodemographic and professional characteristics. By providing empirical evidence from Afghanistan, the study aims to contribute to the development of more transparent, ethical, and evidence-informed pharmaceutical promotion and prescribing practices.

Problem Statement

Pharmaceutical marketing is widely used to inform healthcare professionals about medicines through

sales representatives, promotional materials, free samples, sponsored educational activities, gifts, digital advertising, and other promotional strategies. Although these activities can improve awareness of available and newly introduced medicines, they may also influence prescribing decisions and raise concerns regarding independent, ethical, and evidence-based prescribing. In Afghanistan, healthcare professionals operate in a healthcare environment where pharmaceutical companies actively promote their products; however, empirical evidence regarding the extent to which such marketing strategies are associated with prescribing practices remains limited. In particular, there is insufficient evidence on healthcare professionals' exposure to pharmaceutical marketing, their perceptions of its influence, their attitudes toward promotional activities and incentives, and whether greater exposure is associated with differences in prescribing practices. This evidence gap makes it difficult to understand the role of pharmaceutical marketing in clinical decision-making and to develop appropriate policies for ethical pharmaceutical promotion. Therefore, this study examines the impact of pharmaceutical marketing strategies on prescribing practices among healthcare professionals in Afghanistan.

Objectives

- To assess healthcare professionals' exposure to different pharmaceutical marketing strategies in Afghanistan.
- To examine healthcare professionals' perceptions of the influence of pharmaceutical marketing on prescribing decisions.
- To identify the major factors considered by healthcare professionals when prescribing medicines.
- To assess healthcare professionals' attitudes toward pharmaceutical marketing, gifts, incentives, and related ethical considerations.
- To examine the relationship between pharmaceutical marketing exposure and prescribing practices among healthcare professionals.

- To estimate the association between pharmaceutical marketing exposure and prescribing practices after accounting for selected sociodemographic and professional characteristics.

Research Questions

- What is the level of healthcare professionals' exposure to pharmaceutical marketing strategies in Afghanistan?
- To what extent do healthcare professionals perceive pharmaceutical marketing strategies as influencing their prescribing decisions?
- What are the major factors considered by healthcare professionals when prescribing medicines?
- What are healthcare professionals' attitudes toward pharmaceutical marketing, gifts, incentives, and related ethical considerations?
- Is there a significant relationship between pharmaceutical marketing exposure and prescribing practices among healthcare professionals?
- Does pharmaceutical marketing exposure remain significantly associated with prescribing practices after accounting for selected sociodemographic and professional characteristics?

Research Hypotheses

H₀: Pharmaceutical marketing exposure is not significantly associated with prescribing practices among healthcare professionals in Afghanistan.

H₁: Pharmaceutical marketing exposure is significantly associated with prescribing practices among healthcare professionals in Afghanistan.

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Research Methodology

This study employed a quantitative cross-sectional research design to examine the association between pharmaceutical marketing strategies and prescribing practices among healthcare professionals in Afghanistan. The target population consisted of healthcare professionals, including physicians, dentists, pharmacists, and other relevant professionals involved in medicine-related decision-making. A purposive sampling technique is used to recruit eligible participants who had relevant professional experience and potential exposure to pharmaceutical marketing activities.

Data are collected using a structured questionnaire consisting of sections covering sociodemographic and professional characteristics, exposure to pharmaceutical marketing strategies, perceived influence of marketing on prescribing decisions, factors considered when prescribing medicines, attitudes toward pharmaceutical promotion, gifts and incentives, ethical considerations, and prescribing practices. Most study variables are measured using five-point Likert scales. Participation is voluntary,

and confidentiality and anonymity of respondents are maintained throughout the study.

Before analysis, the collected data are screened for completeness, duplicate responses, coding errors, missing values, and out-of-range observations. Composite scores are subsequently generated for the main study constructs. The internal consistency of the multi-item scales is assessed using Cronbach's alpha.

Data are analyzed using Stata version. Frequencies and percentages are used to summarize categorical variables, while means and standard deviations are calculated for Likert-scale items and composite measures. The Shapiro–Wilk test is used to assess the distribution of the composite variables. Because the main variables showed departures from normality, Spearman's rank correlation is used to examine the bivariate relationship between pharmaceutical marketing exposure and marketing-responsive prescribing practices.

In addition, robust linear regression is employed to estimate the association between pharmaceutical marketing exposure and marketing-responsive prescribing. A multivariable robust regression model is used to determine whether this association remained significant after accounting for selected sociodemographic and professional characteristics, including age group, professional category, qualification, professional

experience, and number of patients seen per day. Regression diagnostics and sensitivity analyses are also performed to assess the robustness of the findings. Statistical significance is determined at $p < 0.05$, and 95% confidence intervals are reported. As the study employed a cross-sectional observational design, the statistical findings are interpreted as associations rather than causal effects. Ethical principles of voluntary participation, confidentiality, anonymity, and appropriate use of the collected information are maintained throughout the research process.

Result:

This section presents the findings concerning pharmaceutical marketing strategies and prescribing practices among healthcare professionals in Afghanistan. The analysis is conducted using the final cleaned dataset of respondents. Descriptive statistics are used to assess pharmaceutical marketing exposure, perceived influence on prescribing, prescribing factors, attitudes, and ethical considerations. Spearman's rank correlation and robust linear regression are used to examine the association between pharmaceutical marketing exposure and marketing-responsive prescribing practices.

Table 1. Sociodemographic and Professional Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Age	20–29 years	40	68.97
	30–39 years	13	22.41
	40–49 years	5	8.62
Gender	Male	58	100.00
Professional category	Physician	27	46.55
	Dentist	13	22.41
	Pharmacist	12	20.69
	Other healthcare professional	6	10.34
Qualification	Diploma	5	8.62
	Bachelor's degree	14	24.14
	Master's degree	26	44.83
	MD	1	1.72
	Specialist/Residency	12	20.69
Professional experience	<5 years	2	3.45
	5–9 years	4	6.90
	10–14 years	21	36.21
	15–19 years	31	53.45
Patients seen per day	10–19	50	86.21
	20–29	4	6.90
	30–49	4	6.90

Table 1 shows that most respondents are aged 20–29 years (68.97%), followed by those aged 30–39 years (22.41%) and 40–49 years (8.62%). All respondents are male. Physicians constituted the largest professional group (46.55%), followed by dentists (22.41%), pharmacists (20.69%), and other healthcare professionals (10.34%). Regarding educational qualifications,

44.83% held a master's degree, 24.14% held a bachelor's degree, and 20.69% reported specialist/residency qualifications. More than half of respondents (53.45%) reported 15–19 years of professional experience, while 36.21% had 10–14 years. Most respondents (86.21%) reported seeing 10–19 patients per day.

Table 2. Reliability Analysis of the Study Constructs

Construct	Items	Cronbach's Alpha	Interpretation
Pharmaceutical marketing exposure	B1-B15	0.914	Excellent
Perceived influence on prescribing	C1-C12	0.827	Good
Factors considered in prescribing	D1-D12	0.876	Good
Attitudes toward pharmaceutical marketing	E1-E8	0.886	Good
Ethical considerations	F1-F6	0.935	Excellent
Marketing-responsive prescribing	G1-G3	0.832	Good

The reliability analysis demonstrated satisfactory internal consistency across all study constructs. Cronbach's alpha values ranged from 0.827 to 0.935. Pharmaceutical marketing exposure demonstrated excellent reliability ($\alpha = 0.914$), while the ethical-considerations scale showed the

highest reliability ($\alpha = 0.935$). The marketing-responsive prescribing scale also demonstrated good internal consistency ($\alpha = 0.832$). Overall, the results indicate that the study constructs had adequate internal consistency for subsequent statistical analysis.

Table 3. Exposure to Pharmaceutical Marketing Strategies

Rank	Pharmaceutical marketing strategy	Mean	SD
1	Sponsored educational meetings	3.21	1.17
2	Visits from pharmaceutical representatives	3.07	1.24
3	Advertisements in medical journals	3.05	1.15
4	Gifts/promotional items	2.90	1.51
5	Free medicine samples	2.78	1.38
6	Sponsored conferences/seminars	2.52	1.13
7	Sponsored clinical/educational materials	2.48	1.37
8	Invitations to sponsored events	2.45	1.40
9	Social media advertisements	2.40	1.26
10	Discounts/special offers	2.38	1.25
11	Sponsored research/academic activities	2.22	1.58
12	Brochures/promotional materials	2.14	1.05
13	Information about newly launched medicines	2.07	0.95
14	Direct phone/messaging communication	2.03	0.97
15	Digital/online pharmaceutical promotions	2.02	0.98
—	Overall pharmaceutical marketing exposure	2.51	0.83

The above table shows the overall pharmaceutical marketing exposure score is 2.51 (SD = 0.83), indicating a generally low-to-moderate level of reported exposure. Sponsored educational meetings had the highest mean exposure score (M

= 3.21, SD = 1.17), followed by visits from pharmaceutical representatives (M = 3.07, SD = 1.24) and advertisements in medical journals (M = 3.05, SD = 1.15). Digital/online pharmaceutical promotions had the lowest mean exposure (M =

2.02, SD = 0.98), followed by direct phone or messaging communication (M = 2.03, SD = 0.97). These results suggest that traditional face-to-face and educational promotional approaches are more

prominent than digital pharmaceutical marketing among the respondents.

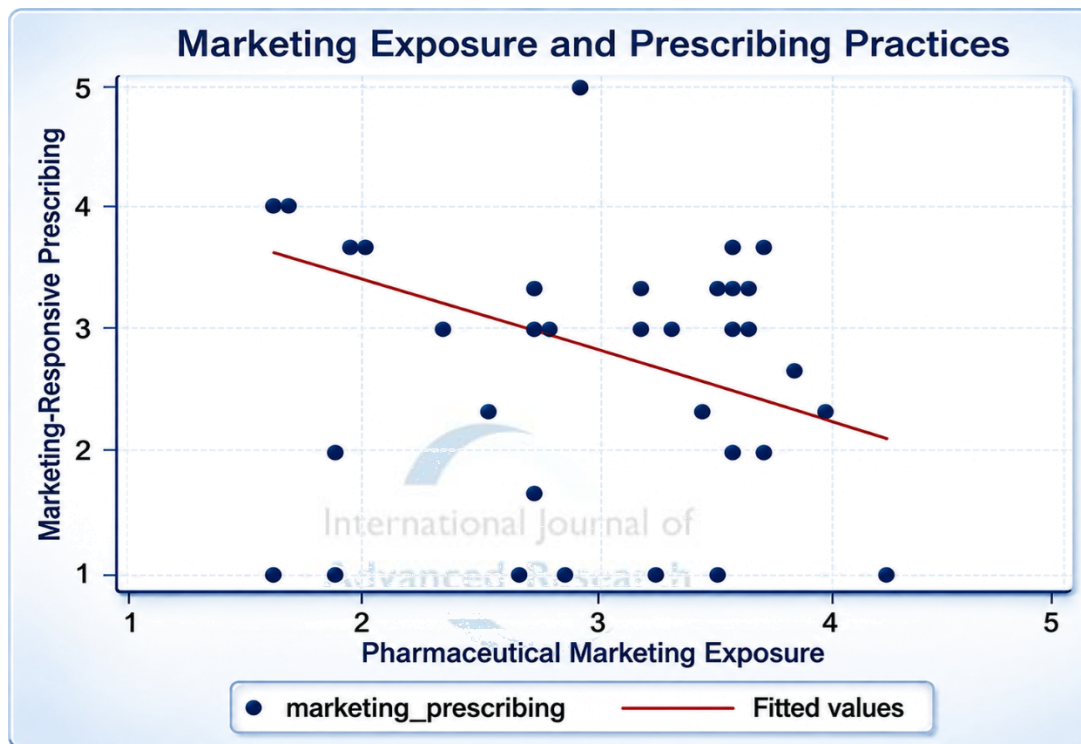


Figure 1. Exposure to Pharmaceutical Marketing Strategies

Figure 1 illustrates the mean levels of exposure to different pharmaceutical marketing strategies among healthcare professionals. Sponsored educational meetings showed the highest reported exposure, followed by visits from pharmaceutical representatives and advertisements in medical journals. In contrast, digital/online pharmaceutical promotions and direct phone or

messaging communication showed comparatively lower exposure. Overall, the figure indicates that traditional, educational, and face-to-face marketing strategies are more commonly reported than digital promotional approaches.

Table 4. Perceived Influence of Pharmaceutical Marketing on Prescribing Decisions

Rank	Item	Mean	SD
1	Promotional materials influence choice between similar medicines	3.95	1.26
2	Marketing influences prescribing even when influence is not fully recognized	3.69	1.19
3	Marketing influences quantity/frequency of prescribing	3.59	1.01
4	Promotional information influences perception of medicine safety	3.57	1.27
5	Free samples influence prescribing decisions	3.53	1.13
6	Representative information influences prescribing	3.50	1.20
7	Sponsored education influences medicine preferences	3.43	1.04
8	Marketing influences branded versus generic selection	3.21	1.14
9	Representative recommendations influence medicine selection	3.17	0.94
10	Repeated brand exposure increases likelihood of prescribing	3.02	1.64
11	Representatives increase awareness of new medicines	2.81	1.42
12	Promotional information influences perceived effectiveness	2.59	1.21
—	Overall perceived prescribing influence	3.34	0.71

The above table show that the overall perceived influence score is 3.34 (SD = 0.71), suggesting a moderate level of perceived pharmaceutical marketing influence on prescribing decisions. The highest-rated influence is promotional materials affecting the choice between similar medicines (M = 3.95, SD = 1.26). Respondents also showed relatively high agreement that marketing could influence prescribing even when its influence is

not fully recognized (M = 3.69, SD = 1.19). The lowest-rated item concerned promotional information influencing perceptions of medicine effectiveness (M = 2.59, SD = 1.21). Overall, the findings indicate that respondents perceived pharmaceutical marketing as influencing several aspects of prescribing decisions, although the magnitude varied across promotional mechanisms.

Table 5. Factors Considered by Healthcare Professionals When Prescribing Medicines

Rank	Factor	Mean	SD
1	Clinical effectiveness	3.98	1.02
2	Previous clinical experience	3.79	0.93
3	Clinical guidelines	3.76	1.17
4	Recommendations/opinions of colleagues	3.64	0.93
5	Published scientific evidence	3.50	1.06
6	Patient preference	3.34	1.00
7	Medicine safety	3.29	1.69
8	Medicine availability	3.03	1.18
9	Information from pharmaceutical representatives	2.71	1.35
10	Brand reputation	2.53	1.31
11	Pharmaceutical promotional materials	2.53	1.27
12	Affordability/cost to patient	2.47	1.39
—	Overall prescribing-factor score	3.22	0.79

The above table shows the Clinical effectiveness is the most highly rated prescribing consideration ($M = 3.98$, $SD = 1.02$), followed by previous clinical experience ($M = 3.79$, $SD = 0.93$) and clinical guidelines ($M = 3.76$, $SD = 1.17$). Published scientific evidence and colleagues' recommendations also received relatively high scores. In contrast, information provided by

pharmaceutical representatives ($M = 2.71$, $SD = 1.35$), brand reputation ($M = 2.53$, $SD = 1.31$), and promotional materials ($M = 2.53$, $SD = 1.27$) are rated comparatively lower. The findings indicate that respondents reported placing greater importance on clinical and professional considerations than on direct pharmaceutical promotional factors.

Table 6. Attitudes Toward Pharmaceutical Marketing and Ethical Considerations

Dimension/Item	Mean	SD
Attitudes toward pharmaceutical marketing		
Representatives provide useful information	3.31	0.86
Marketing helps professionals learn about new medicines	3.22	0.94
Promotional information is reliable	3.34	0.93
Representatives may emphasize benefits/minimize risks	3.71	1.26
Promotional claims should be independently verified	3.71	1.14
Conflicts of interest should be disclosed	3.41	1.35
Training to evaluate promotional information is needed	3.21	1.07
Pharmaceutical marketing should be regulated	2.98	1.22
Overall attitude score	3.36	0.83
Ethical considerations		
Small gifts can affect attitudes toward brands	3.81	1.19
Free samples may increase prescribing	3.78	1.20
Incentives may create conflicts of interest	3.93	1.37
Pharmaceutical-company relationships should be disclosed	3.98	1.37
Marketing should not compromise professional judgment	4.02	1.33
Institutional policies governing marketing are needed	3.36	1.36
Overall ethical-consideration score	3.81	1.13

The above table shows the overall attitude score is 3.36 ($SD = 0.83$). Respondents particularly agreed that pharmaceutical representatives may emphasize medicine benefits while minimizing risks ($M = 3.71$) and that promotional claims should be independently verified ($M = 3.71$). Ethical considerations received a comparatively higher overall score ($M = 3.81$, $SD = 1.13$). The highest agreement concerned the principle that

pharmaceutical marketing should not compromise professional judgment ($M = 4.02$, $SD = 1.33$). Respondents also expressed relatively strong agreement regarding disclosure of relationships with pharmaceutical companies and the potential for pharmaceutical incentives to create conflicts of interest. These findings demonstrate notable awareness of ethical issues surrounding pharmaceutical marketing

Table 7. Association Between Pharmaceutical Marketing Exposure and Marketing-Responsive Prescribing

Analysis	Estimate	SE	95% CI	p-value
Spearman correlation	$\rho = -0.635$	—	—	<0.001
Robust linear regression	$B = -0.561$	0.137	-0.836 to -0.286	<0.001

The above table shows the Spearman's rank correlation demonstrated a strong, statistically significant negative association between pharmaceutical marketing exposure and marketing-responsive prescribing practices ($\rho = -0.635$, $p < 0.001$). Thus, respondents reporting greater exposure to pharmaceutical marketing tended to report lower marketing-responsive prescribing scores. The robust linear regression confirmed this finding. Pharmaceutical marketing

exposure is significantly and negatively associated with marketing-responsive prescribing ($B = -0.561$, robust SE = 0.137, 95% CI: -0.836 to -0.286, $p < 0.001$). A one-unit increase in the pharmaceutical marketing exposure score is associated with an estimated 0.561-point decrease in the marketing-responsive prescribing score. Marketing exposure explained approximately 21.3% of the variance in the prescribing score.

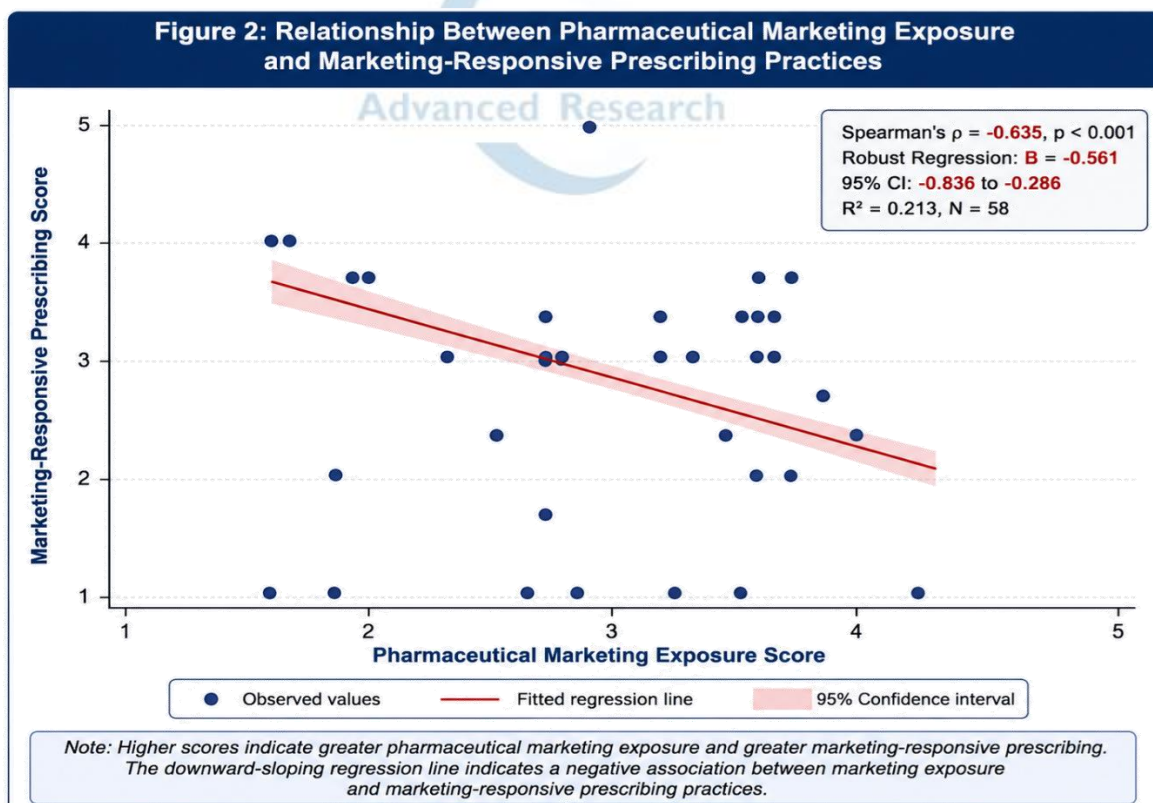


Figure 2. Relationship Between Pharmaceutical Marketing Exposure and Prescribing Practices

Figure 2 shows a clear negative relationship between pharmaceutical marketing exposure and

marketing-responsive prescribing practices. Higher exposure scores are associated with lower

marketing-responsive prescribing scores. This visual pattern is consistent with the significant Spearman correlation ($\rho = -0.635$, $p < 0.001$) and

robust regression result ($B = -0.561$, 95% CI: -0.836 to -0.286 , $p < 0.001$).

Table 8. Robust Linear Regression Models Predicting Marketing-Responsive Prescribing

Predictor/Model statistic	Unadjusted model	Adjusted model
Marketing exposure, B (Robust SE)	$-0.561 (0.137)^*$	$-0.583 (0.132)^*$
95% CI	-0.836 to -0.286	-0.850 to -0.315
Age group 2	—	0.359 (0.391)
Age group 3	—	0.796 (0.655)
Profession 2	—	$-0.071 (0.371)$
Profession 3	—	0.023 (0.595)
Profession 4	—	0.193 (0.531)
Qualification 2	—	0.010 (0.677)
Qualification 3	—	0.095 (0.566)
Qualification 4	—	$-0.723 (0.837)$
Qualification 5	—	$-0.543 (0.749)$
Experience 2	—	$-0.373 (0.930)$
Experience 3	—	0.075 (0.658)
Experience 4	—	0.698 (0.678)
Patients/day 3	—	0.372 (0.395)
Patients/day 4	—	0.144 (0.400)
N	58	58
R ²	0.213	0.332

The above table shows the After adjustment for age group, professional category, qualification, professional experience, and number of patients seen per day, pharmaceutical marketing exposure remained significantly and negatively associated with marketing-responsive prescribing ($B = -0.583$, robust SE = 0.132, 95% CI: -0.850 to -0.315 , $p < 0.001$). The adjusted model explained 33.2% of the variance in marketing-responsive

prescribing. The exposure coefficient changed only slightly from -0.561 in the unadjusted model to -0.583 after adjustment, indicating that the observed association remained relatively stable after accounting for the selected respondent characteristics. None of the included categorical covariates is individually statistically significant at the 5% level.

Table 9. Sensitivity Analysis After Excluding Potentially Influential Observations

Analysis	Primary analysis (N = 58)	Sensitivity analysis (N = 54)
Spearman's ρ	-0.635^{***}	-0.735^*
Regression coefficient (B)	-0.561^{***}	-0.569^*
Robust SE	0.137	0.103
95% CI	-0.836 to -0.286	-0.775 to -0.363
R ²	0.213	0.282

The above table shows that the Sensitivity analysis is performed after excluding four observations that exceeded the Cook's D screening threshold. The negative association remained statistically significant. The robust regression coefficient is -0.569 ($p < 0.001$), while Spearman's correlation increased in magnitude to $\rho = -0.735$ ($p < 0.001$).

These findings demonstrate that the main negative association is not dependent on the potentially influential observations, supporting the robustness of the primary results. The four observations are retained in the primary analysis and excluded only for this sensitivity assessment.

Table 10. Summary of Hypothesis Testing

Test	Result	p-value	Decision
Spearman correlation	$\rho = -0.635$	<0.001	Reject H_0
Unadjusted robust regression	$B = -0.561$	<0.001	Reject H_0
Adjusted robust regression	$B = -0.583$	<0.001	Reject H_0
Sensitivity regression	$B = -0.569$	<0.001	Supports robustness

The above table show that the null hypothesis stated that pharmaceutical marketing exposure is not significantly associated with prescribing practices among healthcare professionals in Afghanistan. The alternative hypothesis proposed a significant association. The Spearman correlation demonstrated a significant negative association ($\rho = -0.635$, $p < 0.001$). This finding is confirmed by both the unadjusted robust regression ($B = -0.561$, $p < 0.001$) and adjusted robust regression ($B = -0.583$, $p < 0.001$). The relationship also remained significant in the sensitivity analysis. Therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is supported. Pharmaceutical marketing exposure is significantly associated with marketing-responsive prescribing practices among healthcare professionals in the study sample. However, the direction of this association is negative, meaning that greater reported exposure to pharmaceutical marketing is associated with lower marketing-responsive prescribing scores.

Discussion

The study show that pharmaceutical marketing is common among healthcare professionals in Afghanistan, particularly through sponsored educational meetings, pharmaceutical representatives, and medical-journal advertisements, while digital promotion is less prominent. Respondents perceived

pharmaceutical marketing as having a moderate influence on prescribing decisions, but they reported placing greater importance on clinical effectiveness, professional experience, clinical guidelines, and scientific evidence than on promotional factors.

Healthcare professionals also demonstrated considerable awareness of ethical concerns related to pharmaceutical marketing, including conflicts of interest, gifts, incentives, disclosure, and the need to independently verify promotional claims. The main statistical finding showed a significant negative association between pharmaceutical marketing exposure and marketing-responsive prescribing practices. This finding differs from several previous studies that reported a positive influence of pharmaceutical promotion on prescribing. The inverse relationship may reflect greater professional awareness or critical evaluation among those with higher marketing exposure, although causal conclusions cannot be drawn from the cross-sectional design. Overall, the findings highlight the importance of ethical regulation, independent medicine information, and evidence-based prescribing practices in Afghanistan.

Conclusion

This study concludes that pharmaceutical marketing is significantly associated with marketing-responsive prescribing practices among

healthcare professionals in Afghanistan. Respondents reported the greatest exposure to sponsored educational meetings, pharmaceutical representatives, and medical-journal advertisements, while digital promotional strategies are less common. Although pharmaceutical marketing is perceived to influence several aspects of prescribing, healthcare professionals reported giving greater importance to clinical effectiveness, professional experience, clinical guidelines, and scientific evidence than to direct promotional factors. The findings also showed a relatively high level of awareness regarding ethical concerns, including gifts, incentives, conflicts of interest, disclosure, and the need to protect professional judgment. Most importantly, pharmaceutical marketing exposure showed a significant negative association with marketing-responsive prescribing, and this relationship remained significant after adjustment for selected sociodemographic and professional characteristics and in sensitivity analysis. Therefore, the null hypothesis is rejected and the alternative hypothesis is supported. Overall, the results suggest that pharmaceutical marketing is related to prescribing behavior, but the direction and nature of this relationship are complex. Because the study used a cross-sectional design, the findings should be interpreted as associations rather than causal effects.

Recommendation

Strengthen evidence-based prescribing: Healthcare professionals should continue to prioritize clinical effectiveness, medicine safety, clinical guidelines, and independent scientific evidence when making prescribing decisions.

Improve critical evaluation of pharmaceutical promotion: Healthcare professionals should receive regular training on how to critically assess information provided by pharmaceutical representatives, promotional materials, sponsored activities, and digital marketing.

Develop clear ethical guidelines: Healthcare institutions and relevant health authorities should establish and enforce guidelines governing

pharmaceutical gifts, incentives, sponsorships, and relationships between healthcare professionals and pharmaceutical companies.

Promote transparency and disclosure: Healthcare professionals should be encouraged to disclose relevant relationships or potential conflicts of interest with pharmaceutical companies, particularly when participating in sponsored educational or professional activities.

Strengthen independent medicine information: Healthcare institutions should improve access to independent and reliable sources of medicine information so that prescribing decisions are not overly dependent on commercially sponsored information.

Regulate pharmaceutical promotional activities: Relevant regulatory authorities in Afghanistan should strengthen monitoring of pharmaceutical marketing to ensure that promotional information is accurate, balanced, ethical, and consistent with patient safety and rational medicine use.

Conduct further research: Future studies should use larger and more diverse samples across different regions of Afghanistan and consider longitudinal designs and objective prescribing records to better understand the relationship between pharmaceutical marketing exposure and actual prescribing behavior.

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