

A QUESTION OF TRUST: MALAYSIANS'  
PERCEPTIONS OF THE FINANCIAL  
RELATIONSHIPS BETWEEN PHYSICIANS AND  
THE MEDICAL MANUFACTURING INDUSTRY

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## LIST OF ABBREVIATIONS

ACC	Acceptability
AMA	American Medical Association
AMSA	American Medical Student Association
ATD	Attitude towards Disclosure
CME	Continuous Medical Education
COI	Conflict Of Interest
EFPIA	European Federation of Pharmaceutical Industries and Associations
MBBS	Bachelor of Medicine, Bachelor of Surgery
MCCG	Malaysian Code on Corporate Governance
MMI	Medical Manufacturing Industry
MMC	Malaysian Medical Council
PD	Perceived Distrust
PNE	Perceived Negative Effects
PhAMA	Pharmaceutical Association of Malaysia
PhRMA	Pharmaceutical Research and Manufacturers of America
RM	Ringgit
SPSS	Statistical Package for the Social Sciences
USA	United States of America

## ABSTRACT

In the past few years, the relationships between physicians and the pharmaceutical and medical device industry have attracted increasing scrutiny by patients, lawmakers and the media due to increasing awareness and concerns about conflict of interest. Physicians and patients share a unique relationship in which trust plays a significant role, but both patients and physicians find it difficult to navigate this relationship more ethically. This research study aims to study the factors and their contribution in perception of trust or distrust among the patients while trying to explore the benefits of transparency and disclosure of the financial relationships by physicians on their relationship with pharmaceutical and medical device industry. Also, along with patients' perceptions, this study has shed light over the factors influencing the perceptions of under-training doctors. Although, they probably share the common interests as physicians, examining their perspective can help in better understanding and evaluating the gaps in teaching and learning methods in medical education curricula.

# **CHAPTER 1**

## **Introduction**

Health care research is necessary for understanding the social construction of current medical ideology. Its results provide more information on the benefits and consequences that come along with the practice of medicine. Patients are too often left out of the equation, because quantifying the stories, beliefs, and feelings of individuals is difficult.

Financial associations and business arrangements between physicians and the medical manufacturing industry (MMI) are common. (Hampson et al., 2006) These associations occur in various forms such as payments made to physicians in exchange for consulting, covering for travel expenses of physicians when attending educational conferences, physicians' ownership in company stocks and or dispensing free drug samples.

In order to advance medicine, many believe that time is the most critical factor. Almost all the health care related companies have a pro-business agenda, with market-driven motives emphasizing private enterprises to favour economic objectives. By illustrating the broader behaviours present in association with physicians and pharmaceutical and medical device industry (together referred to as MMI), concerns for future studies related to patients' perceptions can be emphasized.

Within the life sciences and healthcare industries, various anti-corruption and patient safety movements have gained a lot of traction throughout the world, including Malaysia and the Asia-Pacific region. Promoting ethical behaviours and avoiding conflict of interest (COI) in physician-industry interaction is cornerstone of these relationships. COI is defined by Holmes et al. (2004) as "situations whereby the secondary powers (e.g. financial gain) adversely influence physician's primary interest i.e. patient welfare." These relationships have been noted to exist

even among biomedical scientific investigators and MMI and thus are not only limited to affect physicians-patient interactions. This has lead to increasing concerns about biomedical research's biased and pro-industry conclusions. Furthermore, some have raised concerns about physicians' financial COI leading to selective reporting of results of clinical testing.

## **1.1 Research Background**

To promote transparency in physician-MMI relationships, and avoid COI, many countries and industry associations have adopted a range of laws and codes of ethics. Such regulations are proposed to enhance patient's decision-making capability and safeguard public's trust by making relationships between physicians and MMI transparent. With the provision of The Malaysian Code on Corporate Governance (MCCG), first in March 2000 and subsequent revisions in 2007, 2014 & 2017 (Securities commission Malaysia, 2017), the Malaysian corporate governance standards have improved. Ethical behaviour is one of the pillars of corporate governance. In Malaysia, the Pharmaceutical Association of Malaysia (PhAMA), while providing a Code of Marketing Practices, however, does not mandate a public disclosure of financial relationships ("PhAMA Code," 2019).

On the other hand, various physician associations around the world have raised a range of objections to these obligations, with a major worry being, that "the public will misinterpret the disclosed information, fail to distinguish compensation for research-related services from payments of a more promotional nature, and generally view these financial relationships as tainting their medical decisions" (Perry, D. Cox & A. D. Cox, 2014). Also, since public disclosure also infringes upon a physician's personal data, privacy concerns are also being tightly navigated. Since we live in an era of shared decision making, the stake holders i.e. consumers input is vital. Consumers, hereby the general public seeking health care services are chief stakeholders and their perceptions should be investigated regarding this matter. Moreover, in order to protect public's trust and the healthcare system's trustworthiness, it is critical to give due consideration to public opinion as well as to further publics' participation in health policy making.

The purpose of this study is to examine whether there is any consensus or rationale for enacting any disclosure act or law in Malaysia to increase transparency in



physician-MMI relationships. The access to this financial information is reckoned to improve informed decision-making of the healthcare consumers. To understand these assumptions better, an empirical study of healthcare consumers' perceptions of financial relationships between physicians and MMI will be designed. Apart from consumer perceptions, analysis of opinions of people on the other side of spectrum, the trainee doctors i.e. medical students & interns/housemen, will also be performed. Since medical students and interns/ housemen (together referred to as under-training doctors) are "forming early preferences and practice patterns, they may be particularly vulnerable to the effects of industry promotions" (Zipkin & Steinman, 2005). Research has shown that medical students are likely to practice the habits that they learn or acquire during their training (Bellin, McCarthy, Drevlow & Pierach, 2004). Another study by Monaghan et al. (2003) concluded that under-training doctors' training curricula must address the impact of interactions with MMI before they start their postgraduate training since their attitudes toward the MMI are formed prior to graduation. As Bellin et al. (2004) stated "Early student-pharmaceutical industry interactions establish a foundation for later pharmaceutical industry influence."

This study intends to explore the view-point of public and under-training doctors towards the physician-MMI interactions or financial relationships in terms of acceptability (ACC), perceived negative effects (PNE) and attitudes towards disclosure (ATD). By comparing the results of both groups, a holistic cost-benefit analysis of these financial relationships can be presented. The study's research approach will include reviewing published literature in order to link important concepts of the issue together, while simultaneously filling in the gaps present in the current findings. Lastly, a review of various government and industry regulations in Malaysia as well as around the world on this issue will be performed.

## **1.2 Problem Statement**

The MMI's business practices are causing as much debate as are their outlandish, ever-escalating profits. The MMI, especially the pharmaceutical industry has been monitored and criticized for its aggressive approaches to product approval, medication promotion, blocking competition and thwarting regulation. Drug

companies defend themselves by pointing out strong industry competition, the threat of generic prescriptions, and the high research costs to develop new, ground-breaking drugs.

Several important stakeholder groups play key roles in the pharmaceutical industry, for example, consumers as users, physicians as advisors and decision makers, and insurers as payers. Pharmaceutical transparency is a very rapidly evolving subject and financial relationships between physicians and pharmaceutical companies are prone to immense media scrutiny. In response to public pressures, various countries are drafting regulations that require public disclosure of all transfers of value made by the pharmaceutical companies (Grundy, Habibi, Shnier, Mayes, & Lipworth, 2018). But a lot of these regulations are considered as reactive, rather than being well thought out after appropriate public deliberation. In Malaysia, while no such regulation currently exists that requires public disclosure of transfers of value, there have been calls for bringing more transparency in the healthcare and associated industries. Disclosing the financial relationships between MMI and health care providers will help patients make better-informed decisions while choosing the health care providers. General public/healthcare consumer's opinions are important since they are the key stakeholders in the healthcare system. However, most physicians worry that whether the patients will be able to ascertain the differences between research-related remunerations from payments that are more of a promotional nature. As Hess (1956), the President of the American Medical Association stated that "If a man is good in his heart, then he is an ethical member of any group in society. If he is bad in his heart, he is an unethical member".

Ethics as such play an important role in any corporate governance model. The hallmark of a good corporate governance process is that it empowers the public to decide for themselves so that they can make the correct decisions. It's also known that being ethically right is subjective. The influences of differences in cultures determine what is right or wrong. A certain thing that is acceptable in one culture could be totally unacceptable in another. Within an industry, the corporate governance provides a compliance framework so that the integrity is maintained. Furthermore, the corporate governance encourages healthy ethical values. Thus corporate governance can be viewed as a wider global society that aims to ensure equality for all the shareholders and maintaining ethical values at the same time.

In such a scenario, this study will be of great value to any MMI that is seeking to proactively regulate their relationship with physicians and to drive a top-down corporate governance approach to compliance. Not just limited to the MMIs, corporate governance councils and compliance committees of large hospitals and physician organizations can use this study to regulate their interactions with pharmaceutical, medical device companies and their representatives.

### **1.3 Research Aim**

The aim of this research is to explore general public and under-training doctor's awareness, ACC or appropriateness, PNE and ATD of physicians-MMI relationships.

### **1.4 Research Questions**

The present study will answer the following questions with the help of various analytical tools and methods.

1. Awareness: Are public and under-training doctors aware of physicians' relationships with MMI?
2. ACC/Appropriateness:
  - 1) Do general public and under-training doctors actually care about physicians' relationships with MMI?
  - 2) Do they feel that it is appropriate for physicians to have any financial relationships with MMI?
3. Perceived effects: Do general public and under-training doctors feel that these relationships influence physicians' prescribing habits?
4. Perceived distrust (PD): Will awareness, ACC, PNE and ATD affect the level of trust/distrust towards these relationships?
5. Attitudes towards disclosure:
  - 1) If the data of financial relationships is made accessible, will they avail it to make informed-decisions on choosing their health care provider?
  - 2) Do general public/ under-training doctors want these financial relationships to be disclosed before seeking/giving treatment?

6. With regard to under-training doctors:

Under-training doctors were considered as a separate study group as they undergo different type of conditioning in the medical school compared to their peers which may or may not influence their perceptions about the financial relationships between physicians and MMI. To explore the perceptions of under-training doctors, this study was done with following questions in mind:

- 1) Are they aware of any guidelines regarding interacting with the MMI?
- 2) Will the prior exposure to MMI influence their perceptions?
- 3) Will the acquired knowledge and training during their course regarding interacting with MMI influence their perceptions?
- 4) Will the year of training of under-training doctors (student or intern/houseman) influence their perceptions?

## 1.5 Research Objectives

The key objectives of this study are:

- 1) To examine the perceptions (awareness, ACC/appropriateness, PNE, PD, attitudes towards disclosure) of general public/healthcare consumers towards physician's financial relationships with MMI.

Being the chief stakeholders in the healthcare system, the general public/healthcare consumers' opinions are of utmost importance. Moreover, their faith in healthcare system will ensure its continued efficiency. The various aspects of perceptions that would be explored include awareness, ACC/appropriateness, PNE, PD, attitudes towards disclosure and opinions regarding specific types of physician-MMI interactions. A self-administered questionnaire will be used to study their perceptions.

- 2) To examine the perceptions (awareness, ACC/appropriateness, PNE, PD, attitudes towards disclosure) of under-training doctors towards physician's financial relationships with MMI.

Research has shown that promotional activities by MMI influences the prescribing practices of the physicians. These industry promotions especially impact the

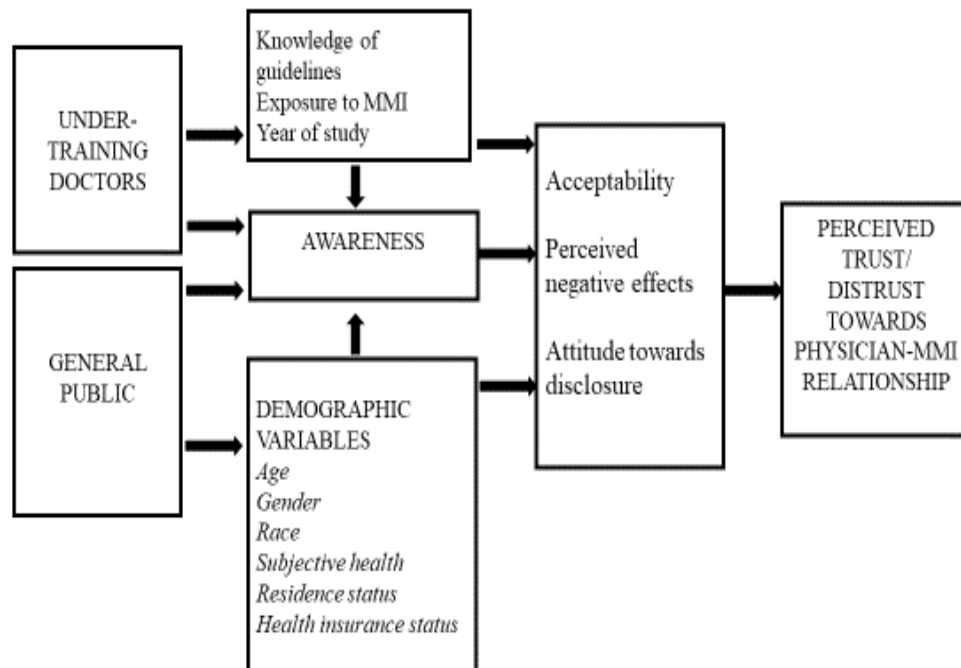
budding physicians or under-training doctors as they are in the early stage of developing prescribing practices. Their perceptions will help guide educational interventions and policy making to prevent COI. A self-administered questionnaire will be used to collect data.

3) *Comparison of perceptions of general public and under-training doctors.*

Literature review suggests that disagreement persists between these two groups with regard to perceptions towards physician's financial relationships with MMI. With the data received, a comparison of their perceptions will be made and presented.

## 1.6 Research Model

A proposed conceptual framework based on the objectives and questions of this research was created and is shown here.



## **1.7 Hypothesis of the study**

The hypotheses on each of the components of conceptual model were developed to review the public's and under-training doctors' perceptions about physician-MMI financial relationships. Hypothesis of the current study are:

### **1.7.1 Demographic factors (Public)**

- H1A:** Age will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1B:** Gender will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1C:** Race will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1D:** Subjective health will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1E:** Residence status will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1F:** Health insurance status will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1G:** Education status will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H1H:** Annual income will significantly influence the perceptions towards physicians' financial relationships with MMI.

### **1.7.2 Under-training doctors**

- H2A:** Prior exposure of under-training doctors to MMI will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H2B:** Prior knowledge and training in interacting with MMI will significantly influence the perceptions towards physicians' financial relationships with MMI.
- H2C:** The year of study of under-training doctors will significantly influence the perceptions towards physicians' financial relationships with MMI.

### **1.7.3 Public and under-training doctors**

- H3A1:** Awareness will significantly influence public's perceptions towards physicians' financial relationships with MMI.
- H3A2:** Awareness will significantly influence under-training doctors' perceptions towards physicians' financial relationships with MMI.
- H3B1:** ACC/Appropriateness will significantly influence public's PD.
- H3B2:** ACC/Appropriateness will significantly influence under-training doctors' PD.
- H3C1:** PNE will significantly influence public's perceived distrust.
- H3C2:** PNE will significantly influence under-training doctors' PD.
- H3D1:** Positive attitudes towards disclosure will significantly influence public's PD.
- H3D2:** Positive attitudes towards disclosure will significantly influence under-training doctors' PD.

## **1.8 Significance of the Study**

Malaysia currently does not have any law requiring a public disclosure of all transfers of value made by a pharmaceutical or any medical device manufacturing company to a health care provider or a health care organization. Malaysia's PhAMA, while providing a Code of Marketing Practices, does not mandate a public disclosure of financial relationships. Around the world, this issue has gained a lot of momentum with the passing of US's Sunshine law and EFPIA (European Federation of Pharmaceutical and Affiliated Associations) mandated disclosures in Europe. Even in the Asia-Pacific region, many countries like South Korea, Australia, Indonesia and Philippines have started to standardize their regulations around this issue. It is only a matter of time before this issue steam rolls into a major compliance pain point from a corporate governance and ethics point of view in Malaysia. Hence, this study will present a unique point of view for how the healthcare industry in Malaysia can tackle this issue.



## **1.9 Chapter Design**

This research project is covered in five chapters. Chapter 1 discusses the problem statement, aims and objectives of the research, research model as well as the hypotheses of the study. It also provides an outline of the basic research questions. Chapter 2 would include the review of previous literature on the research topic. It would present an in-depth analysis and assessment of relevant past studies. Efforts will be made to discern any gaps in research by investigating how the research has developed over time, as well as the status of current research in this field. Chapter 3 would outline the operation framework of current research. It will include discussion on the research methodology including questionnaire preparation, sampling methods, data collection, data processing and analysis. Chapter 4 would report the results of the current research. Finally, Chapter 5 would discuss the results with respect to their respective hypothesis as well as results of the previous studies. It would include outlining the research gaps, implications and approach suggestions for future research.

## **CHAPTER 2**

### **Literature Review**

#### **2.1 Overview**

The main aim of this chapter on literature review is to explore and analyse published literature related to interactions between physicians' with pharmaceutical companies or medical device manufacturers (referred as 'Medical manufacturing industry' or 'MMI' in the text). Both the patients as well as under-training doctors' awareness and attitude towards this topic will be explored. An effort will be made to identify any areas for further study.

#### **2.2 Physician-MMI relationships**

Most of the MMI employ numerous promotional strategies for improving sales of their prescription drugs and medical devices. These strategies are mainly intended to target physicians and consumers. Because physicians are the primary decision makers while selecting and choosing a prescription drug or a medical device, MMI usually concentrate most of their public relation efforts on physicians. These public relation tactics include visits by the MMI representatives to the doctor's office, free prescription samples, soliciting participation in research activities, print brochures, and sponsorship of medical events, among others. One of the controversial strategy that MMI employ is the study of physicians prescribing habits by gathering prescription data from the pharmacies (Greene, 2007).

Early nineties saw an upsurge in the furore over the alleged connivance between physicians and the MMI. Especially in the US, with the news spreading through the media, movies and publications, the trust of public in their physician was undermined. Concerns were raised about the ethical issues surrounding these

relationships. The increase in interactions of the MMI with under-training doctors was viewed as having an eroding effect on the medical profession (Sigworth, Nettleman, & Cohen, 2001; Zipkin & Steinman, 2005). Many authors vouched for the divulgence of the financial ties between the physicians and the MMI. However, most of the physicians themselves were not in favour of public disclosure fearing decline in the trust between patients and physicians. Most of the physicians however, agree that best medical evidence should dictate the prescribing decisions. Moreover, contrary to the public's belief, most of the physicians feel that these financial ties don't have any effect on their prescribing habits. However, the evidence suggests otherwise (Halperin, Hutchison & Barrier, 2004).

A study found that physicians' interacting with the companies' manufacturing drugs were more likely to request adding those drugs to a hospital formulary (Chren and Landefeld, 1994). Another study found that physicians having more contacts with pharmaceutical representatives are more likely to prescribe costly medications (Caudill, Rich, Johnson, & Mckinney, 1992).

Patient satisfaction is a multidimensional concept that can be used as index of healthy relationships between patients and health workers (Eveleigh et al., 2012). It also reflects patients' perceptions as well as expectations compared to the de facto care (Edlund et al., 2003). According to studies conducted by Aziz and Chong (2015) and Waljee et al., (2008), patients rating of their experiences is influenced by numerous factors such as "specific individual (met and unmet) needs, care outcomes, prior experience, and comparisons to those of fellow patients." Baker, (1997) highlighted that cultural factors and patient's mood may also influence patient satisfaction. The role of demographic features including age, gender, level of education and earnings in effecting patient satisfaction has been established (Danforth et al., 2014; Ntabaye et al., 1998).

As stated by Miller and Horowitz (2000), "Trust in physicians is generally high, although potentially vulnerable as patients learn more about their physicians' financial incentives." In a focused group survey, they explored the effect of financial disclosure on patients' trust as well as their attitudes and interest regarding knowing physicians' financial incentives. They concluded that most of the patients will disregard the financial information and may not use it simply because of lack of knowledge.

Ubel (2001) asserted that divulging physician's reimbursements to the patients is complex and challenging process. Another issue is how much of information disclosure is enough? What are the optimum ways to achieve this disclosure? And, who should disclose this information?

Hibbard, Slovic, & Jewett (1997) suggested that providing consumers with the maximum amount of information may not be the most effective way to improve informed consumer choice. For decision making, both quality and cost data should be provided. They stated that, public may not be able to process and evaluate the complex quality information which is often vague compared to cost which is straightforward.

## **2.3 Publics' perceptions**

### **2.3.1 Demographic Factors**

Various studies have noted the differences in public perceptions about physician-MMI financial relationships arising out of differences in demographic factors such as age, gender, educational status, subjective health, annual income etc. Similarly the public perceptions about their physicians' financial incentives varied among different demographic groups. These differences in perceptions include awareness, ACC, PNE as well as attitudes towards disclosure as shown in **appendix A**.

### **2.3.2 Awareness**

Generally speaking the common public is mostly unaware of these relationships. Literature review has further reiterated this finding. Blake & Early (1995) noted that the public's awareness about different types of gifts varies. In their study most of the respondents were more aware about free drug samples than a coffee maker. People with education beyond high school and those with good subjective health were more likely to be aware of gifts compared to who had lower education or those who reported poor health. With regard to specific type of physician-gifts from MMI, Jastifer and Roberts (2009) found that the patients' awareness varied from 94% to 19%, of free drug samples and golf tournament fees respectively. The general awareness about these relationships also varied according to education level and subjective health. The study by Mainous, Huesten & Rich (1995) noted that

most of the patients are unaware of the gifts for personal-use to physicians compared to the office-use gifts. Gibbons et al. (1998) found that only 54% of the surveyed population were aware of these gifts. Similarly, another study (Weinfurt et al., 2006) that examined opinions of prospective research participants on financial COI between physicians and MMI found that most of the participants were unaware of the COI and those who were aware, their awareness was influenced by news media's coverage.

In a cancer research trial, Hampson et al. (2006) found that 75% of the participants were not fully aware of the financial ties related to clinical studies. The participants included cancer patients enrolled for clinical trials and most of them were unconcerned about physician-MMI financial ties or COI. In other studies, the percentage of patients unaware of any COI between physician and drug companies was 76% (Tattersall, Dimoska, & Gan 2009), 60% (Edwads & Ballantyne, 2009), 66% (Grande, Shea & Armstrong, 2012) and 75% (Green, Masters, James, Simmons & Lehman, 2012) respectively.

A survey of the post-operative patients from US and Canada with regard to the surgeons' ties with medical device manufacturers found the awareness to be 54% and 35% respectively (Camp et al., 2013). Higher education was associated with increased awareness as well increased disapproval to the surgeons' receiving gifts of value more than \$100 from the MMI. Another survey of pre-operative patients who were enrolled for joint replacement surgery, revealed that only 47% knew about COI involving the surgeon and the implant manufacturer (Lieberman, Pensak, Kelleher, Leger & Polkowski, 2013).

In Canada, a study found only 34% of the public were aware of COI regarding physician-MMI ties. However, most of the respondents were females, older age groups, and those with higher annual incomes (Holbrook et al., 2013). However, a study in Turkey (Semin, Güldal, Özçakar & Mevsim, 2006) noticed that close to 83% of the participants were aware of the promotional activities by the drug companies including giving gifts to the physicians. Generally however mostly the public is not aware and some feel surprised to know about these relationships.

### **2.3.3 Acceptability/Appropriateness**

Many studies have been conducted to examine the acceptance or appropriateness of the financial relations between physicians and MMI.

In a telephonic survey in the USA, Mainous et al. (1995) assessed perceptions of the patient's towards professional appropriateness of physician acceptance of gifts and its potential impact on their health care. Higher-educated patients viewed personal gifts to physicians as detrimental to cost as well as quality of the health care. An interesting finding of their study was that the patients who had received free medication samples had a more negative view of personal gifts than those who had not received medication samples. However, this study did not examine attitudes about other types of financial ties such as company-sponsored social activities at medical conferences etc.

Another study in USA, by Blake and Early (1995) surveyed 486 patients and accompanying adults at family practice centres. They used self-administered questionnaire to study patients' perceptions of gifts to physicians from the MMI. The participants were informed about the various physician-MMI relationships by the authors. They found that 70% of the subjects considered that physicians were influenced by these gifts. Older subjects were more critical of these gifts compared to their younger counterparts. Rates of disapproval were consistently higher for men than women.

In US, La Puma et al. (1995) compared the patient's and doctor's attitudes about financial disclosure as a component of informed consent during post-marketing research of a newly approved drug, using self-administered questionnaires. Compared to 36% doctors, most of the patients (56%) felt that the fee paid to physician for enrolling patients for the research was unacceptable. Most doctors and patients agreed that some physicians might be lured to enrol patients just for the fee. Gibbons et al. (1998) in a survey comparing patients and their physicians' attitudes toward MMI gifts found that the patients who felt that their doctor did not accept gifts felt gifts less appropriate than patients who felt their own doctor accepted gifts. Similar findings of patients' disapproval of physician-MMI financial ties were noted in studies in Turkey (Semin et al., 2006), USA (Goff, Mazor, Meterko, Dodd & Sabin, 2008; Jastifer & Roberts, 2009) and Australia (Edwards & Ballantyne, 2009; Tattersall et al., 2009). Research findings suggest that inexpensive and

patient-use gifts are seen by public as more appropriate compared to expensive and personal-use gifts. Interestingly, in a survey in Pakistan (Qidwai, Qureshi, Ali & Alam, 2003), most respondents agreed that accepting gifts by physician as ethical as they considered “doctor is next to God.”

#### **2.3.4 Perceived negative effects**

The patients do generally believe that the monetary relationships between physicians and the MMI affect prescribing and eventually the cost of treatment. The survey by Blake and Early (1995) found that 64.0% of the patients believed that gifts increase the cost of medications. In the same study 70% of the respondents believed that physician’s prescribing habits do get influenced by these gifts. Similarly, the telephonic survey by Mainous et al. (1995) found that patients usually view the acceptance of personal gifts that has no patient-benefit by physicians as inducing a pernicious effect on the cost and quality of the health care.

In the study by Gibbons et al. (1998) comparing perceptions of physicians and patients, most of the patients who thought that the gifts were inappropriate believed that the gifts affect the physicians’ prescribing. Overall the patients were less permissive of the gifts compared to the physicians. The survey by Jastifer and Roberts (2009) found that 42% of patients think that physician’s prescribing of medications was influenced by gifts from the MMI and 67.3% believed that it increased medication costs.

Research has shown that people with higher education are less permissive of the physician’s financial conflicts (Blake & Early, 1995; Kao, Zaslavsky, Green, Koplan & Cleary, 2001; Gallagher, St. Peter, Chesney & Lo, 2001; Jastifer & Roberts, 2009; Mainous et al., 1995; Pereira & Pearson, 2001; Semin et al., 2006). Interestingly, a survey of patients enrolled in cancer-research trials noted that majority of them were not worried about physicians’ financial ties (Hampson et al., 2006). Similarly, a survey of patients in Orthopaedic spine surgery clinic noted that most of the patients would want the physicians to work with industry and get compensated for their role (Khan et al., 2007). In fact, in another study the respondents believed that the financial relationships would make the physician work better for patients care (Weinfurt et al., 2006).

### **2.3.5 Attitudes towards Disclosure**

With rapid development of information and technology and ease of dissemination of information, as well as changes in social climate, patients' expectations have soared. This has been aided by improvement in patients' general awareness as well as improved living standards, thus expecting quality care. Literature reveals mixed results as far as the patients' perceptions about the disclosure of financial ties are concerned. Most of the studies however show that patients want to know the financial COI.

Finkel (1991) studied the perceptions of the subjects who were recruited for a clinical trial. The subjects were divulged the financial process involved in the trial and were then asked about their thoughts. The author noticed that the subjects were more worried about betterment of their condition and least bothered about the financial processes. The authors suggested against providing financial information to patients undergoing clinical trials as this information was of little significance. However, the data included 16 subjects which is too small to reach a meaningful conclusion.

Many other studies however highlighted the public's desire for disclosure. (Hampson et al., 2006; La Puma et al., 1995; S.Y. Kim, Millard, Nisbet, Cox & Caine, 2004; Tattersall et al., 2009; Weinfurt et al., 2006) In an online poll conducted by the British Medical Journal on its website (bmj.com), 96% of the participants stated that "they would like to have all the financial relationships between doctors and drug companies conducted with transparent contracts that are disclosed to patients" (Eaton, 2003).

Kao et al., (2001) noticed that most of people are not interested in knowing how their physicians are being paid. They studied 2086 patient's awareness and perceptions regarding the physician reimbursements using telephonic interview. Only 11% of the patients were aware of capitation as a physician payment method. Hampson et al. (2006) interviewed 253 cancer patients enrolled in trials. Questions were asked encompassing the following six domains: "awareness of and concern about conflicts of interest, the effect of financial conflicts of interest on study participation, attitudes about policies and practices regarding research conflicts of interest, attitudes about disclosure of conflicts of interest, trust, and sociodemographic and medical characteristics." Interestingly, 80% of the subjects



were not at all worried about the financial conflicts. Most of them were permissive of the financial ties between researchers or cancer centres and the MMI. This study included serious patients, so a point could be made that they were more concerned/worried about their betterment rather than their physician's financial ties.

The next question that arises is about the type of disclosure. Various studies have noted a variety of disclosure types preferred by public including pamphlets or displaying it in physicians office (Tattersall et al., 2009), verbal discussions during consultations (Oakes, Whitham, Spaulding, Zentner & Beccard, 2015), online database (Perry et al., 2014), as well as accredited identification systems (Edwards & Ballantyne, 2009). Overall, a written document stating the disclosure has been noted to be the most preferred method (Fadalallah et al., 2016).

### **2.3.6 Perceived Trust/ Distrust**

According to Calnan and Rowe (2008) "Trust is particularly important in the context of healthcare because it is a means of bridging the vulnerability, uncertainty and unpredictability inherent to the provision of healthcare." According to Tucker, Wong, Nie & Kleinman (2016), "a more earned and conditional or critical trust is an appropriate basis for the doctor-patient relationship." Improved patient trust in his physician has been associated with better health care outcomes (Lee and Lin, 2009). Generally, the perceptions of COI lowers patients' trust levels in the physicians and health care system. To maintain and nurture trust is the utmost goal of health profession as loss of trust results in poor patient satisfaction and reduced compliance towards treatment recommendations. Thus, to build up this trust, disclosure of all interactions between physicians and MMI is being recommended. A study investigated general public's awareness and attitudes towards promotional activities by pharmaceutical industry in Australia (Edwards & Ballantyne, 2009). One of the findings of the study was that participants who viewed promotional activities as less trustworthy preferred those physicians who had no financial ties to the industry. Grande et al. (2011) studied the influence of perceptions of physician-MMI financial relationships and its affect on physician trust. They noted that the participants who believed that physicians accept gifts had low physician trust.

Another study in South Africa reiterated that accepting gifts by physicians from the MMI undermined patients trust. (Wise& Rodseth, 2013) According to study by Fisher, DiPaola, Noonan, Bailey & Dvorak (2012), public trust in North America is positively inclined towards surgeons and physicians involvement in research sponsored by pharmaceutical industry that can be beneficial to patients. The study also stressed on the need for the regulations on the financial interests of the doctors participating in the research. Also, it was noted that the majority of these respondents do not trust government or pharmaceutical industry alone regarding the regulations relating to COI between physicians and pharmaceutical industry. More than 70% of the respondents felt that the COI regulation should include all the stakeholders.

In a study by Perry et al. (2014) to examine the public's perceptions of various types of payments made by MMIs to physicians, the authors noted that the physicians who did not accept any payments were considered most trustworthy compared to physicians who did.

To specifically understand the effect of the gifts receiving by physicians from pharmaceutical industry on public trust, a survey of patients in outpatient clinics was conducted by Green et al. (2012) in USA. It was noted that most of the respondents were unaware about the existence of any interactions between the patients and pharmaceutical industry. Also majority of them wanted to know about the existence and the extent of the relationship, whether their physicians accepted any gifts more than \$100 of value. The study concluded that acceptance of gifts from the pharmaceutical industry significantly undermines patient's trust and intent to adhere to the medical advice.

The concept of "Informed Consent" where by the physicians make optimum clinical decisions has been broadened to include patients' decision in choosing the best treatment for them. There should be no patient coercion to choose a particular treatment. As stated by Edwards & Ballantyne (2009), "Pharmaceutical promotional activities may threaten informed consent because the full extent of the relationship between pharmaceutical manufacturers and doctors will probably be opaque to patients. Some patients may be unaware of the level of influence industry has on the treatment they are receiving and as such they would be consenting on the basis of incomplete information or erroneous assumptions." Furthermore, some studies have shown that often the physicians usually don't involve patients fully in

decision-making process especially during the informed consent (Braddock et al., 1999; Tay, 2005). In Malaysia, the MMC guidelines for consent of treatment does not include disclosure of physician-MMI relationships (“Malaysia Medical Council,” n.d).

## **2.4 Under-training doctors’ perceptions**

Some studies have tried to explore the differences in the perceptions of physicians and patients as both are the important stakeholders in the healthcare industry. Notably, none of the study has been conducted in Malaysia.

It has been noted that physicians themselves are hesitant to admit that the interactions with industry (gifts) may alter their prescribing, but at the same time they feel that these interactions may affect their colleagues’ prescribing habits (Sierles et al., 2005; Steinman, Shlipak & McPhee 2001; Wazana, 2000). However, in a recent study by Lieb and Scheurich (2014), 42% of the doctors agreed that their prescribing may be affected by pharmaceutical sales representatives’ visits.

Some physicians consider free medical samples and continuing medical education as the ethically acceptable gifts (De Ferrari, Gentile, Davalos, Huayanay & Malaga, 2014). However, Lieb & Scheurich (2014) found that accepting MMI sponsored CME influenced prescribing patterns. Besides CME, they found that acceptance of even office stationery and the belief that MMI representative provide adequate information, influenced prescribing habits. As noted by Lahey (2014), the free drug samples delivers a short-term economic benefit, however the hidden agenda is to promote new and expensive drugs. He explicitly stated, “Each physician or physician practice must contemplate whether these samples are educational gifts or manipulative bribes or both?” Evidence suggests that provision of free drug samples influences physicians prescribing decisions as shown by a number of studies. (Adair & Holmgren, 2005; Boltri, Gordon & Vogel 2002; Cole, Kesselheim & Kesselheim, 2012)

These studies have found that with availability of free drug samples the physicians tend to prescribe the heavy advertised and expensive drugs resulting in increased treatment costs. Another concern with free-drug samples is that they are misused and resold for financial gains.

The medical students' attitudes towards MMI interactions are comparable to that of the physicians. As they course through their clinical postings and internships that are overseen by physicians, the medical students observe and get influenced by physicians conduct. As reported by Sierles et al. (2005), 93.2% of the students in their study reported being asked or required by a physician to attend at least one drug-company sponsored lunch.

A survey of faculty and residents of internal medicine about their perceptions of the advantages vs ethical impropriety arising out of interactions with MMI representatives, found that residents were more worrisome of the potential influence on the prescribing by such interactions (Mckinney et al., 1990).

Stressing the need for written regularity policies regarding interactions of under-training doctors with industry, Brotzman & Mark (1993) found that the residents training in departments with written regulatory policies in place found gifts less appropriate than their peers who were training in departments without such policies. Keim, Sanders, Witzke, Dyne & Fulginiti (1993) reiterated the need for further training of under-training doctors in bioethics. In their survey, the authors noted that most of the residents perceived accepting gifts from MMI as appropriate, however fewer than half of them felt that they are influenced by such gifts. Similarly, another survey to assess Emergency Medicine residents' beliefs and attitudes concerning interactions with MMI representatives found that almost half of the residents were unaware of any guidelines regarding these interactions (Reeder, Dougherty & White, 1993). As a result 80% of the residents believed that these interactions were beneficial and only 20% felt that these interactions could influence their prescribing habits. Another survey of the psychiatry under-trainees' attitude towards interactions with MMI noted that almost half of the respondents felt that these interactions did not affect their prescribing habits (Hodges, 1995). Interestingly, the more money and promotional items the trainee had received, the more likely they were of the view that these interactions did not affect prescribing. A study by Soyk, Pfefferkorn, McBride & Rieselbach (2010) amongst the medical students at University of Wisconsin noted that "most student-MMI interactions took place at locations remote from the main campus, with free lunches (70.2%), snacks (66.9%), and small, non-educational items (55.8%) representing the most common gifts." Of those surveyed, 78% students felt they had received very non-specific instructions from their institution regarding interacting with MMI representatives.

It was also noted that pre-clinical students compared to the clinical students were more hesitant of using educational resources as well as accepting gifts from the MMI. Another study found change in attitude of medical students towards physician-MMI interactions during their training period (Austad et al., 2013). The authors noted that as the training progressed the students became less averse to these interactions and there was decline in the belief that these interactions affect prescribing or reduce public's trust. Equivocal perceptions of medical students towards MMI interactions have been noted in studies in Norway (Lea, Spigset & Slørdal, 2010), France (Montastruc et al., 2014) and Greece (Filippiadou et al., 2017).

#### **2.4.1 Effect of educational interventions on perceptions**

Hopper, Speece & Musial (1997) studied the effect of an educational intervention on resident attitudes about interactions with MMI. They found that residents who attended lectures and discussions on ethics of promotional activities by MMI were more concerned of the promotional activities and their effect on prescribing compared to residents who did not attend. Steinman et al. (2001) stressed the need for education and policy programs to help under-training doctors to learn to critically appraise gifts from the MMI. They found that most of the residents determined the appropriateness of the gifts based on their cost rather than the educational value. Also, 61% of the residents did not believe that these gifts could actually influence their own prescribing habits. Wilkes & Hoffman (2002) used a one hour seminar during small-group teachings to examine the changes in attitudes of students toward MMI sponsorship of research, physician-MMI interactions and drug advertisements as educational tools. The students' perceptions changed after their participation in the educational programme. Most of the students who originally perceived these issues acceptable, were unsure after the educational intervention.

Similar results of positive effects of educational intervention on residents' perceptions were noted by a study amongst family medicine residents to inform them of effects of pharmaceutical marketing (Agrawal, Saluja & Kaczorowski, 2004). The residents after the intervention had more cautious attitudes, thought of

MMI marketing strategies as less ethically appropriate and less valuable to patients and reported less intention to use them in the future.

Wofford and Ohl (2005) examined the effect of an educational intervention on knowledge and attitudes in third year medical students regarding interactions with MMI representatives. Most of the students were unaware of the guidelines regarding the interactions and considered the interactions of educational value at par with that of practising physicians. After the intervention, 62.1% of the students felt these interactions influence prescribing compared to 44.2% before the educational intervention. However, their perceptions of the degree of bias of MMI-representative information also decreased from 84.1% to 72.9%. Similarly in Finland, a survey of medical students found that students considered MMI as a vital source of drug-related information (Vainiomaki, Helve & Vuorenkoski, 2004). This changed after a law was enacted that restricted the promotion of prescription medicines to medical students. A follow-up survey in 2008 noted that this legislative reform reduced student-MMI contact as well as reduced the importance of MMI promotion as a source of drug-related information (Vuorenkoski et al., 2008).

The educational interventions without a consistent institutional policy have been noted to have limited effect on the under-training doctors' perceptions (Schneider, Arora, Kasza, Van Harrison & Humphrey, 2006). However the presence of guidelines does not guarantee conformity, as suggested by few studies. (Austad et al., 2013; Brett, Burr & Moloo, 2003; Sergeant, Hodgetts, Godwin, Walker, & McHenry, 1996) Moreover studies have shown that under-training doctors are not aware of the guidelines. Chakrabarti, Fleisher & Staley (2002) surveyed psychiatry residents in Canada and found that 75% of them were unaware of any guidelines regarding interactions with MMI. Also, most of them were unaware of any structured teachings with regard to COI resulting from these interactions. Sierles et al. (2005) found that 704 out of 822 medical students who were surveyed were unaware of any guidelines regarding interaction with MMI. Moreover, most of them believed that they were entitled for the gifts and these gifts did not affect their prescribing. On the contrary, a study of Harvard Medical School noted that many students were skeptical of MMI participation in their education and considered the MMI gifts to be inappropriate (Hyman, Hochman, Shaw & Steinman, 2007).

Other authors have highlighted the vulnerability of medical students to fall for MMI practises (Sarikaya, Civaner & Vatansever, 2009), the need for clear ethical guidelines at medical schools (Siddiqui et al., 2014) and early educational interventions during pre-clinical years (Fein, Vermillion & Uijtdehaage, 2007; Monaghan et al., 2003).

## **2.5 The Malaysian situation and the World**

In Malaysia, the PhAMA has drawn up and adopted a code (“PhAMA Code,” 2019) to maintain high standards of conduct in the marketing of pharmaceutical products. This PhAMA Code, also called as the PhAMA Code of Pharmaceutical Marketing Practices was drafted in 1978 and has been constantly updated since then. The code envisages fairness and honesty while providing product information as well as professional behaviour by the members, while marketing the products so that judicious prescribing decisions could be made. With regard to interactions with the healthcare providers, the code states that “No financial benefit or benefit-in-kind (including grants, sponsorships, gifts, scholarships, subsidies, support, consulting contracts or educational or practice related items) may be provided or offered to a healthcare professional in exchange for prescribing, recommending, purchasing, supplying or administering products or for a commitment to continue to do so. Nothing may be offered or provided in a manner or on conditions that would have an inappropriate influence on a healthcare professional's prescribing practices.” Furthermore, it states “Any financial support of medical societies, hospitals and clinics’ social event e.g. annual general meeting, annual dinner, family day, sports day, etc. in the form of donation and/or gifts are not allowed.”

The code allows for product related or general utility promotional aids valued up to RM100. Small gifts like cakes, cookies and mandarin oranges valued up to RM 100 are permitted twice a year. The Malaysian Medical Council [MMC] (Malaysian Medical Council, n.d.) also forbids improper endorsing of drugs or appliances. The MMC states that “A practitioner's motivation may be regarded as improper if he has prescribed a drug or appliance purely for his financial benefit or if he has prescribed a product manufactured or marketed by an organisation from which he has accepted an improper inducement.” Furthermore, it reiterates that physicians

should disclose any financial interest in any facility to the patient. The American Medical Association (AMA) (“Physician Financial transparency,” 2010) and the Pharmaceutical Manufacturers of America (PhRMA) (“PhRMA Code,” 2017) allow gifts of benefit to education of patients and of value up to \$100 or less.

Brennan et al. (2006) proposed stringent measures to avoid the financial conflict of interest that included stopping the practices of small gifts, medicine samples, as well as any industry sponsored educational ventures. Similar views were echoed by some other authors (Goldbloom, 1981; WS Sandberg, Carlos, Sandberg & Roizen, 1997) as well as American Medical Student Association (AMSA) (American Medical Student Association, n.d.). The argument put forward by the opponents of gifts is that, even small gifts may induce the expectations of reciprocity in the receiver, thus affecting his or her objectivity (Brennan et al., 2006). Thus some institutions have completely banned the acceptance of any gifts including CME sponsorships from MMI. (Fugh-Berman and Batt, 2006).

Even the free drug samples provided by the pharmaceutical industry have been demonstrated to be a marketing tool as the wealthy or already insured are more likely to receive them compared to the poor and uninsured (Chimonas & Kassirer, 2009; Cutrona et al., 2008). Furthermore, a study found that patients receiving free drug samples were less adherent to the medication compared to those starting the same drug with a prescription (Alexander Zhang & Basu, 2008). The counter-argument by the pharmaceutical industry is that the free drug samples “provides patients and physicians a ready access to new treatment options” (Hartung et al., 2010). The Yale University School of Medicine, USA advises cautious use of free drug samples for patients and prohibits its use by physicians or their family members. (Coleman, Kazdin, Miller, Morrow & Udelsman, 2006). Similar restrictions on accepting and distributing drug samples have been applied at some local clinics in USA. However, the intended results of this practice in terms of reduction in branded drug use, were modest at best (Hartung et al., 2010).

The PhAMA code (“PhAMA Code,” 2019) considers it appropriate for a pharmaceutical company to provide financial support by for the purpose of continuing medical education. The code does not have a legal binding and the maximum penance against any non-conformer member company is the sanction of adverse publicity. Moreover there are no guidelines for medical students-drug company interactions like the one by AMSA. In US and some other countries, the



medical ethics and bodies of law mandate the disclosure of any financial conflicts of interest (Hall, Kidd & Dugan, 2000).

Besides USA, studies to assess physicians' perceptions towards MMI have been conducted in Canada (Strang et al., 1996), Germany (Lieb & Brandtönes 2010; Lieb & Scheurich, 2014), Turkey (Güldal & Semin, 2000; Vancelik, Beyhun, Acemoglu & Calikoglu, 2007), Greece (Tsiantou et al., 2013), Greece & Cyprus (Theodorou et al., 2009), Peru (De Ferrari et al., 2014), Yemen (Al-Areefi & Hassali, 2013; Al-Hamdi, Hassali & Ibrahim, 2012) as well as in Asia in India (Roy, Madhiwalla & Pai, 2007), Japan (Saito, Mukohara & Bito, 2007) and Malaysia (Masood, Hassali, Ibrahim & Shafie, 2015). No study so far has been done in Malaysia to explore patients' perceptions of effects of physician's interactions with the MMI.

According to Academy of Medicine of Malaysia (AMM) (Academy of Medicine of Malaysia, n.d.), "professional ethics encompasses the personal, organisational and corporate standards of behaviour expected of professionals in medical practice. The ethical obligation of a doctor includes respect of the rights of patients, colleagues and other health professionals. This obligation will extend to safeguarding patient confidence and privacy within the constraints of the law." It is acknowledged that medical profession can be influenced by the business practices of the MMI. Thus, it is increasingly being stressed that the medical decisions should be based on clinical evidence and should not be influenced by MMI recommendations.

The Malaysian Medical Council issues directives and guidelines to maintain high standards of ethical conduct while practicing medicine. The guideline explicitly state that the clinical decisions regarding patient health care should be based on clinical evidence without any influence of MMI. However these guidelines are voluntary and not mandated by law. The guidelines do not encompass the disclosure of these relationships.

## **CHAPTER 3**

### **Research Method**

#### **3.1 Overview of Research Method**

This chapter will integrate all the key concepts like research questions, the framework, hypothesis, objectives and approaches to derive the most suitable methodology to address the aim of the research in the most logical and a meaningful manner (Bolt, 2014). According to Kerlinger and Lee (2000), research is a “systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena.” Thus with the systematic use of various research methods, an attempt is made to use all the available known resources to find the answer to the “unknown”.

According to Woody (1927), research basically comprises of “critical thinking behaviour that further includes defining and redefining problems, formulating a hypothesis, collecting, organizing and analysing data; studying results and reaching conclusions and lastly, carefully testing and re-testing the conclusions to determine whether they fit the formulating hypothesis.” Steiner and Stephenson (1930) defined research as “the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.”

The literature review undertaken in the previous chapter has presented a detailed and in-depth evaluation of the previous research in the field of interactions between medical manufacturing industry and physicians. The examination of the literature has, thus, ignited some major debates and critical issues in the literature, which indicate some particular knowledge gaps in respect of the research topic and

demand further, detailed research especially with respect to Malaysia, where no such study has been undertaken so far.

Also, a brief review of the current policies in Malaysia' Code of Marketing Practices which are being enforced by Malaysia's research-based pharmaceutical industry association has been done. In addition to this, an attempt has been made to provide the perspective regarding ethical behaviour as against the standards mentioned in MCCG as well as the guidelines for practising physicians to deal with MMI, as given by MMC and other regulatory bodies.

### **3.2 Research Approach**

According to Saunders, Lewis & Thornhill (2009), with regard to determining the research approach, one needs to choose any of the following two:

- ***Deductive approach*** comprises of having a theory and hypothesis based on literature reviews and then designing a research strategy to test the hypothesis
- ***Inductive approach*** includes analysis of collected data to develop a theory i.e. building theory.

For the purpose of this thesis, a deductive approach was used. From the hypothesis and theories, the research framework was prepared. It will be used to analyse the results after running the tests and drawing the conclusions. With regard to research strategies, they include qualitative and quantitative research. The main distinction between qualitative and quantitative research designs is about the question of scale or 'depth versus breath' (Sayer, 1992: 242).

This research will adopt quantitative research method which are considered as exploratory research. Exploratory research is referred to gather information about the interrelationships among a set of variables. Also, structured data collection procedures will be used.

### **3.3 The Sample**

A sample is defined as a group of relatively smaller number of people selected from a population for the purpose of investigation. The members involved in this process are called participants. The process of extracting a sample is called sampling. Although there is no fixed rule in sampling, the kind and type of research, aims, background and objectives of the research are taken into consideration.

#### **3.3.1 Sampling Techniques**

There are primarily two sampling techniques: the probability and the non-probability sampling technique. With the probability sampling technique, every member of the population has a known probability of being included in the sample, while under the non-probability sampling technique, every member does not have an equal chance of being selected (Lim & Ting, 2013).

Probability sampling is applied when one aims to find a strong linkage between the research populations while maintaining the objectivity of the research findings. The stronger the link, the greater is the confidence that the sample is characteristic of the population for which trends, patterns and variations are being tested (Daniel, 2011). Thus, this is the most common reason for using probability sampling in quantitative studies. The methods used in probability sampling include simple random sampling, cluster sampling and the stratified sampling method. On the other hand, the non-probability sampling technique includes convenience sampling, quota sampling, judgement sampling and snowball sampling. This technique focuses more on convenience and is thus more flexible in nature, which thus tends to introduce bias and can cause systematic errors in the research (Lohr, 2009). Also, it should be noted that convenient sampling is not always a mutually exclusive category of non-probability sampling technique, rather it is used in various other types of it. For example, one can use judgement and convenient sampling together based on the requirements of the research process and the time allotted for the research.

Under convenience sampling, researchers select individuals to be included in the sample population on the basis of how easily they are accessible. Although, this sampling technique is easiest to perform, it does not adequately represent the nature

and characteristics of entire target population thus creating room for bias and errors (Flick, 2015). On the other hand, random sampling carries an advantage as in it, every element of the population has an equal or a non-zero chance to become a part of the sample set, thus eliminating chances of a bias (Flick, 2015). The sampling technique to be used here is a mix of probability and non-probability techniques. Convenience sampling technique is basically used as a non-probability sampling tactic wherein the respondents are selected as per their convenience, proximity and accessibility (Etikan, Musa & Alkassim, 2016). This type of sampling is also known as Non-proportionate quota sampling as the sample size from each sub-group may not be proportionate to the size of the sub-group in relation to the overall the population.

### **3.3.2 Target Population**

Respondents consisted of both male and female population who may or may not be aware of the existence of the relationship between physicians and the MMI but had some exposure to healthcare industry in the past. Prospective participants were administered the questionnaire by hand, email and Google forms. Also, some questionnaires were filled up by face-to-face interviews whereby the respondents were asked to complete a questionnaire about their perceptions and experiences. The age group for the target respondents was above 18 years and below 70 years. Saunders et al. (2009) suggested that a purposeful or a judgemental sampling enables to use one's judgement to select cases that will best enable to answer one's research questions in the best possible manner to meet the research objectives. Malhotra and Peterson (2005) suggested that the sample size is the aggregate number of respondents or focus to be contemplated on the research. In present study, the demographic composition of the respondents for exploring perceptions of the general public included population from the Klang valley.

More than 700 sets of questionnaires were distributed for this research among the members of public in various parts of Klang valley. It is the most populous area in Selangor, which holds most of the population of Malaysia according to official census figures from the government of Malaysia (Department of statistics Malaysia, 2011).

### 3.3.3 Sample Size

Yamane sample calculation (Yamane, 1967) is a way to determine the sample size for a research study. It is the most ideal method to use when the only thing you know about the underlying population you are sampling from is its size. The Yamane sample size states that:

$$n = \frac{N}{1 + N * (e)^2}$$

Where  $n$  is Yamane sample size,  $N$  is underlying population size and  $e$  is determined from the confidence one seeks from the study. That is, if one wants to be 95% sure about the results of study then  $e = 0.05$ . Using this formula for a population of age group 18-70 years, the sample size comes out to be in the range of 300-350.

With regards to medical students, currently, there are 32 medical schools in the country (11 public and 21 private). At the end of 2014, there were 18,789 students in all years in Malaysian medical schools (Wong & Kadir, 2017). In the present study no distinction was made between clinical and preclinical students. Both preclinical and clinical students were considered together as medical students whereas those who have recently passed the MBBS course were labelled as intern or houseman. More than 400 sets of questionnaires were sent to medical students and interns/housemen studying or working in medical colleges and hospitals all over Malaysia through Google forms.

Both patients and under-training doctors were assured that any information and answers or opinion they would share through the questionnaires will be kept strictly confidential and will be used only for the purpose of research for understanding their perceptions of relationships between physicians and the MMI.

Gorsuch (1983) and Kline (1994) suggested sample size of at least 100 subjects to do an adequate research that can give valuable results. Therefore, the present research used a sample size of 361 for public and 215 for medical students and interns/housemen from various universities and hospitals in Malaysia.

### 3.4 Research Instrument/ Questionnaire

After reviewing various literature sources, an attempt was made to identify various factors that may influence the perceptions of the general public and under-training doctors towards the relationship between physicians and the MMI. The questions have been adopted based on existing literature and have been designed to test hypothesis that have also been derived from the research previously conducted in the field. (Blake & Early, 1995; Bodenheimer, 2000; Camp et al., 2013; Fisher et al., 2012; Green et al., 2012; Grundy et al., 2018; Jastifer & Roberts, 2009; Perry et al., 2014; Tattersall et al., 2009)

Wording was modified to add references to include both the pharmaceutical and medical device industry. The modified scale was then evaluated for internal validation after the pilot study. Due diligence was maintained to test the questionnaires during the pilot test and pre-test procedures of the research so that any anomalies could be checked and corrected.

#### 3.4.1 Questionnaire design

The questionnaire structure was designed to obtain relevant data to run the analysis. Based on literature review, the variables to be measured were identified in order to develop the questionnaire effectively. Also, attempts were made to keep the questionnaire design at a simple and basic level so as to help public members to easily understand questions. The study's purpose as well as the confidentiality information that the participation was anonymous and voluntary was clearly mentioned on survey's cover page and the e-mail invitation.

The participation in the survey involved no reimbursements. No interventions were advised or suggested. Public and under-training doctors were advised to answer questions based on their understanding and were encouraged to ask and approach the author for any queries or difficulties regarding the questionnaire. Ethics approval was obtained from the concerned department before the questionnaire was sent out to the respondents.

The questionnaire for general public included all the demographic details such as age, gender, etc. (**Appendix B**) in part I. Also in part I, dichotomous (yes/no) questions were asked to examine their awareness about the physician-MMI

relationships as well as about their exposure to healthcare. Statements to discern their perceptions regarding the physician-MMI financial relationships were presented in part II. The last part of the questionnaire included a multiple choice question regarding their preferred type/types of disclosure.

The questionnaire for under-training doctors included basic demographic information about age, gender, year of study of MBBS and other information. (**Appendix C**). Dichotomous (yes/no) questions were asked regarding awareness of prevalence of Physician & MMI gift relationships, awareness of any guidelines regarding acceptance of gifts from the MMI as well as any training they received to make informed choices about participation in MMI marketing during their course. These questions were followed by statements to find out their perceptions regarding the physician-MMI financial relationships in part II. Similar to the public's questionnaire, the last part of the questionnaire included a multiple choice question regarding their preferred type/types of disclosure. Thus, the part II of the questionnaire was similar for both public and under-training doctors.

All the respondents were requested to not to focus on their role but answer questions more holistically keeping their entire experience (including non-pharmaceutical/healthcare industry related) in mind when answering the questions. The feedback from the under-training doctors had basically been designed to "stretch their imagination" and answer questions looking ahead 5-7 years when they will be practicing physicians.

### **3.4.2 Pilot Study**

The survey questions were refined through a pilot study carried out in a group of 30 patients for public perceptions and around 20 medical students for perceptions of under-training doctors. The respondents for this pilot test for public mostly included adults pursuing the MBA programme and lecturers from UTAR. The data for this pilot test was collected through online email. Also, a pre-test was done before the pilot test by obtaining the opinion of subject experts on various aspects of the questionnaire. The questions that were asked included:

- 1) Were the instructions in the questionnaire precise and clear?
- 2) Were the questions precise and clear?



- 3) Whether there were any problems in understanding questions or in providing answers?
- 4) Whether their own experience influenced the type of answers they will provide?
- 5) Whether there was any minimum or maximum payment amount that they considered was acceptable for the physician to receive from MMI?

After collecting the data for this pilot test and feedback from the experts, recommended amendments were done in questionnaire for the wording and sentencing of the questions. The SPSS software was used to find out the reliability of the questionnaire based on the Cronbach's alpha value and was noted to be .711 & .755 for public and under-training doctors' questionnaires respectively.

Based on the research conducted by Hair, Black, Babin, Anderson & Tatham (1998), the reliability of the questionnaire variables was assessed based on Cronbach's alpha. The Cronbach's alpha value for the various variables used in the research was more than 0.7. Gardner (1995) stated that "alpha is maximised when every item in a scale shares common variance with at least some other items in the scale." The questionnaire was designed as shown in **appendix D**, with questions designed to answer specific variables categorised into a tabulated form.

### **3.4.3 Measurement/ Likert Summated Scale**

The questionnaire were prepared in English language. Respondents were asked to choose the appropriate given options and Likert scaling points on the questionnaire that can best describe their perceptions. The questionnaires are divided into two sections that were Part I (Demographic Details and Awareness) & Part II (Perceptions).

In the Likert scale, as in the given questionnaire, normally a respondent is asked to respond to each of the statements in terms of several degrees. It usually has five degrees (but at time 3 to 7 can also be used) of agreement or disagreement which may range from strongly agree - agree - neutral - disagree - strongly disagree. Likert scale is easier to develop and is considered more reliable because respondents find easier to answer the questions. The only limitation with this scale is that the undecided or the neutral can get inclined towards agree or disagree without actually being favourable to any of these.

The online versions of these survey questionnaires were also conducted on the similar lines with the help of Google forms.

### **3.5 Data Collection**

Data collection has an important role in any research process. In any research method, mainly two different methods are applied to gather information, i.e. primary and secondary data. Primary data is one that is collected for the first time by the researcher. It is factual in nature and is usually a real time data while secondary data is the data already collected or produced by others and is mostly based on past experiences. Primary data sources include surveys, observations, experiments, questionnaires and personal interviews. On the other hand, secondary data collection sources are government publications, census, websites, books, journal articles, internal records etc.

For the present research, primary data were collected through the general survey by the form of structured questionnaires administered during personal interviews and sent out by email or other electronic means. Data were collected over a certain time period. It can be termed as cross-sectional rather than longitudinal as it were collected for one time only. The total time frame was around 10 weeks to collect the data for this research.

A total of 700 questionnaires were distributed to the public and 400 to the medical students and out of these, 362 and 214 completed questionnaires were returned to be analysed. Therefore, the response rate of the present study is 51.7% and 54.25% respectively. The data collected were used to conduct reliability tests as well as statistical analyses.

### **3.6 Data Processing and Analysis**

The questionnaires returned by the participants were assessed for their ACC level for their data provided. The data was edited and coded. All the data were entered to a statistical software system called SPSS version 24.0 for Windows (SPSS, IBM) which was used to process the data.

### 3.6.1 SPSS Statistical Package for the Social Science (SPSS)

The statistical analysis of data fulfils various purposes. It summarizes large mass of data into understandable and meaningful form, while the reduction of data facilitates further analysis. As a large amount of data was involved and there were surveys of two different groups of population being done concurrently that needed to be compared and analysed, data processing was done by SPSS (IBM) to achieve efficiency. SPSS (IBM) is preferred by non-statisticians as it has a user-friendly interface and drop down menus that make research simpler and faster. SPSS (IBM) is a highly popular and a versatile software that is commonly used among academic researchers as it allows many different types of analyses, transformations, and many other forms of output.

The SPSS (IBM) was used to analyse any cross tabulation or association or grouping among the variables or the factors that emerged from the data collected during the survey.

The results of the demographic characteristics of the respondents were reported by using tables. Reliability test were carried out to measure the respondent responses to ensure the consistency of the research findings. Cronbach's Alpha value of each of the variable was then reported to justify its reliability of data collected for this research.

### 3.6.2 Statistical Tests used for Data Analysis

#### 3.6.2.1 Descriptive Statistics

Descriptive statistics are the basic measures that can be used to describe any given survey data. It basically consists of summary descriptions of single variables (also called "univariate" analysis) and the associated survey sample. Thus a descriptive statistic is a summary statistic that quantitatively describes or attempts to summarize the basic features of a collection of the information. Therefore, it can be used to simplify a data which has got numerous components that needs to be analysed.

Examples of descriptive statistics for survey data include *frequency* and *percentages distributions*, measures of *central tendency* (which include the mean, median and mode), and *dispersion* measures such as the range and standard

deviation, which describe how close the values or responses are to central tendencies. The various descriptive methods that were used to analyse the data comprised of the following:

a) *Distribution:*

The distribution is a summary of the frequency of individual values or ranges of values for a variable. Commonly used method to analyse distribution is frequency distribution. A graph can give a clear and a pictorial representation of such distribution. This is known as a histogram or a bar chart. One can also employ skewness and kurtosis to check, if the data is normally distributed or not to make a decision regarding the tests that should be run for the research analysis. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the centre point. In this study histograms of the response data were studied to check for the normality before doing inferential statistics. Normality means that the dependent variable is approximately uniformly distributed for each category of independent variable.

b) *Kurtosis:*

Kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution. That is, data sets with high kurtosis tend to have heavy tails, or outliers. Data sets with low kurtosis tend to have light tails, or lack of outliers. A uniform distribution would be the extreme case. In this study the kurtosis of response data were examined to satisfy the assumptions of normality to perform parametric statistics.

c) *Histogram:*

Histogram is an effective graphical technique for showing both the skewness and kurtosis of data set. According to H.Y. Kim (2013) along with the histograms, an absolute values of  $< 2$  for skewness and  $< 7$  for kurtosis can be used as reference value to determine normality in a study with sample size of more than 300. This method was followed for the present study data to ascertain normality before proceeding to parametric tests.

d) *Central tendency:*

The central tendency is the calculation or estimation of the centre of the distribution of values. The Mean is the most widely used method of describing central tendency. The Median is the numerical value found at the exact middle of the set of values and the mode is the most frequently occurring value in the set of scores. In this study mean was used for continuous variables and medians for categorical variables.

e) *Dispersion:*

It basically refers to the spread of the values around the central tendency. Standard Deviation gives an accurate and a detailed estimate about the dispersion in the given data.

f) *Correlation:*

Correlation helps to describe the relationship between the two variables, whether there is any positive or negative correlation or there is no correlation between the variables. Pearson product-moment correlation is appropriate when both variables are measured at an interval level. For two ordinal variables, the Spearman rank Order Correlation (rho) or the Kendall rank order Correlation (tau) is used. Point-Biserial Correlation is used when one measure is a continuous interval level one and the other is dichotomous (i.e., two-category). Pearson's correlation determines the strength and direction of the linear relationship between two variables. Pearson product-moment correlation is usually used on interval or ratio data, however if the assumptions of the normality are markedly violated, the Spearman correlation can be used. Spearman's correlation determines the strength and direction of the monotonic relationship between two variables. In this study Pearson's  $r$  analysis was performed to examine the correlations amongst dependent variables (ACC, PNE, positive attitude towards disclosure and PD).

g) *Association:*

To see whether or not two categorical variables are related to each other, Chi-square ( $\chi^2$ ) tests are done. It tells us the association or relation between the categorical variables. Before doing these tests, some assumptions are essential. Like, when the data are displayed in a contingency table, the expected frequency count for each cell of the table should be at least 5. In this study  $\chi^2$  tests were done to study

association between age categories, gender, race, subjective health, residence status, education status, health insurance status, annual income with awareness.

### *3.6.2.2 Inferential Statistics*

Inferential statistics play an important role in all the research studies as they help in comparing the average performances of the two groups on any single measure or a construct to find whether there is any significant difference between them. Most of the major inferential statistical tests are derived from the General Linear Model (GLM) which comprises of a variety of tests that are used in applied and social research. Linear model is the foundation for T-test, ANOVA (Analysis of variance), ANCOVA (Analysis of covariance), multivariate methods including factor analysis, cluster analysis, multidimensional scaling as well as regression analysis. In this research, ANOVA and linear regression were applied to understand the relationship between various demographic characteristics, independent variables and dependent variable. For independent variables with two levels or groups, independent samples *t*-test were used. The hypothesis **H1<sub>B</sub>**, **H1<sub>E</sub>**, **H2<sub>A</sub>**, **H2<sub>B</sub>**, **H2<sub>C</sub>**, **H3<sub>A1</sub>**, and **H3<sub>A2</sub>** were tested using independent samples *t*-test. One-way ANOVA is used when there is one independent variable with three or more levels or groups and one dependent continuous variable. This means there is only one independent variable and “between-group” different subjects in each of the group. ANOVA was carried out to test the hypothesis that age (**H1<sub>A</sub>**), race (**H1<sub>C</sub>**), subjective health (**H1<sub>D</sub>**), health insurance status (**H1<sub>F</sub>**), education status (**H1<sub>G</sub>**), annual income (**H1<sub>H</sub>**), awareness (**H3<sub>A1</sub>** & **H3<sub>A2</sub>**) will influence the perceptions towards physician-MMI relationships (acceptability, PNE, positive ATD and PD). Statistically significant ANOVA results were followed up by Tukey’s post hoc tests.

Regression analysis is a method of statistical evaluation that helps in examining the relationship between two or more variables of interest. It can be used to confidently differentiate the important factors from the less important ones. It also informs us about how these factors influence each other. Another use of regression is in estimation of values of dependent variables from observed values of independent variables.

Multiple linear regression is a statistical technique that is commonly used to confirm the relationship between multiple independent variables and a single dependent

outcome variable (Marill, 2004). Multiple Regression is preferred to other statistical techniques because it can easily deal with significantly large amount of data while inferring the effect of multiple continuous independent variables on a single dependent variable (Kieras & Just, 2018).

### 3.6.2.3 *Multiple Regression Analysis*

In this research project, multiple regression has been used in association with other research methods to explore the relationship between independent variables including ACC, PNE and ATD and PD as a dependent variable. Therefore, to test the hypothesis **H3<sub>B1</sub>**, **H3<sub>B2</sub>**, **H3<sub>C1</sub>**, **H3<sub>C2</sub>**, **H3<sub>D1</sub>** & **H3<sub>D2</sub>**, multiple linear regression was used, P value of less than 0.05 were considered statistically significant. The multiple regression equation would be:

$$PD = \beta_0 + \beta_1 ACC + \beta_2 PNE + \beta_3 ATD_{it} + e$$

### 3.6.2.4 *Validity and Reliability*

Research is valid when it provides necessary information and enhances knowledge. Reliability and validity help to reduce the risk of bias in the responses while applying a theory to empirical findings. According to Saunders et al. (2009), reliability differs from validity in the sense that reliability is associated with generalisation of the result and validity is more associated with whether the “observation shows reality”. A reliable research work does not use any vague information or unethical practices that are prohibited in the academic field (Baumgarten, 2012).

Validity and reliability are two main key aspects in the evaluation of efficiency of any questionnaire design. Validity assesses whether or not a questionnaire is measuring what it intends to measure (Zikmund, Babin, Carr & Griffin, 2010). Content validity is evaluated by experts in the field whose feedback is commonly sought during questionnaire design. Similarly, reliability refers to repeatability i.e. the ability of the questionnaire to produce consistent findings whenever administered (Oppenheim, 1992). The Cronbach’s Alpha is a common method to assess reliability of questionnaires. It uses inter-item correlations to measure

internal consistency (Rattray and Jones, 2007). Reliability testing is an important part of data analysis and demonstrates the extent to which the collected data is reliable at a significant level (Lancaster, 2005).

It is essential to identify to avoid any bias issues in a research study in to ensure the originality and authenticity the data. According to Bernard (2012), a bias factor in the data collection does not ensure that the responses are given in their original context without manipulation of information. In order to avoid bias issues in the research project, a proper selection process is essential for the researcher without any personal interest or intervention in selection of candidates. Therefore, a random sampling strategy was used to select respondents.

### **3.7 Ethics**

Ethics approval was taken from the department and the committee overseeing the final year MBA project and due diligence was maintained to adhere to the all the guidelines mentioned in the post-graduate handbook for the UTAR students.

#### **3.7.1 Information privacy and confidentiality**

All the information collected during the survey and interview method were secured with regard to privacy and confidentiality, thus helping secure participants' interests against any harm because of sharing any personal and official experiences (Jackson, 2010). Information privacy and confidentiality was maintained by providing information anonymity and data records were kept in password-protected documents. Also, the survey and interview questions were carefully designed to avoid asking for any personal information, such as name, telephone number or address.

#### **3.7.2 Voluntary Consent**

Before approaching participants for survey questionnaires, participants' permission and consent to their voluntary participation were obtained by sending them a cover letter and consent form. The consent form was also attached as a foreword to the



Google forms used in the research. This ethical consideration prevented the occurrence of an issue of unjustified pressure to participate that may affect the research results in relation to manipulative or fake information, and incomplete questionnaire entries. Within this ethical consideration, participants were allowed to withdraw their participation with no obligation to give a justification or explanation for the same (Jackson, 2010). All the data collected and used in the research is plagiarism free, as the data presented is a result of the questionnaires prepared with original ideas without copying from others' work. This ethical consideration helps in improving data authenticity (Kimmel, 2009).

### **3.8 Conclusion**

This chapter has examined the research methodology implemented in this study. In order to accomplish the research objectives and answer the research questions effectively, the research uses the quantitative research design based on the surveys done using questionnaires in which most of the questions were answered based on a Likert scale. The survey involved a two pronged approach, involving both the patients and the public having exposure to healthcare industry in the past as well as under-training doctors studying or working in Malaysia. Survey method significantly contributed to increase the validity, accuracy and authenticity of the research by allowing the determination of the relationship between the key factors and moderators in an empirical and an objective method.

## CHAPTER 4

### Research Results

Mean and standard deviation were computed for quantitative variables while frequency and percentages were used to display qualitative variables. To study associations between independent variables (age categories, gender, race, subjective health, residence status, education status, health insurance status, annual income) and awareness  $\chi^2$  tests were done. For bivariate analysis, independent samples t-tests and one way ANOVA followed by Tukey's post hoc tests were used to find out association and effect size between independent and dependent variables. Pearson  $r$  analysis was performed to examine the correlations amongst dependent variables (Acceptability, PNE, positive ATD and PD). In this study, multiple linear regression was used for multivariate analysis to control confounding variables. Significant predictors and other variables which had p value  $<0.1$  were entered into the multiple linear regression model. The Level of significance was set at 0.05.

#### 4.1 Public Data

A total of 361 surveys were completed. The demographic features of the participants are shown in table 4.1. The mean age of the respondents was  $38 \pm 11.76$  years (range 18-71 years). More than half (57.1%) of the participants were aware of the relationships between physicians and MMI and 31.3% used some website for physician ratings. Of those who were aware, 52.9% had witnessed an interaction between physician and MMI. Almost half (48.8%) of those who were unaware, responded that their perception of about medical profession has changed after knowing about these relationships. One-third of the participants acknowledged receiving free drug-samples from their physicians. Almost 82% of the respondents

mentioned that either they themselves or their household were on prescription medicines as shown in table 4.2. Online database was noted to be the most preferred type of disclosure ( $n = 168$ , Figure 4.1). Thirty-nine percent of the participants chose <RM1000 to be the accepted value of the gifts to physicians from the MMI as shown in figure 4.2. The responses of public to the ACC of various interactions between physicians and MMI are shown in table 4.3 as percentages.

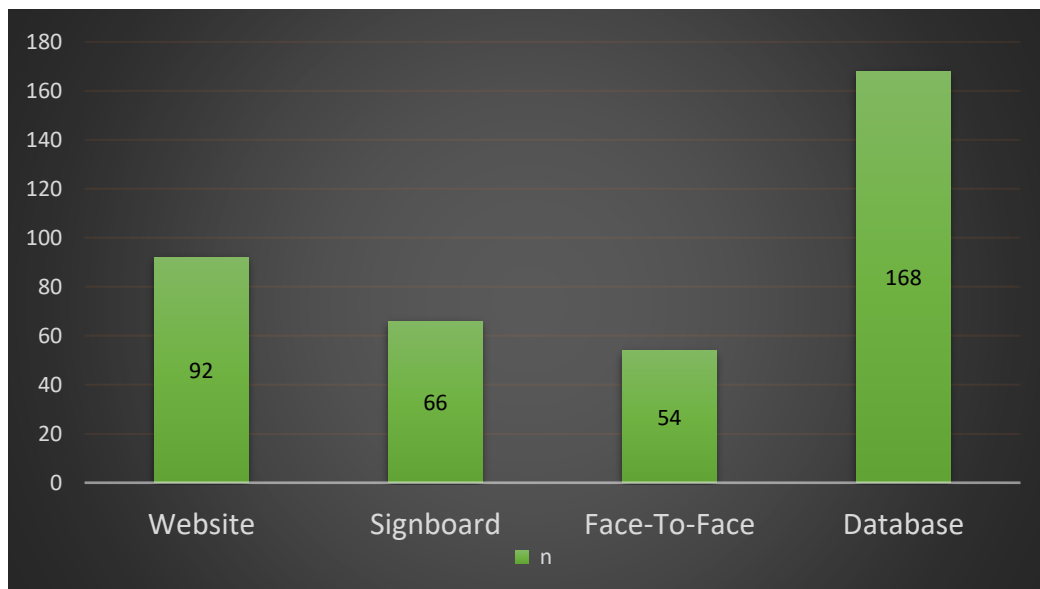
Table 4.1: Demographic characteristics (*n* =361)

<b>Age (years)</b>	<b><i>n</i></b>	<b><i>percent</i></b>
18-29	101	28.0%
30-39	106	29.4%
40-49	100	27.7%
50-59	30	8.3%
>60	24	6.6%
<b>Gender</b>		
Male	175	48.5%
Females	186	51.5%
<b>Race</b>		
Malay	128	35.5%
Chinese	107	29.6%
Indian	92	25.5%
Others	34	9.4%
<b>Subjective Health</b>		
Very good	78	21.6%
Good	126	34.9%
Fair	93	25.8%
Bad	39	10.8%
Very bad	25	6.9%
<b>Education</b>		
Postgraduate	175	48.5
Undergraduate	98	27.1%
Secondary	88	24.4%
<b>Health Insurance</b>		
Private	213	59.0%
Other	69	19.1%
None	79	21.9%
<b>Residence Status</b>	<b><i>n</i></b>	<b><i>percent</i></b>
Local	294	81.4%
Foreigner	67	18.6%
<b>Annual Income in Ringgits</b>		
0-50k	156	43.2%
50k-100k	112	31.0%
>100k	93	25.8%

Table 4.2: Awareness and exposure to healthcare

<b>Aware of Physician-MMI gift relationships</b>	<i>n</i>	<i>percent</i>
Yes	206	57.1%
No	155	42.9%
<b>Witnessed direct interaction between a physician &amp; MMI</b>	109	30.2%
<b>Taking prescription medicine: Self or in household</b>		
Yes	292	80.9%
No	69	19.1%
<b>Surgery with an implantable device: currently seeking or in past</b>		
Yes	41	11.4%
No	320	88.6%
<b>Received free drug samples from treating physician</b>		
Yes	120	33.2%
No	241	66.8%
<b>Used website for physician rating</b>		
Yes	113	31.3%
No	248	68.7%

Figure 4.1: Public's preferred type of disclosure



Adapted from Perry et al. (2014)

Figure 4.2: Public's perceptions of acceptable value of gifts

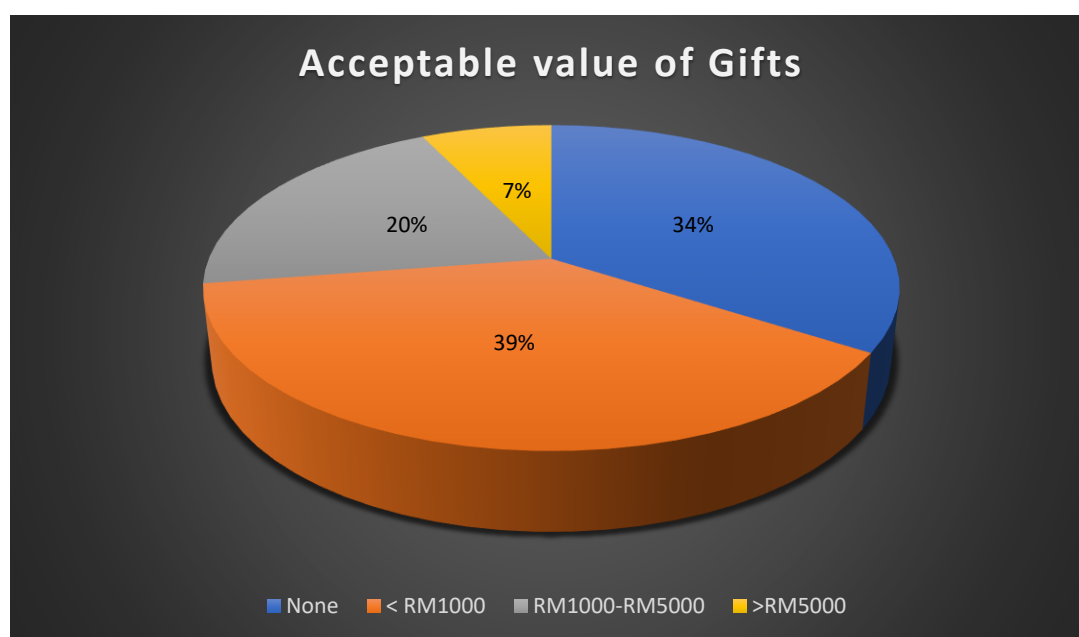


Table 4.3: Acceptability of various interactions by respondents (%)

Types of interactions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<i>Gifts of personal-use</i>	19.1	32.0	27.4	14.6	6.9
<i>Gifts of general utility</i>	8.3	6.9	28.7	48.9	6.9
<i>Gifts of patient use</i>	4.1	5.8	32.4	48.9	8.8
<i>Free medicine samples for patient use.</i>	3.9	10.2	25.0	45.6	15.2
<i>Free medicine samples for personal use.</i>	6.6	22.7	34.3	30.7	5.5
<i>Educational material</i>	0.6	2.2	20.7	55.8	20.7
<i>Cultural courtesy items</i>	7.2	14.4	35.3	39.5	3.6
<i>Sponsorship of medical society's events</i>	7.2	14.4	35.3	39.5	3.6
<i>Funding of educational programmes</i>	7.2	13.0	24.8	45.9	9.1
<i>Reimbursement of travel expenses</i>	12.4	19.6	29.3	32.3	6.4
<i>Ownership of company stocks.</i>	22.9	29.0	29.3	16.9	1.9
<i>Payments as speaking fees</i>	13.3	21.0	31.2	31.5	2.8
<i>Payments for developing new drugs.</i>	10.5	19.6	29.6	35.1	5.2
<i>Paid members of the MMI's board.</i>	10.8	25.4	31.5	30.1	1.9

$\chi^2$  tests were done to study association between age categories, gender, race, subjective health, residence status, education status, health insurance status, annual income with awareness. The prevalence of awareness was higher in foreigners (70.1%) compared to locals (53.7%). The difference in prevalence of awareness among these was statistically significant. Also, statistically significant associations were found between prevalence of awareness and respondents with respect to their subjective health, education status and annual income as shown in tables 4.4 to 4.7.

**Table 4.4: Association between Subjective Health and Awareness**

Awareness					
Subjective health	Aware <i>n</i> (%)	Unaware <i>n</i> (%)	$\chi^2$	df	p value
Very good	54 (69.2)	24 (30.8)	13.336*	4	.010
Good	74 (58.7)	52 (41.3)			
Fair	39 (42.4)	53 (57.6)			
Bad	24 (61.5)	15 (38.5)			
Very Bad	14 (53.8)	12 (46.2)			

\*Chi Square Test was performed, Level of significance was set at  $p < 0.05$ , *df* = degree of freedom

**Table 4.5: Association between Education status and Awareness**

Awareness					
Education	Aware <i>n</i> (%)	Unaware <i>n</i> (%)	$\chi^2$	df	p value
Postgraduate	112 (64.7)	61 (35.3)	8.901*	2	.012
Undergraduate	47 (47.5)	52 (52.5)			
Secondary	46 (51.7)	43 (48.3)			

\*Chi Square Test was performed, Level of significance was set at  $p < 0.05$ , *df* = degrees of freedom

**Table 4.6: Association between Residence status and Awareness**

Awareness						
Residence status	Aware <i>n</i> (%)	Unaware <i>n</i> (%)	$\chi^2$	df	POR	p value
Local	158 (53.7)	136 (46.3)	5.986	1	0.49	.014
Foreigner	47 (70.1)	20 (29.9)				

*\*Chi Square Test was performed, Level of significance was set at  $p < 0.05$ , POR= prevalence odds ratio, df= degrees of freedom*

**Table 4.7: Association between Annual Income and Awareness**

Awareness					
Annual income (in Ringgits)	Aware <i>n</i> (%)	Unaware <i>n</i> (%)	$\chi^2$	df	p value
0-50k	76 (48.7)	80 (51.3)	11.773*	2	.003
50k-100k	63 (56.3)	49 (43.8)			
>100k	66 (71.0)	27 (29.0)			

*\*Chi Square Test was performed, Level of significance was set at  $p < 0.05$ , df= degrees of freedom*

In order to test the hypothesis that age, gender, race, subjective health, educational status, health insurance status, residence status, annual income and awareness will influence the perceptions towards physician-MMI relationships (ACC, PNE, positive ATD and PD), independent t-test for gender, residence status and awareness and between-groups ANOVA for age categories, race, subjective health, educational status, health insurance status and annual income were performed respectively. Prior to conducting the ANOVA, the assumptions of normality were examined by checking for skewness, kurtosis, Shapiro-Wilk test and visual examination of histograms. Furthermore, the assumptions of homogeneity of variances was tested and satisfied by Levene's *F* test. To evaluate the nature of differences between groups, the statistically significant ANOVA was followed up by Tukey's post hoc tests.

Undergraduates compared to postgraduates ( $p = .047$ ) and secondary ( $p = .003$ ), Chinese race compared to Malay race ( $p = .000$ ) and others ( $p = 0.049$ ), annual income of 0-50k compared to those with annual income of 50k-100k ( $p = .042$ ) and



those who were not aware of these relationships ( $p = .002$ , table 4.8) were found to be more acceptable of these relationships. People aged 60 and above compared to age groups 18-29 ( $p = .000$ ), 30-39 ( $p = 0.017$ ), 40-49 ( $p = .032$ ) and 50-59 ( $p = .003$ ) were less tolerable of these relationships ( $p = .000$ ). With regard to negative effects of these relationships, females ( $p = .002$ ) as shown in table 4.9 and Indians ( $p = 0.001$ ) perceived these relationships to be more harmful. Prior awareness ( $p = .000$ ), higher education ( $p = .002$ ), higher annual income ( $p = .018$ ), Indians ( $p = .029$ ) and Malays ( $p = .010$ ) perceived increased distrust towards these relationships. Higher annual income ( $p = .007$ ), better subjective health ( $p = .030$ ), prior awareness of these relationships ( $p = .000$ ) were associated with positive effects of disclosure. Residence status (local or foreigner) and Health insurance (private, other, and none) differences were not significant for ACC, PNE, positive ATD and PD. The statistical significant results of independent between-groups ANOVA are shown in table 4.10.

On Pearson's  $r$  data analysis of the surveyed participant's perceived ACC ( $M = 3.12$ ,  $SD = .70$ ) PNE ( $M = 2.97$ ,  $SD = .50$ ) and positive attitude about disclosure ( $M = 3.74$ ,  $SD = .64$ ) with PD ( $M = 3.10$ ,  $SD = .54$ ), significant correlations were found as shown in figure 4.3-4.5. The results showed PD had weak negative correlation with ACC  $r = -.214$  and moderate positive correlation with PNE and positive ATD,  $r = .445$  &  $.313$  respectively.

A standard multiple linear regression was performed to assess the ability of ACC, PNE and attitudes towards disclosure to predict the distrust (Table 4.11). Preliminary analyses were performed to ensure there was no violation of the assumption of normality, linearity and multicollinearity. A significant regression equation was found ( $F(3,356) = 16.962$  ( $P = 0.000$ ), with an  $R^2$  of 0.118 ( $SE 0.503$ ). ACC did not significantly predicted the PD ( $t = -1.868$ ,  $p = .063$ ). However, PNE ( $t = 3.168$ ,  $p = .002$ ) and attitudes towards disclosure ( $t = 5.2011$ ,  $p = .000$ ). The standardized coefficient  $\beta$  for perceived effects and ATD were 0.159 and 0.264 respectively. Participants' predicted distrust was equal to  $2.178 + 0.118 \times \text{Negative effects} + 0.231 \times \text{ATD}$ . Thus attitudes towards disclosure made the strongest contribution in explaining the PD.

Figure 4.3: Correlation between Negative effects and Distrust

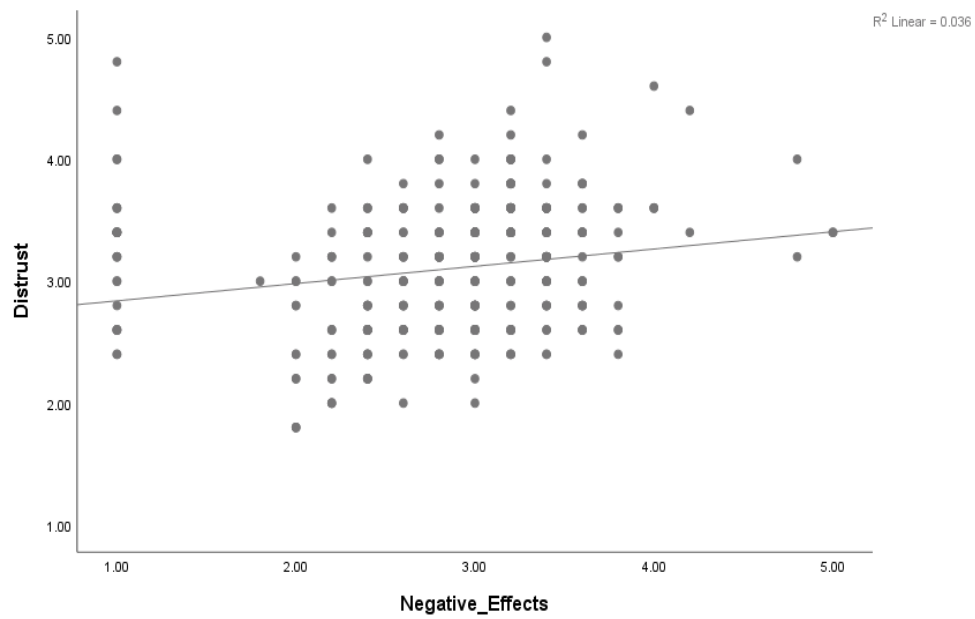


Figure 4.4: Correlation between Acceptability and Distrust

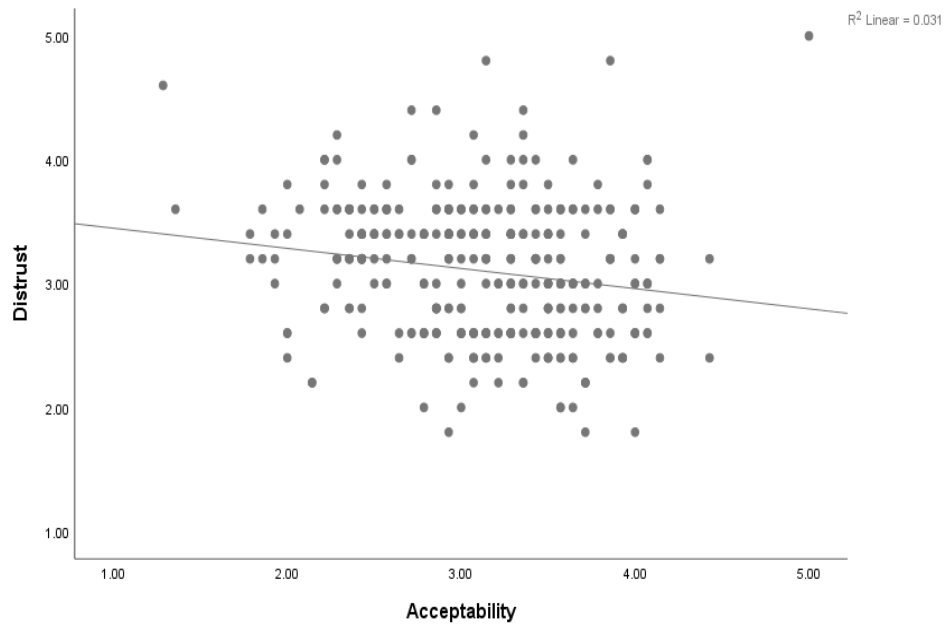


Figure 4.5: Correlation between Disclosure and Distrust

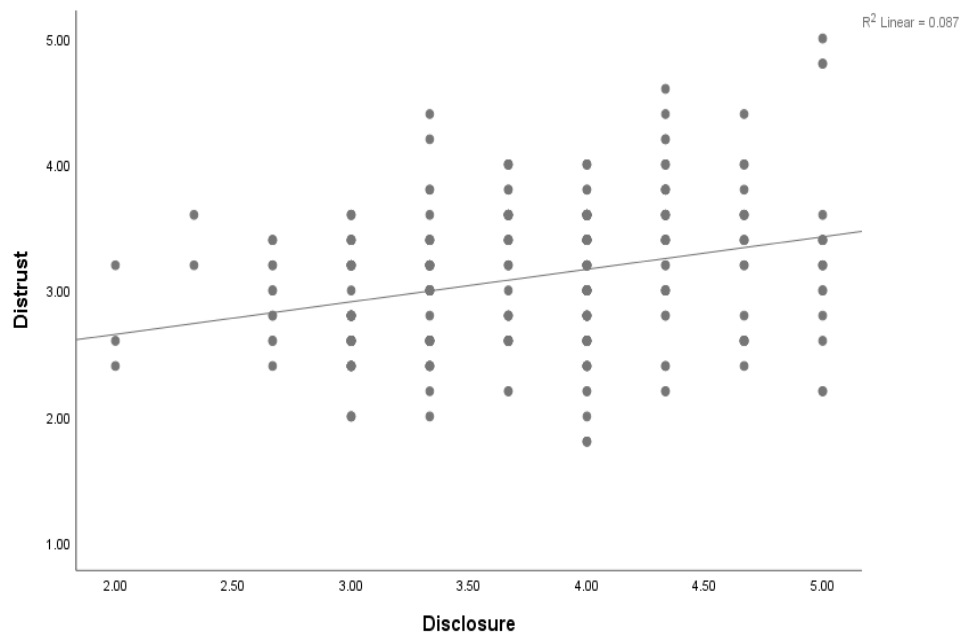


Table 4.8: Association between Awareness and Perceptions

ACC				
Awareness	Mean (sd)	95% CI	t	p value
Aware	3.041 (0.60)	-.344_ -.105	3.702	.000
Unaware	3.266 (0.53)			
ATD				
Awareness	Mean (sd)	95% CI	t	p value
Aware	3.842 (0.62)	.125_ .376	3.916	.000
Unaware	3.591 (0.57)			
Distrust				
Awareness	Mean (sd)	95% CI	t	p value
Aware	3.333 (0.49)	.442_ .637	10.90	.000
Unaware	2.794 (0.43)			

\*t test was performed, Level of significance was set at  $p < 0.05$

Table 4.9: Association between Gender and PNE

PNE				
Gender	Mean (SD)	95% CI	<i>t</i>	p value
Male	2.716 (.735)	.0811_-.376	3.048*	.002
Female	2.945 (.689)			

\**t* test was performed, Level of significance was set at  $p < 0.05$

Table 4.10: Association of demographic variables with Perceptions

Dependent Variables	Independent Variables	F(df)	p value	$\eta^2$
ACC	Age (categories)	5.681(4)	.000	.060
	Race	6.516(3)	.000	.052
	Education	5.608(2)	.004	.030
	Annual income	3.613(2)	.028	.020
PNE	Race	6.621 (3)	.000	.053
Positive ATD	Subjective health	2.637(4)	.034	.029
	Annual income	4.831(2)	.009	.026
Distrust	Race	3.973(3)	.008	.032
	Education	6.053(2)	.003	.033
	Annual income	3.880(2)	.022	.021

ANOVA test was performed, Level of significance was set at  $p < 0.05$

$\eta^2$ : Partial Eta Squared

Table 4.11: Multiple linear regression to predict PD

Predictor Variables	Standardized coefficient $\beta$	<i>t</i>	95% CI	p value
ACC	-.096	-1.868	-.181_-.005	.063
PNE	0.159	3.168	.045_-.192	<b>.002*</b>
Positive ATD	0.264	5.201	.144_-.319	<b>.000*</b>

\*Correlation is significant at level 0.05 (2-tailed)

Dependent Variable: PD

## **4.2 Under-training doctors Data**

A total of 215 surveys were completed. The demographic features of the participants are shown in table 4.12. The mean age of the respondents was  $24 \pm 3.22$  years (range 19-36 years). Around 40% of the participants were aware of the relationships between physicians and MMI however, only 10% have heard of any guidelines regarding accepting gifts from MMI. For those who were aware of the guidelines ( $n = 22$ ) the source of the guidelines was Ministry of Health (9), Malaysian Medical Council (5), University/college (4), PhAMA (3) and news (1). Only 7% of the respondents acknowledged that they were trained enough during their courses about how to interact with MMI-representatives. However, around 40% have had prior exposure to a MMI related activity such as free drug-samples, gifts, lunches, MMI-sponsored talks etc. Eighty four percent (Table 4.13) felt that free samples by MMI is a good way to learn about new products.

Table 4.12: Demographic features of under-training doctors

Age (years)		
Range	19-36	
Mean	24.11	
SD	3.1	
Median	24.00	
	<i>n</i>	<i>percent</i>
Gender	95	44.2%
Male	120	55.8%
Females		
Race		
Malay	97	45.1%
Chinese	82	38.1%
Indian	33	15.3%
Others	3	1.4%
Subjective Health		
Very good	24	11.2%
Good	102	47.4%
Fair	48	22.3%
Bad	26	12.1%
Very bad	15	7.0%
Year of training		
Undergraduate	153	71.2%
Intern/Houseman/MO	62	28.8%
Health Insurance		
Private	150	69.8%
Other	11	5.1%
None	54	25.1%
Residence Status		
Local	201	93.5%
Foreigner	14	6.5%

Table 4.13: Under-training doctors Awareness

<b>Aware of Physician-MMI gift relationships</b>	<i>n</i>	<i>percent</i>
Yes	87	40.5%
No	128	59.5%
<b>Aware of guidelines regarding acceptance of gifts from MMI</b>		
Yes	22	10.2%
No	193	89.8%
<b>Trained enough to interact with MMI-representatives</b>		
Yes	15	7.0%
No	200	93.0%
<b>Prior exposure with MMI-related activity</b>		
Yes	85	39.5%
No	130	60.5%
<b>Free-samples by MMI is a good way to learn about new products?</b>		
Yes	179	83.6%
No	35	16.4%

Around 43% percent of the under-training doctors compared to 39% of public chose <RM1000 to be the accepted value of the gifts to physicians from MMI as shown in figure 4.6. The responses of under-training doctors regarding the ACC of various interactions between physicians and MMI are shown in table 4.14 as percentages. Most ( $n=92$ ) of the participants preferred online database as a method of disclosure as shown in figure 4.7. A comparison of preferred type of disclosure between public and under-training doctors is shown in table 4.15. Comparative results of public vs undertraining doctors' awareness and perceptions about certain types of Physician-MMI interactions are shown in figure 4.8 & 4.9 respectively. Overall comparison between public and under-training doctors' perceptions is shown in table 4.16.

Figure 4.6: Under-training doctors' acceptable value of gifts

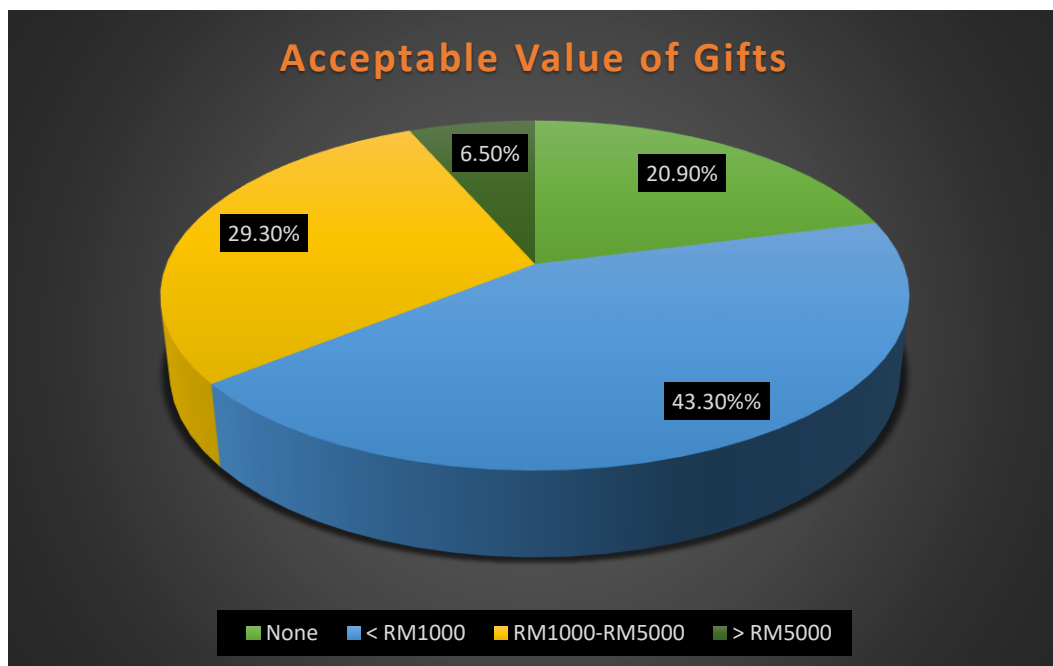
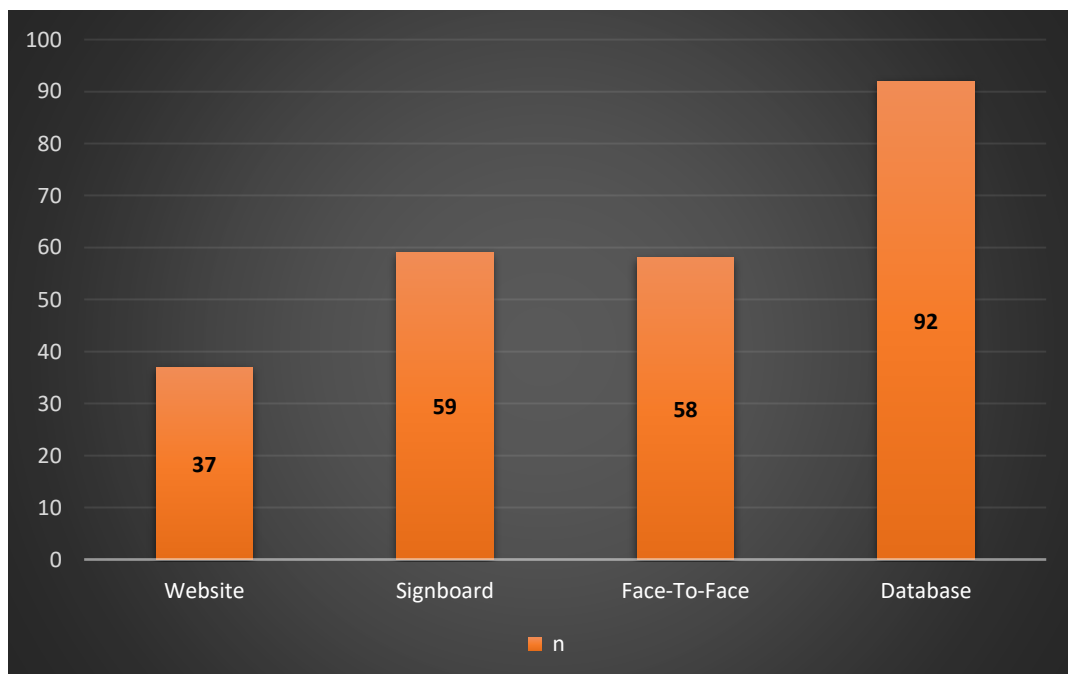


Figure 4.7: Under-training doctors' preferred type of Disclosure



*Adapted from Perry et al. (2014)*



Figure 4.8: Comparison of Awareness of public and under-training doctors

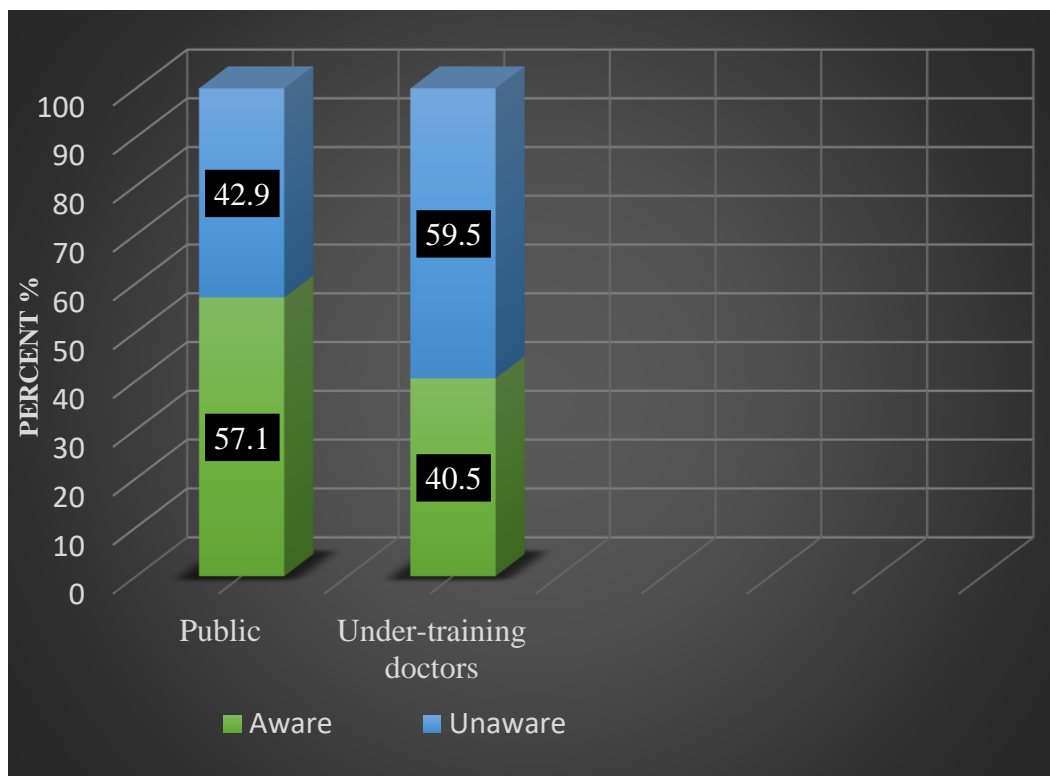
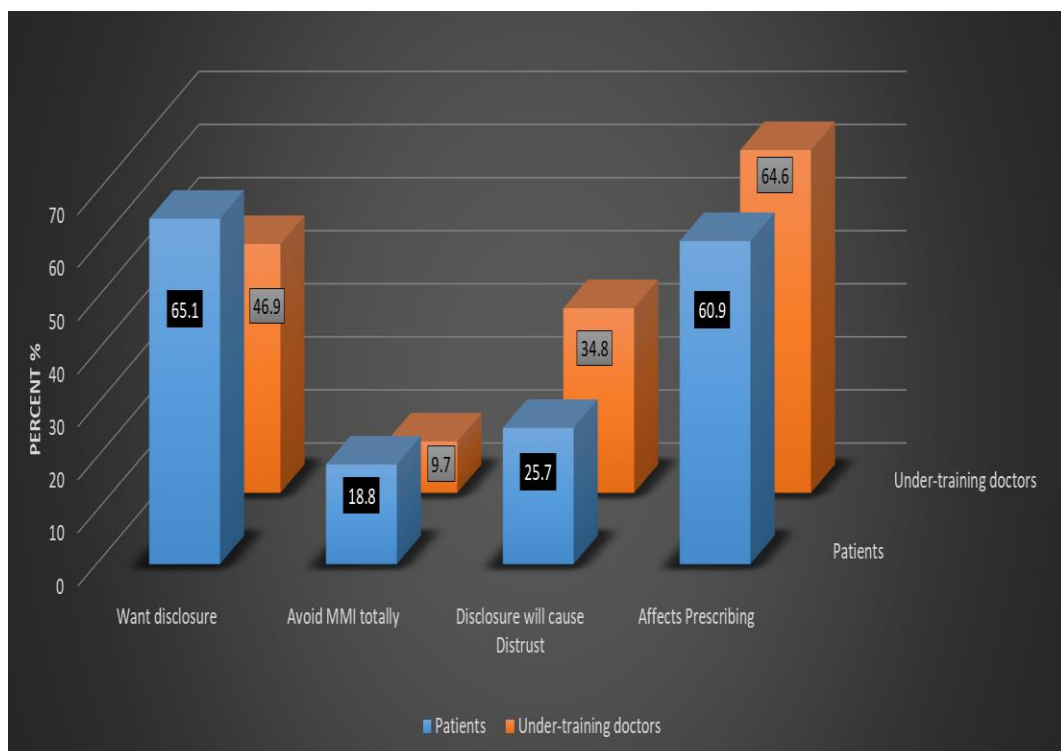


Figure 4.9: Comparison of perceptions of public and under-training doctors



$\chi^2$  tests were done to study association between gender, race, subjective health, residence status, year of training, health insurance status, annual income with awareness. Only the 'Year of training' was found to be significantly associated with prevalence of awareness. The prevalence of awareness was higher in intern/houseman (51.6%) compared to prevalence of awareness in medical students (35.9%). The difference in prevalence of awareness in groups was statistically significant ( $p = .034$ ) as shown in table 4.16.

**Table 4.14: Acceptability of various interactions by under-training doctors (%)**

<b>Types of interactions</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<i>Gifts of personal-use</i>	14.9	38.6	24.2	18.6	3.7
<i>Gifts of general utility</i>	2.8	9.8	23.7	47.4	16.3
<i>Gifts of patient use</i>	1.9	10.2	32.1	41.9	14.0
<i>Free medicine samples for patient use.</i>	3.7	19.1	29.3	38.1	9.8
<i>Free medicine samples for personal use.</i>	8.8	25.6	37.7	26.0	1.9
<i>Educational material</i>	0.5	3.7	18.6	48.8	28.4
<i>Cultural courtesy items</i>	4.7	8.8	34.9	41.9	9.8
<i>Sponsorship of medical society's events</i>	3.7	5.1	30.7	44.2	16.3
<i>Funding of educational programmes</i>	2.8	3.7	15.3	54.0	24.2
<i>Reimbursement of travel expenses</i>	1.9	11.2	26.0	43.7	17.2
<i>Ownership of company stocks.</i>	12.6	23.7	36.3	19.5	7.9
<i>Payments as speaking fees</i>	5.6	14.9	33.0	40.9	5.6
<i>Payments for developing new drugs.</i>	7.9	10.7	24.7	47.0	9.8
<i>Paid members of the MMI's board.</i>	5.1	19.5	41.4	27.4	6.5

**Table 4.15: Preferred type of disclosure: public vs under-training doctors**

Type of Disclosure	Public		Under-training doctors	
	<i>n</i>	<i>percent</i>	<i>n</i>	<i>percent</i>
<i>Physician Website</i>	92	25.6%	37	17.2%
<i>Signboard in physician's office</i>	66	18.3%	59	27.4%
<i>Face-to-face during consultation</i>	54	15.0%	58	27.0%
<i>Online database</i>	168	46.5%	92	42.8%

**Table 4.16: Overall comparison of perceptions**

Perceptions	Public		Under-training doctors	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Acceptability	3.14	.58	3.37	.53
<i>PNE</i>	2.83	.72	2.69	.51
<i>ATD</i>	3.73	.61	3.48	.55
<i>PD</i>	3.10	.54	2.99	.48

**Table 4.17: Association between Year of training and Awareness**

Awareness						
Year of training	Aware <i>n</i> (%)	Unaware <i>n</i> (%)	$\chi^2$	df	POR	p value
Medical student	55 (35.9)	98 (64.1)	4.494	1	.526	.034
Intern/Houseman	32 (51.6)	30 (48.4)				

\*Chi Square Test was performed, Level of significance was set at  $p < 0.05$ , POR= prevalence odds ratio, df= degrees of freedom

In order to test the hypothesis **H2A**, **H2B**, **H2C** and **H3A2** that prior exposure of under-training doctors to MMI, prior training in interacting with MMI, year of training and awareness will influence the perceptions towards physician-MMI relationships (ACC, PNE, positive ATD and PD), independent t-test were performed.

Although not part of the original hypothesis, independent t-tests to ascertain the association of other demographic factors (gender and residence status) of under-

training doctors with their perceptions were performed. Similarly, the between-groups ANOVA were performed for race, subjective health and health insurance status. Prior to conducting the ANOVA, the assumptions of normality were examined by checking for skewness, kurtosis, Shapiro-Wilk test and visual examination of histograms. Furthermore, the assumptions of homogeneity of variances was tested and satisfied by Levene's *F* test.

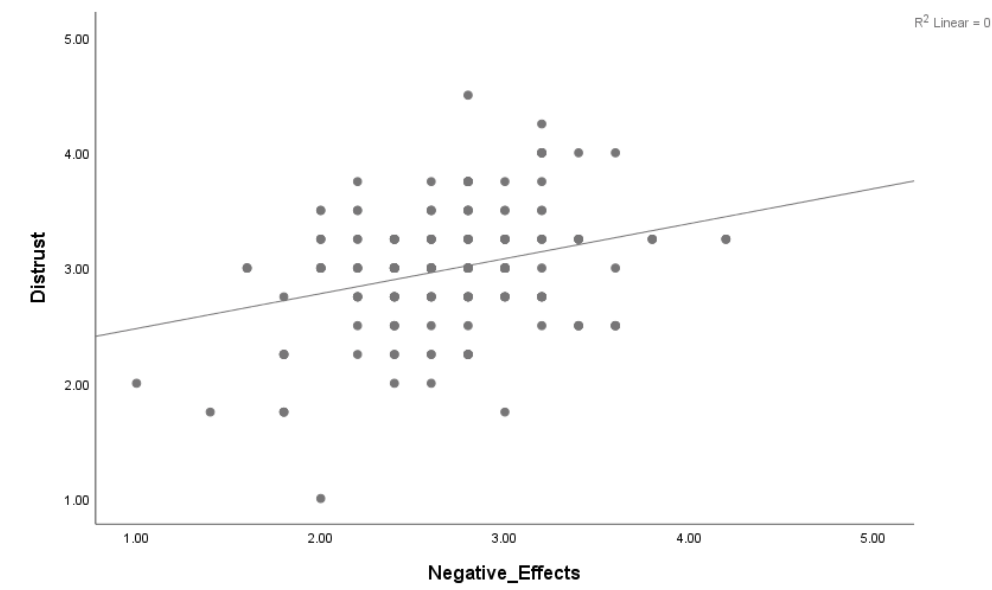
Only female gender ( $p = .014$ ) showed significant ACC of these relationships as shown in table 4.17. No other independent variable like race (Chinese, Malay, Indian, others), subjective health (Very good, good, fair, bad, very bad, health insurance (private, other, none), residence status (local, foreigner), prior exposure of under-training doctors to MMI (Yes/No), prior training in interacting with MMI (Yes/No), year of training (medical students, intern/houseman) and awareness showed any significant difference with respect to ACC, PNE, positive ATD and PD. On Pearson's *r* analysis of the surveyed participant's perceived ACC ( $M = 3.37$ ,  $SD = .53$ ) PNE ( $M = 2.69$ ,  $SD = .51$ ) and positive attitude about disclosure ( $M = 3.48$ ,  $SD = .55$ ) with PD ( $M = 2.99$ ,  $SD = .48$ ), moderate correlations ( $r = .328$ ) was found between PD and PNE. As the PNE increased, the PD in the relationships between physicians and the MMI increased (Figure 4.8). The results showed that ACC ( $p = .377$ ) and positive ATD ( $p = .244$ ) had no significant correlation with PD.

Table 4.18: Under-training doctors' gender and ACC

ACC				
Gender	Mean (sd)	95% CI	<i>t</i>	p value
Male	3.275 (.589)	.0358_ .3186	2.470	.014
Female	3.452 (.462)			

\**t* test was performed, Level of significance was set at  $p < 0.05$

Figure 4.10: Association between Perceived Negative Effects and Distrust



A standard linear regression was performed to assess the ability of PNE to predict the distrust (Table 4.18). ACC and ATD were not considered for linear regression as there was no linear relationship with PD as assessed by scatter plots and Pearson  $r$  correlation. A significant regression equation was found ( $F(3,211) = 8.307$ , ( $p = .000$ ), with an  $R^2$  of 0.106 (SE 0.460). The standardized coefficient  $\beta$  for PNE 0.341. The PD =  $1.833 + 0.325 \times \text{PNE}$ . Thus, PNE predicted PD, ( $t = 4.778$ ,  $p = .000$ ).

Table 4.19: Multiple linear regression to predict under-training doctors' PD

Predictor Variables	Standardized coefficient $\beta$	$t$	95% CI	p value
ACC	0.071	1.011	-.062_.192	.313
PNE	0.341	4.778	.191_.459	<b>.000*</b>
ATD	0.019	0.291	-.098_.132	.771

\*Correlation is significant at level 0.05 (2-tailed)

Dependent Variable: PD

## **CHAPTER 5**

### **Discussion and Conclusion**

#### **5.1 Overview**

The final chapter of this research will include discussions regarding the research hypotheses and the research problems, followed by the discussion of major findings and implications.

The aim of this study was to understand the perceptions of Malaysian public and under-training doctors regarding the relationship between physicians and the MMI, while trying to find the differences in the perceptions among these two groups.

As stated in the introduction, in order to promote transparency in relationships between physicians and MMI and to avoid any COI, many countries have adopted certain laws and codes of ethics. In 2007, the pharmaceutical industry trade association Medicines Australia adopted a code of conduct that mandated the industry to publicly disclose their spending on educational events for healthcare professionals (Medicine Australia, 2007). Later in 2015, it was amended to include any payments made to healthcare professionals for public disclosure. The physician payments Sunshine Act (2010) (later renamed as National Physician Payment Transparency Program) was adopted by USA to increase transparency of financial relationships between health care providers and pharmaceutical manufacturers by making disclosure mandatory. Besides USA, other countries that have implemented or are envisaging to implement laws for disclosure of such information include France, Slovenia, Turkey, Australia and Japan (Grundy et al, 2018). The MMI with annual revenues exceeding \$100 million were required by the law to disclose the amount of payments made to the physicians (Di Paola et al., 2010). Perry et al. (2014) reviewed the impact of this legislature on public perceptions about physician-MMI relationships and found that in public considers the ‘type’ of

payments more important than the ‘amount’ of payments. The respondents in their study believed that the physicians who receive payments for consultation to the MMI were more knowledgeable and ‘expert’.

The underlying basis for enacting these laws and codes is the assumption that making all such relationships between a physician and MMI transparent will help patients make an informed opinion and thus help avoid the COI, if any. Many authors have welcomed the idea of financial disclosure, and have detailed the type and extent of disclosure. Others, however are against disclosure stating that it will bring distrust among general public and cite lack of understanding of the full disclosure by public. The other question is whether the people who are in dire need of health care will bother about such disclosures. Will the public make use of this information to decide from whom or where they want the treatment? The jury is still out to find the optimum method and the extent of the disclosure.

## **5.2 Discussion on Results/Analysis**

Out of the 700 questionnaires distributed among the patients, 361 completed surveys were received. The demographic composition of the respondents has been mentioned in the results section. Out of 400 questionnaires distributed among under-training doctors, 215 completed surveys were received for the purpose of research. Thus, giving a response rate of 52% for the public and 54% for the under-training doctors. After analyzing the data using various research methods to test the hypothesis that were framed at the beginning of the research, following conclusions were derived.

### 5.2.1 Demographic factors (public)

HYPOTHESIS		ACCEPTED/ REJECTED
<b>H1<sub>A</sub></b>	Age will significantly influence the perceptions towards physician's financial relationships with MMI.	ACCEPTED
<b>H1<sub>B</sub></b>	Gender will significantly influence the perceptions towards physician's financial relationships with MMI.	ACCEPTED
<b>H1<sub>C</sub></b>	Race will significantly influence the perceptions towards physician's financial relationships with MMI.	ACCEPTED
<b>H1<sub>D</sub></b>	Subjective health will significantly influence the perceptions towards physician's financial relationships with MMI.	ACCEPTED
<b>H1<sub>E</sub></b>	Residence status will significantly influence the perceptions towards physician's financial relationships with MMI.	<b>REJECTED</b>
<b>H1<sub>F</sub></b>	Insurance status will significantly influence the perceptions towards physician's financial relationships with MMI.	<b>REJECTED</b>
<b>H1<sub>G</sub></b>	Education status will significantly influence the perceptions towards physician's financial relationships with MMI.	ACCEPTED

Based on the literature review, many studies have been done to understand the influence of demographic factors on the perception of trust or distrust among the patients. These factors include age, gender, race, education, annual income, subjective health, residence status and health insurance status. However, in case of under-training doctors, the research has not prioritized the effect of the various demographic factors on their perceptions. In the present study, although not included in the hypothesis, the effect of demographic factors on the under-training doctors' perceptions was also examined.

#### 5.2.1.1 Age

Based on the literature review, studies done by Blake & Early (1995), Kao et al. (2001), Gallagher et al. (2001) and Justifer & Roberts (2009) found that old age is associated with increased PNE of relationships between physicians and MMI. Similarly, a study by Khan et al. (2007) found that younger people are less worried about physician-MMI interactions. In contrast, a study by Semin et al. (2006) noted that older age is associated with decreased PNE. Other studies have noted that younger people are more aware (Grande et al., 2012) and desire disclosure



(Tattersall et al., 2009) more than their older counterparts. Holbrook et al. (2013) found that as the age increases the tolerance towards the physician-MMI relationships decreases with noted exception of free drug-samples. The results derived from this survey found that age does affect the publics' ACC of the relationships between physicians and the MMI. Old age, especially people who were 60 years and above were less tolerable of these interactions.

Age has been noted to be a significant factor with regard to ethical conduct (Ruegger & King, 1992). Supporting this view, the results of the present study indicate that older people are more inclined to ethical decisions and thus perceive these interactions as less acceptable. A larger study with increased sample of older population may shed some more light in this context. Age as an independent factor was not studied for under-training doctors as most of the respondents were relatively young, ranging from 19-36 years. Instead, the 'Year of training' (medical student vs intern/ houseman) was used to analyse the data to understand the differences in the perceptions among these groups as students in different levels or years of medical course would have different prevalence or kinds of exposure to the MMI. Filippiadou et al. (2017) in a study in Greece, noticed that clinical students had more exposure than the pre-clinical students and accepted gifts from pharmaceutical companies more often. Other studies have also highlighted the fact that different level or year of study of medical students influences their perceptions.

#### 5.2.1.2 Gender

Blake and Early (1995) found that male gender was associated with decreased ACC of the relationships between the physician and the pharmaceutical industry. In another study, the female gender was associated with increased perceptions of distrust towards these relationships (Khan et al., 2007). Previous studies have noted that females have more ethical considerations with regard to business practices compared to males (Betz, O'Connell & Shepard, 1989; Ruegger & King, 1992). The results derived from this survey found that gender does have a significant role in the publics' perceptions. The females perceived the relationships between the physicians and the MMI more harmful compared to males. Not many studies have been undertaken to examine the effect of under-training doctors' gender on their perceptions. Biswas (2017) noted differences in interactions among male and

female medical students towards MMI-representatives. The study noted that females in general found the various gifts by MMI inappropriate more than the males. However, the present study found that female under-training doctors were more acceptable of the financial relationship between physicians and the MMI. Compared to female respondents from the public who perceived these relationships to have significant negative effects, no significant differences were noted between the male and female under-training doctors.

#### 5.2.1.3 Race

Literature review revealed that race also influences the publics' perceptions about physician-MMI relationships. In a study by Kao et al. (2001), White race was associated with increased negative perceptions of the relationships between the industry and the physicians. Similarly, other studies have noted the influence of race on perceptions. (Grande et al., 2011; Levinson, Kao, Kuby & Thisted, 2005; Mechanic & Meyer, 2000)

The results of this study found that race has a significant influence over the perceptions of distrust. Indians were most concerned about the negative effect of these relationships. Malays & Indians had the most distrust of these relationships, where as the Chinese found them most acceptable. Race was not a significant factor in case of under-training doctor's perceptions.

#### 5.2.1.4 Subjective Health

Subjective health is state of health that a person perceives for self and includes physical, mental and emotional health aspects as well. Literature review suggests that better subjective health is associated with increased awareness (Blake & Early, 1995). Subjective health correlates well with income and education status. Also, in a study by Fisher et al. (2012) respondents who had undergone or were planning on undergoing a surgery were associated with perceived positive effects of physician-MMI relationships. The present study found that better subjective health of public was associated with positive ATD.

#### 5.2.1.5 Residence Status

Since Malaysia has large population of expatriates who work and reside here, attempt was made to explore whether the residence status of the patient/under-training doctors would have any association with the perceptions about physician-MMI relationships. The study found that there is no relationship between the residence status of the public/under-training doctors and the perceptions about financial relationships between physicians and MMI. Also, literature review did not reveal any major study that was able to determine any link between the residence status and the perceptions towards the physician-MMI relationships.

#### 5.1.2.6 Insurance Status

Literature review suggests that health insurance is associated with increased PNE among the patients of the relationship between the physicians and the pharmaceutical industry (Pereira 2001). Also, study by Jastifer (2009) noted that inadequate health insurance is associated with increased PNE towards physician-MMI relationships as the patient has to bear increased cost of medications. However, in the present study, there was no relationship between insurance status and the perceptions of the patients or under-training doctors towards the physician-MMI relationships.

### 5.2.2 Prior exposure to MMI

<b>H2A</b>	Prior exposure of under-training doctors to MMI will significantly influence the perceptions towards physician's financial relationships with MMI.	REJECTED
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The medical students' attitudes towards MMI interactions are comparable to that of the physicians. As they course through their clinical postings and internships that are overseen by physicians, the medical students observe and get influenced by physicians conduct. As reported by Sierles et al. (2005) 93.2% of the students in their study reported being asked or required by a physician to attend at least one drug-company-sponsored lunch. Others studies have noted the exposure of medical students to the MMI activities during their early years. (Bellin et al., 2004; Beyhun, Kolayli, Can & Topbas, 2016) Moreover, this exposure increases as they progress

through their course. One study noted that 77% of the second-year students had received gifts including drug samples from the MMI (Fein et al., 2007).

As expected, the intern/houseman group was significantly more aware about these relationships compared to medical students. Around 40% of under-training doctors had prior exposure to a MMI related activity such as free drug-samples, gifts, lunches, MMI-sponsored talks etc. Review of literature suggests that most of the under-training doctors find the interactions with MMI acceptable and this favourable perception is partly shaped by the frequent exposure with MMI. In the present study however, no significant correlation was noted between prior exposure to MMI and their perceptions towards physician-MMI relationships.

### 5.2.3 Prior Training in Interacting with MMI

<b>H2<sub>B</sub></b>	Prior training in interacting with MMI will significantly influence the perceptions towards physician's financial relationships with MMI.	REJECTED
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The importance and impact of providing proper guidance and skills to the under-training doctors has been highlighted by many authors. Steinman et al. (2001) stressed upon the importance of education and policy programs to help under-training doctors to learn to critically evaluate the gifts received from the pharmaceutical industry. Various educational interventions have been evaluated. The role of such type of training is increasingly being emphasized and implemented across medical curricula. Wilkes & Hoffman (2002) conducted a one-hour educational intervention seminar during small-group teachings to examine the changes in attitudes of students toward MMI sponsorship of research, physician-MMI interactions and drug advertisements as educational tools and noticed that students' perceptions changed after their participation in the educational programme. Another study in Canada, noted the positive effects of educational intervention on family medicine residents' attitudes towards industry interactions. After the educational intervention the residents were more cautious of the industry interactions and viewed them as less ethically appropriate (Agrawal et al., 2004). Similarly, Wofford & Ohl (2005) examined the effect of an educational intervention in third year medical students on knowledge and attitudes regarding interactions with MMI representatives. After the intervention, 62.1% of the students' felt these

interactions influence prescribing compared to 44.2% before the educational intervention. However, Schneider et al. (2006) emphasized that various educational interventions without a consistent institutional policy will not have lasting effect on the under-training doctors' perceptions. In present study, only 7% of under-training doctors acknowledged that they were trained enough during their courses about how to interact with MMI-representatives, which is obviously insufficient and highlights the need for necessary changes in the curricula to incorporate these skills. Moreover, no significant correlation was noted between prior knowledge and training of under-training doctors with their perceptions of physician-MMI relationships.

#### 5.2.4 Year of training

<b>H2c</b>	Year of training will significantly influence the perceptions towards physician's financial relationships with MMI.	REJECTED
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Year of training has been shown to influence the perceptions of medical students towards interactions with MMI. Previous studies have compared the pre-clinical and clinical students' perceptions (Fitz et al., 2007; Hyman et al., 2007; Seirles et al., 2003; Soyk et al., 2010). In some studies, clinical year students have been noted to be more acceptable of interactions with MMI (Fitz et al., 2007; Soyk et al., 2010). Whereas, in a study by Hyman et al. (2007) clinical students were less accepting of MMI sponsored events compared to the preclinical students. The present study compared the perceptions of medical students which included both preclinical as well as clinical year students with interns/housemen who are actively working in hospitals and are expected to have more exposure to MMI. As expected the prevalence of awareness about physician-MMI relationships was significantly higher among interns/housemen compared to medical students. No other significant differences were noted between perceptions of these two groups of under-training doctors.

### 5.2.5 Awareness

<b>H3A1</b>	Awareness will significantly influence the public's perceptions towards physician-MMI interactions.	ACCEPTED
<b>H3A2</b>	Awareness will significantly influence the under-training doctors' perceptions towards physician-MMI interactions.	ACCEPTED

The existence of financial relationships between the physicians and the MMI is an enigma to most of the patients as they are not completely sure about whether such a relationship does exist. And if it exists, to what extent it does? Literature review suggests that most of the respondents in the past were more aware about free drug-samples as the only relationship that existed.

Hampson et al. (2006) carried out a survey of patients recruited in a cancer research trial. The study found that 75% of the participants were not fully aware of the financial ties related to clinical studies. These patients however, were also unconcerned about physician-MMI financial ties or COI. In other studies, the percentage of patients unaware of any interactions between physician and MMI was 76% (Tattersall et al., 2009), 60% (Edwards & Ballantyne, 2009), 66% (Grande et al., 2012) and 75% (Green et al., 2012) respectively. However, a study in Turkey by Semin et al. (2006) reported that around 83% of the participants were aware of the promotional activities by the drug companies including giving gifts to the physicians.

The present study found that more than half (57.1%) of the participants were aware of the relationships between physicians and MMI. Of those who were aware, 30.2% had directly witnessed an interaction between physician and MMI. Also, it was noted that prior awareness of these relationships significantly affected ACC of these relationships. Those who were unaware of these relationships were more acceptable of these relationships. In other words, those who were aware of these relationships were less permissive. Also, prior awareness of these relationships was associated with increased desire for disclosure as well as increased PNE.

On the other hand, the survey of under-training doctors revealed that although, around 40% of the under-training doctors were aware of the relationships between physicians and the MMI, only 10% of that had heard of any guidelines regarding

accepting gifts from MMI. Other studies have noted percentages of the under-training doctors' awareness of guidelines as 10% (Alssageer & Kowalski, 2013), 29.6% (Gupta, Nayak & Sivaranjani, 2015), 33.5% (Biswas, 2017), 42.7% (Wofford & Ohl, 2005) and 46% (Reeder et al., 1993). For those who were aware of the guidelines in the present study, the source of the guidelines regarding the ethical practices was Ministry of Health (9), Malaysian Medical Council (5), University/college (4), PhAMA (3) and news (1). Again the results underline the need for increased training and knowledge of medical students during their study course. Many authors have reiterated the need to incorporate professionalism and ethics training in the early years of study course (Haque et al., 2016; Manson, 2008; Mattick & Bligh, 2006). Interestingly, present study noted that the percentage of public who were aware of these relationships was more than that of under-training doctors.

### 5.2.6 Acceptability/ Appropriateness

<b>H3B1</b>	ACC/Appropriateness will significantly influence public's PD	REJECTED
<b>H3B2</b>	ACC/Appropriateness will significantly influence under-training doctors' PD	REJECTED

Patients' ACC of the relationships between the physicians and the MMI is influenced by many factors like awareness, educational status, age etc. (Blake & Early, 1995; Mainous et al., 1995). Gibbons et al. (1998) compared physicians' and patients' attitudes towards the pharmaceutical gifts. The study noted that most of the patients considered their own doctors accepting gifts as inappropriate. On the contrary, most doctors considered accepting gifts from MMI as appropriate. Similar findings of patients' disapproval were observed in studies in Turkey (Semin et al., 2006), USA (Goff et al., 2008; Jastifer & Roberts, 2009) and Australia (Edwards & Ballantyne, 2009; Tattersall et al., 2009). Other studies have noted that inexpensive gifts and gifts for patient-use are considered more appropriate by patients as compared to expensive and personal-use gifts.

In the present study, the ACC had no significant correlation with PD ( $P = 0.377$ ). However, ACC/appropriateness was associated with positive effects of disclosure.

The participants who found these relationships acceptable were more in favour of positive effects of disclosure. Also, the ACC varied according to the type and the value or price of gifts received by the physicians as shown in the table 5 and the figure 2 in results section. Most of patients in the present survey were permissive of physicians accepting gifts from MMI. The ACC percentage was least for ownership of stocks of the company that manufactures drugs or medical instruments. Most participants perceived the free medicine samples for patient's use and educational materials like journals or text books etc. as acceptable. Around 39% percent general public considered it to be acceptable for a physician to accept gifts worth less than RM1000 per year, while 20% considered that it is acceptable for a physician to accept gifts of value between RM1000- RM5000 per year. Also, it is worth noticing that around 34% patients concurred that the physician shouldn't accept any gift at all from the MMI. From this research analysis, it was found that ACC/ appropriateness had no significant correlation with PD.

In the present study around 40% of the under-training doctors have had prior exposure to a MMI related activity such as free drug-samples, gifts, lunches, MMI-sponsored talks etc. Regarding the type of interactions, 54% thought that MMI's "*Funding of educational programmes & fellowships*" is okay (Table 15). In response to the question that whether "Free samples by MMI is a good way to learn about new products", 84% of them agreed. With regard to acceptable value of gifts, the around 43% (compared to 39% of public) preferred gifts of value < RM 1000. Only 21% (compared to 34% of public) of under-training doctors believed that physicians should not accept any gifts from MMI.

Steinman et al. (2001) studied that most of the residents judged the appropriateness of the gifts by their cost rather than their educational value. Brotzman & Mark (1993) found that the residents who are undergoing training in medical departments with written regulatory policies in place found gifts less appropriate than their peers who were training in departments without such policies. Keim et al. (1993) also stressed the need for further training of under-training doctors in bioethics. In their survey, the authors noted that most of the residents perceived accepting gifts from MMI as appropriate. According to a systematic review done by Austad, Avorn & Kesselheim (2011), the undergraduate doctors or under-training doctors get substantial exposure to pharmaceutical marketing and this exposure is usually associated with positive attitude towards marketing with respect to pharmaceutical



industry and scepticism about the negative implications or effects of these interactions. Furthermore, they noted that around 20% of the under-training doctors acknowledged interacting with MMI to learn about drugs, despite the limits imposed by their institutions.

### 5.2.7 Perceived Negative Effects

<b>H3<sub>C1</sub></b>	PNE will significantly influence public's PD	ACCEPTED
<b>H3<sub>C2</sub></b>	PNE will significantly influence under-training doctors' PD	ACCEPTED

Literature review indicates that patients believe that financial relationships between physicians and MMI does reflect on their prescribing behaviour and thus increases the cost of the treatment. The survey by Blake and Early (1995) concluded that 64% of the patients believed that gifts increase the cost of medications and around 70% of the respondents believed that physician's prescribing habits do get influenced by these gifts. Another survey by Mainous et al. (1995) found that patients usually view the acceptance of personal gifts by physicians (that has no patient-benefit) as having a negative effect on either the cost or the quality of care. Jastifer and Roberts (2009) noted that 42% of the patients think that a gift from a drug company significantly influenced a physician's prescribing of medication and 67.3% of them believed that it increased medication cost.

In the present survey, 70% of the respondents felt that these relationships affect physician's judgement and prescribing, while 49.1% believed that these gifts increase treatment costs. Moreover, it was found that PNE have a significant and a direct effect on the distrust among the patients towards the financial relationships between the physicians and the MMI.

With regard to under-training doctors, Steinman et al. (2001) reported that 61% of the residents did not believe that these gifts could actually influence their own prescribing habits. Physicians themselves are hesitant to admit that the interactions with industry (gifts) may alter their prescribing behaviour, but at the same time they feel that these interactions may affect their colleagues' prescribing habits (Sierles et al., 2005; Steinman et al., 2001; Wazana, 2000). However, in a study by Lieb and

Scheurich (2014), 42% of the doctors agreed that their prescribing behaviour may be affected by pharmaceutical sales representatives' visits.

In Finland, a survey of medical students found that students considered MMI as one of the most important source of pharmaceutical information, thus perceiving these interactions positively. (Vainiomaki et al., 2004) Another survey assessed Emergency Medicine residents' beliefs and attitudes concerning interactions with MMI representatives. The survey found that almost 50% of the residents were unaware of any guidelines regarding these interactions. As a result 80% of the residents believed that these interactions were beneficial and only 20% felt that these interactions could influence their prescribing habits (Reeder et al., 1993).

A survey of psychiatry under-trainees also noted that almost half of the respondents felt that these interactions did not affect their prescribing habits. It was concluded that, the more money and promotional items the trainee had received, the more likely they were of the view that these interactions did not affect prescribing (Hodges, 1995).

Also according to the systematic review of various studies done in the past regarding the topic, it was noticed that medical students' attitudes towards marketing practices is variable and unclear, rather somewhat contradictory too. This actually depended on the type of the interaction or financial relationship between the physicians and MMI (Austad et al., 2011).

The present survey found that around 65% of the under-training doctors acknowledged that these relationships affect prescribing. However, only around one third (33.4%) believed that the cost of these gifts is ultimately passed to the patients, thereby increasing treatment costs. Moderate correlations existed between PNE and PD. The increase in PNE increased the distrust towards the relationships between physicians and MMI. The results of multiple linear regression established that PNE significantly predicted PD.

### 5.2.8 Attitude towards Disclosure

<b>H3<sub>D1</sub></b>	Positive attitudes towards disclosure will significantly influence public's PD	ACCEPTED
<b>H3<sub>D2</sub></b>	Positive attitudes towards disclosure will significantly influence under-training doctors' PD	REJECTED

The recent advancements in the field of information and technology along with the increasing popularity of social media plays an important role in increasing awareness and thus increasing expectations of the patients from the physicians and the healthcare industry as a whole. Literature review suggests conflicting results with regards to patient's perceptions towards the disclosure of financial relationships between physicians and the medical manufacturing industry. Most of the studies have showed that patients' want to know the financial COI. Public's desire for disclosure is highlighted by many studies (Hampson et al., 2006; Kim et al., 2004; La Puma et al. 1995; Tattersall et al., 2009; Weinfurt et al., 2006).

Eaton (2003) conducted an online survey through British Medical Journal website. It was noted that 96% of the participants wanted to have all the financial relationships between doctors and drug companies conducted with transparent contracts and disclosed to them. However, Lieberman et al. (2013) in a survey of orthopaedic patients who planned to undergo surgery, found that most of them were not concerned with physician-MMI financial COI.

In the present survey, around 65% of the participants desired that MMI should self-report and disclose this information to public. Almost 70% believed that the disclosure will help them make better-informed decisions regarding choosing health care providers. Most of the participants chose online database as a preferred method of disclosure. The positive ATD (desire for disclosure) significantly correlated with the perception of distrust towards the financial relationships between the physicians and the MMI. As the desire for disclosure increased, the PD also increased.

Many countries and industry associations have adopted laws, codes and guidelines to promote transparency by disclosure of any financial relationships that exist between physicians and MMI. Such regulations are created and adopted with an assumption, that making all such relationships between a physician and MMI transparent, will enhance patient's decision-making capability and safeguard public trust. Most of the physicians are not in favour of public disclosure fearing decline in the trust between patient and physicians. But they agree that best medical evidence should be the only rationale that should dictate the prescribing decisions. Also, in contrast to the public's views, the physicians themselves feel that these financial ties don't have any effect on the prescribing habits. However, the literature review indicates otherwise (Halperin et al., 2004).

In case of under-training doctors, 46% indicated that the MMI should self-report and disclose this information to public. On linear regression, it was noted that the positive ATD had no significant correlation with the PD.

Also, another important question is about the optimal type or method of disclosure. Various studies have noted a variety of preferred types of disclosure by public that include pamphlets or displaying signboards in physician's office (Tattersall et al., 2009), verbal discussions during consultations (Oakes et al., 2015), online database (Perry et al., 2014), as well as accredited identification systems (Edwards & Ballantyne, 2009). Overall, a written document stating the disclosure (pamphlets) has been noted to be the most preferred method. (Fadalallah et al., 2016). In the present study, both public and under-training doctors' preferred type of disclosure was an online database.

After checking the data for normal distribution and multicollinearity, multiple linear regression was applied to the three Independent variables namely ACC, PNE and the desire for disclosure on the dependent variable i.e. PD, the ANOVA  $F$  was 16.962 ( $P = 0.000$ ) and the adjusted  $R$  square was 0.118. Thus, it can be concluded that there is a significant relationship between the independent variables and the dependent variables and 12% of the variability in distrust could be explained by ACC, PNE and desire for disclosure. The lesser value of  $R$  square can be explained by the existence of significant effect of awareness that was tested using descriptive methods along with demographic factors. Also, as the questions were mainly directed towards patients' experience and understanding of the effect of the physician's financial relationships with MMI, which is a relatively new concept for them. The study found many answers as neutral, which may have possibly affected the  $R$  square results. The standardized coefficient  $\beta$  for ACC, PNE and desire for disclosure were -0.096, 0.159 and 0.264 respectively. This explains that the desire for disclosure has the strongest contributory role in explaining the PD.

Also, while studying the correlations between various variables, it was analyzed that PD had weak and negative correlation with ACC and moderate positive correlation with PNE and positive ATD.

### **5.3 Comparison of Perceptions between Public & Undertraining Doctors**

After comparing the data of both the surveys for public and the under-training doctors, it was found that demographic factors (except gender) do not have a significant influence over the perceptions of under-training doctors compared to those of the public.

Regarding awareness, it was noted that among public, 57.1% of the respondents were aware about the interactions between physicians and MMI, while 42.9% were unaware. Of those who were aware, almost 30.2% had witnessed a direct interaction between a physician and MMI prior to the survey. Surprisingly, for under training doctors, only 40.5% were aware of the existence of such relationships and 59.5% were unaware prior to this survey. While trying to understand the effect of the independent variables that affect the perceptions of distrust towards these relationships amongst the public, it was noted that PD had weak negative correlation with ACC and moderate correlation with PNE and positive ATD. Also, with the help of multiple linear regression, it was found that only 12% of the variability in PD could be explained by ACC, perceived effects and ATD. Among these, positive attitudes towards disclosure made the strongest contribution in predicting the PD.

Among under-training doctors, moderate correlations were found only between PD and PNE. As PNE increased, the trust in relationships between physicians and MMI decreased. Also, with the help of multiple linear regression, it was found that only 10.6% of the variability in PD could be explained by ACC, PNE and ATD. Among these, only PNE significantly predicted PD.

#### **ACC**

Around 43% of the under-training doctors as compared to 39% of public chose < RM 1000 as the accepted value of the gifts to physicians from MMI. While 34% among patients and 20.9% among under-training doctors feel that a physician should not accept any gift from the medical manufacturing industry. Regarding the ACC of specific interactions between the physicians and medical manufacturing industry, most of the patients were more permissive of physicians receiving educational materials like journals and textbooks and receiving free medicine samples for patient use. Most of these respondents disagreed with physicians

receiving gifts of personal use such as sporting or entertainment tickets, dinners and electronics and ownership of company stocks.

For under-training doctors, ACC of these specific interactions were different. In addition to physicians receiving educational materials like journals and textbooks, these doctors/students were also more permissive of funding of educational programmes and fellowships. Also, just like patients, these respondents felt it less acceptable or appropriate, when physicians receive gifts of personal use such as sporting or entertainment tickets, dinners and electronics and ownership of company stocks.

### Type of Disclosure

Regarding the comparison of type of disclosure preferred by under training doctors, it was found that while 22.2% respondents among patients feel that there is no need for disclosure of the financial relationships that exist between physicians and medical manufacturing industry, 32.1% of under-training doctors (respondents in this survey) feel that there is no need for the disclosure. Most of the patients (46.5%) responded that online database showing the financial relationships between physicians and MMI is the preferred type of disclosure followed by physician website and signboard in physician office. Majority of under-training doctors (42.8%) also agree that online database showing the financial relationships between physicians and MMI is the preferred type of disclosure followed by signboard in physician office and face to face disclosure during consultation.

## **5.4 Conclusion**

Healthcare is an institution that requires trust since the patient trusts their physicians for their well-being. Consumers or patients are the key stakeholders in both the MMI and healthcare industry and thus their opinions are important. Disclosing the financial relationships, the existence and the extent of these relationships to be precise, will help them to make a better-informed decision while choosing the healthcare provider.

The major purpose of this study was to evaluate the perceptions of the general public towards financial relationships of physicians with the medical manufacturing

industry. Comparative study were also conducted that included the under-training doctors about the awareness and perception of these relationships. The respondent group in the data collected for this survey consisted of people of various age groups, education level, economic and health status. A comprehensive analysis of the data was done using statistical tools and the responses were divided into different groups. The data provided significant insights into the extent the general public is aware and views physicians' financial relationships as a COI. The study revealed that more than half of the respondents were aware of the financial relationships while a significant proportion had even witnessed a direct interaction between the physician and the MMI. In contrast, a significant proportion of under-training doctors were unaware of these relationships which represented a counter-view to the popular belief that respondents working in a medical setting would have greater awareness of such interactions. Also, through this thesis, an attempt was made to analyze the factors that can help promote trust among patients and encourage under-training doctors to give their input and response regarding their perceptions about the same.

The collaborations between physicians and medical manufacturing industry have historically been collaborative in nature and have the potential of contributing immensely towards patient care, public health and medical education for the medical students. The challenge is to create policies that can help create innovation and promote trust while keeping in mind, the interest of all the stakeholders, especially the patients.

Also, it is pertinent to add that the incorporation of laws or regulations related to disclosure or COI can be helpful only if there is awareness regarding the nature of the relationships. Clear guidelines and adherence to corporate governance policies related to transparency and ethics, by both MMI and physicians, can prove to be a driving force towards improving and maintaining trust among patients.

Also, it can be concluded that for the under-training doctors, who are the future physicians, medical education curricula should be designed as such so that they can get more exposure and information regarding the ethical aspects of the relationships between the healthcare industry and the MMI and are able to deal with them effectively and efficiently.

## **5.5 Implications of the Study**

This study has both theoretical and practical implications as it has tried to include the domains of ACC, PNE and ATD that were never studied, even in isolation, for the perceptions of trust/distrust about the financial relationships between the physicians and the MMI in Malaysia. Furthermore, in this study, an attempt was made to understand the perceptions of public while keeping in mind, their demographic characteristics. It was noted that ATD was significant in influencing PD. Future researchers in this field can create more unique models by adding or dropping the individual variables or constructs.

Also while researching for the data amongst under-training doctors, it was found that majority of them were not aware of the existence of any financial relationships between MMI and physicians and they were not aware of any guidelines regarding the same. Thus, it is advisable for medical educators and course directors to add more ethical dimensions towards their courses while providing clear guidelines to under-training doctors about dealing with MMI.

Along with healthcare industry, MMI should also ensure that their interests should be aligned along with the interests of all the stakeholders, especially the patients and attempts should be made to avoid COI, if any. Also, as it has been studied in this project that ATD can significantly influence the perception of trust among patients. As voluntary disclosure and guidelines are toothless, an argument can be made in the favor of enacting laws about disclosure that will ensure better compliance and increased adherence to corporate governance policies.

## **5.6 Limitations**

There are certain limitations in this research project that should be addressed in future researches in the given field, if any. Firstly, most of the questionnaires were answered through Google online forms especially for medical students. Most of the patients who participated in this study also responded through Google forms. This resulted in limited contact between researcher and respondents throughout the period of data collection and thus there was very less control over the respondent's interpretation of various questions in the questionnaire.



Secondly, the questionnaire consisted of around 30 questions, which were considered “too many” by some respondents but as the questions were important for the research objective and were optimized based on pilot study and pre-testing, the number could not be brought down. Therefore, for future studies, it is suggested to breakdown the various aspects of research framework for a better response rate. Thirdly, this study is a cross-sectional study which can influence the results as there were many respondents who were not even aware of the existence of the financial relationship between physicians and pharmaceutical industry. For these respondents, it would have been a better idea to understand their change in perception about trust after a certain period of generating awareness amongst them, while also educating them about conflicts of interest and disclosure.

Although the number of respondents were around 670, including patients and under training doctors, the demographic characteristics such as age, gender, race and education status were not equally distributed. Lastly, most of the respondents, especially the patients were from Klang valley area, which has the highest urban population in Malaysia. The present study did not include rural population. It would be interesting to survey a bigger sample size and compare perceptions of subjects from the rural and urban areas of the country.

## **5.7 Recommendations for Future Research**

For any future research on this research project, the researcher is advised to conduct separate independent studies for patients and under-training doctors, to understand their perception of trust or distrust in a more detailed manner. Also, it might be interesting to note the difference in the outcomes of the studies, if the survey was done after doing an intervention. For example, the study by Wikes & Hoffman (2002) examined the change in the attitude of the medical students towards the pharmaceutical industry’s sponsorship of medical research and usage of drug advertisements as educational tools after an hour of educational intervention. Similar intervention studies to understand the differences in perception of patients after creating awareness and educating them about potential sources of transparency and disclosure will not only have good research implications but also influence the perception of trust among the patients.

As the nature of this research project was exploratory and deductive, it provides ample opportunities for future researchers both in theoretical research as well as in practical validation of the concept.

Also, as the response rate to this survey was moderate, providing an incentive or follow-up reminders to the respondents would have been helpful in increasing the sample size, which would have helped reduce non-response bias.

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## APPENDIX A

### INFLUENCE OF DEMOGRAPHIC VARIABLES ON PERCEPTIONS

Author	Research Title	Differences in perceptions
Mainous (1995)	Patient perceptions of physician acceptance of gifts from the pharmaceutical industry	<u>Education</u> : Higher education associated with perceived negative effects (health care cost and quality)
Blake (1995)	Patients' attitudes about gifts to physicians from pharmaceutical companies	<u>Education</u> : Higher education associated with increased awareness, decreased ACC, increased PNE (cost of treatment) <u>Subjective health</u> : Better health associated with increased awareness <u>Gender</u> : Male gender associated with decreased ACC <u>Age</u> : Old age associated with decreased ACC
Kao (2001)	Physician incentives and disclosure of payment methods to patients	<u>Education</u> : Higher education associated with increased desire for disclosure, PNE <u>Race</u> : White race associated with increased PNE (quality of care) <u>Age</u> : Older age associated with increased PNE (quality of care) <u>Annual income</u> : Higher income associated with increased PNE (quality of care)
Gallagher (2001)	Patients' attitudes toward cost control bonuses for managed care physicians	<u>Education</u> : Higher education associated with increased PNE <u>Age</u> : Older age associated with increased PNE

Pereira (2001)	Patient attitudes toward physician financial incentives	<p><u>Health insurance</u>: Commercial insurance associated with increased PNE</p> <p><u>Annual income</u>: Higher income associated with increased PNE</p> <p><u>Education</u>: Higher education associated with increased PNE</p>
Kim (2004)	Potential research participants' views regarding researcher and institutional financial conflicts of interest	<p><u>Education</u>: Higher education associated with increased desire for disclosure</p>
Semin (2006)	What patients think about promotional activities of pharmaceutical companies in Turkey	<p><u>Age</u>: Older age associated with decreased PNE</p> <p><u>Education</u>: Higher education associated with increased PNE</p>
Hampson (2006)	Patients' Views on Financial Conflicts of Interest in Cancer Research Trials	<p><u>Education</u>: Higher education associated with increased PNE</p>
Khan (2007)	The Surgeon as a consultant for medical device manufacturers	<p><u>Gender</u>: Female gender associated with increased PNE</p> <p><u>Age</u>: Younger age associated with decreased PNE</p> <p><u>Education</u>: Higher education associated with increased PNE</p>
Tattersall (2009)	Patients expect transparency in doctors' relationships with the pharmaceutical industry	<p><u>Age</u>: Younger age associated with higher desire for disclosure</p> <p><u>Education</u>: Higher education associated with higher desire for disclosure</p> <p><u>English as first language</u>: associated with increased PNE</p>
Jastifer (2009)	Patients' awareness of and attitudes toward gifts from pharmaceutical companies to physicians	<p><u>Age</u>: older age associated with increased PNE(increased cost of medications) and decreased desire for disclosure</p> <p><u>Education</u>: Higher education associated with increased PNE (effects on prescribing and increased costs of medications)</p> <p><u>Annual Income</u>: higher income associated with increased PNE (increased cost of medications)</p> <p><u>Health insurance</u>: Inadequate insurance associated with increased PNE (increased cost of medications)</p>
Grande (2011)	Pharmaceutical industry gifts to physicians: patient beliefs and trust in physicians and the health care system	<p><u>Age</u>: Younger age associated with increased awareness</p> <p><u>Education</u>: Higher education associated with increased awareness</p> <p><u>Income</u>: Higher income associated with increased awareness</p>

Fisher (2012)	Physician-industry conflict of interest: public opinion regarding industry-sponsored research	<u>Health status</u> : respondents who had undergone or were planning on undergoing an operation that involved implantation of a surgical device were associated with perceived positive effects
Camp (2013)	Patients' views on surgeons' financial conflicts of interest	<u>Education</u> : higher education associated with increased awareness and increased reluctance to expensive gifts
Holbrook (2013)	What do Canadians think about physician–pharmaceutical industry interactions?	<u>Age</u> : Older age associated with decreased ACC (except drug samples for patient use)

## APPENDIX B

### SURVEY QUESTIONNAIRE FOR GENERAL PUBLIC

#### Part I:

Please fill in the blanks or place an X or check mark next to the word or phrase that best matches your response.

Date: [                      ]

#### Age

<input type="text"/>	Years
----------------------	-------

#### Gender

<input type="checkbox"/>	Male
<input type="checkbox"/>	Female

#### Race

<input type="checkbox"/>	Malay
<input type="checkbox"/>	Chinese
<input type="checkbox"/>	Indian
<input type="checkbox"/>	Others

#### Health status “How would you describe your overall state of health?”

##### Health status

<input type="checkbox"/>	Very good
<input type="checkbox"/>	
<input type="checkbox"/>	Good
<input type="checkbox"/>	
<input type="checkbox"/>	Fair
<input type="checkbox"/>	Bad
<input type="checkbox"/>	Very Bad

##### Education

<input type="checkbox"/>	Secondary
<input type="checkbox"/>	Undergraduate
<input type="checkbox"/>	Postgraduate

##### Health Insurance

<input type="checkbox"/>	Private
<input type="checkbox"/>	Other
<input type="checkbox"/>	None

#### Residence status

<input type="checkbox"/>	Local
<input type="checkbox"/>	Foreigner

#### Annual Income in RM

<input type="checkbox"/>	0-50k
<input type="checkbox"/>	50-100k
<input type="checkbox"/>	>100k

Please write your hometown or state. \_\_\_\_\_

The Medical manufacturing industry (**MMI**): the pharmaceutical industry, medical device industry and life science industry are all together referred to as Medical Manufacturing industry.

Conflict of interest (**COI**): **COI** is usually defined as situations whereby physician’s primary interest i.e. patient welfare is adversely influenced by secondary interests such as economic or personal gain.

*Patient status*

**Do you or anyone in your household takes a prescription medicine on a regular basis?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**Are you currently seeking or have received a treatment for a condition that required surgery with an implantable device?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

*Awareness*

**Are you aware of prevalence of Physician & MMI gift relationships?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**If yes, have you ever witnessed a direct interaction between a physician & MMI?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**If No, Does this knowledge change your perception about medical profession?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**Have you ever received free drug samples from your treating physician?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**Have you ever used online website for checking rating of physicians?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

.

**Part II:** Please choose your response to the following statements by putting a check mark at the respective columns

<i>The following statements are based on the relational dynamics of physicians and the medical manufacturing industry.</i>	<i>Strongly disagree</i> <b>1</b>	<i>Disagree</i> <b>2</b>	<i>Neutral</i> <b>3</b>	<i>Agree</i> <b>4</b>	<i>Strongly agree</i> <b>5</b>
1. It is ok for physicians to receive gifts for personal-use such as sporting or entertainment tickets, dinners and electronics items.					
2. It is ok for physicians to receive gifts for <i>general utility</i> such as pens and stationary items.					
3. It is ok for physicians to receive patient's counselling or teaching aids.					
4. It is ok for physicians to receive free medicine samples for patient use.					
5. It is ok for physicians to receive free medicine samples for personal use.					
6. It is ok for the physicians to receive medical educational material, e.g. journals, textbook & anatomy models.					
7. It is ok for the physicians to receive cultural courtesy items such cakes, cookies, dates and mandarin oranges during festive occasions.					
8. It is ok for the MMI to sponsor medical society's social events such as annual dinner, annual meetings etc.					
9. It is ok for the MMI to fund educational programmes & fellowships of physicians.					
10. It is ok for the MMI to reimburse physician travel expenses for educational conferences.					
11. It is ok for the MMI to offer ownership/company stocks to the physicians.					
12. It is ok for the physicians to receive payments as speaking fees at MMI's promotional events.					

13. It is ok for the physicians to receive payments from MMI in exchange for helping them in developing new drugs.					
14. It is ok for the physicians to be paid members of the MMI's advisory board.					
15. The cost of these gifts from MMI to physicians is ultimately passed on to the patients.					
16. Collaborations between physicians and MMI lead to drug & medical device innovation that eventually improve patient care and public health.					
17. Interactions with MMI representatives enhance physicians' knowledge of new products or drugs.					
18. The financial relationships affect physician judgment and prescribing patterns.					
19. Physicians should avoid or refuse visits from MMI representatives.					
20. If a physician has financial ties with MMI, I am less likely to follow his/her treatment recommendations.					
21. The MMI should self-report and disclose the financial relationships to public.					
22. The disclosure of financial relationships will act as a deterrent to inappropriate financial relationships.					
23. The disclosure of financial relationships will negatively affect public's trust.					
24. The disclosure of financial relationships will help public make better-informed decisions regarding choosing health care providers.					
25. MMI should do research on their products without physician input or direction so as to avoid conflict of interest.					
26. The physician researchers with ties to MMI are more likely to report results					



that are favourable to the products of those companies.					
---	--	--	--	--	--

*In your opinion, how many Ringgits' worth of free office-use and personal gifts is acceptable for a physician to receive in 1 year?*

- ☐ None  
☐ <RM1000  
☐ RM1000-RM5000  
☐ >RM5000

*Which of the following is/are your preferred Types/Methods of disclosure? You can choose more than one.*

1.	None- No need to disclose.	
2.	This information should be placed on the physician's website.	
3.	A sign should be posted in the physician's office.	
4.	The physician should tell me face-to-face about this relationship.	
5.	An online database should be available where you can look up this information for	
6.	Other _____	

**Thank-you for spending your time to fill-in this questionnaire.**

## APPENDIX C

### SURVEY QUESTIONNAIRE FOR MEDICAL STUDENTS/INTERNS

#### Part I:

Please fill in the blanks or place an X or check mark next to the word or phrase that best matches your response.

Date: [            ]

Age	Gender	Race
<input type="text"/> Years	<input type="checkbox"/> Male	<input type="checkbox"/> Malay
	<input type="checkbox"/> Female	<input type="checkbox"/> Chinese
		<input type="checkbox"/> Indian
		<input type="checkbox"/> Others

#### Health status “How would you describe your overall state of health?”

Health status	Undergraduate year	Health Insurance
<input type="checkbox"/> Very good	<input type="checkbox"/> Third year	<input type="checkbox"/> Private
<input type="checkbox"/> Good	<input type="checkbox"/> Fourth year	<input type="checkbox"/> Other
<input type="checkbox"/> Fair	<input type="checkbox"/> Final year	<input type="checkbox"/> None
<input type="checkbox"/> Bad	<input type="checkbox"/> Intern	
<input type="checkbox"/> Very Bad		

**Residence status**

<input type="checkbox"/>	Local
<input type="checkbox"/>	Foreigner

**Annual Income in RM**

<input type="checkbox"/>	0-50k
<input type="checkbox"/>	50-100k
<input type="checkbox"/>	>100k

The Medical manufacturing industry (**MMI**): the pharmaceutical industry and medical device industry are together referred to as Medical Manufacturing industry.

**Are you aware of prevalence of Physician & MMI gift relationships?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**Are you aware of any guidelines regarding acceptance of gifts from the MMI?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**If yes, what is source of the guidelines?** \_\_\_\_\_

**During your MBBS course, are you trained to make informed choices about participation in MMI marketing?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

**Part II:** Please choose your response to the following statements by putting a check mark at the respective columns.

<i>The following statements are based on the relational dynamics of physicians and the medical manufacturing industry.</i>	<i>Strongly disagree</i> <b>1</b>	<i>Disagree</i> <b>2</b>	<i>Neutral</i> <b>3</b>	<i>Agree</i> <b>4</b>	<i>Strongly agree</i> <b>5</b>
1. It is ok for physicians to receive gifts for personal-use such as sporting or entertainment tickets, dinners and electronics items.					
2. It is ok for physicians to receive gifts for <i>general utility</i> such as pens and stationary items.					
3. It is ok for physicians to receive patient's counselling or teaching aids.					
4. It is ok for physicians to receive free medicine samples for patient use.					
5. It is ok for physicians to receive free medicine samples for personal use.					
6. It is ok for the physicians to receive medical educational material, e.g. journals, textbook & anatomy models.					
7. It is ok for the physicians to receive cultural courtesy items such cakes, cookies, dates and mandarin oranges during festive occasions.					
8. It is ok for the MMI to sponsor medical society's social events such as annual dinner, annual meetings etc.					
9. It is ok for the MMI to fund educational programmes & fellowships of physicians.					
10. It is ok for the MMI to reimburse physician travel expenses for educational conferences.					
11. It is ok for the MMI to offer ownership/company stocks to the physicians.					
12. It is ok for the physicians to receive payments as speaking fees at MMI's promotional events.					

13. It is ok for the physicians to receive payments from MMI in exchange for helping them in developing new drugs.					
14. It is ok for the physicians to be paid members of the MMI's advisory board.					
15. The cost of these gifts from MMI to physicians is ultimately passed on to the patients.					
16. Collaborations between physicians and MMI lead to drug & medical device innovation that eventually improve patient care and public health.					
17. Interactions with MMI representatives enhance physicians' knowledge of new products or drugs.					
18. The financial relationships affect physician judgment and prescribing patterns.					
19. Physicians should avoid or refuse visits from MMI representatives.					
20. If a physician has financial ties with MMI, his patients are less likely to follow his/her treatment recommendations.					
21. The MMI should self-report and disclose the financial relationships to public.					
22. The disclosure of financial relationships will act as a deterrent to inappropriate financial relationships.					
23. The disclosure of financial relationships will negatively affect public's trust.					
24. The disclosure of financial relationships will help public make better-informed decisions regarding choosing health care providers.					
25. MMI should do research on their products without physician input or direction so as to avoid conflict of interest.					
26. The physician researchers with ties to MMI are more likely to report results that					

are favourable to the products of those companies.					
--	--	--	--	--	--

*In your opinion, how many Ringgits' worth of free office-use and personal gifts is acceptable for a physician to receive in 1 year?*

- ☐ None  
☐ <RM1000  
☐ RM1000-RM5000  
☐ >RM5000

*Which of the following is/are your preferred Types/Methods of disclosure? You can choose more than one.*

7.	None- No need to disclose.	
8.	This information should be placed on the physician's website.	
9.	A sign should be posted in the physician's office.	
10.	The physician should tell me face-to-face about this relationship.	
11.	An online database should be available where you can look up this information for	
12.	Other _____	

**Thank-you for spending your time to fill-in this questionnaire.**

**APPENDIX D**

**QUESTIONNAIRE VARIABLES**

<b><u>Part I</u></b>  Demographic Features	1)	Age	Independent Variable
	2)	Gender	
	3)	Race	
	4)	Health status	
	5)	Education	
	6)	Health Insurance	
	7)	Residence status	
	8)	Annual income	
Awareness	1)	Awareness regarding the relationships between physicians and MMI	Independent Variable
	2)	If yes, have you ever witnessed a direct interaction between any physician & the MMI?	
	3)	Do you or anyone in your household takes a prescription medicine on a regular basis?	
	4)	Are you currently seeking or have received a treatment for a condition that required surgery with an implantable device?	
	5)	Have you ever received free drug samples from your treating physician?	
	6)	Have you ever used online website for checking rating of physicians?	
<b><u>Part II</u></b>	1)	It is OK for physicians to receive gifts for personal-use such as sporting or entertainment tickets, dinners and electronics items	
	2)	It is OK for physicians to receive gifts for general utility such as pens and stationary items	
	3)	It is OK for physicians to receive patient's counselling or teaching aids	

ACC/ Appropriateness*	4)	It is OK for physicians to receive free medicine samples for patient use.	Independent Variable
	5)	It is OK for physicians to receive free medicine samples for personal use.	
	6)	It is OK for the physicians to receive medical educational material, e.g. journals, textbook & anatomy models.	
	7)	It is OK for the physicians to receive cultural courtesy items such cakes, cookies, dates and mandarin oranges during festive occasions.	
	8)	It is OK for the MMI to sponsor medical society's social events such as annual dinner, annual meetings etc.	
	9)	It is OK for the MMI to fund educational programmes & fellowships of physicians	
	10)	It is OK for the MMI to pay for physician travel expenses for educational conferences.	
	11)	It is OK for the MMI to offer ownership or company stocks to the physicians.	
	12)	It is OK for the physicians to receive payments as speaking fees at MMI's promotional events.	
	13)	It is OK for the physicians to receive payments from MMI in exchange for helping them in developing new drugs.	
	14)	It is OK for the physicians to be paid members of the MMI's advisory board.	
	15)	The cost of these gifts from MMI to physicians is ultimately passed on to the patients.	
	16)	Collaborations between physicians and MMI lead to drug & medical device innovation that eventually improve patient care and public health.	
	17)	Interactions with MMI representatives enhance physicians' knowledge of new products or drugs.	



PNE*	18)	The financial relationships affect physician judgment and prescribing patterns.	Independent Variable
	19)	MMI should do research on their products without physician input or direction so as to avoid conflict of interest.	
ATD*	20)	The MMI should self-report and disclose the financial relationships to public.	Independent Variable
	21)	The disclosure will act as a deterrent to inappropriate financial relationships.	
	22)	The disclosure will help public make better-informed decisions regarding choosing health care providers	
PD	23)	If not aware of these relationships, does this knowledge change your perception about medical profession?	Dependent Variable
	24)	Physicians should avoid or refuse visits from MMI representatives.	
	25)	If my physician has financial ties with MMI, I am less likely to follow his/her treatment recommendations.	
	26)	The disclosure will negatively affect public's trust.	
	27)	The physician researchers with ties to MMI are more likely to report results that are favourable to the products of those companies.	
Acceptable value of gifts	28)	In your opinion, how many Ringgits' worth of free office-use and personal gifts is acceptable for a physician to receive in 1 year	Independent Variable
Preferred type of disclosure	29)	What is your preferred type/types of disclosure for this information?	Independent Variable

\*ACC/Appropriateness, PNE, ATD will be used as independent variables to evaluate their relationship with PD during multiple linear regression.

## **APPENDIX E**

### **COVER LETTER**

Date:

Dear Participant:

My name is Dr. Avneet Kaur and I am a post-graduate student at Universiti Tunku Abdul Rahman (UTAR) and am in the process of writing my Master's Thesis. For my thesis project, I am examining public perceptions of financial relationships between physicians and medical manufacturing industry (MMI). I am inviting you to participate in this research study by completing the attached questionnaire. The following questionnaire will require approximately 10 minutes to complete. There is no compensation for responding nor is there any known risk. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researchers will know your individual answers to this questionnaire.

If you choose to participate in this project, please answer all questions as best you can. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavors.

Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the [avneet@utar.edu.my](mailto:avneet@utar.edu.my).

Thank you for your assistance in this important endeavor.

Sincerely yours,

Dr. Avneet Kaur



APPENDIX F  
ETHICAL APPROVAL

UNIVERSITI TUNKU ABDUL  
RAHMAN

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/48/2019

12 March 2019

Mr David Ng Ching Yat  
Department of Accountancy  
Faculty of Accountancy and Management  
Universiti Tunku Abdul Rahman  
Jalan Sungai Long  
Bandar Sungai Long  
43000 Kajang, Selangor

Dear Mr David,

**Ethical Approval For Research Project/Protocol**

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

<b>Research Title</b>	A Question of Trust: Malaysians Perception of Financial Relationships Between Physicians and Medical Manufacturing
-----------------------	--

	Industry (MMI)
<b>Investigator(s)</b>	Mr David Ng Ching Yat Dr Avneet Kaur (UTAR Postgraduate Student)
<b>Research Area</b>	Social Sciences
<b>Research Location</b>	Malaysia
<b>No of Participants</b>	450 participants (Age: 18 - 70)
<b>Research Costs</b>	Self-funded
<b>Approval Validity</b>	12 March 2019 - 11 March 2020

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

**Kampar Campus :** Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia

**Tel:** (605) 468 8888 **Fax:** (605) 466 1313

**Sungai Long Campus :** Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia

**Tel:** (603) 9086 0288 **Fax:** (603) 9019 8868

**Website:** www.utar.edu.my



Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,



**Professor Ts Dr Faidz bin Abd Rahman**

Chairman

UTAR Scientific and Ethical Review Committee

c.c     Dean, Faculty of Accountancy and  
         Management Director, Institute of  
         Postgraduate Studies and Research

**Kampar Campus :** Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia

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