Factors Influencing Prescribe Branded Drugs by Physicians: An Empirical Study in Sri Lanka

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INTRODUCTION

The pharmaceutical industry plays a role in fulfilling basic human needs by ensuring the highest standards of health. This industry plays a vital role by ensuring the required medicine to human beings. However, as Peltier-Rivest (2017) stated, every pharmaceutical industry has its own specific objectives to fulfil. The pharmaceutical business has a similar aim compared to other industries as to augment their market share, turnover and profitability by satisfying customer needs and wants through providing the products according to therapeutic segmentations.

However, in the pharmaceutical industry, it is much harder to deliver the message to the end user by applying above the line (ATL) and below the line (BTL)marketing strategiesas a promotional tool (Gehlbach*et al.*, 1984 and James *et al.*, 2009). Hence, pharmaceutical marketing targetsits audience not throughdirect consumers of pharmaceutical products or services, but through the patients who get recommendationsfromthe physicians, andthus physicians are the final target audience of the pharmaceutical industry. In this context, physicians are the primary customers of the pharmaceutical industry as the target group in applying marketing strategies to establish their brands to influence prescriptions. Therefore, physicians decide to prescribe certain drugs as a resultof marketing strategies of the pharmaceutical organizations which are designed not based on the patients but targeting the physicians. Campbell *et al* (2007), Moynihan (2003) and Ahmed et al. (2016) clearly stated that the association betweenthe doctors and the pharmaceutical companies has gainedmomentum.

As Lexchin (1997) and Gonul*et al.* (2001) highlighted in their empirical studies, pharmaceutical companies market their products using various marketing strategies through samples to doctors, expensive gifts, opportunities for symposiums targeting the doctors and hospitals in addition to offering sponsorship for national and international level conferences, medical detailing with opportunities to medical educational activities targeting individual doctors. Yet, Lexchin (1997),Gonul*et al.* (2001) identified that these marketing promotions can impact on prescription

behaviour of the physicians as well as the doctors themselves as they can ignore due cost and benefits on patients.

Most of the Pharmaceutical Companies spend a lot of money to develop their brands through Physicians' (Consultants') medical prescriptions (Rx) where convincing through following independent variables even not considering their Return On Investment (ROI) atthe initiative stage of products introduction period of its life cycle as suchSponsoring CME's on continuous basis, College activities (Endocrinology, Surgeons, Pediatricians, Gastroenterology etc..) education funds/scientific journals, articles for Physicians from their Senior Registrars (SR) periods to Consultancy level, recruiting efficiency Medical Delegate to do detailing in proficiency, regular sampling, providing scientific products literatures to upgrade knowledge and its molecule benefits transfer to their patients (Vishvanath&Rao,2019).

The universal pharmaceutical business is one of the supreme, significant and dynamic forces of foremost performers in the present financial contextworldwide acquiring almost one trillion US dollars ($) in turnover each year. As stated byITA[1](2016), the International Trade in the last two decades, the drug manufacturers and researchers are being associated with its standards as rapidly emergent markets in the world. Doctors[2]can be considered as the important actors who play a large role in the pharmaceutical industry because they decide which drugs to be used. Therefore, empirical work has shown that having an impact on them is the key forthe pharmaceutical industry. In order to achieve this, almost all the organizations use sales personnel. These sales teams are constantly in touch with these physicians or doctors by providing the required information made available to them. As noted above in the introduction, these industries use various types of strategies to impact the pharmaceutical industry.

These physicians are encouraged to prescribe the drugs which they want to promote. Various strategies are being used such as 'pull' and 'push'. The pharmaceutical industry in relation to the branded products entered to the market comparatively late. During the 1980's and 1990s in Sri Lanka, there were success stories ofbranded products. However, towards the early 2000, the situation changed due to generic competitors entering into the Sri Lankan market. This has helped to cometo the realization that building a strong market for branded products is very important. Another issue that is faced by the industry is the rivalry among the generic competitors with low prices. Therefore, it is important to know the psychological aspect of the doctors in prescribing the branded-drugs in Sri Lanka. Through this study it is expected to find out the key and important factors which help the industry to understand the perspective of physicians. Most leading brand holding pharmaceutical companies listed under the"Top Ten" category (who havedone many innovations and researches) face

[1]the International Trade Administration

[2]All medical practitioners except consultants

great difficulties to reach their expected revenue growth and Return On Investment (ROI)due to the cause of less branded-drug usage in the world. Aitken (2015) IMS Institute for Healthcare Informatics explained in their articles that due to cost factors the physicians are reluctant to recommend branded drugs.

However, when considering the market behaviour of branded-drugs, their recommendation by the physicians has a gradual downward trend and manydifficulties to new acquisition are in place as branded products are being de-grownsignificantly to? The therapeutic segment of antibiotic and anti-diabetes category inthe last financial year. This scenario would be taken into consideration as this opens an opportunity or research gapto do a market research study in this framework on how it behaves, and further with the comparison of empirical studies and present market environment, how it would be positionedin future as decision-makers in the organization.

The paper is organized as follows.Section 1 is the introduction and section 2 provides the problem of the study. Section 3 gives details of the objectives of the study followed by sections 4 and 5 with literature review and conceptualization framework of the study respectively. Section 6 discusses the research methodology, section 7 is on results and the final section is on recommendations.

Problem Statement

Darley Butler Health Care (DBHC) Division is a major revenue contributor for the Darley butler and Co. Ltd. for the last 20 years in Sri Lanka, and it has been treating several segments of therapeutic drugs in Sri Lankan market to fulfil patients' care along with Corporate Social Responsibility (CSR). However, considering the market behavior of branded-drugs recommendation given by the physicians are having a downwards trend and much difficulties to gain a new market share because the branded products are being de-growing significantly as a therapeutic segment of antibiotic and anti-diabetes category in last financial year (Annual Report ,2019-2020, Darley Butler). This scenario would be taken into consideration as this opens an opportunity to address the research gap. further,in comparison of empirical studies and present market environment it can be decided how it would be positioning in future as decision makers in the organization.Therefore, to identify what kind of elements which can influence the physicians in prescribing branded drugs in Sri Lanka is an important question that is expected to address in this empirical study.

Objectives of the Study

Key Objective

The keyobjective of the present study is to appropriately ascertain the influencing factors which encourage physicians to prescribe branded-drugs. The influencing factors can decide the future markets of such products and therefore through the present study it is expected to identifysuch factors.

Specific Objective

- To identify the relationship betweenMedical detailing andprescribed branded-drugs by the physicians
- To identify the relationship between Scientific Literature and prescribed branded-drugs by the physicians
- To identify the relationship between Sponsoring Overseas conferences and prescribed branded drugs by the physicians
- To Identify the relationship between Continuous Medical Education program and prescribed branded-drugs by the physicians
- To identify therelationship betweenRegular Sample Distribution and prescribed branded-drugs by the physicians

CRITICAL REVIEW OF LITERATURE

Review of literature is a systematic survey that contains verification of facts and figures of previous researches on a particular topic, identification ofgaps and space for further research and an addition to new ideas. Also, it is useful to understand as to what has actually happened in the past research and on what basis and assumption these researcheswerecarried out. This chapter deals with the empirical literature on factors influencing prescription of branded-drugs by physicians. However, in Sri Lanka, only a few literature surveys and reviews have been done on that subject. It is evident in previous studies that researchers have adopted diverse approaches in order to detect the factors influencing prescription of branded-drugs behaviorof physicians. The main purpose of this thesis is to understand the underlying relationship/s between factors influencing prescription of branded-drugs behavior of physicians. Hence, the focus would be to review past research and find out areas that have been missed in them and see whichimprovements can be done to enrich the debate on factors influencing prescription of branded-drugs behavior of physicians.

The focus of Gallen's (2011) studywasto identify the aspects that influence the recommending drugs predominantly by leading doctors or orally administrated drugs in the outpatient setting in the USA. The researcher found that several instances mainly influence physician's prescribing; peer influence, financial and managed care considerations, pharmaceutical representatives and drug samples, and direct to consumer advertising. He finally found that pharmaceutical industry hasa deep impact on physicians' prescribing. His further findingwas thatsponsored education programmers too can excerpt high influence. Similar to Gallen,Waheed*et al*. (2011) also wanted to empirically recognize the key aspects that influence medical officer's reliability to recommend and convince brands of drugs,and the researchers used the survey as the technique which was designed to collect data from 71 doctors. The

study concluded that the physical type of rewards given to doctors by the drug companies can make the prescription loyalty. Another finding was that the professional aspect of the representatives of the drug companies positively impact on physicians' prescribing behaviour of branded-drugs.

According to the Dorocki (2014),the pharmaceutical industry has become one of the major sectors of any economyin the present-day context as it has remained consistently in the midst of competitiveness in the world market on top level. Based on the above premise, the researcher tried to evaluate the global trends in the present pharmaceutical industry at the international level. Under the context of increasing globalization, some countries can be identified as market leaders in the said industry such as members of the BRICS (Brazil, Russia, India and China) group. The author confirmed the increasing importance of this industry on the global economy.

Another study by Murshid *et al.* (2016) presented comprehensive information on pharmaceutical marketing efforts and also identified moderating effects of contextual factors on physicians'prescribing decisions. They also presented in their empirical study a crucial conceptual model for explaining the theoretical linkages between marketing strategies of pharmaceutical firms. According to the theoretical explanations, the marketing efforts can impact the doctors when they prescribe drugs are being highly taken up and studies which are still debated. The paper paid further attention on thecontextual factors such as drug attribute, physician persistence habit, and benefit-cost ratio of a drug which may tip the balance in this debate.

Kasliwal (2017) confirmed through his study that prescribing is a concept of'multi-faceted' which has an intermediate impact on consumers as they follow the norm of reciprocity. This norm as the researcher found is a basic guideline when the customers make decisions. This was the prime aim of the researcher in his study when he used a sample of 431 doctors in Indiafrom whom he collected the information using a questionnaire. Findings show that senior medical practitioners use the method of KOL (key opinion leaders) to make rational prescribing decisions based on clinical facts and he also rated these psychosocial factors as less influencing as compared to younger doctors.

Mursid and Mohaidin (2017) suggested that physician's decision to prescribe the drugs are based on a value conceptual model which explains the theoretical relationship between the existing link in the marketing efforts, patients as well as pharmacists and physicians. As per the final findings, a new conceptual model of the physician decision-making process was suggested.

Another study by Salman *et al.* (2018) in relation to the situation in Saudi Arabia found that frequent meetings between physicians and representatives of pharmaceutical companies (PR) and the use of promotional techniques by PRs are concerning. A total of 300 questionnaires were distributed among 233 physicians. According to responses from the questionnaires, 191 (64%) of physicians admitted receiving gifts. Further, 239 physicians agreed on PRs' use of promotional activities while 251 of them emphasized on the need for representative attendance in order to gather correct facts.

Pharmaceutical industry is unique compared to other industries where doctors play an important role as a bridge between pharmaceutical companies and consumers according to Sutiono*et al* (2019). They confirmed that one of the determinants of success for pharmaceutical company lies in the loyalty of doctors in recommending products to patients through the prescribing process. The aim of the study was to identify factors that influence physician prescribing loyalty. A sampling was taken through non-probability techniques with a purposive sampling design. The research instrument used was a questionnaire that was distributed to 110 doctors in Jakarta. Results indicated that the prescribing loyalty of patent drugs by doctors was significantly influenced by pharmaceutical sales representatives and sponsorship support.

A recent study was done by Alowi and Kani (2019) determined the most effective promotional tools putatively influencing physicians' prescription behavior by examining five commonly-used promotional tools;sales promotions,advertising,public relations,direct marketing and personal selling. They used a method of a cross-sectional research design proposed, based on the stimulus organism-response (S-O-R) paradigm in which the data was collected through questionnaires completed by physicians in Sudan using a five-point Likert Scale. Findings showed that thegrowth and financial revenue of pharmaceutical companies strongly depend on the type of promotional tools they use to promote their products.

The objective of the study of Fickweiler*et al.* (2017) was to explore interactions between physicians and the pharmaceutical industry including sales representatives and their impact on physicians' attitude and prescribing habits using cross-sectional studies, cohort studies, randomized trials and survey designs. Further, they used studies with narrative reviews, case reports, opinion polls and letters to the editor excludingdata synthesis. They concluded that physician–pharmaceutical industry and its sales representatives' interactions and acceptance of gifts from the company's PSRs have been found to affect physicians' prescribing behavior and are likely to contribute to irrational prescribing of the company's drug. Therefore, intervention in the form of policy implementation and education about the implications of these interactions is needed. Parallel to studies of Fickweiler*et al.* (2017), Murshid(2017)too attempted to suggest a value conceptual model that explains the theoretical linkages existing amongmarketing efforts, patient and pharmacist and physician decision to prescribe the drugs. The study suggested that a new conceptual model of the physician decision-making process is required.

Krunal (2020) confirmed that various promotional activities like detailing of a medical representative, continuing medical education, medical camps and customer relationship management have an impact on the prescription behavior of doctors but at varying rates. In order to arrive at thisconclusion, the researcher used 100 self-administered structured questionnaires completed by doctors practicing in different specialities like general practitioners, Physicians, gynaecologists, pediatricians and dentists.

Study done by Joel Lexchin (2015)in relation to Canada questioned “What information do physicians receive from pharmaceutical representatives?” and arrived at the conclusion that the Canadian doctors should not be passive recipients of information provided by sales representatives. Physicians who choose to continue to see representatives must critically compare the information they get from them with that contained in scientific publications.

As per the findings of Viswanath and Rao (2019), the pharma companies leverage their marketing tools to influence physicians to prescribe their products to patients in India to buy medicines as per the prescription. Thus, Physician’s prescription is a decision to buy the product on behalf of the consuming end-user. Most of the researches were concentrated on medical factors in their research, however, Viswanath and Rao (2019) paid their attention on non-medical factors too on the minds of the physicianswhile prescribing. On the other hand, some consumers becomemore knowledgeable, poseconcerning??questions to the physicians and even suggest alternatives.

“In Bangladesh same drug molecules are sold under different brand names by different pharmaceutical companies. To persuade the physicians to prescribe their brands pharmaceuticals engage in marketing techniques like giving samples, gifts, sponsoring travel etc…….” (Hossain, 2013, pp.01). Therefore,the perk of pharmaceutical companies nowadays is to have astrong impact on physicians as nearly two thirds of the practitioners (66 %) like to write brand names of drugs on a prescription. This is clearly beneficial for the pharmaceutical companies but at the end of the run, it affects the patients. People canget treatment at a lower cost if the prescriber prescribes drugs by generic name.

The objective of the study of Ahmed (2020) was to study the “Efficacy, safety, and cost of medication are the major concerns for a patient; thus, this research addresses factors that influence the physician’s prescription behaviour”. The researcher empirically tested and found that marketing efforts, patient’s characteristics and pharmacist factors have a positive and significant influence on the physician’s decision to prescribe medicines. The used model explainedthe association between marketing efforts, pharmacist factors, patient characteristics and the physician’s decision to prescribe a drug. This unique model also includedthe influence of cost and benefit ratio, drug characteristics, physician’s persistence and trustworthiness as moderating variables. The researcher collected 984 physicians’ responses from the urban centers of Pakistan through a structured questionnaire. The findings revealed that the marketing efforts, patient’s characteristics and pharmacist factors have a positive and significant influence on the physician’s decision to prescribe medicines. The findings as per researcher werehelpful for the marketers of the pharmaceutical industry to save wasteful marketing expenditures for the product portfolios and measured variables that may help to make meaningful marketing strategies for the physician’s prescription.

The aim of the empirical study of Shamim-ul-Haq*et al.*(2014) was to examine the factors which influencethe prescription behaviour of physicians. The technique of Regression Analysis was used and they arrived at the conclusion that there are two factors which impact a lot more than any other factor namelynew drug in market and the promotional tools. The research wasbased on panel data. There are certain factors which influence the prescription behavior of physicians such as new drug in market, brand prescription, sponsorship to conferences, promotional tools and drug samples. Influence heavily dependson how the salespersons promote their brands.

Kamuhabwa and Kisoma (2015)conductedtheir study in relation to Tanzania using interviews of 192 medical practitioners from 11 public and 3 private health facilities. There were considerable variances between prescribers who workedin public and private health facilities with regard to the factors which influence their prescribing decisions. Researchers further identifiedtextbooks (64 %) and internet (63 %) as main sources of prescribing information.According to the findings, systematic samples positively affect the physicians to recommend drugs in private sector than in the public sector.

Another area explained in their researchwas that medical practitioners in private health facilities of approximately 97 % aremore concerned with the proven effectiveness of drugs than those working in public health facilities. However, evidence found bythe study of LotfI*et al.* (2015) confirmed that policymakers addressing the issue of physicians' interaction with pharmaceutical company need to be aware of the low quality of supporting evidence due to the use of non-validated questionnaires (given the bias that could be introduced into the findings). This is contradictory evidence to the most of the empirical studies found in relation to the doctors prescribing branded drugs. The researchers, therefore, recommended theneed for further research to validate the findings.

Punchibandara (2010) revealed through his study that promotional strategies of pharmaceutical organizations hada significant impact on physicians when prescribing branded drugs. According to his study, Product Managers, Brand Managers and marketing leaders have to be concerned about their decision- making process.

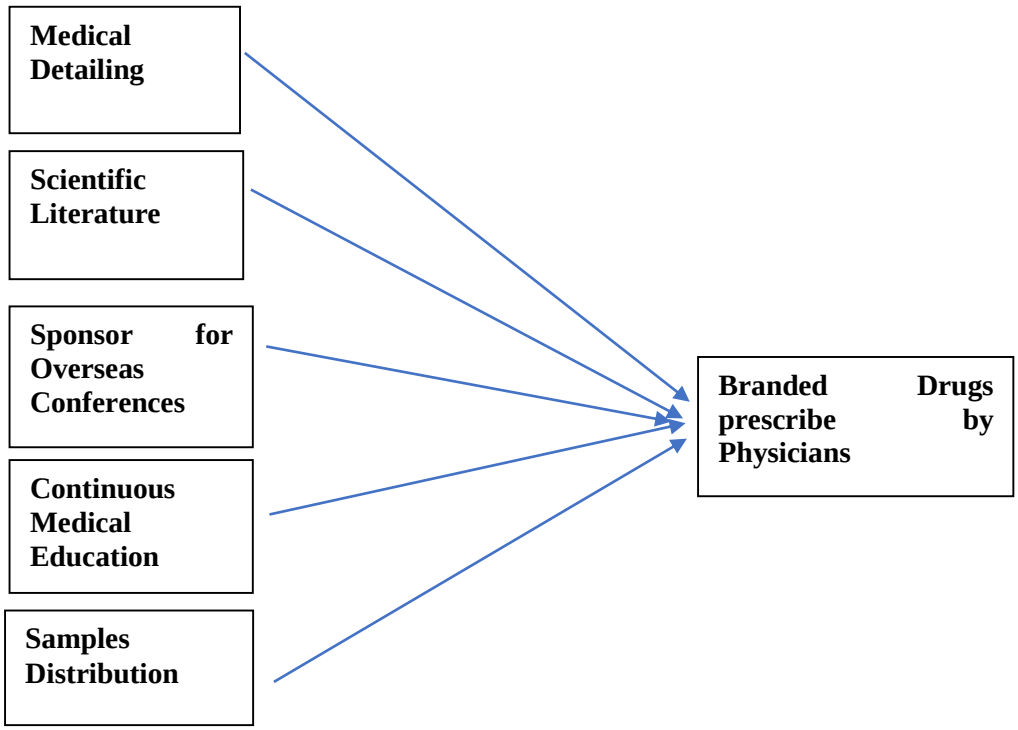
Schumock et al. (2004) explained different views oninfluencing factors by physicians in theirstudy. It was identified that hospital setting, drug-related factors such as safety and effectiveness, and policy or administrative factors, formulary status, clinical pharmacists, formulator members were the most significant elements to influence physicians to prescribe the drugs. Thus, it is significant for those pursuing to alter prescribing behaviour to not justunderstand the factors most influential in the process.

In Saudi Arabia, physicians' and Pharmaceutical Representatives'(PRs) close relationship, promotional techniques, sponsoring future studies significantly influence physician's prescriptions. This has been proven through the research study of Bahammam*et al.* 2018.after completing 300 questionnaires.

Conceptualization Framework

Based on the literature review, a conceptual framework was developed as shown in figure 01. As figure 01indicates, promotional strategies have a significant impact on prescribing branded-drugs by physicians in Sri Lanka. The conceptual framework is a linear model showing the relationship between the independent variables and dependent variables. In the Sri Lankan context, promotional activities which are listed in figure 01 can be considered as promotional strategies and they influence the recommendation on prescribing branded drugs by the physicians.

Figure 01: Conceptual framework



RESEARCH METHODOLOGY

Targeted Population

Distribution of Medical Officers by Regional Director of Health Services Division –December 2019 (Provisional).

RDHS Division	Senior	Cons	MO- Hos	MO-	MO-Sch	MO-Mal	MO-Fila	MO-	MO-Ven	MO- Tub	MO-	MO-	MO-Judi	MO-BB	MO-	TOTAL
Colombo	75	621	3074	70	3	5	4	0	2	35	5	21	10	100	333	5125
Gampaha	14	163	1311	61	1	0	1	7	16	0	1	0	4	35	59	1941
Kalutara	8	96	596	41	0	0	1	0	2	0	0	0	6	20	4	880
Western Province	97	880	4981	172	4	5	6	7	20	35	6	21	20	155	396	7146

Notes:RDHS (regional director of health services), Senior MO (senior and deputy medical officers), Cons(consultant), MO-Hos, MOH, sch, Mal, Fila, Lepr, Ven, Tub, Epido, Mater, Judi, BB, Other- (medical officers in hospitals, MOH office, schools, malaria, filarial, leprosy, venereologist, tuberculosis, maternity, judicial, blood bank and others respectively)

Source: Medical Statistical Unit

Table 01: Regional Director of Health Services Divisions

The target population of the study was the doctors related to the health sector in Sri Lanka and they were either general practitioners in the Western province or Medical Officers and Resident Medical Officers of the Government and Private sector or the consultants of all specialities either working in government or private hospitals (Colombo, Gampaha. Kalutara districts).

Sample Design

Cluster Sampling was selected for the present study. The reason to choose this kind of sampling technique wasbecause the whole population is widely scattered in a larger geographical area inthe western province of Sri Lanka. In order to get the samples from different?? the researcher used five variables in the study in doing statistical analysis and arriving at the conclusions. Therefore, a total sample of 108 was collected from the said geographical areas.

Data Collection Method

The data was collected through questionnaire from the target population (physicians). Questionnaire includedfive (05) Likert Scale (Shamim-ul-Haq, 2014)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Techniques Used in the Study

In order to find out the relationship between independent variables and the dependent variable, the regression technique was used in the present study. The Statistical Package for the Social Sciences (SPSS) software wasused to identifythe relationship between the dependent (Branded-Drugs Prescribing by Physicians) and independent variables (Medical Detailing, Scientific Literature, Sponsoring Conferences, Continuous Medical Educational, Sample Distribution).

Reliability And Validity Test – Cronbach's Alpha

In order to test the reliability and validity of the variables of the study, the Cronbach's Alpha wasused as recommended by Sekaran (2006). It's a test of reliability and scale. The test was developed by Lee Cronbach in 1951 through which reliability was tested. Cronbach's Alpha test wasused to see if multiple questions on Likert Scale surveys werereliable. The coefficient of reliability rangedfrom 0-1 which provided an overall assessment of the reliability. In the scale, if all items are entirely independent from one another then the Alpha value (α) is equal to zero($\alpha = 0$). Ifall variables have high covariances,it means $\alpha = 1$, if the coefficient is below 0.6 itconsiders to be poor in reliability and those which reach 0.7 and above are acceptable (Jayasooriya&Samaraseka, 2019).

Descriptive Analysis

Descriptive statistics are used to describe the basic features in a data study. They provide a simple summary about the samples and measures. Descriptive analysis is useful as it provides basic information about variables in the study and their respective relationship.

ANOVA Test

An ANOVA Test is useful to get an idea about survey results; whether they are significant or not. It is helpful to the researcher to analyze if the null hypothesis is rejected or alternative hypothesis is accepted. Therefore, in the present study, the following model was used.

Model Equation:

$$\boldsymbol{BDPP = \beta_0 + \beta_1 MD + \beta_2 SL + \beta_3\, SPON + \beta_4 CME + \beta_5\, SAM + \epsilon} \ldots\ldots\ldots\ldots (\mathbf{1})$$

Equation 1 illustrates the model to be estimated for the present study. $\boldsymbol{\beta_0, \beta_1, \beta_2, \beta_3\, , \beta_4\, and\, \beta_5}$ are coefficient of the model to be estimated.

Where:

BDPP	- Branded Drug Prescribed by Physicians
MD	- Medical Detailing
SL	- Scientific Literature
SPON	- Sponsorship for Conferences
CME	- Continuous Medical Education
SAM	- Sample
ϵ	- Error term

Hypothesis of the Study

H:$_1$- Medical Detailing as promotional strategy of Pharmaceutical Industry have a significant impact on prescribing branded drugs by the physicians.

H:$_2$– Distribution of the scientific literature is important for prescribing branded drugs by the physicians.

H:$_3$- Sponsoring physicians for conferences can be an important promotional strategy for influencing factor for prescribing branded drugs by physicians.

H:$_4$ – Organizing Continuous Medical Education(CME's) program has a significant impact on prescribing branded drugs by physicians.

H:$_5$ – Distribution of Physician samples have a significant impact as a promotional strategy on prescribing branded drugs.

RESULTS AND DISCUSSION

Reliability of Data Collection Mechanism

Consistency of the item selected has been proved reliable through reliability analysis (Haele&Twycorss, 2015). Cronbach's alpha is the most common and highly used measure of internal reliability. It is highly recommended for multiple Likert questions in a survey or questionnaire through which a scale can be developed (Sekaran, 2006; Bonett& Wright, 2014). Cronbach's alpha coefficient(α) ranges the value between zero (0) and one (01) as George and Mallery (2003) confirmed and suggested the following as the 'rule of thumb', excellent, good, acceptable, questionable, poor and unacceptable. However, in the present study as suggested by George and Mallery (2003), strongly disagree, disagree, neither disagree nor agree, agree and strongly agree were included??. In order to arrive at the internal consistency of the items in the questionnaire, the present study ran the reliability test with taking 108??indicating the results as per shown in the Table 02.

According to Table 02, Cronbach's alpha coefficient indicates how items in the data series are positively correlated with each other. Therefore, the closer the reliability reaches to 1, better the reliability and validity are. However, a level 0.6 can be taken as poor in reliability and those items reaching 0.7 show that they are acceptable. Thus, Table 02 clearly illustrates the reliability statistics for variables selected in the study which have reached 0.7 and above. According to the Cronbach's alpha values, all the variables (branded-drugs prescribed by the physicians, medical detailing, Scientific literature, Sponsorship for the overseas conferences, Continuous Medical Education, Sample distribution) recorded 0.7 or above. Therefore, these results can be considered as reliable (Haele&Twycorss,2015).

Table 02: Reliability Statistics

Reliability Statistics – Cronbach's Alpha		
Variables	**Cronbach's Alpha**	**Number of Items**
BDPP	0.826	03
MD	0.705	04
SL	0.776	03

SPON	0.795	04
CME	0.759	05
SAM	0.822	05

Notes:BDPP (branded drugs prescribed by physicians), MD (medical detailing), SL (scientific literature), SPON (sponsorship for overseas conferences), CME (continuous medical education), SAM (sample distribution)

Reliability = 1:better; Reliability = 0.6:poor; Reliability =0.7: acceptable

Source: Prepared by the Authors using SPSS

Table 4.2 indicates the overall reliability statistics (Cronbach's Alpha-α) for the entire variables used in the study. Alpha value indicates 0.889 which is highly positive and reliable.

Table 03: Overall Reliability Statistics

Cronbach's Alpha	**Number of Items**
0.889	24

Descriptive Statistics

In this study, each indicator statement in the questionnaire has been estimated on a 1- 5 Likert Scale. According to the Likert Scale selected in this study, level 5 indicates the highest agreements for the given statements while 1 is for the lowest statements. Point – 03 is considered to be the neutral point. The table 4 illustrates the descriptive statistical analysis that were used to described the level of intensity of each determinant (Medical Detailing, Scientific Literature, Sponsorship overseas conferences, Continuous Medical Education, Sample Distribution) of the independent variables. Table 4 Cleary shows that mean values of all independent variables are very closer or little higher than the neutral point where the value of the dependent variable (BDPP) is also little higher than the neutral point (3.93).Sample distribution(SAM) and sponsorship overseas conferences(SPON)both have relatively high mean value compared to the other independent variables. Also,the value of the independent variables that have reached "agree level" 4 are SL and CME. The results indicate that SL and CME have a high impact on prescribing branded drugs in Sri Lanka. While others; MD, SPON, SAM, also have an impact on BDPP. The values which are higher than the neutral point describe positive answers that doctors in Sri Lanka incline for branded drugs than the generics. BDPP shows

the minimum of 2.67 and maximum of 4.67. The minimum and the maximum values of the MD records as 2.25 (min) and 5 (max) respectively which indicates it has reached 'highly agree' position in the study when variables SPON reaches minimum of 1.25 while maximum records as 4.75 which is almost close to the highest position. When all the variables are considered, all have reached beyond the level 4 and closer to level 5. Table 4 depicts the association between independent variables and the dependent variable. All independent variables are correlated with the dependent variable in the study.

Table 04: Descriptive Statistics

Descriptive Statistics

Variable	**N**	**Maximum**	**Minimum**	**Mean**	**St: Deviation**
BDPP	108	2.67	4.67	3.93	0.426
MD	108	2.25	5.00	3.71	0.511
SL	108	3.86	4.33	4.03	0.111
SPON	108	1.25	4.75	3.47	0.701
CME	108	3.40	4.80	4.08	0.308
SAM	108	3.00	4.60	3.82	0.369

Source: Prepared by the Authors using SPSS

Correlation Analysis to Test Hypothesis of the study

Table 5: Correlation between BDPP and MD

		BDPP	MD
BDPP	Pearson Correlation	1	.294**
	Sig. (2-tailed)		.002
	N	108	108
MD	Pearson Correlation	.294**	1
	Sig. (2-tailed)	.002	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

As per Table 5, the correlation between branded drugs prescribed by physicians (BDPP) and medical detailing (MD) is 0.294. It shows apositive and strong relationship. Therefore, BDPP shows a positive correlation with MD. The significant value (p-value) is 0.002 which is lower than the accepted p-value and hence medical detailing has a statistically significant relationship with the dependent variable (BDPP).

Table 6: Correlation betweenBDPP and SL

		BDPP	SL
BDPP	Pearson Correlation	1	.325**
	Sig. (2-tailed)		.001
	N	108	108
SL	Pearson Correlation	.325**	1
	Sig. (2-tailed)	.001	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis as per Table 6 between branded drugs prescribed by physicians (BDPP) and Scientific Literature (SL) denotes 0.325 with p-value 0.001. This value is less than the accepted p-

value of 5%level of significance. This relationship indicates a significant relationship between SL and BDPP in this study.

Table 7: Correlationbetween BDPP and SPON

		BDPP	SPON
BDPP	Pearson Correlation	1	.189*
	Sig. (2-tailed)		.049
	N	108	108
SPON	Pearson Correlation	.189*	1
	Sig. (2-tailed)	.049	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation between branded-drugs prescribed by physicians (BDPP) and sponsoring overseas conferences (SPON) is illustrated in Table 7. The correlation value indicates as 0.189 while the p-value takes 0.049 at 5% level of significant indicating that the variable SPON shows a statistically significant and positive relationship with BDPP.

Table8:Correlation betweenBDPP and CME

		BDPP	CME
BDPP	Pearson Correlation	1	.601**
	Sig. (2-tailed)		.000
	N	108	108
CME	Pearson Correlation	.601**	1
	Sig. (2-tailed)	.000	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

Table 8 shows the correlation between branded drugs prescribed by physicians (BDPP) and continuous medical educational programs. According to the results, the BDPP shows the correlation value of 0.601 at 5% significant level. This shows the positive relationship and significant p- value is less than 5% significant level. Therefore, it can be concluded that CME has a positive and statistically significant correlation with the dependent variable BDPP.

Table 9: Correlation betweenBDPP and SAM

		BDPP	**SAM**
BDPP	Pearson Correlation	1	.592**
	Sig. (2-tailed)		.000
	N	108	108
SAM			

** Correlation is significant at the 0.01 level (2-tailed).

According to the Table9, the correlation between branded drugs prescribed by physicians (BDPP) and distribution of physician sample (SAM) is depicted. Italso shows a highly positive and statistically significant??. The correlation value indicates 0.592 with a 5% significant level confirming the variable SAM has an influence on the dependent variable BDPP.

Summary of Correlation Analysis

The present study mainly covered five hypotheses (H1, H2, H3, H4, H5) to identify statistically any relationship between the dependent variable (BDPP)and independent variables (MD, SL, CME and SAM) and the summary of findings are given in Table 10.

Table 10: Summery of Correlation Analysis

Hypothesis	**Relationship to BDPP**	**Results**	**Conclusion**
H1	Positive Relationship	0.294(0.0020)	Accepted**
H2	Positive Relationship	0.325(0.001)	Accepted**
H3	Positive Relationship	0.189(0.490	Accepted**
H4	Positive Relationship	0.601(0.000)	Accepted**
H5	Positive Relationship	0.592(0.000)	Accepted**

**denotes significant at 5%

Source: Prepared by the Authors using questionnaire data Source

Multiple Regression

Model Summary

Table 11: Results of Model Summary

Model Summary

Model	R	R- Squraed	Adjusted R-Squraed	Std. Error of the Estimates
1	0.653[a]	0.427	0.399	0.44012

a. Predictors: (Constant), Scientific Literature, Sponsor Conferences, Medical Detailing, Sample Distribution, Continuous_Education

Source: Prepared by the Authors using questionnaire data

Table 12: ANOVA Table

Results of the ANOVA test

Model	Sum of Square	df	Mean Square	F	Significance
Regression	14.870	5	2.974	15.35	0.000[b]
Residual	19.952	103	0.194		
Total	34.822	108			

a. Dependent Variable: Branded Drugs

b. Predictors: (Constant), Scientific Literature, Sponsor Conferences, Medical Detailing, Sample Distribution, Continuous_Education

Source: Prepared by the Authors using questionnaire data

Table 13: Coefficient Table

Results of the Coefficient Test

Model	**Unstandardized Coefficient**		Standardized Coefficients		
	B	Std. Error	Beta	t-Statistics	Sig.
Constant	0.781	.392		1.984	.04
MD	.009	.078	.010	.120	.05
SAM	.373	.115	.341	3.238	.02
CME	.431	.123	.377	3.511	.01
SPON	-.046	.060	-.063	-.769	.04
SL	.021	.079	.023	.264	.03

Source: Prepared by the Author using questionnaire data

a. Dependent Variable: Branded Drugs

Notes: MD(medical detailing),SAM(sample distribution),CME(continuous medical education),SPON(sponsor for overseas conferences),SL(scientific literature)

According to the regression coefficient results given in Table 13, the null hypothesis of H_1, H_2, H_3, H_4 and $H_5$are accepted as the corresponding significant values MD (0.05), SL (0.03), SPON (0.04), CME (0.01), SAM (0.02) were less than 0.05 ($p>0.05$) which indicate that null hypothesis of **H_1**,which is Medical Detailing as a promotional strategy of the pharmaceutical industry, significantly impacts on prescribing branded-drugs by physicians. Further, the null hypothesis of **H_2**, that is the Distribution of Scientific Literature, is also important when prescribing branded- drugs by physicians. Also, the null hypothesis of **H_3**, which indicates Sponsoring for Overseas Conferences, can be an important promotional strategy to influence factorsrelated to prescribing branded drugs by the physicians. On the other hand, the null hypotheses of **H_4**(Continues Medication Programs) and **H_5**(Distribution physician samples) indicate the highest impact on branded drugs prescribed by the physicians as coefficient values in both variables are positively and statistically significant because p-values in both variables are less than0.05 ($p<0.05$) level of significant. Therefore, it can be concluded that all the independent variables collectively impact on the 'Branded Drugs Prescribed by the Physicians' in Sri Lanka.

Therefore, the estimated would be:

$$BDPP = \beta_0 + \beta_1 MD + \beta_2 SL + \beta_3 SPON + \beta_4 CME + \beta_5 SAM \ldots\ldots\ldots (2)$$

BDPP= 0.781+ 0.009+ 0.001+ 0.046+ 0.431+ 0.373

CONCLUSION AND RECOMENDATION

The purpose of this study was to find out which factors can have an impact on branded drugs prescribed by the physicians in Sri Lanka, focusing on three districts namely Colombo, Gampaha and Kalutara. In order to find that out, five main independent variables were identified as promotional strategies which doctors in Sri Lanka use commonly in recommending branded drugs which are promoted by the pharmaceutical industry in Sri Lanka. In this study, Medical Detailing, providing Scientific Literatures, Sponsoring Overseas Conferences, Continuous Medical Education program, Distribution Physicians Samples were used as a promotional strategy which were identified through the review of literatures even though studies in relation to the Sri Lankan context are limited. The main technique used in the study was a questionnaire with Likert scale. A sample of 130 doctors was selected randomly. However, due to the unexpected situation that arose in the country?? only 108 doctors responded to the questionnaires and accordingly the study was done.

The research of the present study further revealed that the promotional strategies that are being used by the pharmaceutical industry in Sri Lanka have significantly impacted the doctors in the medical field in recommending the branded drugs. Further, promotional strategies that are discussed in the study indicate a positively significant?? towards branded drugs that are prescribed by the doctors. These findings indicate to all the pharmaceutical companies in Sri Lanka (except government sector) that the branded drugs they import to the country havea high impact on the country's pharmaceutical industry. Further indications are that if drugs are locally manufactured, it is required to maintain standards that are equivalent to the international standards. If not, locally manufactured drugs will not be able to attract the doctors in the field. The managerial implication that can be arrived at through this empirical study is that though the product/s is unique, using medical detailing, scientific literature, sponsorship for overseas conferences, continuous medical education and samples distributionare an integral part of the marketing strategy in achieving marketing objectives.

Key Findings of the Analysis

The following key findings were recognized during the study.

- Medical Detailing in Sri Lanka can be identified as a promotional strategy when prescribing branded drugs.
- The second key finding is that scientific literature has a direct impact on branded drugs recommended by the physicians in Sri Lanka. It was found that medical Practitioners believe

that scientific literature is a way of enhancing their medical knowledge and therefore they believe it has a positive impact on recommended branded drugs.

- It was further found that making the sponsorships available for doctors to take part in overseas conferences is a beneficial factor as they believe that it can open a new avenue to the latest knowledge in the world and that has been proven in this study.
- The questionnaire firmly confirmed that continuous Medical Educational Programs is a good ground for medical practitioners especially those new comers to the medical profession. CME programs are also an opportunity to pharmaceutical industry as they can take part and interact with doctors. This was confirmed in the analysis as it has become a variable with high impact.

Distribution of samples among the doctors has become a pragmatic opportunity as they can offer same sample to the patients and get the direct feedback of the given sample for testing products' efficacy and accuracy.

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