**Pharmaceutical marketing and prescribing decisions**

Pharmaceutical marketing refers to drug marketing, it designs all drug promotion activities. The aim of these activities is to inform the physicians about the medication, to generate interest, to convince him to evaluate and attempt to prescribe these drugs in order to obtain a frequent prescription. [1]

The decision maker is the “physicians” who prescribes the drug between alternatives and the end user is the patient who pays for the prescribed drugs [2]

There are various factors that influence the decision to prescribe a drug, some of them are pharmacological factors and others are non-pharmacological factors.

**Medical Representative and prescribing decisions**

Medical representatives play a vital role in drug marketing. According to a study conducted in New Zealand (1994), medical representatives are the source of prescribing information for general practitioners. [3]. Most of the drug information provided by MRs were brand name of the drugs and drug indications [4].

In Yemen, the majority of physicians considered that MRs were a useful means of identifying new drugs. However, a clear majority of physicians felt that information provided by MRs often biased in favor of their products or insufficient or, even worse, misleading because they believe that the MRs approach is to sell products and not to spread information [4] [5].

In Iraq, a study reveals that specialist physicians were visited by 1-3 Medical representatives per day and the number of medical representatives visits is proportional to the number of patients in the doctor’s clinic [6].

A qualitative meta-synthesis illustrated a commonality among 15 included studies whereby physicians almost always believe that interactions with physicians and medical representatives can influence the prescribing patterns of their colleagues, but not theirs. In addition, physicians are immune to any potential marketing influence. This is mainly because most physicians believe they have the expertise and knowledge to assess the information presented and distinguish valid information from exaggerated and biased information.[7]

Several studies show a positive relationship between physicians and medical representatives [8], they perceive medical representatives as sources of information and education and in addition one study found that for older physicians better quality information was provided by sales representatives trained in pharmacy or employed by multinational companies [9]. While some studies show skeptical attitudes about the contribution of medical representatives to teaching and education [10].

**Source of information and prescribing decisions**

The top 5 sources used to get drug information are: journals, dosage books, AAP News, medical representatives and PDA based databases [11] and according to a study carried out in Turkey the main referral sources for prescribing were commercial information provided by sales representatives of pharmaceutical companies [12]. However sources of commercial information have a negative influence on prescribing, clinical recommendations are the only resource associated with better indicators, even if the effects are weaker [13].

**Samples and prescribing decisions**

Free samples provided to doctors have many purposes [2] :

* Samples can be the only visual reminder of the product
* Samples can have a lasting impact on clinicians because they add tangibility to the medical offer. Acceptance of samples means some commitment to prescribing the product in the future.
* The samples soften the effect of increased price sensitivity.

According to Lurker and Caprara (2005), samples are given to patients diagnosed with a condition to confirm drug efficacy and tolerability or to patients without medical coverage and may be unable to pay for a selective drug [14].

It has been shown that availability of samples increases prescribing of the same brands, makes doctors adopt new drugs faster and shift prescribing decisions towards less appropriate options [15].

**Gifts and prescribing decisions**

Gifts of any size have a powerful effect on human relationships. Reciprocity is a powerful guiding principle for human interaction. DeJong et al showed that a meal under $ 20 can increase prescribing of statins, beta blockers, ACE inhibitors, and antidepressants [16].

The reasons for accepting gift offers are: [17]

* Human nature
* You don't want to say no
* To remember the product
* Small gifts are always welcome
* Gifts are found in every profession
* Doctors' salaries are insufficient
* Other reasons

A study conducted in Colombia in 2017 confirms that industry gifts are associated with more expensive prescriptions and more branded prescriptions. Prescribers who received the gifts wrote an average of two additional prescriptions per patient, compared to the prescribers who did not receive the gifts [18].

**Payments and prescribing decisions**

Payments from the drug company had a direct effect on the prescribing decision. One study revealed that physicians who received higher payments had greater changes in average expenditures for opioids, daily doses, and expenditures per daily dose [19]. Additionally, another study showed that one additional payment in the hospital's referral area was associated with extra days full of marketed oral anticoagulants and non-insulin diabetes medications.[20]

**Digital marketing and prescribing decisions**

Research in Pakistan shows the biggest impact of webinars and webcasts on changes in clinical practice, but the pharmaceutical sector still spends only a small percentage of its resources on digital marketing. [21]

**Price and prescribing decisions**

The price of pharmaceutical products plays a vital role in promoting medicine to doctors.

Numerous studies show that physicians can be viewed better by their patients if they take into account their patients' financial condition and health insurance when choosing a particular drug from among the alternatives [10]

However, according to the publication "Modeling the effects of pharmaceutical marketing", physicians work for the benefit of patients and have no financial incentive to be price sensitive [2]. Doctors 'price sensitivity is second only to considerations of drug efficacy and patients' conditions [22]. Additionally, product sampling can reduce the price elasticity of some drugs [23].

**Brand and prescribing decisions**

The brand has had a huge impact on prescription style, so it is imperative for drug companies to identify doctors who demonstrate their brand description in brand loyalty.

**Pharmacist and prescribing decisions**

A survey was conducted among a sample of 705 physicians in the city of Sana’a to determine the influence of expertise, collaborative efforts and pharmacist reliability on the physician prescribing model. This results in a significant positive relationship between physician prescribing decisions and pharmacist collaboration and reliability. The expertise of pharmacists did not significantly influence doctors’ prescribing decisions. These results therefore confirmed the role of the pharmacist in the prescribing decision.[24]

**Demographic factors**

In addition to promotional activities, different demographic factors involve the decision process. Much research has shown that female physicians are more attractive than men for pharmaceutical marketing, young physicians are more affected by pharmaceutical companies than older people and the field of physicians is seen as a very important factor. [25]

Demographics and socio-economic factors leave some room for changing prescribing decisions, but factors such as knowledge, level of education, experience, number of practicing professionals, cost sharing and guidelines can be directly influence prescribing behavior.[26]

**Other factors**

The number of patients seen per day can influence the prescribing pattern of, a high number of patients seen per day means shorter time per patient and this can affect the rational decision-making process regarding prescribing.[27]

**Specialty of doctors and prescribing decisions**

Research in the United States (2009) found that specialist surgeons have more favorable attitudes than physicians trained in other specialties towards a variety of interactions with industry and that pediatricians are the ones that interact the least with promotional activities. [28]

Anesthesiologists reported few encounters with medical representatives and more than half of them felt that most promotional activities and giveaways affected prescribing behavior. In contrast, pediatricians reported a large number of encounters with medical representatives and, likewise, more than half of them did not believe that promotional activities influenced prescribing behaviors.[8]

**Research**

* Explore the nature of the pharmaceutical market in Lebanon and all factors affecting prescribing decisions.
* Evaluate the effect of medical representative on prescribing pattern.
* Assess the role of key opinion leader as persuasive tools to convince other physicians to prescribe selective medication.
* Explore the knowledge, beliefs and attitudes of patients and the general public towards physician-industry interactions and the effect of patients on prescribing pattern.
* Examine the Effect of drug prices on prescribing pattern
* Explore the effect of Digital marketing on prescribing decisions specially during lockdown covid19.
* Determine marketing activities that have a greatest effect on prescribing pattern.
* Explore all the non-pharmacological factors that influence prescribing decisions.
* Develop a pharma model that is applied in the Lebanese pharmaceutical market to increase investments of the pharmaceutical industry, to determine effective marketing tools, to reduce pharmaceutical marketing expenses, to ensure patient care and reduce irrational prescribing

**Importance of this study**

* There is an urgent need, in Lebanon, to discuss the factors that affect the physicians’ prescribing and to develop guidelines to improve the ethical and scientific quality of information imparted through medical representatives.
* From a managerial perspective, the pharmaceuticals companies need to identify the factors that influence the physicians ‘prescribing pattern in order to choose the effective promotional tool and focus their effort in definitive area to increase their benefits.
* Develop digital marketing specially after covid19 lockdown.

**Methods:**

-A questionnaire survey will be distributed for more than 500 physicians (divers specialist, divers classes, divers location, divers age, divers gender…)

-A questionnaire survey will be distributed for more than 100 medical representatives.

- A questionnaire survey will be distributed for a large sample of patients

-A questionnaire survey will be distributed for a significant number of pharmacists

-Explore the effects of Webinar and Webcasts on prescribing decisions (through interview with some doctors)

-Meta synthesis analysis

**References**

1. Understanding and Responding to pharmaceutical promotion, World Health Organization / Health Action International.
2. Fusun F. Gonul, Franklin Carter, Elina Petrova and Kannan Srinivasan : Promotion of Prescription Drugs and Its Impact on by Choice Behavior, Journal of Marketing, 2001.
3. A N Thomson,B J Craig and P M Barham: Attitudes of general practitioners in NewZealand to pharmaceutical representatives, British journal of General Practice,1994.
4. Iloh, Gabriel Pascal, and Miracle Chukwuonye. “Drug promotion in a resource-constrained Nigerian environment: A cross-sectional study of the influence of pharmaceutical sales representatives on the prescribing behaviors of medical practitioners in Abia State.” Archives of Medicine and Health Sciences, vol. 5, no. 2 (2017)
5. Yoon EY, Clark SJ, Gorman R, Nelson S, O’Connor KG, Freed GL. Differences in pediatric drug information sources used by general
6. Dhulfiqar Alhilali and Ehab Mudher Mikhael: Gift Acceptance and Its Effect on Prescribing Behavior among Iraqi Specialist Physicians, Published Online June 2014 in SciRes. <http://www.scirp.org/journal/pp>, 2014.
7. Shahrzad Salmasi, Long Chiau Ming and Tahir Mehmood Khan: “Interaction and medical inducement between pharmaceutical representatives and physicians: a meta-synthesis”, Journal of Pharmaceutical Policy and Practice, 2016.
8. DeFerrariA, GentilleC, DavalosL, HuayanayL, MalagaG. Attitudes and Relationship between Physicians and the Pharmaceutical Industry in a Public General Hospital in Lima, Peru. PLoS ONE 2014
9. Kamal S, Holmberg C, Russell J, Bochenek T, Tobiasz-Adamczyk B, Fischer C, et al. Perceptions and Attitudes of Egyptian Health Professionals and Policy-Makers towards Pharmaceutical Sales Representatives and Other Promotional Activities. PLoS ONE 2015
10. Fickweiler F, Fickweiler W, Urbach E. Interactions between physicians and the pharmaceutical industry generally and sales representatives specifically and their association with physicians’ attitudes and prescribing habits: a systematic review. BMJ Open 2017
11. Montoya, Netzer, and Jedidi ; Dynamic Allocation of Pharmaceutical Detailing and Sampling. Marketing Science.2010
12. Vancelik, S., Beyhun, N.E., Acemoglu, H. et al. Impact of pharmaceutical promotion on prescribing decisions of general practitioners in Eastern Turkey. BMC Public Health 7, 122 (2007).
13. Ferna´ndez-A´lvarez I, Zapata-Cachafeiro M, Va´zquez-Lago J, Lo´pez-Va´zquez P, PiñeiroLamas M, Garcı´a Rodrı´guez R, et al. (2019) “Pharmaceutical companies information and antibiotic prescription patterns: A follow-up study in Spanish primary care”. PLoS ONE
14. Bala, Bhardwaj, and Chen: The Role of Physician Learning and Patient Payment Ability Marketing Science.
15. Kamal S, Holmberg C, Russell J, Bochenek T, Tobiasz-Adamczyk B, Fischer C, et al. Perceptions and Attitudes of Egyptian Health Professionals and Policy-Makers towards Pharmaceutical Sales Representatives and Other Promotional Activities. PLoS ONE 2015
16. DeJong C, Aguilar T, Tseng C W,Lin G A,Boscardin W J and Dudley R A: Physician Prescribing Patterns for Medicare Beneficiaries, JAMA Intern Med., 2016.
17. Fahad Alosaimi, Abdulaziz Alkaabba, Mahdi Qadi and Abdullah Albahlal: Acceptance of pharmaceutical gifts: Variability by specialty and job rank in a Saudi healthcare setting, Saudi medical journal, 2013.
18. SusanF.Wood Tyler Bysshe , JoannaPodrasky , Alycia Hogenmiller , MeghanA.McMonagle , Adriane Fugh-Berman and Janani Raveendran: Influence of pharmaceutical marketing on Medicare prescriptions in the District of Columbia, PLoS ONE, 2017.
19. Zezza MA, Bachhuber MA (2018) “Payments from drug companies to physicians are associated with higher volume and more expensive opioid analgesic prescribing”. PLoS ONE.
20. Fleischman, William et al. (2016)“Association Between Payments from Manufacturers of Pharmaceuticals to Physicians and Regional Prescribing: Cross Sectional Ecological Study.” BMJ
21. Masood Jawaid and Syed J. Ahmed : Pharmaceutical Digital Marketing and Its Impact on Healthcare Physicians of Pakistan: A National Survey, Cureus,2018.
22. Marc A. Rodwin: Pharmaceutical Price and Spending Controls in France: Lessons for the United States International, Journal of Health Services, 2020.
23. Michael L. Capella, Charles R. Taylor, Randall C. Campbell and Lance S. Longwell ; Do Pharmaceutical Marketing Activities Raise Prices? Evidence from Five Major Therapeutic Classes. Journal of public policy&Marketing.2009
24. Murshid, Mohsen Ali; Mohaidin and Zurina; Influence of the expertise, collaborative efforts and trustworthiness of pharmacists on the prescribing decisions of physicians. Journal of Pharmacy Practice & Research. Apr2019
25. Micheline Khazzaka: Pharmaceutical marketing strategies’ influence on physicians’ prescribing pattern in Lebanon: ethics, gifts, and samples, BMC Health Services Research, 2019.
26. Majid Davari, Elahe Khorasani, Bereket MollaTigabu. Factors Influencing Prescribing Decisions of Physicians: A Review. Ethiop J Sci. 2018
27. Jastifer J, Roberts S.; Patients’ awareness of and attitudes toward gifts from pharmaceutical companies to physicians. Int J Health Serv. 2009
28. Deborah Korenstein, Salomeh Keyhani, Joseph S. Ross: Physician Attitudes Toward Industry, American Medical Association, 2010
29. Sayed Hesam Aldin Sharifnia ,Mehdi Mohammadzadeh,Gelareh Arzani, Jamshid Salamzadeh, Sayed Abolfazl Abolfazli, Alireza Zali and Ali Reza Khoshdel Main Factors Affecting Physicians’ Prescribing Decisions: The Iranian Experience. Iranian Journal of Pharmaceutical Research.2018
30. Schumock, Glen T et al. “Factors That Influence Prescribing Decisions.” Annals of Pharmacotherapy.2004