FACTORS THAT AFFECT ATTITUDE TOWARDS GENERIC DRUGS PERCEPTION: COMPARISON OF PHYSICIANS & GENERAL PRACTITIONERS OF KARACHI CITY

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Abstract:

Doctors are usually concerned about the quality of generic drugs, and possible liabilities connected with their use,therefore; we examine the attitudes of Pakistani Physicians towards generic drug prescribing. This study not only evaluates practice of Physicians to prescribe generic drugs but also compare it with General Practitioner in Karachi. The findings shows that in both specialties (Physicians & GPs) prefer to prescribe generic drugs because of more academic detailing as sales representative of generic companies visited them many times in month to remind / update them on generic drugs. In this study we focus five areas that affect doctors prescribing habit of generic drugs. Our research concludes that only in one area having similarities between both that is "Under which condition do you prefer to prescribing generic drugs to the originals".

 In addition to above, generic drugs companies also conducts local trial of their drugs at doctors / hospital level to show the effectiveness of their drugs compare to the original drugs Moreover doctors (GPs) rated least to the Better marketing / Availability option as sales representative visited them so they usually make sure the availability of drugs at doctors nearby pharmacy but in the case of Physician it is reversed.Many pharmaceutical companies influence doctor's decision in prescribing generic drugs as they visited them many times in month. As far as information provided by the pharmaceutical companies to the doctors, agreed both specialties (Physicians & GPs) that both brand drugs as well as generic companies provide unbiased data about drugs, but branded drug companies are more ethical in this regard.

Key Words: Generic drug, Branded drug, Physician, General Practitioners (GPs)

1. Introduction

A generic drug is a copy of an original drug for which the patent has expired. A generic drug may be marketed either with a brand or the generic name. An original drug contains new active ingredient, that is, it is currently or was formerly protected by a patent.

World Health Organization also explain a generic in similar to above "A generic drug is a pharmaceutical product, usually intended to be interchangeable with an innovator product, which is manufactured without a license from the innovator company and marketed after the expiry date of the patent or other exclusive rights".

The pharmaceutical market consists of several different sub-markets, characterized by very different degrees of competitiveness.
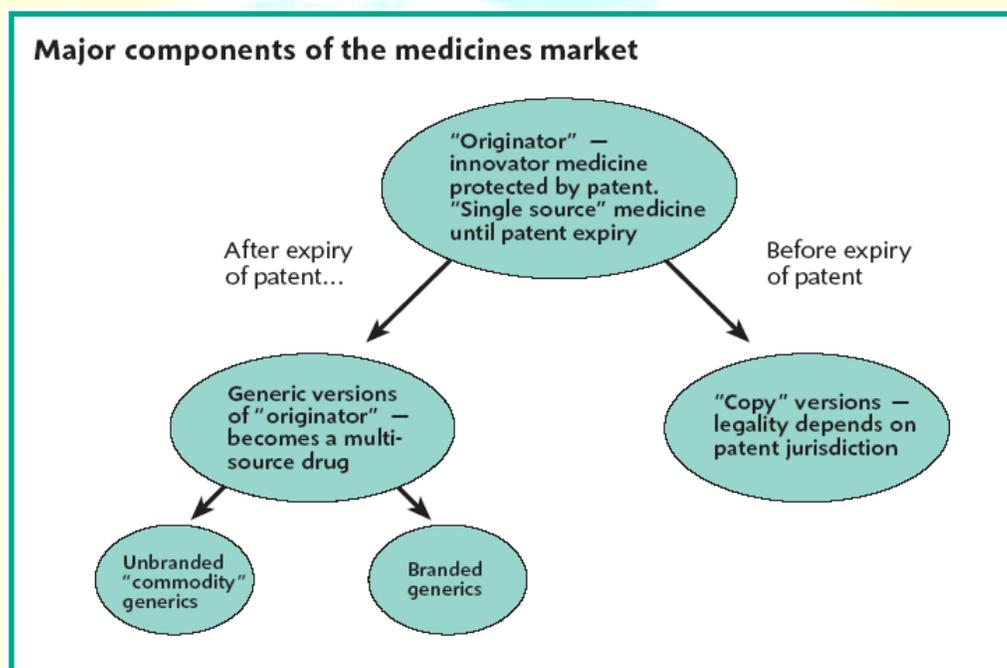
Source: The World Medicines Situation: World Health Organization 2004

Ground-breaking pharmaceutical medicines with patent protection (hereafter referred to as "original brands") are protected from competition in the jurisdiction of the patent for the life of the patent. Legal competition in this sub-market is limited to competition by "therapeutic equivalent" medicines with either a different composition or manufacturing process from the original brand. At the other end of the spectrum are some generic pharmaceuticals known as "commodity generics".

Generics drugs in general are pharmaceutical products usually intended to be exchangeable with the research drugs, marketed after the expiry of patent or other exclusivity rights and usually manufactured without a license from the innovator company. This large category includes pharmaceuticals that were formerly patent protected, but whose patent has expired. It also includes pharmaceuticals that have never been patented, as well as copies of patented pharmaceuticals in countries without such a patent. Whether such copies are legal or illegal depends on the patent jurisdiction in which such pharmaceuticals are manufactured (WHO 2004).

Another sub-sector of the generics market is generic medicines with their own brand names, each manufactured by a single company and hereafter referred to as "other brands". Yet other generic medicines (commodity generics) are sold under the generic name and may be manufactured and marketed by many companies. This is a highly price competitive sub-market, as buyers can choose among several sources of supply of chemically identical medicines. Many developing countries also have important markets in counterfeit medicines. A counterfeit medicine is defined as "one which is deliberately and fraudulently mislabeled with respect to identity and/or source. The economic power of generics is based on three market realities (Medco Health Solutions 2007).

There are two pharmaceutical industries. Their products are technically and pharmacologically identical, but economically very different. We call them "branded" and "generic". The most peculiar characteristic of the branded industry is monopoly. A branded drug is manufactured by one company only. At the beginning of a drug history, the exclusivity is justified by patent, by protection of a novelty. Then, the exclusivity originates from trade mark (trade name). The most important characteristic of the generic industry is competition. After the patent expiration, there can be many manufacturers. They fight each other. The price of a generic product becomes10-50 times smaller than the price of the branded product. The quality of a branded drug and its generic homologue is equal. No doubt, because any drug has to be approved by the respective governmental agency. The agency does not accept inferior quality. (The Lancet, 2002)

The subject is exciting. Therefore, we took a closer look in our study at novelties. Some pharmaceutical inventions are products of scientists or good luck, and not industrial research, e.g. penicillin, chlorpromazine (Largactil, Thorazine), sildenafil (Viagra). They did not cost $500 million. (The Lancet, 2002)

Drugs remain 10-20 or even 50-100 times too expensive "forever". Patent system totally degenerated in pharmaceutical industry. Trademarks add to the misfortune. Canceling patents and trademarks in general is hardly likely to happen. Perhaps a limitation of privileges would be sufficient:

- The validity of patents should be shortened from 20 to 10 years,

- Trade marks (branded names) should be cancelled after 15 years of utilization,

- All obstacles hindering competitors from doing generics immediately after the patent expiration should be removed. (WHO, Boston, 2000)

Low prices Generic drugs generally cost 30% to 80% less than their brand-name counterparts (FDA 2007). The price spread depends on a variety of factors, including the level of market competition. During the first 6 months that a new generic drug is available, it may have only one manufacturer, and the generic product will typically be priced close to the brand. As more manufacturers enter the market, prices for the generic products tend to fall rapidly. If a large number of manufacturers enter the market, generic drug prices may fall to a level that is 80% or more below the price of the brand (Association 2007).

In sharp contrast to the branded pharmaceutical market, which has stalled in recent year, the generics market is enjoying a period of unprecedented success. In 2005 the world generics market was worth $45bn, a growth of 14% on the previous year. (Visiongain 2006)

1.2 An Overview of Pakistanipharmaceutical industry & health sector in Pakistan

Pakistan's US$1.62bn pharmaceutical market is the 10th largest in Asia Pacific, behind the Philippines (US$2.58bn) and ahead of Vietnam (US$1.53bn). Annual per-capita spending on medicine is US$10, which is far below the regional average of US$142. Market access is challenging and operational risks are high in Pakistani pharmaceutical market. A key feature of Pakistan's pharmaceutical market is the low price of medicine.

There are about 650 leading Nationals and Multinational pharmaceutical companies operating in Pakistan. Of this total 23 are multinationals and rests of companies are local companies. The local companies could be classified into three categories which are (1) Manufacturing units (2) Importers that imports drugs in finished form, and (3) Franchisers (not to be mixed up by the franchisors in the FMCG). These are companies that have all the marketing setup and facilities. These companies obtain the rights of marketing of the drugs of other companies on profit sharing

basis. Total prevailing market size (March 2010) of the industry is of Rs.137.7 billion. [IMS, Q3 & Q4, 2010].

Pakistan Pharmaceutical Market (PKR in Billion)
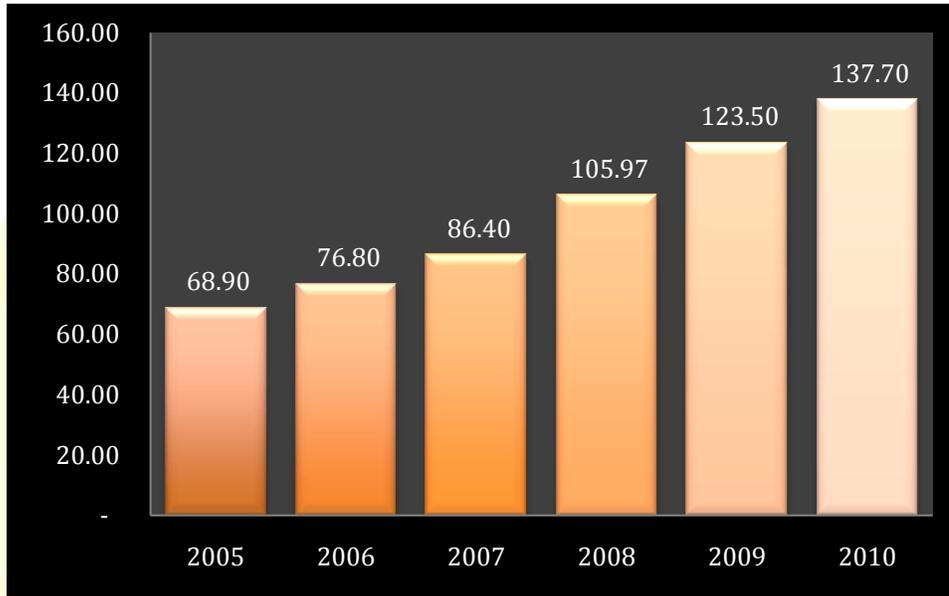
Source: IMS – PKPI Q2 2010 (MAT)

In the year 2009 the industry realized a high degree of fluctuation in the growth rate. One of the major reasons for such a trend was merger and acquisition, and glutting the market by local pharmaceutical industry. However on an average the growth rate in the year 2009-10 was about 15.4% per annum. Comparatively the growth rate in the year was 2008-09 was about 12%. [IMS, Q1 & Q2, 2010]

A tough competition exists between the multinationals and nationals, day by day nationals are taking up the share and in the last six years they have taken around 7% share in value. The gap between multinationals and nationals narrows further during 2009-10 with multinationals losing another 1.7% share to nationals. At present multinationals hold 46.9% share of the market while the nationals have captured 53.1% of the pharmaceutical business. From around 80% share in the pharma retail market, the MNCs have lost around 29% during the last twenty years as the national continue to improve their performance in the market place. Almost an identical trend is observed in

units as well, nationals having 54.05% as compared to multinationals 45.95%. [IMS, Q1 & Q2, 2010].

Top 10 Pharmaceutical Companies (PKR in Millions)
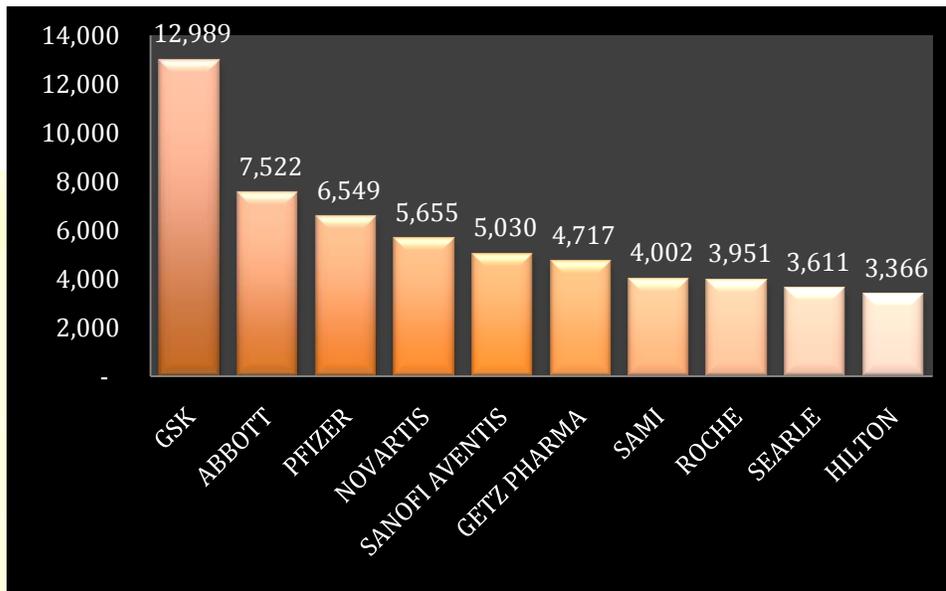
Source: IMS – PKPI Q2 2010 (MAT)

The overall market dynamics are tilted in favour of national companies as they are continuously launching new products at a much faster rate than MNCs, a trend which is becoming increasingly evident. In terms of new product market in value, the sales contribution gap between multinational and national companies has also increased over the last five years. The products launched before 1991 are dominated by the multinationals while after 1991 it is shifting towards the national. However, the leading 20 products of the industry are still those products which are launched by the MNCs between 1970 and 1990. [IMS, Q1 & Q2, 2010]

Generic (Copy) Drugs (% Share of Total Market)
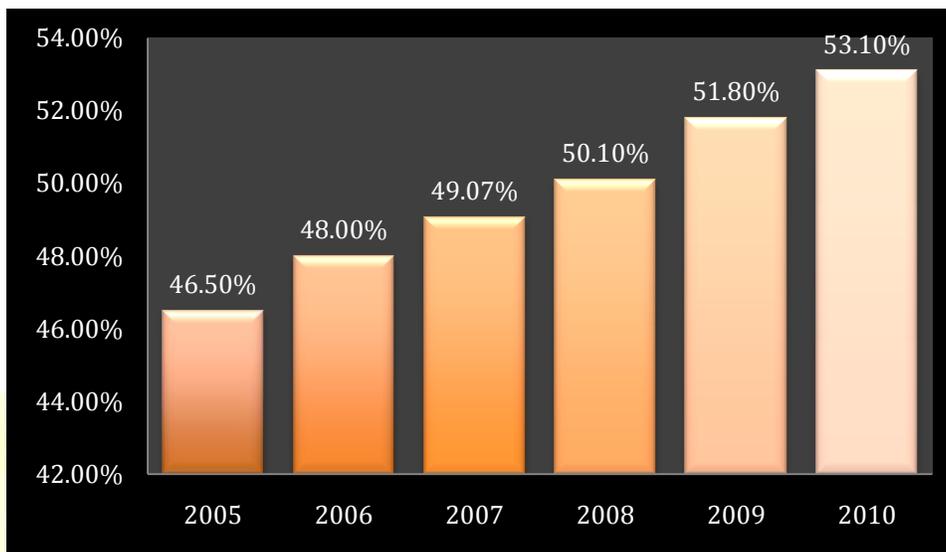
Source: IMS – PKPI Q2 2010 (MAT)

Above graph shows that market share of generic drugs in Pakistan in continuously increases over the years reach to 53.1% market share and likely to cross 55% market by the end of this year. This can also validated by the number of generic drugs making company in top ten pharmaceutical in Pakistan Getz Pharma, Hilton Pharma, Sami Pharma& Searle are top four generic drugs making companies listed in top 10 pharmaceutical companies in Pakistan.

Research (Branded) Drugs (% Share of Total Market)
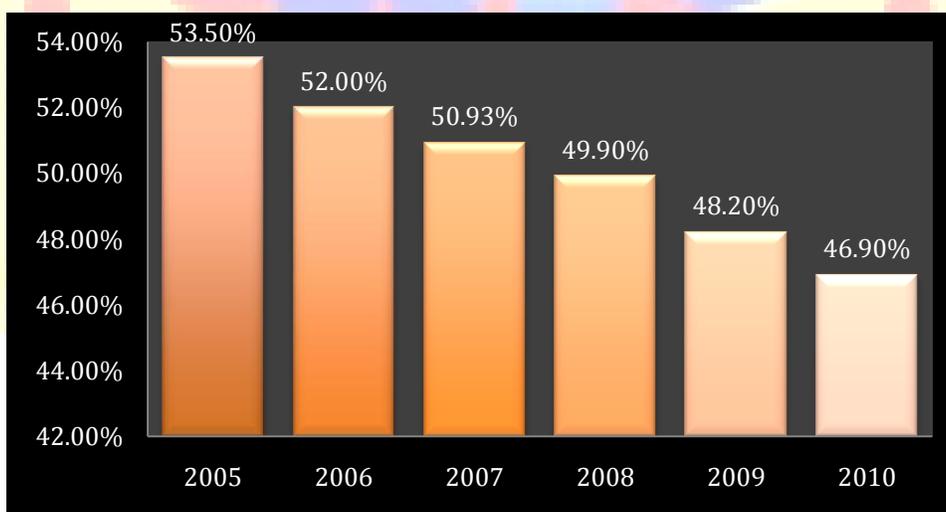
Source: IMS – PKPI Q2 2010 (MAT)

While looking at the research drugs market share in Pakistan continuously decreasing compare to the local / generic drugs making companies in Pakistan more than 53% market share in Year 2010 (IMS Q2 2010).

1.3 Problem Statement

To find out attitude of Pakistani Physicians towards prescribing generic drugs and compare it with general practitioners of Karachi City so as to see the difference among Physicians & General practitioners.

1.4 Research Hypothesis

1.　　Doctors usually followed patient's demands for drugs by defined drug name in both specialties (Physicians & General Practitioners).

2.　　Patient gets information on drugs from same sources.

3.　　Both Physicians & General Practitioners prescribe generic drugs under same condition to the original one.

4.　　Pharmaceutical companies influence Physicians for prescribing generic drugs in similar manners.

5.　　Pharmaceutical companies provide unbiased data about drugs to both Physicians & General Practitioners in a similar way.

2. Previous Research

Many research studies have been conducted in different parts of the World on the undertaken subject taken. Few of them were conducted on the behavior of prescribing habit of the doctors, whereas, most of studies have been conducted on the marketing aspect of the Pharmaceutical companies which affect the prescribing behavior of doctors through their ethical and non-ethical marketing practices.

2.1 introduction

To the best of our knowledge, there is no published systematic or narrative review investigating the perceptions of physicians on generic medicines prescribing and substitution. Therefore, in order to get a better understanding on areas of agreement and disagreement held by physicians around the world on the concepts of generic prescribing and substitution, this narrative review

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was undertaken. In this article, we provide a chronological literature review on physicians' perceptions, experiences, and opinions towards generic medicines prescribing and use.

Table: A summary of the studies included in the review investigating physicians' perception of generic medicines

Study	Country	Methods	Participants	Outcomes	Limitations
Bearden and Mason (1980)	USA	Mail survey	418 physicians	Results revealed that confidence in regulation, potential savings, and impacts on medicine research represent reasonable determinants of physician preference of generic medicines.	Study was done in only one unspecified state and the setting was not well described.
Study	Country	Methods	Participants	Outcomes	Limitations
Tilyard*et al* (1990)	New Zealand	Mail survey	200 GPs	Most of the respondents (67%) actively prescribed generic medicines. About 52% of GPs were opposed to pharmacists' generic substitution and their views were influenced by the proof of generic bioequivalence and cost saving. And 70% indicated that patients' generic medicine use was because of the GPs choice.	Small sample size and sampling technique was not well described.
Shulkin*et al* (1992)	USA	Mail survey	63 resident physicians	Most of the respondents (73%) believed that generic and brand name medicines were equally effective. Some differences by specialty were seen: for instance, psychiatry residents were more likely than surgery or internal medicines residents to prescribe brand name medicines.	Sampling technique (convenience sampling) and small sample size.
Study	Country	Methods	Participants	Outcomes	Limitations
Turnbull and Parsons (1993)	UK	Researcher administered survey	39 GPs	The physicians' attitudes towards generic medicines depended on various product features, namely, the therapeutic category and dosage form complexity. The attitudes also varied among different physicians' practice characteristics. Physicians who worked alone had an aversion to generic prescribing. The physicians with higher number of years practicing in generic practice were more inclined to prescribe brand names.	The sampling population restricted to a small geographic area, sampling technique (convenience sampling) and small sample size.

Study	Country	Methods	Participants	Outcomes	Limitations
Study	Country	Methods	Participants	Outcomes	Limitations
Banahan and Kolassa (1997)	USA	Mail survey	396 physicians	Physicians were classified into pro-substitution (43.2%) and anti-substitution groups (56.8%). The pro-substitution and anti-substitution groups were significantly different with respect to beliefs about and experiences with generics and knowledge of the FDA bioequivalence standard. Only 17% of physicians correctly identified the FDA standards for bioequivalence.	The study was supported by grant from a brand name industry.
McGettigan*et al* (1997)	Ireland	Mail survey	107 GPs	Several factors contributed to low generic prescribing among the Irish physicians. The physicians were concerned about the reliability or quality of generic products, possible legal liabilities associated with generics use and the fact that pharmacists may dispense more expensive proprietary preparations in the case of private prescriptions written generically.	Sample size was small and may not be representative of GPs in the country.
Paraponaris*et al* (2004)	France	Mail survey	600 GPs	This study evaluated factors explaining GPs' willingness to prescribe in international non-proprietary names (INN). Nearly 76% of the respondents indicated that they were willing to write their prescriptions using INN. The GPs were less reluctant to prescribe INN when they have high workloads, regularly use practice guidelines, pay for medical journals, have a personal computer to get distant electronic materials or have some activities in a hospital or health centre.	The data were collected from one province, thus the generalizability of the results is limited.
Study	Country	Methods	Participants	Outcomes	Limitations
Barrett (2005)	USA	Web-based survey	425 physicians	The majority of the physicians (95%) support the use of generic substitutes for brand name medicines when they are available and appropriate for the patients. Physicians say that	Online samples are limited to only those who participated in the research. Hence, there are potentials for non-response error.

Study	Country	Methods	Participants	Outcomes	Limitations
				they feel pressured by patients (69%), health-care plans or insurance companies (91%) to prescribe generic drugs.	

Study	Country	Methods	Participants	Outcomes	Limitations
De Run and Felix (2006)	Malaysia	In-depth interviews and self-administered survey	15 hospital-based physicians (interviewed in the first phase) and 62 physicians from the same institution answered a questionnaire	This study determined perceptions of physicians in a public hospital towards patented and generic medicines. The respondents viewed patented medicines as superior in quality, efficacy and safety. Generic medicines were perceived as more affordable, but lack of quality control and uncertain efficacy. Factors that affect physicians' prescribing decisions include their own experience, literatures, patient affordability and hospital policy.	Data were collected from one province, thus the generalizability of the results is limited. Biases from experience of respondents could have affected the reliability of the findings.
Hassali*et al* (2006)	Australia	Semi-structured qualitative interview	10 GPs	The responding GPs have mixed attitudes toward generics prescribing. There were GPs who viewed generics as equally effective as the innovator brands. Some GPs were dissatisfied with the generic substitution policy because their personal role as prescriber is being threatened by the pharmacists. There were concerns about patient confusion arising from substitution. None of the GPs knew the bioequivalence acceptability criteria for generic medicines.	Study was confined to one state only, so the findings cannot be extrapolated.

Study	Country	Methods	Participants	Outcomes	Limitations
Heikkila*et al* (2006)	Finland	Structured qualitative interviews	49 physicians	The majority of physicians (86%) were satisfied with generic substitution policy. The main reason mentioned for substitution was cost saving. Around half of the physicians thought interchangeable medicines in certain medicine groups are not equally effective and safe.	Convenient sampling technique, thus the results cannot be generalized to all Finnish physicians.

Study	Country	Methods	Participants	Outcomes	Limitations
Gossell-Williams (2007)	Jamaica	Survey administered via multi channels (e-	60 physicians	Around 49% of the responding physicians were mostly prescribing generic willingly.	Physicians selected to participate in the survey is limited

Study	Country	Methods	Participants	Outcomes	Limitations
		mails, fax, face-to-face interviews and by phone)		There were doubts about whether bioequivalence of a generic was equitable to therapeutic equivalence to innovator medicine. About 33% of the physicians had experienced clinical problems with generic substitutes that they perceived would not have occurred with the innovator.	to their listing in local directory, hence this will increase the potential of non-response bias.

Study	Country	Methods	Participants	Outcomes	Limitations
Razal&Shafi (2007)	Pakistan	In-depth interviews and self-administered survey	50 General Practitioners	The findings shows that in both countries prefer to prescribe generic drugs because of more academic detailing as sales representative of generic companies visited them many times in month to remind / update them on generic drugs	General Practitioners selected to participate in the survey is limited to one major City, hence this will increase the potential of non-response bias.

2.2 Methodological Quality

The retrieved literature was abstracted using a standardized data abstraction form in a table format containing most of the elements presented in above table and our selection criteria. Each study was reviewed by all the six authors and a consensus meeting was convened to ensure quality assurance. The most prominent pitfall identified was that the studies were restricted to certain geographical areas, provinces or states in which the results could not be generalized to the whole country of study. Three studies suffered from inadequate sampling technique, (Shulkin, D.J. *et al,* 1992) where convenience sampling and panel design, which might have an impact on generalization were used. Two studies suffered from self-report bias owing to dependence on physicians to report their recognition of drugs' names and dispensed drug data, respectively. (Bower, A.D. and Burkett, G.L., 1987) One study was supported by a brand name industry, which implied caution about its findings. (Banahan 3rd, B.F. and Kolassa, E.M., 1997)

2.3 Results

Generally, physicians were neutral to slightly supportive on the use of generic medications. However, the extent of their neutrality and acceptance varied substantially with several factors that can be summarized in the following main categories: policy-related issues, patient-related

variables, drug characteristics and physician-related variable. Each of these categories is briefly discussed in a narrative way below.

2.4 Policy-Related Issues

One of the factors related to the policy is knowledge of regulatory requirements imposed on generic drugs by regulatory authorities. In this context, the available data, (B.F. and Kolassa, E.M., 1997) shows that physicians lack the knowledge of these requirements. Another factor is physicians' confidence in regulatory authorities in ensuring the quality, safety and efficacy of generic drugs. Although this confidence was seen as an important determinant for supporting generics by physicians, (Bearden, W.O. and Mason, J.B., 1980) it differed across countries, (Hassali, M.A., Kong, D.C.M. and Stewart, K., 2006) and within the same country over time. Besides requirements imposed by regulatory authorities, physicians also found that specific provision of health-care financing plan do have an impact on the utilization pattern for generic by physicians. (Barrett, L.L., 2005)

2.5 Patient-Related Factors

Physicians' prescribing decision was seen to be the result from essentially their own decision-making process. However, a certain proportion of this decision can be explained by patient-related variables. These variables include feelings that they can contribute to consumers' saving on drugs by prescribing generically.(Heikkila et al , 2007)

2.6 Drug-Related Factors

Being cheaper than their branded counterparts raised the concerns of the physicians about their quality, safety and effectiveness, especially in the presence of heavy and successful promotional activities from brand name industry. (De Run, E.C. and Felix, M.-K.N., 2006) These concerns faded in many drug classes, but strengthen in a few classes which are considered by physicians to be critical dose drugs. The issues also stem from the exceptional situation of prescription drugs, where drug companies know more about their drugs than the professionals who prescribe them. Another issue that deserves mention is the source of information about drugs that is available to physicians. Most studies found that physicians are exposed to biased and unbalanced

information about drugs from brand name companies, (Kersnik, J. and Peklar, J., 2006) and at the same time weak promotional activities from generic companies. (Barrett, L.L., 2005)

2.7 Physician-Related Factors

Factors found to be related to physicians and their generic versus branded drugs prescribing decisions are socio-demographic factors, unobservable characteristics of physicians and the concern of legal liabilities in case of prescribing generic medicines. Socio-demographic characteristics of physicians studied include age, training level and type, time since graduation, specialty, field experience, practice setting and caseload. Although some studies found some of these socio-demographic variables to be associated with prescribing generically, (Bower, A.D. and Burkett, G.L., 1987) one study found them to explain only a small percentage of prescribing decisions. (Kersnik, J. and Peklar, J., 2006).

2.8 Description & Conclusion of other Studies

Raza&Shafi (2007) have not only evaluated practice of General Practitioner to prescribe generic drugs but also compare doctors it with practice in Slovenia in comparison of Pakistan. The findings shows that in both countries prefer to prescribe generic drugs because of more academic detailing as sales representative of generic companies visited them many times in month to remind / update them on generic drugs.

In addition to above, generic drugs companies also conducts local trial of their drugs at doctors / hospital level to show the effectiveness of their drugs compare to the original drugs Moreover doctors rated least to the Better marketing / Availability option as sales representative visited them so they usually make sure the availability of drugs at doctors nearby pharmacy.(Raza&Shafi, 2007).

3. Research Method

3.1 Primary data and Methodology

A **questionnaire** is designed in which we questions about their knowledge regarding generic drugs, awareness of prescribing costs, price of generic drugs relative to branded drugs and attitude towards use of generic drugs.

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The Researcher has used **MEGASTAT** and **SPSS** statistical software to analyze data collected through **Questionnaire** and comparison with another Pakistani study which was conducted on the same topic but especially prescription behavior of General Practitioners of Karachi. Researcher wants to analyze whether there are the same reasons to prescribe generic or copy products by the Physicians as General Practitioners also prescribe the copy products or some other reasons that also contributing when Physicians prescribe any generic or copy product in Pakistan. **Inferential Statistics** used &**Chi-squared** test was done for group comparisons at **significance of 0.05** was used.

3.2 Sample Size of the Study

Total sample size is 250 Physicians/Consultants selected on the basis of random sampling from different teaching & private hospitals (mentioned above) of different areas of Karachi City i.e. F B Area, Gulberg, Garden, Clifton, Nazimabad, North Nazimabad, PECHS, Saddar, Gulshan e Iqbal, Gulistan e Jouhar, Defence and M.A. Jinnah Road etc.

3.3 Hypothesis testing through Chi Square

The researcher has tested the taken hypotheses through **Chi-squared test**; researcher used **0.05 level of significance** for testing the different variables. The data has been extracted and analyze through the statistical software i.e. **SPSS** and **MEGASTAT** and presented in charts and also shown in the form of graphical presentation.

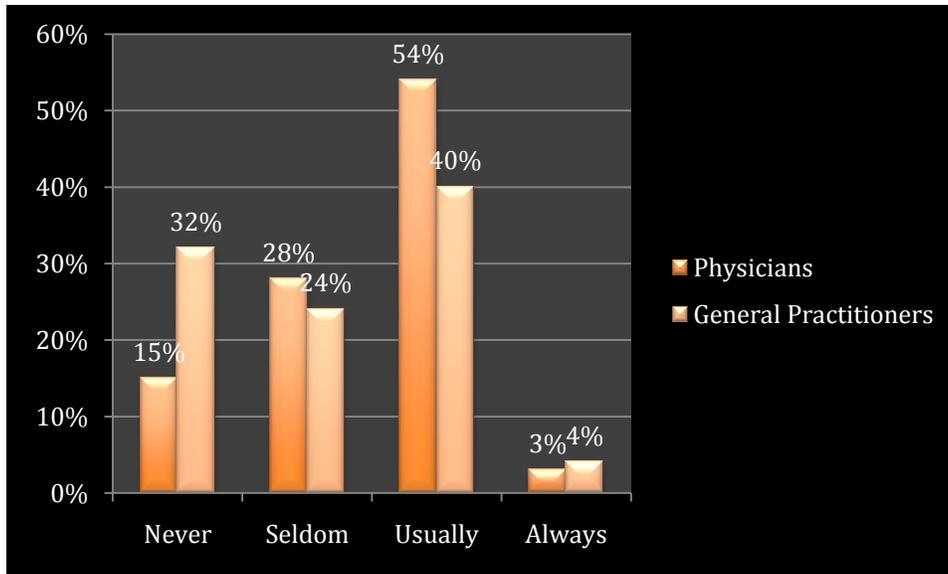$$x^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

4. Data Analysis

The empirical results or the survey findings, Hypotheses testing and interpretations of the study are discussed as below:

HYPOTHESES TESTING
4.1 Patients demands for drugs by defined Drug name

	Never	Seldom	Usually	Always
Physicians	15%	28%	54%	3%
General Practitioners	32%	24%	40%	4%

PATIENTS DEMAND FOR DRUG

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H_o: Doctors usually follow patient's demands for drugs by defined drug name in both Specialties (Physicians & GPs)

H_1: Doctors usually do not follow patient's demands for drugs by defined drug name in both Specialties (Physicians & GPs)

	General Practitioners	Physicians	Total
Never	32	15	57
Seldom	24	28	52
Usually	40	54	94
Always	4	3	7
Total	100	100	200

$$x^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

A	Df	p-value	χ^2 (tabulated)	χ^2 (calculated)
0.05	3	1.9E-03	7.815	14.85

In this case we reject Ho because Chi-square calculated 14.85 is greater than tabulated value of Chi-Square 7.814, therefore, it is further concluded that both Specialties (Physicians & GPs) usually not followed patient's demands for drugs by defined drug name at all.

Above graph clearly shows that Pakistani GPs& Physicians not followed the patient's demands for drugs by defined drug name as 32% of GPs and 15% of Physicians, whereas, only 3% Physicians & 4% GPs agreed that the patients' demand the drug by defined name while they were prescribing any drug.

Moreover in case of usually patients' demanded the drug by defined name is 54% in the case of Physicians response whereas, in case of General practitioners, 40% GPs responded that usually Patients demanded the drug by defined name.

4.2 Where do Patients get information about Drugs

	Friends	Consultants	Media/Pharmacy	Waiting Room	Other GPs
Physicians	17%	20%	15%	11%	37%
General Practitioners	38%	16%	6%	26%	14%

INFORMATION ABOUT DRUG
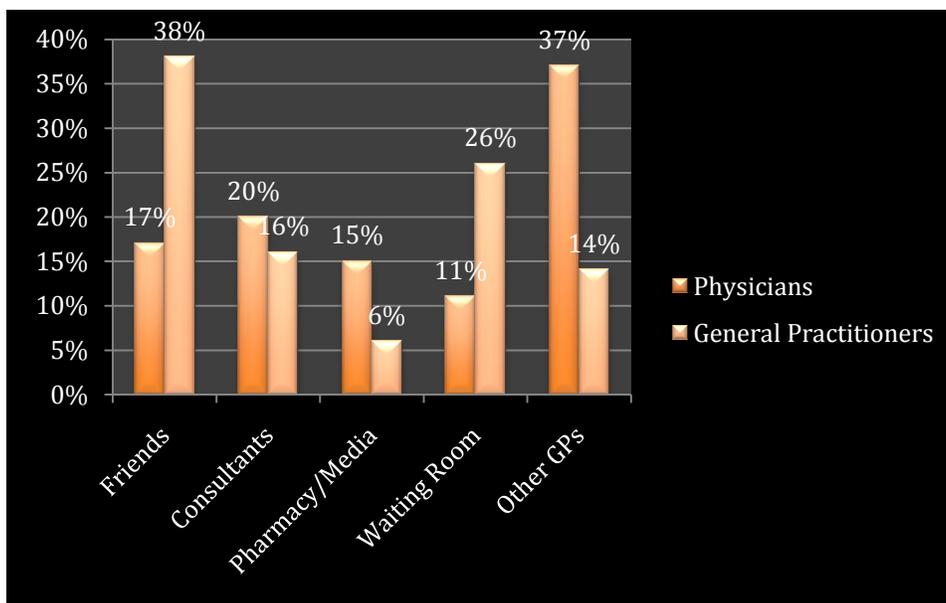
H_o: In both Specialties (Physicians & GPs) patient get information about drug from the same source

H_1: In both Specialties (Physicians & GPs) patient not getting information about drug from the same source

	General Practitioners	Physicians	Total

Friends	38	17	55
Consultants	16	20	36
Pharmacy/Media	06	15	21
Waiting room	26	11	37
Other GPs	14	37	51
Total	100	100	200

| A	df	p-value	χ^2 (tabulated)	χ^2 (calculated)
0.05	4	6.6E-15	9.488	72.54

In this case we reject Ho because Chi-square calculated 72.54 is greater than tabulated value of Chi-Square 9.488, therefore, it is further concluded that in both Specialties (Physicians & GPs) patient not getting information about the drug from same source.

Also shown in graph in case of General Practitioners the patient getting information about the drug from mainly from their friends and waiting room (38% & 26% respectively), while in case of Physicians the patient getting information from other General Practitioners and other Consultants (37% & 20& respectively).

4.3 Condition in which GPs/Consultants Prefer to Prescribe Generic Drugs

	More academic Detailing	If Generic Drugs were Cheaper	More Clinical Trials	Better Marketing / Availability
Physicians	26%	35%	18%	21%
General Practitioners	34%	28%	24%	14%

CONDITIONS FOR PRESCRIBING GENERIC DRUGS
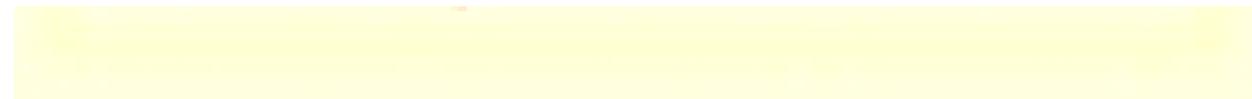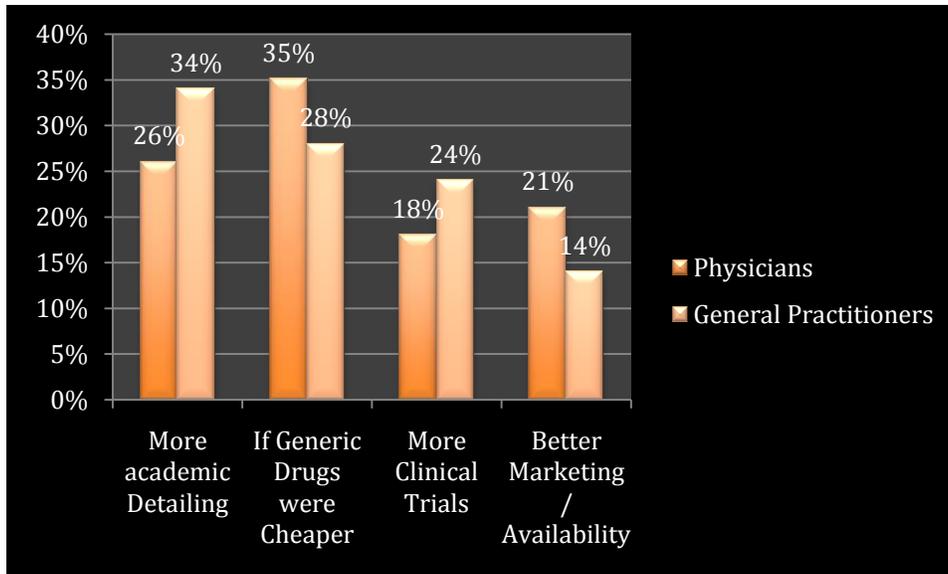
H$_o$: In both Specialties i.e. Physicians & GPs prescribe generic drugs under same condition to the original one (Research Brand)

H$_1$: In bothSpecialties i.e. Physicians & GPs prescribe generic drugs under different condition to the original one (Research Brand)

	General Practitioners	Physicians	Total
More academic detailing	34	26	60
If generic drugs were cheaper	28	35	63
More clinical trials	24	18	42
Better marketing / Availability	14	21	35
Total	100	100	200

| A	Df	p-value	χ^2 (tabulated)	χ^2 (calculated)
0.05	3	1.9E-03	7.815	7.63

In this particular case we accept Ho because Chi-Square calculated 7.63 is less than the tabulated value of Chi-Square 7.815 means that in both Specialties i.e. Physicians &GPs prescribe generic drugs under same condition to the original one (Research Brand).

In both Specialties, General practitioners rating more to the More academic detailing of the drugs i.e. 34%, whereas, in case of Physicians the highest rating (35%) has secured in the condition when generic or copy drugs are cheaper. Second highest rated factor in prescribing generic drugs, if generic drugs were cheaper (28%) in the case of General Practitioners and in case of Physicians More academic detailing secured 26% rating. Followed by more clinical trial of these drugs conducted (24%) in case of General Practitioners whereas, in case of Physicians better marketing or easy availability has secured 21% rating. The lowest rated factor is the Better marketing / Availability in case of General Practitioners i.e. 14% and in case of Physicians more clinical trials are the lowest rated i.e. 18%.

4.4 Pharmaceutical companies influence in prescribing generic drugs

	No Influence at all	Small Influence	Considerable Influence	Immense Influence
Physicians	34%	37%	18%	11%
General Practitioners	40%	30%	28%	2%

INFLUENCE OF PHARMACEUTICAL COMPANIES
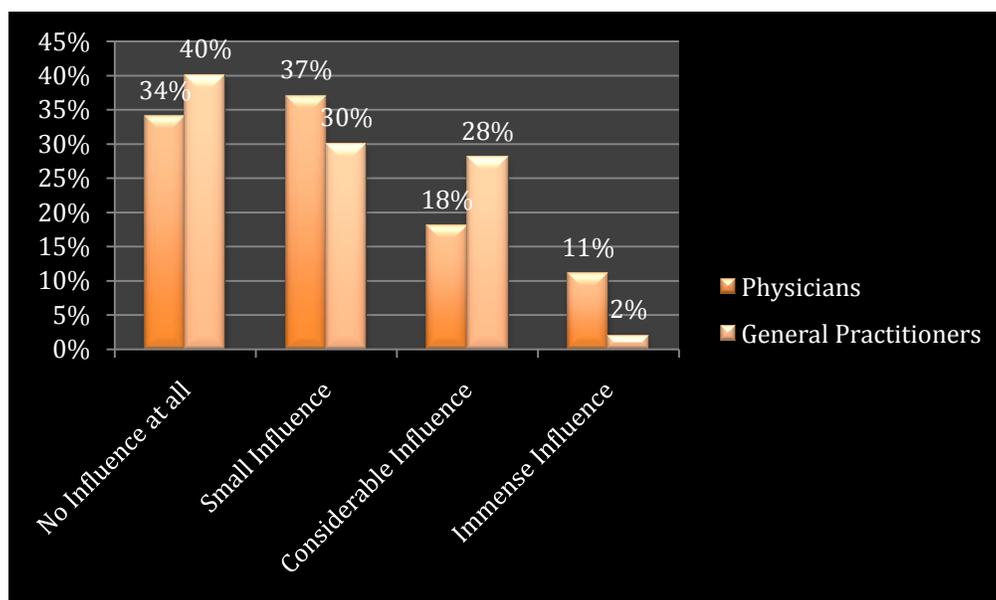
H_o: Do pharmaceutical companies influence Physicians for prescribing generic drugs in similar manners?

H_1: Do pharmaceutical companies influence Physicians for prescribing generic drugs in different manners?

	General Practitioner	Physician	Total
No influence at all	40	34	74
Small influence	30	37	67
Considerable influence	28	18	46
Immense influence	02	11	13
Total	100	100	200

A	df	p-value	χ^2 (tabulated)	χ^2 (calculated)
0.05	3	4.2E-10	7.815	46.60

In this particular case we reject Ho because Chi-Square calculated 46.60 is greater than tabulated value of Chi-Square 7.815 means pharmaceutical companies influence both General Practitioners& Physicians for prescribing generic drugs in different manners.

In case of Physiciansthe respondents havean opinion that pharmaceutical companies not influence at all to prescribe generic drugs 34% compare to General Practitioners' case had 40%, while in case of small influence 37% of Physicians agreed that some companies but small influence in prescribing drugs, moreover General Practitioners' case the respondents have an opinion of 28% that pharmaceutical companies have considerable influence on GPs to prescribe the generic drugs.

4.5 Unbiased data about drugs

	No One	Generic Drug Companies	Brand Name Drug Companies	Both Equally

Physicians	25%	15%	33%	27%
General Practitioners	20%	12%	26%	42%

UNBIASED DATA ABOUT DRUG
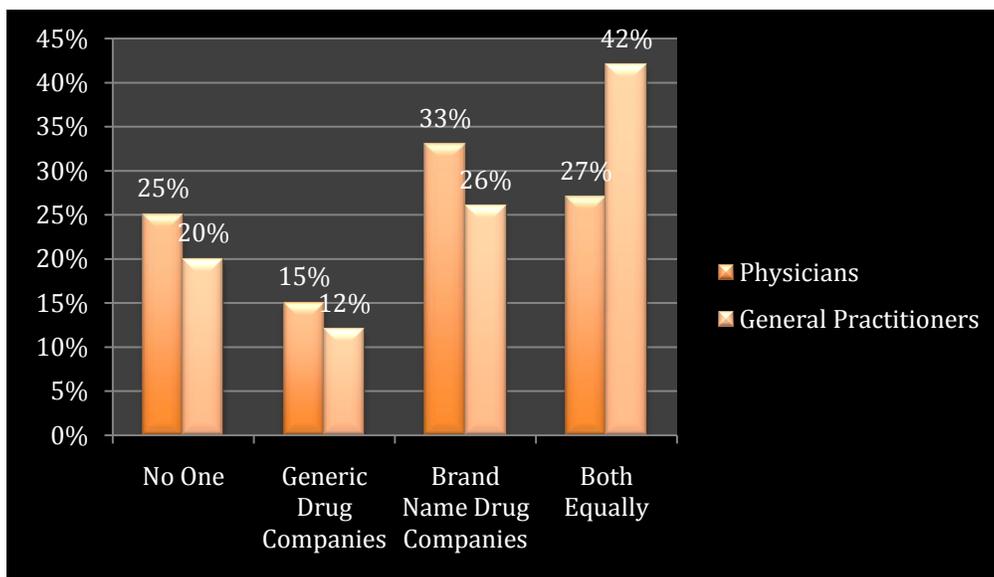
H$_o$: Do pharmaceutical companies provide unbiased data about drugs for both Specialties (GPs & Physicians) in similar way?

H$_1$: Do pharmaceutical companies not provide unbiased data about drugs for both Specialties(GPs & Physicians) in similar way?

	General Practitioners	Physicians	Total
No one	20	25	45
Generic-drug companies	12	15	45
Brand-name drug companies	26	33	41
Both equally	42	27	69
Total	100	100	200

A	df	p-value	χ^2 (tabulated)	χ^2 (calculated)
0.05	3	2.1E-10	7.815	48.01

We reject Ho because Chi-Square calculated 48.01 is greater than tabulated value of Chi-Square 7.815 means and it is further concluded that the pharmaceutical companies are providing unbiased data to Physicians and General Practitioners in a different manner.

Physicians & General practitioners both agreed that both generic as well as branded "research" drugs companies provide unbiased data of their drugs (27% in Physicians &42% in GPs), in case of Physicians, 15% of respondents agreed that the generic product companies are more biased in order to provide true data, whereas, in case of GPs study 26% respondents agreed that the Branded name drug companies provide unbiased compare to 33% Physicians case, in case of Generic drug companies 20% GPs & 25% Physicians agreed that neither Brand product name nor Copy (generic) are providing any biased data.

5.1 Summary and Conclusion

The summary and conclusion of the study and the recommendations on the basis of the empirical results are given as follows:

In this study find out that in both the specialties Physicians & General Practitioners prefer to prescribe generic drugs because of More academic detailing as sales representative of generic companies visited them many times in month to remind / update them on generic drugs.

In addition to this factors cost of generic drugs also play vital role in prescribing generic drugs as the price between original drugs as high as four times of generic drugs price and most the patients in low line areas not able to afford this high price drugs resulting General Practitioner prescribe them low price generic drugs to treat their illness.

Nowadays generic drugs companies also conducting local trial of their drugs at doctors / hospital level to show the effectiveness of their drugs compare to the original drugs resulting increase in the confidence of the doctors to prescribe the generic drugs to their patients in many diseases even now doctors prescribing generic version of drugs in chronic disease as well.

Doctors rated least in case of general practitioners but significant in the case of Physicians to the Better marketing / Availability option as sales representative visited them so they usually make sure the availability of drugs at doctors nearby pharmacy.

Many pharmaceutical companies specially influence doctor's decision in prescribing generic drugs as they visited them many times in month compare to Physicians in GPs case pharmaceutical companies but more pressure on the General Practitioner to prescribe the generic drugs.

As far as information provided by the pharmaceutical companies to the doctors agreed in both specialties (Physician & GP) that both brand drugs as well as generic companies provide unbiased data about drugs. But in this study proved that branded product companiesare more ethical in order to provide the unbiased data as compared to General Practitioner, while in case of General Practitioner are on greater extend agreed to Generic drugs companies provide unbiased data on their drugs, according to the previous study of General Practitioners.

5.2 Recommendations

1. Pakistani pharmaceutical market growing at mainly because of generic drugs so Generic drugs maker have to follow the global practices of manufacturing of drugs with reliable source of raw material (active ingredient) for generic drugs resulting doctors confidence in prescribing generic drugs.

2. Increase medical knowledge of their sales representative to deliver drug message more clearly to Physicians so they can understand and start prescribing their drugs.

3. Generic drugs companies have to make sure that they always used unbiased data for their drugs that is not only beneficial for drugs also position company as ethical company that always follow of pharmaceutical industry / medicine ethics for promoting their drugs to the doctors.

4. As General Practitioner segments provide 60% of all prescription in Pakistan so Generic companies have to focus them more along with consultants (Physicians) and Resident Medical Officer (RMOs) in order increase their prescription share.

5. As academic detailing is the most effective tool to promote data generic drugs companies have to make more attractive / memorable for the doctors by using different attention grabbing approaches.

6. Only Over the Counter (OTC) drugs allow to the patient without having any prescription as OTC already passed safety criteria of MOH.

7. Companies should always make sure that their drugs should always be available in the market as well as nearby pharmacy of doctors so that patient can easily find drugs prescribed by the doctors.

8. All pharmaceutical companies especially generic drugs companies make whatever information provides to doctors must supported by the valid source so that anyone in healthcare check it if they wants.

9. Ministry of health make sure all companies also submit their cost of manufacturing of their drugs in order to get approval of their drugs for both generic as well as original research brands.

10. Doctors must prescribe those drugs (irrespective of branded or generic version) are effective as well as economical drugs to their patients so that can face minimum burden of cost of medication.

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