THE INFLUENCE OF DRUG PROMOTION TECHNIQUES ON PRESCRIBING DECISIONS AMONG PHYSICIANS IN SANA'A CITY, YEMEN

MAHMOUD ABDULLAH HUSSEIN AL-AREEFI

UNIVERSITI SAINS MALAYSIA

2013

THE INFLUENCE OF DRUG PROMOTION TECHNIQUES ON PRESCRIBING DECISIONS AMONG PHYSICIANS IN SANA'A CITY, YEMEN

By

MAHMOUD ABDULLAH HUSSEIN AL-AREEFI

Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

July 2013

DEDICATION

This thesis would be incomplete without a mention of the support given me by my brother, Abdulmajied Abdullah, to whom this thesis is dedicated.

ACKNOWLEDGEMENT

The completion of this thesis would not have become a reality without the invaluable support, sacrifices, encouragement, and inspiration of several individuals and organisations. Hence, I wish to present my appreciation to all those who extended their support in many different ways.

I would firstly like to thank my supervisor Professor Mohamed Izham Mohamed Ibrahim, PhD for guiding my development till I am able to complete a project of this magnitude. He has worked faithfully to teach me the steps necessary to develop a well built proposal necessary to get my research started on a solid ground, and helped to develop this thesis to its full potential. He showed a great deal of interest in reading, reviewing and giving critical feedback on all aspects of my thesis. His profound level of knowledge and experience, his constructive criticism helped keep me constantly focused and enabled me to make the significant progress required to complete this thesis. Also, I am grateful to him for his continuous support, morally and financially, that help to push me to a higher level of achievement than I often thought possible.

I also acknowledge with gratitude the intellectual support of my co-supervisor Associated Professor Mohamed Azmi Ahmad Hassali, PhD who has provided me with valuable assistance, especially in the qualitative phase. He helped open my mind to the techniques and skills handling qualitative research. Also, I am very grateful for his friendly support and enthusiasm. For both of my supervisors, a hearty thank you.

I am also grateful for the service and support I received from other staff in the department of Discipline of Social and Administrative Pharmacy at Universiti Sains

Malaysia. Many thanks go to the newly elected Programme Chair, Associated Professor Asrul Akmal Shafie, PhD. My sincerest appreciation also goes to Mr. Firdauz and all other staff.

I would like to acknowledge my gratitude to Ministry of Public Health & Population Yemen for its sponsorship, granting me a scholarship to achieve my doctorate. Particular thanks also go to Dr. Fisal Al-Quhaly the Director of Ministerial Office of Ministry of Public Health & Population Yemen. Also I owed special gratitude to Dr. Gamal Nasher, the Deputy Minister, Planning and Development Sector, Ministry of Public Health & Population Yemen. My special appreciation is also extended to my friends, Dr Abdullah Al-Dahbly, Dr Yehaya Al-Marany and Dr Mahfudh Al-Musally, for moral support and encouragement.

Last but not least, I wish to give a heartfelt thanks to my father and mother who offered their endless support and constant prayers. I'd also like to express my love and appreciation to my beloved wife, my lovely sons and daughters for their help and patience for my long absence pursuing this study. Finally, I want to take the opportunity to thank my brothers and sisters and cousins for their constant support and encouragement and for reading and providing feedback on early drafts of this work. I want to express my sincere thanks to them all. This academic journey would not have been possible without their love, patience, and sacrifices along the way.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

BNF	British National Formulary
CME	Continuing Medical Education
GDP	Gross Domestic Product
GPs	General practitioners
MEMI	Middle East Medical Index
MIMS	Monthly Index of Medical Specialities
MoPHP	Ministry of Public Health & Population
MRs	Medical Representatives
SBDMA	Supreme Board of Drug and Medical Appliances
WHO	World Health Organization

PUBLICATIONS AND CONFERENCE ATTENDANCE

Al-Areefi, M. A., Hassali, M. A. & Ibrahim, M. I. M. (2012). A qualitative study exploring medical representatives' views on current drug promotion techniques in Yemen. *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing,* 12**,** 143-149.

Al-Areefi, M. A., Hassali, M. A. & Mohamed Ibrahim, M. I. The role of pharmaceutical marketing and other factors in prescribing decisions: The Yemeni experience. *Research in Social and Administrative Pharmacy*. In Press

Al-Areefi MA, Izham MIM, Hassali MA. (2013). Physicians' Perceptions, beliefs and attitudes toward interactions with pharmaceutical company medical representatives. First international conference bioethics and professional practice. International Medical University, Kuala Lumpur, Malaysia. 8 - 9 May 2013.

PENGARUH TEKNIK PROMOSI UBATAN ATAS KEPUTUSAN MEMPRESKRIPSI DALAM KALANGAN DOKTOR DI BANDAR SANA'A, YEMEN

ABSTRAK

Industri farmaseutikal melabur banyak dalam promosi dan ia menggunakan berbagai strategi promosi untuk mempengaruhi keputusan doktor untuk mempreskripsi. Tujuan kajian ini adalah untuk meneroka faktor-faktor yang digunakan untuk mempengaruhi keputusan doktor mempreskripsi dan peranan mereka dalam proses membuat keputusan. Khususnya, kajian ini menyiasat hubungan antara doktor dan wakil industri farmaseutikal dan untuk mengenal pasti persepsi doktor, kepercayaan dan sikap ke arah interaksi dengan wakil industri farmaseutikal tersebut, dan untuk meneroka faktor-faktor yang berpotensi diubah suai yang mempengaruhi interaksi mereka; untuk mengenal pasti sumber utama maklumat doktor gunakan untuk mendapatkan pengetahuan mengenai ubat-ubatan baru dan untuk meneroka bagaimana mereka mempengaruhi keputusan doktor mempreskripsi; dan untuk menyiasat hubungan ciri-ciri doktor dan faktor penempatan amalan dengan faktor-faktor yang lepas. Kajian ini telah dijalankan menggunakan kaedah langkah demi langkah. Dalam fasa pertama, kaedah kajian kualitatif telah digunakan untuk memahami secara mendalam fenomena berkaitan persekitaran dan sejauh mana masalah teknik promosi ubat. Dalam fasa kedua, kaedah kuantitatif, iaitu kajian keratan lintang telah digunakan. Kajian dilaksanakan di Sana'a, Yemen. Doktor di hospital awam dan swasta telah diselidiki. Kesemua instrumen telah diuji ukuran kebolehkepercayaan dan kesahihannya. Analisis deskriptif dan inferensi termasuk

taburan frekuensi, peratusan, min (sisihan piawai), median (julat interkuartail), ujian-ujian t sampel tidak bersandar, Mann–Whitney, analisis varians, Kruskal-Wallis, analisis faktor, dan analisis regresi linear berganda telah digunakan. Paras signifikan adalah 0.05. Dapatan kajian fasa satu mendedahkan bahawa kebanyakan wakil-wakil industri farmaseutikal yang ditemuramah tidak mempunyai pengetahuan mengenai tatakelakuan, dan penggunaan teknik-teknik promosi mereka yang berbeza bergantung pada strategi syarikat, pertimbangan dan/atau kemahiran mereka sendiri, dan tekanan daripada doktor dan jabatan jualan industri farmaseutikal. Kebanyakan doktor didapati menyambut baik kunjungan wakil penjual dan menganggap menerima sampel percuma, hadiah dan pelbagai sokongan sebagai amalan biasa. Walaupun doktor melaporkan kumpulan faktor yang mempengaruhi proses mempreskripsi seperti indikasi ubat-ubatan, sifat-sifat ubat, konteks pesakit, faktor-faktor persekitaran dan pemasaran farmaseutikal, mereka masih bergantung kepada pengalaman peribadi mereka apabila membuat keputusan mempreskripsi. Selain itu, keputusan mereka untuk memilih ubat tertentu mungkin berdasarkan hubungan mereka dengan wakil syarikat dan aktiviti pemasaran firma. Penemuan daripada fasa kedua kajian mendedahkan bahawa sebahagian besar doktor melaporkan telah menerima sampel ubat-ubatan (n=432, 96.2%), hadiah kecil (n=384, 85.5%) dan telah dijemput untuk seminar atau simposium oleh syarikat farmaseutikal (n=381, 84.9%) dalam tempoh enam bulan sebelum menjawab soal selidik ini. Lebih daripada 80% (n=375; 83.5%) responden menganggap wakil syarikat sebagai satu cara yang berguna untuk belajar tentang ubat-ubatan baru, dan majoriti (n=383, 85.1%) menegaskan bahawa mereka akan terus untuk bertemu dengan wakil syarikat. Selain itu, kekerapan lawatan wakil syarikat untuk doktor didapati berkaitan dengan pemberian barangan promosi yang lebih. Doktor yang mempunyai komitmen

pekerjaan lebih masa dan mempunyai kaitan akademik adalah lebih cenderung secara signifikan untuk menerima barangan promosi yang bernilai rendah. Walau bagaimanapun, doktor lelaki, doktor am dan pakar yang mempunyai komitmen pekerjaan hari biasa dan mempunyai klinik swasta adalah jauh lebih cenderung secara signifikan untuk menerima barangan promosi yang bernilai tinggi. Kepercayaan doktor dalam kesesuaian penerimaan mereka terhadap item-item promosi, di samping, sikap terhadap syarikat-syarikat farmaseutikal telah didapati mempunyai peranan penting dalam meramalkan interaksi doktor dengan syarikat farmaseutikal (Adj. R^2=0.208). Juga penemuan yang diperolehi daripada model regresi kajian ini mencadangkan bahawa, kepercayaan doktor dalam kesesuaian penerimaan mereka terhadap barangan promosi, interaksi dengan syarikat farmaseutikal, penerima barangan promosi bernilai rendah dan sumber maklumat langsung daripada syarikat mempunyai peranan dalam meramalkan keputusan mempreskripsi oleh doktor (Adj. R^2=0.422). Doktor mempunyai sikap yang bercampur-campur terhadap perkhidmatan maklumat yang disediakan oleh wakil syarikat. Majoriti doktor mempercayai bahawa kebanyakan teknik promosi tidak menimbulkan masalah etika utama. Kajian ini menjelaskan peranan syarikat-syarikat farmaseutikal dalam mempengaruhi keputusan mempreskripsi, dan meneroka pelbagai faktor yang berkaitan yang mempengaruhi proses membuat keputusan doktor.

THE INFLUENCE OF DRUG PROMOTION TECHNIQUES ON PRESCRIBING DECISIONS AMONG PHYSICIANS IN SANA'A CITY, YEMEN

ABSTRACT

The pharmaceutical industry invests heavily in promotion, and it uses a variety of promotional strategies to influence physicians' prescribing decisions. The purpose of this study is to explore those factors used to influence physicians' prescribing decisions and their role in decision-making process. Specifically, this study investigates the relationships between physicians and medical representative (MRs) and to identify physicians' perceptions, beliefs and attitudes toward interactions with those MRs, and to explore the potentially modifiable factors influencing those interactions; to identify the main sources of information physicians use to obtain knowledge about new drugs and to explore how they influence physicians' prescribing decisions; and to investigate the relationship of physicians' characteristics and practice-setting factors with previous factors. This study was conducted in a step-wise approach. In the first phase, a qualitative research method was adopted to have an in-depth understanding of the phenomenon surrounding the nature and extent of drug promotion techniques. In the second phase, a quantitative method was applied using the cross-sectional. Research was conducted in Sana'a, Yemen. Physicians in public and private hospitals were surveyed. All instruments were tested for its reliability and validity measures. Descriptive and inferential statistical analyses including frequency distributions, percentages, means (sd), median (IQR), independent samples t-test, Mann–Whitney test, ANOVA, Kruskal-Wallis test, factor analysis, and multiple linear regression analysis were

applied. Level of significance (α) is equal to 0.05. Findings of phase one study revealed that most medical representatives interviewed did not have knowledge about any code of conduct, and their use of different promotional techniques depends on company's strategy, their own judgment and/or skills, and pressures from physicians and pharmaceutical company sales departments. Most physicians were found to be welcoming representatives' visits and consider receiving free samples, gifts and various kinds of support as a normal practice. Although physicians reported group of factors that influence the prescribing process such as drug indications, drug attributes, patient context, environmental factors and pharmaceutical marketing, they still rely on their personal experiences when making prescribing decisions. Further, their decisions to choose a particular drug may be based on their relationships with MRs and firms' marketing activities. Findings from phase two of the study revealed that a high proportion of physicians reported having received drug samples (n= 432; 96.2%), small gifts (n = 384; 85.5%) and having been invited to seminars or symposia by the drug company (n= 381; 84.9%) in the six months preceding the administering of the questionnaire. More than 80% (n=375; 83.5%) of the respondents considered the MRs to be a useful means of learning about new drugs, and majority (n=383; 85.1%) asserted that they would continue to meet with MRs. Moreover, the frequency of visits of MRs for physicians were found associated with provision of more promotional items. Those physicians who have overtime occupational commitment and have academic affiliation were significantly more likely to receive low-value promotional items. However, male physicians, GPs and specialists who have normal day occupational commitment and have private clinic were significantly more likely to receive high-value promotional items. The physicians' belief in the appropriateness of their acceptance of those promotional

items, in addition to, attitude toward pharmaceutical companies were found to have significant role in predicting physicians' interactions with MRs (Adj. R^2 = 0.208). Also findings obtained from regression model of this study suggested that, physicians' belief in the appropriateness of their acceptance of promotional items, interactions with MRs, receiver of low value promotional items and company-direct information sources have a role in predicting physicians' prescribing decisions (Adj. R^2 = 0.422). Physicians had mixed attitudes toward the informational services provided by MRs. The majority of physicians appeared to believe that most promotional techniques do not pose major ethical problems. This study clarifies the role of pharmaceutical companies in influencing prescribing decisions, and explores a variety range of related-factors that affects physicians' decision-making process.

CHAPTER 1

GENERAL INTRODUCTION

1.1 Background

Over the past two decades, interactions between physicians and the representatives of pharmaceutical companies have received increased scrutiny both within the medical field and among the public, as they create conflicts of interest which pose the risk of biasing physicians' decisions in prescribing medications (Zipkin and Steinman, 2005; Raad and Appelbaum, 2012). According to Gagnon and Lexchin (2008), pharmaceutical companies in the United States spent almost $57.5 billion on promotions, which amounts to approximately $61,000 per physician. Interactions between drug companies and physicians are pervasive and these interactions begin in medical school, continue throughout physicians' residency training, and persist throughout a physician's career (Blumenthal, 2004). These relationships take the form of advertisements, printed materials, contacts made by medical representative (MRs), gifts, samples, non-educational gifts (i.e., pens, mugs), educational materials such as textbooks, journals and reprints of industry publications, social events which may include meals and funding for travel or lodging to attend educational symposia, the sponsorship of physicians' Continuing Medical Education (CME), honoraria, research funding, and even direct employment (Orlowski and Wateska, 1992; Wazana, 2000; Austad et al., 2011). One significant consequence of such relationships has been that they often result in a conflict of interests between a physician's duties to their patient on the one hand and the pharmaceutical industry's interest in maximising the sale of its products on the other, which may contribute to the over prescribing of medications and additional negative effects on patient health and the economy.

Marketing is a common activity in business. The definition of marketing differs based on the opinions of the researcher. The most recent definition for marketing, released by the American Marketing Association (2008), includes the role marketing plays within society at large, and defines marketing as a science, an educational process and a philosophy—not just as a management system. “Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large” (Gundlach and Wilkie, 2009).

Pharmaceutical marketing is the business of advertising or otherwise promoting the sale of drugs. The World Health Organization (WHO) defines pharmaceutical promotion as “all information and persuasive activities by manufacturers and distributors, the effect of which is to induce the prescription, supply, purchase and/ or use of medicinal drugs” (Norris et al., 2005). In this regard, the WHO and several NGOs are concerned with the unethical and inappropriate approach to the promotion of pharmaceutical products. At the 1997 roundtable on the WHO’s Ethical Criteria for Medicinal Drug Promotion, for instance, there was firm agreement among participants that the inappropriate promotion of medicinal drugs remained a problem both in developing and developed countries (World Health Organization, 1988). Apart from the concern over unethical and inappropriate drug promotion techniques, there has also been increasing concern over the irrational, inappropriate and, at times, harmful prescribing practices of physicians (Carthy et al., 2000).

The WHO’s code which governs the promotion of drugs unfortunately has not yet been implemented by most member countries; Yemen is one of them; as such, it has had a minimal impact on global standards of drug promotion. The

International Federation of Pharmaceutical Manufacturers' code, compliance with which is essentially voluntary, has been proven to be ineffective (Joel Lexchin, 1995). As a result of such concerns, the efforts of pharmaceutical companies to promote prescription drugs have attracted the attention of policymakers, because such activities may affect the rate at which different drugs are prescribed and consumed, the total amount spent on health care and, ultimately, health outcomes.

1.2 Country profile and pharmaceutical sector background

Yemen is a medium size country with an area of 527,968 sq km. The country is situated in Middle East in the Southwest corner of the Arabian Peninsula, bordering the Arabian Sea, Gulf of Aden to the South, and Red Sea to the West, between Oman to the East, and Saudi Arabia to the North. The population of Yemen was estimated at 23,833000 in 2011. About 32% of total population are living in urban areas (MoPHP, 2011).

Yemen is a low-income country, with a per capita Gross Domestic Product (GDP) of $926. The main natural resources of Yemen are petroleum, fish, rock salt, marble; small deposits of coal, gold, lead, nickel, and copper; fertile soil in West. Petroleum accounts for roughly 25% of GDP and 70% of government revenue. However, Yemen is facing difficult long term challenges, including declining water resources and a high population growth rate (MoPHP, 2011).

Total expenditure on health as a percentage of GDP is 5.63%, while the budget of the Yemeni Ministry of Health, as a percentage of the government's budget, is 3.58%; out-of-pocket expenditures on health-related services as a percentage of total health expenditures are 66.33% (MoPHP, 2011). Public health services are not free; the patient is expected to pay a prescription fee, the ex-store

cost of the medicines plus 10% and the cost of any required diagnostic tests (Al-qubati and Ahmed, 2007)

In Yemen, as in many other developing countries, public and private health services are primarily available in major cities. The annual statistical health report (2010) of the Ministry of Public Health & Population (MoPHP) shows a total of 3,092 private pharmacies and a total of 5,974 physicians, including dentists (MoPHP, 2010).

The Yemeni pharmaceutical market is an open market overseen by the Supreme Board of Drug and Medical Appliances (SBDMA). In the last decade, the drug manufacturing industry in Yemen has experienced rapid growth; in 1990, there was one local pharmaceutical manufacturer, whereas there are currently nine manufacturers operating in the country. Local manufacturers account for only a small portion of the total market (6.85% in 2006 and 10.8% in 2010); medicines imported via private sector agents cover most of the country's needs (approximately 85%). The number of registered medicines has reached 12,596 (Al-Hamdi et al., 2012). The Yemeni pharmaceutical market was estimated to be worth $297 million total as of 2010, compared with a $70 million estimate as of 2000 (a compounded annual growth rate of 17.42%) (SBDMA, 2010)

1.3 Problem statement

The prescription drug market is unique in the sense that the end user is not the person tasked with choosing the product to be purchased, since it is the physician who is responsible for selecting the correct medication for patients from among the various available options. Companies therefore seek to direct their promotional efforts toward physicians in an effort to influence their choices, thus setting as the

primary purpose of promotion to increase sales, despite any negative effect doing so might have on patient health and the economy.

In the specific context of Yemen, as has been mentioned earlier, there is significant increase in the numbers of registered drugs and as a consequence of this the competition among drug companies highly intensified. This has meant that there has been a greater need for more intensive marketing and expanded promotional activities. In this context, the contacts and relationships between the pharmaceutical industry and its representatives on the one hand and physicians on the other have been seen as a vital part of marketing and promotional activities. There are currently no national drug promotion regulations in Yemen, however, nor is there any clear mechanism by which to monitor the promotional activities of the pharmaceutical industry. Apart from the absence of any comprehensive regulations controlling drug promotion, there is also very little information regarding both the nature and extent of the interactions between pharmaceutical companies and physicians as well as the attitudes of physicians regarding such interactions. Similarly, little is known about whether these attitudes are present from an early stage or develop during the course of a physician's career through the influence of the pharmaceutical companies. As a result of this lack of information, the drug promotion practices in Yemen and their impact on the prescribing decisions of physicians continue to remain a mystery to many stakeholders in the public health sector.

Bearing in mind the above concerns, this study aims to investigate the nature and extent of the relationships between pharmaceutical companies and physicians in Yemen. In doing so, this study will focus on investigating Yemeni physicians' sources of information regarding new drugs as well as drug promotion practices and their impact on physicians' prescribing decisions in Yemen.

The objectives of this study are thus, first, to gain insight into the nature and extent of Yemeni physicians' relationships with MRs and their influence on physicians' prescribing decisions and, second, to develop models which are able to explain the potentially modifiable factors which influence physicians' prescribing decisions. In order to achieve these objectives, this study will adopt a mixed-mode methodology of quantitative and qualitative approaches.

1.4 Rationale for and importance of the study

There are a number of reasons for concern over the impact pharmaceutical companies' marketing strategies may have on a physician's prescribing decisions. These include: (Buckley, 2004)

- the fact that drug promotion is often misleading;
- the risk of disease-related fear-mongering;
- the increasing costs of drugs within the national health system; and,
- the fact that new drugs are the ones most heavily promoted, and these are the ones with the least well-understood safety profiles.

Interactions between physicians and the medical representatives (MRs) of pharmaceutical companies therefore raise a number of scientific and ethical questions.

Thus, there is a need for more research regarding the causal relationships between pharmaceutical companies and physicians' prescribing behaviours. Such a need is succinctly summarised in the WHO-sponsored review on drug promotion where Norrie and his associates (2005) found gaps in evidence regarding more high-

quality studies which establishes causal relationship between drug promotional activities and attitudes and physicians' prescribing behaviours, and they stressed for a need of qualitative studies exploring the relationships between physicians' attitude towards pharmaceutical promotions and their other characteristics. They also highlighted in their review that all the previous evidence related to drug promotional studies, are from developed countries and there is lack of such study from developing countries (Norris et al., 2005).

Gallan (2005) developed a general theoretical model of physicians' prescribing behaviour in an outpatient setting, which was based upon the factors enumerated in the literature review. According to Gallan, the body of evidence pertaining to the factors which influence physicians' prescribing of pharmaceuticals is relatively small, and more research is needed to better identify the correlation of factors and their effect on how physicians' actually prescribe pharmaceutical products.

Based on the above-mentioned scientific and ethical considerations and in the context of Yemen, it is imperative to conduct a comprehensive study which explores the potentially modifiable factors that influence both physicians' interactions with MRs and physicians' prescribing decisions, and which evaluates the possibility of using these factors to manage pharmaceutical companies' promotional techniques through the development of appropriate models.

In this regard, to the best of the researcher's knowledge no study on the impact of drug promotion practices which focused in particular on the prescribing decisions of physicians has yet been conducted in the Yemeni context. This study through mixed-methods therefore aims to investigate the impact of the nature and

extent of the relationship between pharmaceutical companies and physicians in Yemen and will attempt to develop models capable of explaining the potentially modifiable factors which influence the prescribing decisions of physicians.

1.5 Significance of the study's findings

The findings from the study conducted have several potential benefits as discussed below:

1. This study findings will help to clarify the issues pertaining to pharmaceutical promotion techniques and how these affect prescribing practices in Yemen .The findings are expected to identify the benefits to the various parties in the pharmaceutical sector in Yemen, which include policymakers, the MoPHP, the SBDMA, physicians' professional organisations, medical boards, individual physicians, health-related colleges, MRs and pharmaceutical companies.
2. This information may prove important to currently practicing physicians who interact with pharmaceutical companies. Identifying the potential influences of pharmaceutical companies' marketing techniques on their own prescribing practices will be important in order to make appropriate judgments about the information and compensation they receive from the pharmaceutical companies.
3. The findings of this study will provide much-needed information for professional physicians' organizations and medical boards as they attempt to develop and disseminate standards of care, professional guidelines and

scopes of practice, and may choose to develop guidelines which are related to physicians' interactions with pharmaceutical companies.

4. The findings of this study will provide much needed information regarding the nature and extent of MRs' marketing techniques and their relationships with physicians, and the impact these factors have on physicians' prescribing decisions. Such findings will allow policymakers in the public and private health sector in Yemen, and especially the SBDMA, to better manage and control the promotional activities of MRs and develop suitable policies and regulations pertaining to drug promotion, as well as to develop guidelines which set out what should be considered appropriate interactions between physicians and MRs, while seeking to diminish if not eliminate the apparent ethical conflicts of interest inherent to the relationship between the two sectors.

5. The findings will provide insight into and a better understanding of intern and postgraduate students' attitudes and behaviours in response to pharmaceutical promotions and the effect of physicians' interactions with the representatives of a given pharmaceutical company. This information will be important to faculty members, as medical schools will then be able to address the issue of pharmaceutical companies' influence over the curriculum, to prepare medical and postgraduate students to critically assess the information they receive from pharmaceutical sources while in training and their critical decision-making processes as they relate to prescribing medications in a clinical setting.

6. The findings of the study can make a significant contribution by identifying the factors potentially able to be modified which influence physicians' interactions with MRs and their prescribing decisions. The findings of this study will be of great importance for industry organisations as they attempt to develop effective self-regulations and local codes of conduct and encourage the pharmaceutical companies to comply with the ethical marketing practices and self-regulation thus developed.

7. This study will provide insight into those factors which influence physicians' prescribing behaviour with regard to new-to-market drugs, which is important for understanding the role of pharmaceutical marketing in influencing prescribing decisions. The findings of this study will therefore be important to all stakeholder groups as they attempt to design and evaluate those interventions aimed at pharmaceutical promotion practices and effecting behavioural change among physicians.

1.6 Objectives

The aims of this study are as follows:

1. To identify the main sources of information physicians use to obtain knowledge about new drugs.

2. To identify physicians' perceptions, beliefs and attitudes toward interactions with pharmaceutical company MRs.

3. To explore the potentially modifiable factors which influence physicians' interactions with medical representatives.

4. To explore the potentially modifiable factors which influence physicians' prescribing decisions.

5. To identify the relationship of physicians' characteristics and practice-setting factors with their perceptions about the factors influencing their prescribing decisions, beliefs, attitudes toward interaction with MRs and sources of information.

1.7 Thesis overview

Figure 1.1 shows the chapter-by-chapter content of this thesis, as well as the study phases.

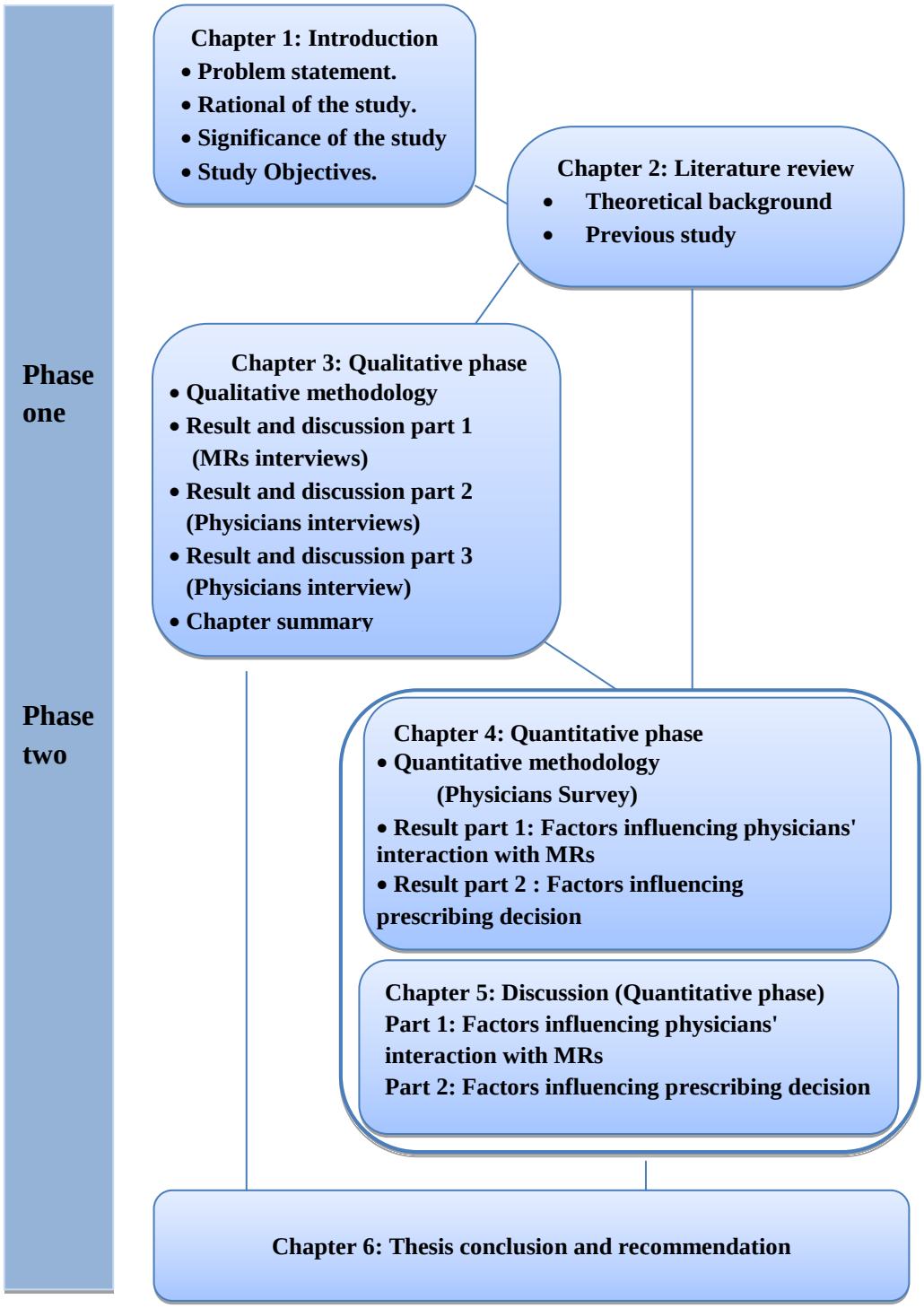

Figure 1. 1 Thesis overview flow chart

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The aims of this study are firstly to gain insight into the nature and extent of Yemeni physicians' relationships with medical representatives (MRs) and their influence on physicians' prescribing decisions and secondly to develop models which are able to explain the potentially modifiable factors which influence physicians' prescribing decisions.

The present chapter begins with an explanation of the concepts and terminology used in the research (section 2.2), with a brief general overview of the factors that influence physicians' prescribing decisions (section 2.3) followed by a comprehensive review of the different sources of drug information and the role of industry sources in drug prescribing decisions (section 2.4). An overview of drug promotion is then presented, including a comprehensive review of physicians' interactions with medical representatives and the attitudes and perceptions which result from their interactions with those medical representatives (section 2.5). After thoroughly reviewing all the factors influencing prescribing decisions, the theoretical background is explained (section 2.6). General conclusions are presented (section 2.7). Based on the theoretical models reviewed through the previous sections, the conceptual framework of this study is developed (section 2.8), research questions are presented (section 2.9) and finally the hypotheses of the research are presented (section 2.10).

2.2 Concepts and terminology

For a proper understanding of the information provided in this thesis, some of the terms and concepts are defined below.

Pharmaceutical Medical Representatives: Their job is to meet individually with physicians and promote company products, visit physicians on a regular basis, over a week or month, promote a drug's advantages and even push the physicians toward using their products (Al-Hamdi, 2012). Pharmaceutical detailing is a marketing technique used by pharmaceutical companies to educate a physician about a vendor's products in the hope that the physician will prescribe the company's products more often (Rouse, 2011).

Interns: Interns are physicians gaining supervised practical experience in hospital after graduating from medical school (Mari, 2008)

General practitioners (GPs): Those physicians who have no additional qualifications after their graduation (MBBS) are classified as 'general practitioners' (GPs) (Mari, 2008).

Residents: A resident is a physician serving a residency in which he or she obtains medical training and education. This normally follows graduation from medical school and becoming licensed to practice medicine. The resident completes his medical school training and/or an internship and goes through the process of receiving specialized training (Mari, 2008).

Physicians: Physicians are skilled health care professionals trained and licensed to practice medicine. They are also known as doctors of medicine (Mari, 2008).

Marketing: A business philosophy involving the expectation of the customer's need and recognition of his problem, and thereafter fulfilling of these with products, services and information in a profitable way (Lexicon, 1998).

Theory of planning behaviour constructs

Attitude: Personal evaluation of behaviour.

Subjective Norm: These are beliefs about whether key people approve/disapprove of the behaviour.

Perceived Behavioural Control: The belief that one has and can exercise control over performing behaviour (Fishbein and Ajzen, 1975; Ajzen, 2005).

2.3 An overview of the factors that influence physicians' prescribing decisions

Many studies have been conducted to explain the prescribing decisions of physicians and factors affecting their prescribing patterns. Various factors were mentioned in the literature which influence the prescribing decisions of physians. However, most of these studies were conducted in developed countries. One of these studies conducted in United Kigdom highlighted the importance of the pharmaceutical industry through their medical representatives in raising the awareness of new drugs and consequently affected the prescribing decision of physicians (Prosser et al., 2003). Another study in the United Kingdom also cited commercial sources of information as a factor influencing prescribing decisions (Jacoby et al., 2003). Medical representatives were an important source of information about new drugs for physicians, which were also mentioned in a study conducted by Jones et al. (2001). There are few other considerable factors which affect the prescribing decisions of physicians such as detailing, direct contacts with MRs and promotional activities directed towards medical students and trainee physicians (Naik et al., 2009). However, drug companies do not only offer information to influence prescribing decisions, but also provide samples via MRs to influence the prescribing of new drugs (Tobin et al., 2008). Also, Pitt and Nel (1988) mention that promotional tools

and sales calls by MRs can be perceived as the most influential factors. However, contradicting this, a study mentioned that direct-to-consumer advertising, visual reminders (such as pens and drug samples) and the possession of honorariums were considered as having little or no influence on prescribing decisions (Nutescu et al., 2005). The next stage of prescribing decisions is the evaluation of the drug, which involves multi-factorial influences from several sources. However, the most frequently cited influence was the medical representative (Prosser and Walley, 2003a).

Other factors influencing prescribing decisions mentioned in the literature generated in developed countries were drug attributes including efficacy, adverse drug events, safety, tolerability, cost, and the pharmacological functions of the index drugs (Freeman et al., 1993; Miren I. Jones et al., 2000; Jacoby et al., 2003; Buusman et al., 2007; Tobin et al., 2008; Theodorou et al., 2009; Tušek-Bunc et al., 2010). Other researchers include the availability of drug samples, company marketing practices, levels of risk aversion, previous clinical experience with certain drugs, the improved regimens of drugs, as well as cost or drug price (Miren I Jones et al., 2001; Jacoby et al., 2003; Klein et al., 2006; Buusman et al., 2007; Ljungberg et al., 2007). Although many physicians consider the cost of the medicine to be a secondary factor affecting their prescribing decisions and they were more reluctant to prescribe new drugs due to the effects of increased pressure of drug and fund-holding budgets (Miren I Jones et al., 2001). Therefore, the price was considered to be an important factor by GPs (Buusman et al., 2007). In compliance with that, a study from UK explored cost effectiveness as the main reason behind the maximum use of lansoprazole rather than omeprazole from the general practitioner (Miren I Jones et al., 2001). Also, many consultants reported that cost was a factor which

influenced their decision, with the exception of one respondent who stated that cost was not a factor (Miren I. Jones et al., 2000). Other factors mentioned in the literature included formulary status, the drug's efficacy and the presence of drug use restriction policies (Nutescu et al., 2005). It was also mentioned that patient characteristics were found to be important considerations when physicians prescribe medication (Ljungberg et al., 2007). Among these were patient knowledge, patient convenience and the acceptability of the new drug, along with the patient's economic level and social security (Prosser et al., 2003). Also an important character is patient expectation or a patient request for a drug (Theodorou et al., 2009; Tušek-Bunc et al., 2010). It was reported in the literature that patient demand was one of the most common reasons given by physicians for use of drugs (Schwartz et al., 1989). However, patients requests for specific drug were found to be inspired by direct-to-consumer advertisements (Naik et al., 2009).

An important factor influencing physicians' prescribing decisions in developed countries is what is known as social knowledge or peer pressure (Tušek-Bunc et al., 2010). This pressure was exerted in form of professional peers, pharmacy advisors, colleagues and/or specialists recommendation (Jacoby et al., 2003; Ljungberg et al., 2007; Tobin et al., 2008). Some researchers mentioned that recommendations made by colleagues in informal discussion are the second most important determinant in prescribing decisions (Pitt and Nel, 1988). Also, habit and peer pressure were blamed by physicians for their non-scientific prescribing (Schwartz et al., 1989). Department heads and colleagues in the same specialty were also mentioned as a factor affecting decisions about which drugs can be prescribed to patients (Kisa, 2006).

In addition to all above factors, a common factor reported in the studies conducted in developed countries was personal experience (Pitt and Nel, 1988; Schwartz et al., 1989; Nutescu et al., 2005; Prosser and Walley, 2006; Ljungberg et al., 2007). Hospital consultants and observation of hospital prescribing were cited the second most frequently (Prosser et al., 2003). Others groups included external factors such as independent written literature and health authority medical and pharmacy advisors or what they called scientific knowledge (Jacoby et al., 2003; Prosser and Walley, 2006).

When it comes to developing countries, a study conducted in Turkey revealed that, same as in developed countries, the majority of participants reported that MRs were the main information source regarding the new drugs launched onto the market (Kisa, 2006). According to another study, also conducted in Turkey, general practitioners (GPs) mentioned that their prescribing decisions were affected by their involvement in drug companies' training activities as well as frequent visits by MRs. They also stated that the pharmaceutical companies' drug guides were the most frequent sources used in case of any problems in prescribing decisions (Vancelik et al., 2007). In both Turkey and Slovenia, GPs mentioned that attitudes towards drug marketing and personal involvement in drug promotional activities were important influencing factors in prescribing decisions (Tušek-Bunc et al., 2010). Also, a recent study conducted in China by Weihui et al. (2011) systematically summarized various factors related to prescribing behaviour. According to that study, the factors that influence physicians' prescription behaviour can be classified in seven ways: the physician factor, the patient factor, the disease factor, the prescription factor, the medicine supplier factor, the medicine factor and the policy factor. The most important influences on physicians' prescribing behaviour were the physician factor,

the disease factor and the drug factor. However, the patient factor and policy factor were not included in the first ten influential factors (Weihui et al., 2011).

From a comprehensive analysis of above studies, the researcher found that both qualitative and quantitative studies addressed the issue of factors that influence physicians' prescribing decision and that each of them looked at different aspects of the question. Often, the physicians' prescribing decisions were assessed by using a self-reporting survey questionnaire or an interview in the case of qualitative studies. Some qualitative studies focused on the reasoning behind initiating drug therapy and the prescribing decisions of new drugs launched in the market. Most reviewed studies suggested that prescribing decisions were multi-factorial and were often influenced by more than one factor. A lot of evidence generated from both qualitative and quantitative studies suggesting that pharmaceutical companies influence prescribing decisions of physicians through their medical representatives in terms of raising awareness of new drugs and other drugs promotion activities.

2.4 Sources of drug information

Prescribing is a very complex process that requires an informed decision about the medicine of choice for the treatment of a particular patient. Therefore, up-to-date, high quality information is a powerful tool for making it possible for physicians for better prescribing decisions in order to offer their patients optimal healthcare. The pharmacological basis of therapeutics prescription requires a complex array of information, and clinical decision making is assumed to be based on evidence-based medicine information resources.

The physicians depend on various sources of drug information (Oshikoya et al., 2011). A wide variety of sources of drug information are included in the literature such as pharmacists, colleagues, the British national formulary (BNF), information supplied by patients, the monthly index of medical specialties (MIMS), medical journals, the internet, direct mail advertising, symposia/conferences, free samples, medical representatives, literature from pharmaceutical companies, pharmaceutical company material, drug information centres (DICS)/ drug information units (hospital-based), medical books, drugs and therapeutics bulletins, journal advertisements, physicians' desk reference, regular meetings at hospitals, domestic and international conferences, continuing medical education (CME), medical school lectures, sponsored meetings, professional contacts, national standard treatment guidelines and the extra pharmacopoeia (Strickland-Hodge and Jeqson, 1980; Peay and Peay, 1990; Verhoeven et al., 1995; Lundborg et al., 1998; McGettigan et al., 2001; Spiller and Wymer, 2001; Layton et al., 2007; Rohra et al., 2007; Tumwikirize et al., 2007; Othman et al., 2009; Lua et al., 2011; Oshikoya et al., 2011).

2.4.1 Classification of drug sources of information

Sources of information are classified in the literature into two main categories; professional sources and commercial sources and others (Eaton and Parish, 1976; Peay and Peay, 1984; Peay and Peay, 1990). Also Strickland-Hodge and Jeqson, (1980) categorized sources of information into professional and industrial, while each of these two categories were further categorized into 'active' information and 'passive' information (industry active or passive and professional active or passive). A review of 17 studies was conducted by Williams and Hensel (1991) to explain the sources, importance and use of information about drugs by physicians. They

categorized the drug source of the information into two dimensions, personal/non-personal and commercial/non-commercial. Personal variables included pharmacists, colleagues, detailing, and conferences /meetings/ conventions. Non-personal sources included journal articles, journal advertising, and direct mail. Commercial sources (i.e., marketer controlled) were defined as journal advertising, direct mail, and detailing. Non-commercial sources included journal articles, meetings, conventions, pharmacists, and colleagues.

2.4.2 Availability and access to up-to-date drug information

Sources used by doctors to find medical knowledge include textbooks, journals and electronic databases. However, doctors face the challenge of finding up-to-date information that satisfies the needs of their individual patients, and they may always be overwhelmed by the volume of information provided to them (Smith, 1996). In developing countries, medical representatives are commonly the sole source of information about drugs (Norris et al., 2005). A study in Uganda has revealed that all doctors in private, district, general and teaching hospitals were found to be deficient in terms of their access to current medical information due to problems such as having a lack of time to consult standard pharmacology textbooks and the lack of a reliable internet connection. Also, high cost is an important obstacle to accessing up-to-date information from journal publications and most recent textbooks (Tumwikirize et al., 2007). However, although physicians in developed countries have relatively better access to objective sources of information to counterbalance what the industry promotes, a Swedish survey has revealed that most GPs miss verbal information from non-commercial sources and that they perceive information

differently in terms of what they actually have and what they would like to receive (Lundborg et al., 1998).

GPs generally use the resources that are easily accessible to them in their offices. Textbooks are the most preferred means, followed by consulting with colleagues and journal articles that are available in their offices. GPs are less likely to use medical libraries because of access problems (including the amount of time involved), a lack of skill in using catalogues and databases and difficulty in applying research literature to clinical situations (Cullen, 1997). However, use of the Internet is undoubtedly increasing. A study conducted among GPs in New Zealand revealed that the Internet was ranked higher than medical libraries as a source of information (Cullen, 2002).

2.4.3 The role of commercial information sources in prescribing and the adoption of a new drug

Introduction of a new drug usually occurs proactively by means of wide drug promotion including a visit by a medical representative and direct one-on-one conversations between medical representatives and physicians. Several studies reported that the adoption of new drugs had been at the centre of physicians' interest. Anyhow, physicians favouring non-commercial drug information sources (Peay and Peay, 1990; Lundborg et al., 1998; Spiller and Wymer, 2001; Layton et al., 2007). Despite that, information from commercial sources was received more often than information from non-commercial sources (Lundborg et al., 1998). Medical representatives represented the most frequent source of information about new drugs (Strickland-Hodge and Jeqson, 1980; Rohra et al., 2007). Despite what is revealed by an Australian study (1984), that MRs were not considered to be a

reputable information source, they were still the most often quoted source of information about a new drug, and were the major source among others referred to in order to prescribe (Peay and Peay, 1984)

Several studies conducted in UK revealed that while the professional sources such as the British National Formulary (BNF), medical journals and consultant's recommendations are used more to evaluate sources about the medical value of a new drug, commercial sources such as the Monthly Index of Medical Specialities (MIMS), medical representatives, direct mail industrial material and advertisements in medical journals were more often used as source of information which was helpful for getting information about whether a medicine exists in the market (Eaton and Parish, 1976; Hibberd and Meadows, 1980; Strickland-Hodge and Jeqson, 1980). Results similar to those revealed in UK were also obtained from a study conducted in Thailand by Layton et al. (2007). However, although the medical representatives were considered as being very proficient in offering information about new drugs, information obtained from them was perceived by the physicians as likely to be biased.

Also, many studies were conducted to rate the importance of different information sources about doctors' prescribing. Some of those studies rated colleagues as the most frequent sources of information, followed by books and journals. Also, conferences came before MRs as an important information source in rural areas (Verhoeven et al., 1995). Other studies rated information from industry as having the highest importance among other sources, and among industry sources; while some mentioned MRs as the most important, others listed colleagues, reference books, MRs, promotion materials, scientific papers, journals, the internet and

products launched in drug promotion forums as possible sources of information with no wide differences in their pattern of use (Oshikoya et al., 2011).

From the above studies it could be concluded that drug promotion in general and medical representatives have a specific significant influence on increasing the tendency of doctors to prescribe new drugs. Although this influence varies in strength and can sometimes be shown to not to be significant, in general it should be considered as an important factor in shaping the physicians' prescribing behaviour for new drugs. Also it was found that, with exception of availability and access to up-to-date drug information, no major differences in commercial sources of drug information between developed and developing countries. Lack of availability of official and scientific sources of information make the physicians in developing countries more reliant on commercial sources of information.

2.5 Drug promotion

Promotion refers to used persuasion tools used by companies to increase the use or sales of their products. According to the European Pharmaceutical Market Research Association pharmaceutical market research terms and definitions, promotion is defined as "the communication with individuals, groups, or organisations to directly or indirectly influence audience members attitudes in order to accept/purchase an organisation's products/service" (Lexicon, 1998). The World Health Organization (WHO) defines pharmaceutical promotion as "all information and persuasive activities by manufacturers and distributors, the effect of which is to induce the prescription, supply, purchase and/ or use of medicinal drugs" (Norris et al., 2005).