

**UNDERSTANDING THE PERCEPTIONS
OF THAI PHYSICIANS IN BANGKOK ON PRESCRIBING
THE ORAL ANTI - DIABETIC DRUGS TO T2DM PATIENTS**



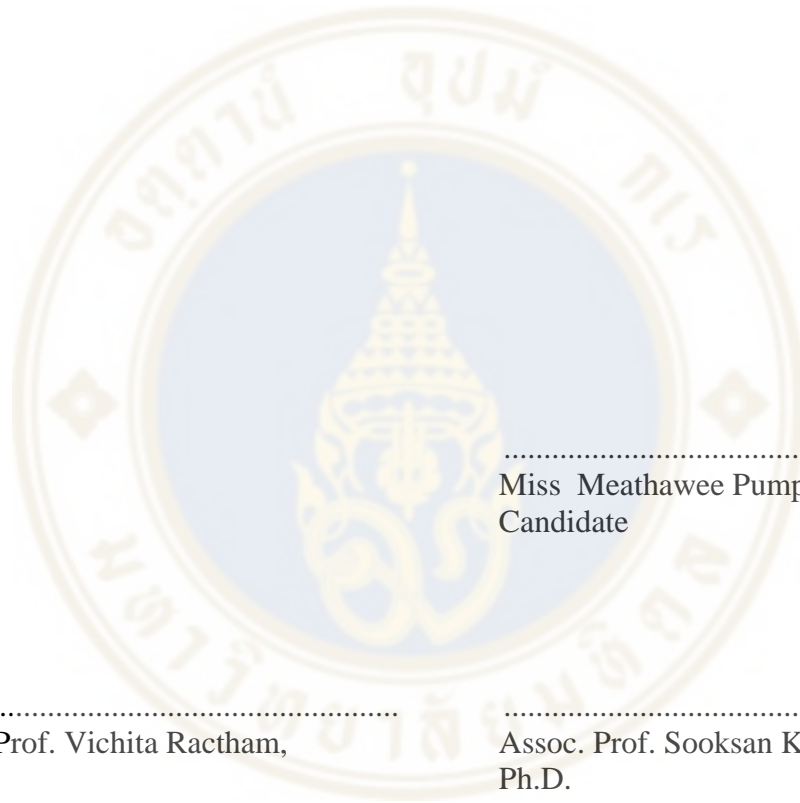
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Thematic paper
entitled
**UNDERSTANDING THE PERCEPTIONS
OF THAI PHYSICIANS IN BANGKOK ON PRESCRIBING
THE ORAL ANTI - DIABETIC DRUGS TO T2DM PATIENTS**

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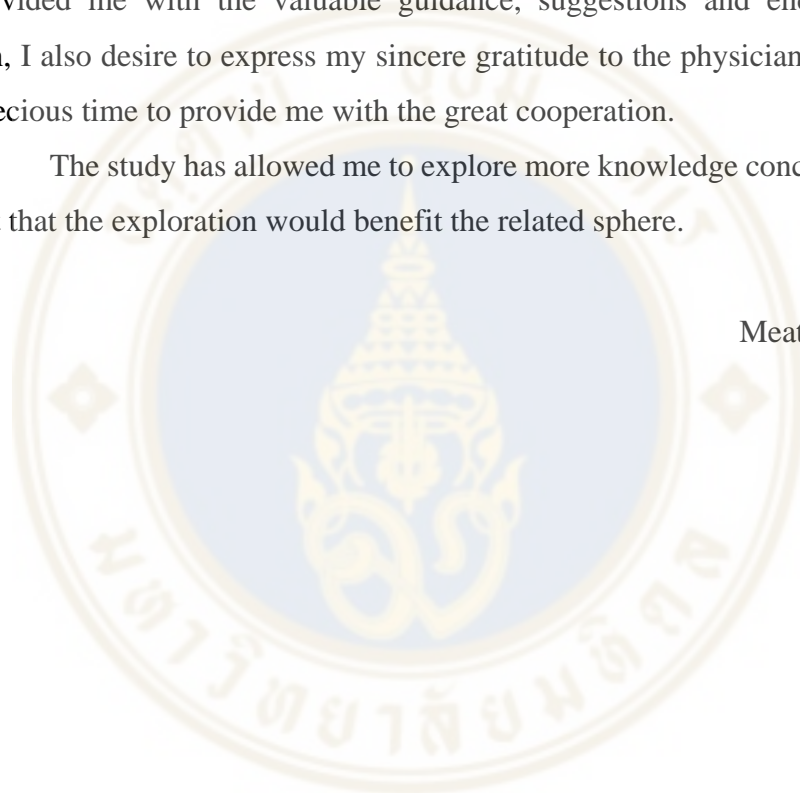
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The study has allowed me to explore more knowledge concerning the topic. I expect that the exploration would benefit the related sphere.

Meathawee Pumpech



UNDERSTANDING THE PERCEPTIONS OF THAI PHYSICIANS IN BANGKOK ON PRESCRIBING THE ORAL ANTI - DIABETIC DRUGS TO T2DM PATIENTS

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ABSTRACT

With the rising burden of type 2 diabetes mellitus, it allows growing competition of the pharmaceutical companies marketing the oral anti – diabetic drugs. This study explores the perceptions of Thai physicians in Bangkok on prescribing the oral anti – diabetic drugs to T2DM patients. The face to face interviews were conducted to collect the deep insights from 25 physicians working in the government hospitals in Bangkok. Their considerations in selecting the oral anti – diabetic drugs were related to many aspects including the patient conditions, the properties of the oral anti – diabetic drugs, affordability and the promotions executed by the drug companies. A new framework involving the oral anti – diabetic drug selection was created, focusing on the effective promotional strategies. It was found that the proper promotions should be informative to rise the physicians’ confidences towards the drug profiles. These promotional strategies can be executed by employing medical representatives, providing the drug samples and arranging the academic meetings.

KEY WORDS: Diabetes/ Oral anti - diabetic drugs/ Perceptions/ Physicians/
Promotions

36 pages

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CHAPTER I

INTRODUCTION

Presently, non-communicable diseases (NCDs) including cancer, heart diseases, stroke, and diabetes, have become the common causes of death worldwide. These issues are able to cause poverty as well as slow down the development of economy in many countries. The NCDs account for 71% of the deaths all over the globe (World Health Organization [WHO], 2018). Among the NCDs, diabetes accounts for 4% of the deaths. The prevalence of diabetes in Thailand is 9.6% (WHO, 2016). That means there are 6.5 million citizens suffering from diabetes. Inevitably, it is the huge burden that threatens the well – beings of Thai citizens. Type 2 diabetes occupies 90% of the total diabetes patients, being considered as the most common type. It happens when the body has insulin – resistant condition or cannot produce enough insulin. Consequently, diabetes can cause many serious conditions including blindness, heart attacks, kidney failure, stroke as well as lower limb amputation. Sriwijitkamol (2011) found that, among Thai diabetic patients, the prevalence of chronic kidney disease and diabetic foot were 48.2% and 40%, respectively. Diabetic retinopathy accounted for 31.2%, cardiovascular diseases for 28.9% and cerebrovascular diseases for 10.6%. It can be clearly seen that diabetes is relevant to many complications from which patients will suffer in the future. Therefore, appropriate treatment should be performed since the first diagnosis.

To achieve the goals of diabetes management, prescribing pharmacological agents is necessary. Endorsed with the guidelines, Metformin is preferred to be the first drug for treating type 2 diabetes. Additionally, a patient-centered approach is also suggested, meaning that if T2DM patients cannot achieve the treatment goals, there are a number of anti-diabetic agents to be added on with Metformin (American Diabetes Association, 2020). The groups of oral anti - diabetic agents that are available in Thailand consist of Alpha-Glucosidase inhibitors (AGIs), Biguanides (Metformin), Dipeptidyl Peptidase-4 inhibitors (DPP-4i), Glinides, Sodium-Glucose cotransporter-2

inhibitors (SGLT2i), Thiazolidinediones (TZDs) as well as Sulfonylureas (SUs). Major players in Thailand anti – diabetic market are composed of AstraZeneca, Boehringer Ingelheim, Eli Lilly, Janssen, Novo Nordisk, Merck, Sanofi and others. They market different brand names of the drugs. Sometimes, they are in the same class.

In selecting the drugs for patients, there are many aspects to be taken into consideration. Since it is the chronic disease, the patients are treated lifelong. The diabetes itself is also relevant to multiple defects. Thus, the pharmacological agents are selected based on glycemic efficacy, safety and tolerability, other properties such as weight reduction, comorbidities, route of administration as well as costs (Thrasher, 2017). Apart from the mentioned concerns, it is found that how physicians select the alternative drugs is also relevant to external components. Generally, price and promotion from pharmaceutical companies are involved in the prescription decision making (Gonul et al., 2001). In terms of the promotions, pharmaceutical marketing activities are conducted in different approaches including personal selling, good rapport with physicians as well as public relations (Narendran & Narendranathan, 2013). Furthermore, it was found that the physicians assess the core product benefits on safety, quality of drugs and efficacy (Inamdar & Kolhatkar, 2012). It can be observed that when the physicians prescribe the drugs, there are a number of conditions to be considered.

For the oral anti - diabetic drug classes, many molecules are available with different trade names from various pharmaceutical companies. Therefore, understanding insights from physicians' perspectives is one of the essential tools for developing effective communication strategies and marketing campaigns to serve the physicians' preferences. In general, the product, price and promotion have been found related to prescribing behaviors. However, for the oral anti – diabetic drugs, there is no research that explores the insights from the physicians' aspects involving how the product, price and promotion are relevant to the prescribing behaviors. Thus, this study aims to find out the perceptions from the physicians in Bangkok towards type 2 diabetes treatment, the way they select the oral anti – diabetic drugs and the elements that are related to their prescribing behaviors. It is expected that the results from the findings can explore the new insights and benefit the pharmaceutical companies that market the

oral anti – diabetic drugs in terms of enhancing the marketing competitiveness. This is the reason why this undiscovered insights should be explored.



CHAPTER II

LITERATURE REVIEW

2.1 Type 2 diabetes treatment

The approaches for treating type 2 diabetes mellitus (T2DM) are suggested by the treatment guidelines, starting from lifestyle modification and using pharmacological agent named Metformin. However, the disease still progresses in many patients. Therefore, helping patients to maintain their glycemic control with only Metformin can be effective for a short period of time. Then, the patients are given other agents for better disease control. The concept of patient – centric approach in selecting the drugs is recommended (ADA, 2020). There are many concerns including cardiovascular comorbidities, hypoglycemia risk, effect on body weight, safety as well as patient preferences to be taken into account. Pharmacological agents which are the essential tools to treat diabetes effectively consist of many classes. Each class of the drug has different mechanism of actions, addressing the multiple physiological defects in the diabetes. This raises the questions about how the physicians select one of them for the patients. In this study, the perceptions towards type 2 diabetes treatment and how the physicians select anti – diabetic drugs are captured and understood.

2.2 Oral anti - diabetic drugs classes

The important approach of treating T2DM is prescribing the oral anti – diabetic drugs. Thrasher (2017) stated that the options for treating type 2 diabetes mellitus (T2DM) have risen since there was an improvement in understanding of underlying pathophysiological defects. Type 2 diabetes treatment should take multiple defects into account and move towards patient-centricity by considering related aspects apart from glycemic control. A decrease in cardiovascular risk should also be considered. Metformin is recommended to be the first pharmacological agent. For the second line drugs, there are many groups of them to be selected and recommended by

the guidelines. Other drugs are considered according to glycemic efficacy, safety and tolerability, additional properties such as patient comorbidities, weight reduction, route of administration, as well as treatment costs. However, when focusing on patient-centricity concept, therapeutic choices are still selected for the individual patients by the physicians themselves. The available oral anti – diabetic drugs consist of many classes as follows (Clinical Practice Guideline for Diabetes, 2017).

2.2.1 Biguanides

Biguanides suppress hepatic glucose production and improve insulin sensitivity (Gong et al., 2012). The only drug in this class is Metformin. Ammiformin, Berformin SR, Deson etc., are available trade names in Thailand (MIMs Thailand, 2020).

2.2.2 Sulfonylurea (SUs)

Its effects are to increase plasma insulin concentrations by stimulating pancreatic β -cells to secrete the hormone and reducing insulin hepatic clearance. This drug class consists of Glibenclamide, Glipizide, Glicazide and Glimepiride. Each of them is available in different trade names. Glibenclamide is the generic name of Benclamin, Daonil, etc. Glipizide has many trade names including Dipazide, Glycediab, Glygen, etc. Moreover, Diamicron MR 60, Diglucron, Glicabit etc. are the trade names of Gliclazide. And the last one, Glimepiride, is also called of Amarax 2, Amaryl, Diaglip etc., as commercial names (MIMs Thailand, 2020).

2.2.3 Glinides

Its mode of action is similar to Sulfonylureas (SUs) which is to increase secretion of insulin but it lasts for shorter half – life (Guardado-Mendoza et. al., 2013). In Thailand, it is available in the trade name called NovoNorm (MIMs Thailand, 2020).

2.2.4 Alpha - glucosidase inhibitor (AGIs)

It can slow down glucose release from complex carbohydrates and retard glucose absorption, contributing to decrease in postprandial plasma glucose levels (Kumar et. al., 2011). There are two agents in this class including Acarbose and Voglibose. The commercial names are Glucobay and Basen FDT, respectively (MIMs Thailand, 2020).

2.2.5 Thiazolidinediones (TZDs)

The mode of actions are to bind and activate peroxisome – proliferator – activated receptor γ (PPAR γ), which regulates the lipid storage, and insulin sensitization (Schoonjans & Auwerx, 2000). The only drug for this class is Pioglitazone. There are many commercial names in Thailand including Actos, Gitazone/Gitazone Forte, Piozone, etc. (MIMs Thailand, 2020).

2.2.6 Dipeptidyl peptidase-4 inhibitors (DPP-4i)

It can increase insulin secretion by inhibiting DPP4 enzyme which normally degrades the incretin hormones. Each drug molecule has its own trade name. Sitagliptin and Vildagliptin are under the brand names Januvia and Galvus, respectively. The trade names of Linagliptin, Saxagliptin and Alogliptin are Trajenta, Onglyza and Nesina, respectively (MIMs Thailand, 2020).

2.2.7 Sodium-glucose co-transporter 2 inhibitors (SGLT2i)

The mode of action of Sodium-glucose co-transporter 2 inhibitors is to inhibit renal glucose reabsorption and increase glucose excretion. The available drugs in Thailand include Canagliflozin, Dapagliflozin and Empagliflozin. The commercial names are Invokana, Forxiga and Jardiance, respectively.

It can be seen that each drug class consists of many brands from different companies. Due to the high competition of the pharmaceutical industry, the marketing strategies are executed by the drug companies to catch attention from the physicians, resulting in the brand prescription. The drug marketing is considered as having positive

relationship to perceptions of physicians and is integrated in daily lives (Brett et al., 2003). The marketing strategies are relevant to the marketing mix as follows.

2.3 Marketing mix

In pharmaceutical field, the research illustrates that promotion is the most related aspect, followed by price and product. Place, however, is least relevant in the pharmaceutical context (Stros & Lee, 2015). The marketing mix in this area includes the product, price as well as promotion.

2.3.1 Product

The product is related to two main aspects which are the quality of drugs and corporate reputation (Table 1). In addition, the brand name is the component being considered as connected to the quality of drugs.

Table 2.1 The elements of the product aspects from the existing studies

| Product | Inamdar & Kolhatkar (2012) | Biswas & Ferdousy (2016) | Waheed et al. (2011) | Panchal et al. (2012) | Wright & Lundstrom (2004) | Narendran & Narendranathan (2013) | Denig et al. (1988) |
|----------------------|----------------------------|--------------------------|----------------------|-----------------------|---------------------------|-----------------------------------|---------------------|
| Quality of drugs | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Brand name | | | | ✓ | | | |
| Corporate Reputation | | | | | ✓ | ✓ | |

First, the quality of drugs is the most mentioned property. Many studies indicate that the quality of drugs is the major aspect that physicians take into account when prescribing drugs. Panchal et al. (2012) stated that perceived quality comes from perception of customers relating to the overall quality of products serving expected purposes, compared with alternatives. Inamdar & Kolhatkar (2012) found that physicians consider the core product benefits including drug safety, quality of drugs, efficacy while prescribing certain drugs. The physicians always look for the quality

drugs for their patients. Moreover, the quality drugs can also increase the representatives' confidence in detailing the drug brands to the physicians (Biswas & Ferdousy, 2016). The physicians perceive and impress the quality of drugs resulting from their observations on the outcomes of the treatments. If particular drugs from the companies are perceived as being effective, the physicians prescribe the same items next time (Waheed et al., 2011). It can be seen that the quality of drugs plays a key role when physicians opt for a drug. Panchal et. al. (2012) found that branded medicines are scored over generic drugs on all properties regarding perceived quality, excepting the price concern. The physicians have intention to prescribe the branded drugs with higher prices if they are cost-effective for benefits of patients. In addition, physicians believe that communications about perceived quality help increase perception towards the branded products. It can be observed that the brand name drugs are perceived as having higher quality. This aspect is still relevant to the drug quality.

Second, the corporate reputation is also taken into account when the physicians prescribe the drugs. Fombrun & van Riel (1999) gave a definition of corporate reputation as a set of representation of past performances of a company that illustrates the ability of the company to many stakeholders. The company is measured from both employees and external stakeholders in institutional and competitive settings. In pharmaceutical industry, certain corporate brands are important to the corporate reputation from the aspects of the stakeholders (Moss, 2001). Certain pharmaceutical companies such as Novartis, AstraZeneca etc. employ marketing communications in order to increase the corporate brand equity (Moss, 2001). Waheed et al. (2011) defined the corporate reputation as the certain level that the physicians trust and respect a pharmaceutical firm. If the physicians perceive that the reputation of the firm is well respected, they are likely to prescribe the drug if it is effective (Wright & Lundstrom, 2004).

2.3.2 Price

Gonul et al. (2001) stated that the studies and evidence relating to the price sensitivity of the physicians are inconclusive. Nevertheless, the price is likely to be perceived as an important aspect when the physicians select certain drugs. Moreover,

being concern that the effective treatment with less side effects and complications are crucial, the physicians may not perform price consideration if they perceive that the price indicates quality. The marketing research has suggested that both price and advertising are indicators of quality (Nelson, 1974). Additionally, the advertising practices concerning detailing and free samples can be thought as signals of higher quality resulting from the investment put in it (Nelson, 1974).

For the drugs treating chronic diseases, both the patients and the physicians mutually agree to continue using the drugs that are effective from the patients' opinions. Furthermore, due to the positive price – quality signaling impact, a number of generic drugs cannot occupy the majority of market shares in the pharmaceutical industry. The physicians who take the higher efficacy of the drugs into consideration believe that higher price is an indicator of the drug quality. They tend to prescribe the more expensive items when the efficacy is prioritized (Gonul et al., 2001). Therefore, the price is one of the important components. The physicians consider the price with other aspect such as efficacy and the quality of drugs.

2.3.3 Promotion

Pharmaceutical companies execute promotion strategies in many ways including detailing, providing samples, developing good rapport with doctors, having product meetings as well as sponsoring physicians to conferences. The drug promotions are considered as the tools to enhance productivity of the companies with satisfying needs and wants of the customers who are the physicians (Shamimulhaq et al., 2014). Many studies indicate that public relation is the most effective means to influence physicians to prescribe certain drugs (Narendran & Narendranathan, 2013; Biswas & Ferdousy, 2016). The pharmaceutical company promotions are practiced in different approaches including personal selling, public relation, direct mail, advertisement in journals as well as brand reminders (Table 2). According to the past research, the promotion methods that were found effective in physicians' perspective are personal selling and public relation (Biswas & Ferdousy, 2016). In contrast, the less effective marketing efforts are direct mail, advertisement in journals as brand reminders (Lisa et al., 2001; Narendran & Narendranathan, 2013; Spiller & Wymer, 2002).

Table 2.2 Promotions executed by the drug companies in the existing studies

| Promotions | Narendran,& Narendranathan, (2013) | Lisa et al. (2001) | Biswas & Ferdousy, (2016) | Gönül et al. (2001) | Zaki, (2014) | Waheed et al. (2011) | Mizik & Jacobson (2004) | Spiller & Wymer (2002) |
|----------------------------|--|-----------------------|------------------------------------|---------------------------|-----------------|----------------------------|----------------------------------|---------------------------------|
| Personal selling | | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| Public relation | ✓ | | ✓ | | ✓ | | | |
| Direct mail | Less effective | Less effective | | | | | | Less effective |
| Advertisements in journals | Less effective | | | | | | | Less effective |
| brand reminders | Less effective | | | | | | | |

Personal selling is considered as one of the most effective strategies (Lisa et.al, 2001; Mizik & Jacobson, 2004) . It is performed with detailing by the representatives of the brands (Biswas & Ferdousy, 2016). Pharmaceutical sales representatives provide the information about the recent practices of therapy and the drugs including the proper usage, indications, warnings and precautions, contraindications, side effects as well as prices. Apart from the mentioned tasks, they also provide the physicians with free drug samples. The physicians can benefit from receiving the information provided by the sales representatives, which leads to higher success rate of treatment and then results in the competence of the physicians. Mitra & Lynch (1995) found that differentiating advertising links to higher strength of preference in comparison to the reminder advertising. Therefore, the differentiating advertising results in less price elasticity. On the contrary, the advertising is able to increase price elasticity when it increases consideration set size, implying that the competitive products are available. The detailing and providing samples are relevant to both reminder and differentiating effects. Gonul (2001) found that the personal selling which are detailing and giving samples are positive, mostly informative, resulting in an increase in drug prescription probability. Zaki (2014) found that registering for conferences and providing drug samples are the most proper approaches for promoting the drugs to the physicians. Biswas & Ferdousy (2016) found that the frequency of visit

by the sales representatives and personal relationship are able to have an influence on the physicians' decisions to prescribe the brands of certain drugs. Nevertheless, it was found that the excessive detailing or samples can pose negative effects, implying that if promotional activities are over performed, the pharmaceutical companies can be perceived as too aggressive (Gonul, 2001)

Another effective promotion is the public relation. Biswas & Ferdousy (2016) stated that the public relation is related to building good rapport with the physicians. It takes time to develop. This strategy can be accomplished with many practices including sponsoring physicians for conferences, organizing clinical or scientific meetings as well as participating in special occasions such as World Diabetes Day etc. The strategy involves variety of approaches to promote drug brands. It is also found that this strategy is the most efficient way in terms of influencing prescribing behavior.

2.4 Prescribing behaviors

The marketing efforts practiced by pharmaceutical companies are relevant to the product, price and promotion (Shamimulhaq et. al., 2014). Gonul et al. (2001) found that physicians favor certain brands of drugs differently due to external elements including the price and promotion. The pharmaceutical marketing activities are related to the physicians' decisions on selecting the brands of drugs. There are many approaches that are found relevant to the physicians' decisions in prescribing certain brands of the drugs concerning good rapport with doctors, launch meetings, reputation of pharmaceutical companies, brand names as well as the quality of drugs. It was discovered that public relation of the pharmaceutical companies is the most effective strategy. It includes building a good rapport with doctors through certain activities such as sponsoring physicians to conferences as well as arranging the product meetings (Narendran & Narendranathan, 2013).

There are a number of studies suggesting that, in general, the marketing mix including the product, price and promotion is relevant to the prescription behaviors of physicians (Gonul et. al., 2001; Stros & Lee, 2015). Moreover, the place has least

relationship in pharmaceutical context whereas the promotion has been considered as the most relevant aspects, followed by the price and product itself (Stros & Lee, 2015). In this study, the prescribing behaviors mean how physicians select certain items of anti – diabetic drugs.

From the literature review, it can be assumed that the conditions related to the prescribing behaviors of the physicians are the product, price and promotion. The framework was developed as follows:

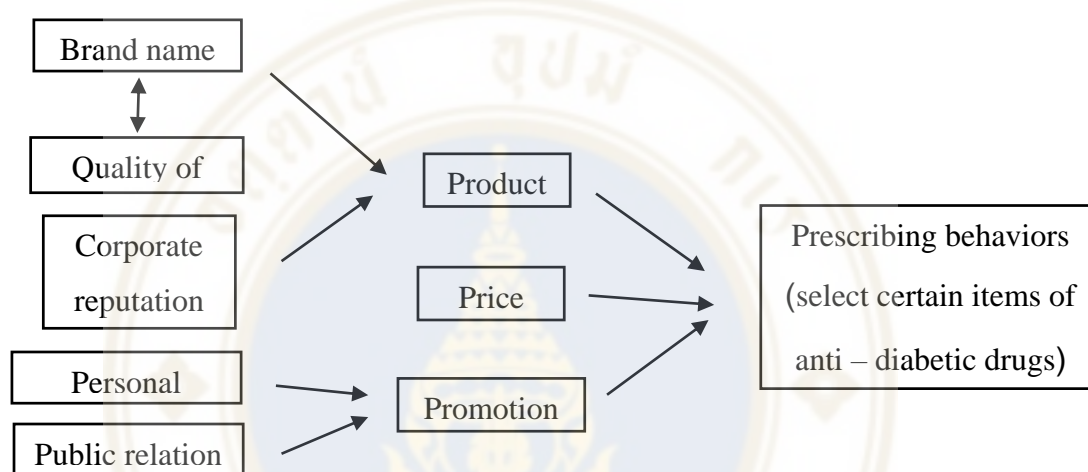


Figure 2.1 Conceptual framework of the prescribing behaviors

Nevertheless, the findings are studied in general context. None of them evaluates the perceptions of the physicians on prescribing the oral anti – diabetic agents in terms of treatment practice and how the marketing mix is related to the prescribing behaviors. In this study, the perceptions of the physicians towards type 2 diabetes treatment, the way they select the oral anti – diabetic drugs as well as how marketing mix is related to the prescribing behaviors are collected and understood.

CHAPTER III

RESEARCH METHODOLOGY

To answer the research question, the face to face interviews were performed for data collection. Open-ended Questions were utilized in order to allow the physicians to share their perspectives freely about the type 2 diabetes mellitus (T2DM) treatment, how they select and prescribe the anti – diabetic drugs as well as how marketing mix are related to their prescribing behaviors. The list of open – ended questions was developed to gain the insights in many aspects of the diabetes treatment. These questions are listed below.

How do you treat T2DM patients?

What do you think about the concept of patient – centricity?

What are the aspects that you consider when prescribing oral anti – diabetic drugs? Please prioritize 3 aspects and explain.

Do the prices are taken into account when selecting the oral anti – diabetic drugs for patients? How?

How do you obtain oral anti – diabetic drugs information?

Have you ever received the drug promotions from pharmaceutical companies? How?

What do you think about the current promotions?

What should the promotions be? Could you suggest?

What are the promotions that you find them effective in promoting the oral anti – diabetic drugs? How?

What are the messages from the pharmaceutical companies relating to the oral anti – diabetic drugs would you prefer?

To ensure the validity of data, the probing technique was utilized. Probing technique is to ask follow – up questions to gain understandings and insights from physicians' perspectives more specifically and more deeply. The interviews were audio – recorded. The contents were transcribed and analyzed utilizing thematic analysis.

The interviewees consisted of 25 English – speaking physicians who were willing to participate in this research. They were endocrinologists, cardiologists, nephrologist as well as other specialties including gastroenterologists, infectious disease specialist and internal medicine, working in government hospitals in Bangkok. They have taken care of type 2 diabetes patients for many years. The years of experiences ranged from 3 – 19 years. The interview has been tested in the field in terms of order and clearness of the questions. Each interview lasted approximately 10-25 minutes.

According to the previous studies, in general, the prescribing behaviors are related to many aspects. Clinical effectiveness, patient preferences, the product itself, prices as well as promotions from pharmaceutical companies are relevant to prescribing behaviors (Brett et al., 2003; Ljungberg et al., 2007; Shamimulhaq et al., 2014; Theodorou et al., 2009). In this study, the physicians were allowed to give their opinions freely on the considered elements when selecting the oral anti – diabetic drugs. The marketing mix was also adopted as the framework to collect and analyze the data whether it is related to the prescribing behaviors.

The marketing mix in terms of pharmaceutical context mainly involves the product, price as well as promotion. From the previous studies, the product itself includes three aspects which are the quality of drugs, brand name and corporate reputation (Panchal et al., 2012; Moss, 2001; Wright & Lundstrom, 2004). If the physicians perceive that some drugs are effective, they are likely to prescribe them next time (Waheed et al., 2011).

The second element is the price. The perception towards the price is inconclusive. Price, at times, is considered as the indicator of drug quality. The physicians tend to prescribe the drugs with higher prices if they prioritize the efficacy (Nelson, 1974; Gonul et al., 2001). In addition, the third aspect which is the promotion is also taken into account when the physicians select certain drugs. The promotions in pharmaceutical context are performed in different approaches including detailing providing samples, building good rapport with physicians, arranging meetings, supporting physicians to conferences as well as public relation. These methods are executed in order to increase the satisfaction of the physicians in terms of fulfilling need

and wants (Biswas & Ferdousy; Narendran & Narendranathan, 2013; Shamimulhaq et al., 2014).

Therefore, the questions and the topics raised during the interviews were based on the framework resulting from the previous studies. The topics were relevant to the prioritized aspects, product properties, price, sources of the drug information, current promotion, suggested promotions, effective promotions as well as useful communication messages.



CHAPTER IV

DATA ANALYSIS

The findings are demonstrated in two parts which are the sample demographics and the results from the interviews.

4.1 The sample characteristics

The interviewees were 25 physicians. The demographics are illustrated in the figure 2. Majority of the respondents were female physicians, occupying 66% of the participants. In terms of specialties, 64% of the respondents were endocrinologists, 32% was equally shared by cardiologists and other specialists and 4% was nephrologist. With regard to the years of experiences, the physicians with 1 – 5, 6 – 10, and 11 – 15 years of experiences occupied 24%, 44% and 24%, respectively. The rest of the pie chart, which was 8% contributed by the physicians with 15 – 20 years of experiences.

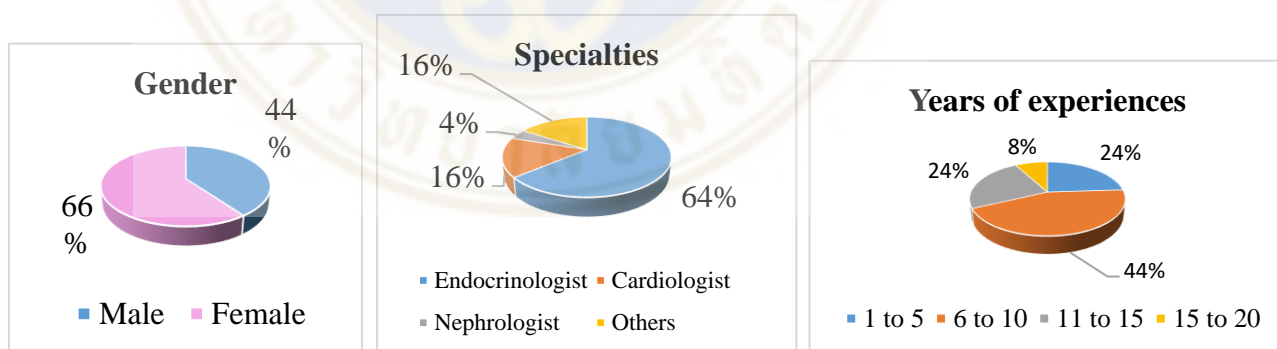


Figure 4.1 Respondents' Demographics

4.2 The results from the interviews

The interviews were designed and conducted to find out the perceptions from the physicians in Bangkok towards type 2 diabetes treatment, the ways they select the oral anti – diabetic drugs and the relevant elements of their prescribing behaviors. According to the findings, the ways they treated the patients depending on the patients' conditions whether they should only adjust the lifestyle or take the oral anti – diabetic drugs. The treatment was also selected based on the concept of patient – centricity. The selection of the drugs and the related aspects were relevant to patient conditions, properties of the drugs, affordability as well as promotions.

4.2.1 The ways the physicians treat type 2 diabetes patients

From the interviews, there were two major approaches that the physicians employed to treat type 2 diabetes patients including lifestyle modification and prescribing pharmacological agents. The lifestyle modification was related to two aspects which were diet control and physical activities. The two approaches were used together to treat the patients in long term.

The methods that the physicians used at the beginning of the treatment depended on the level of blood sugar of the patients. If the patients had low HbA1c level, they were suggested to adjust their lifestyles to reduce the blood sugar. Then, if they cannot control the blood sugar in the next visit, the physicians prescribed the oral anti – diabetic drugs. Prescribing one or two drugs was also relevant to how high the blood sugar was. Most of the doctors prescribed Metformin as the first – line drug. If the patients cannot control the blood sugar with Metformin, they were given the added – on oral anti – diabetic drugs. For the patients with very high HbA1c level, they may receive insulin injection therapy.

“First, the level of the glucose has an effect on the beginning of the treatment whether they should adjust the lifestyle, receive the oral or even insulin.” (6)

“First of all, lifestyle modification should be emphasized in every visit. Secondly, I choose medications that would be appropriate to each patient.” (8)

Most of the physicians thought that the concept of patient – centricity was useful for their practices. They also employed this concept to treat their patients. They

selected the medications by considering the patients conditions in many aspects such as patients preferences, patients concerns, comorbidities, lifestyle, social economic status as well as the treatment targets. Therefore, the treatment was individualized for each patient. The drugs should also be compatible with them. The compatibility between the drugs and patients' conditions also contributed to long term compliance to the treatment. Since diabetes is the chronic disease, the patients are treated lifelong.

“I totally agree with this concept because this disease belonged to the patients. So, the patients should have opportunity to choose which treatment they preferred” (1)

“I think the patient – centricity is very good concept because every patient has individual problems. We have to tailor the treatment for them.” (16)

4.2.2 The aspects relating to the selection of oral anti – diabetic drugs

There were multiple aspects related to the physicians' decisions including the patient conditions, properties of the drugs, affordability and promotions (Figure 3). The findings were different from the existing studies in some aspects. Therefore, a new framework for prescribing behaviors of the oral anti – diabetic drugs was developed as follows.

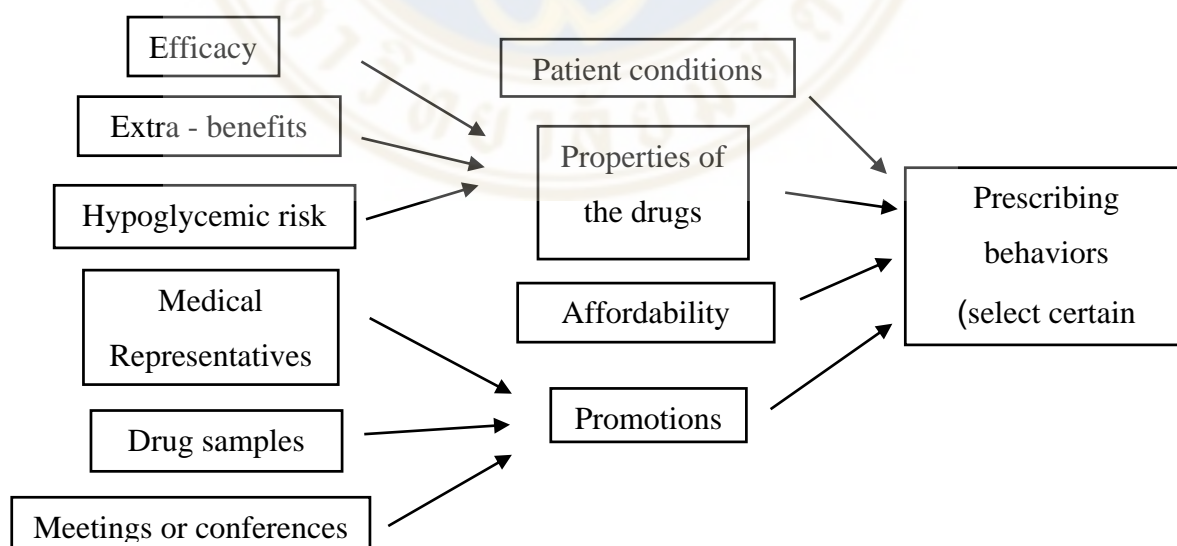


Figure 4.2 Conceptual framework of the prescribing behaviors of the oral anti – diabetic drugs

4.2.2.1 The patient conditions. These conditions were taken into account when the physicians selected the oral anti – diabetic drugs. Due to the fact that they adopted the concept of patient – centricity to their practice, individualized treatment was executed. They considered the patient characteristics such as severity of the disease, weight, comorbidities such as cardiovascular and renal disease, fragility, lifestyles as well as economic status when opting for the oral anti - diabetic drugs.

“The symptoms or severity of hyperglycemia. If the patients have hyperglycemic symptoms, I should start with insulin instead of the oral one. If they have high HbA1c, I will prescribe two agents.” (7)

“Comorbidities. If the patients have renal disease, there are certain limitations for choosing some drugs. For the elderly and fragile patients, we are very careful of using potent drugs such as high dose Sulphonylureas or insulin injection” (3)

4.2.2.2 The properties of the oral anti – diabetic drugs. There were three main characteristics that the physicians placed an importance on concerning efficacy, extra – benefits and hypoglycemic risk. First, the efficacy was one of the top three priorities. The efficacy had two meaning in physicians’ perspectives. The first meaning was the ability of the drugs to reduce the blood sugar level technically called HbA1c. This was the way how the oral anti – diabetic drugs worked.

“I think the efficacy. At least, it should be able to reduce the blood glucose.” (5)

“The first one is efficacy to reduce the blood sugar.” (8)

“Efficacy and potency. It is the most important one.” (13)

The second meaning from some physicians’ aspects included the ability of the drugs to decrease the blood sugar level and the other benefits such as cardiovascular and renal benefits as well as weight reduction.

“The first one is efficacy of the medications. If patients have some diseases such as diabetic kidney disease, stroke or cardiovascular diseases, I try to prescribe the medication that can help to prevent or to treat those diseases.” (1)

“The efficacy of the drugs. For example, if I am concerned about cardiovascular diseases, I might choose some medications that have efficacy to reduce HbA1c and have good effect with the cardiovascular diseases as well.” (9)

The second aspect of the drug properties was extra – benefits. Certain physicians considered the extra – benefits of the oral anti – diabetic drugs separately from the efficacy. The extra – benefits included the cardiovascular benefits, renal protection and weight reduction. This aspect was also taken into consideration.

“Cardiovascular and renal benefits. Because, there are some drugs that benefit in these aspects. If the prices are not patients’ concern, the drugs will be prescribed.” (11)

“Since I treat both obesity and diabetes patients, I am concerned about weight reduction benefit.” (6)

Third, hypoglycemic risk, this side effect was mentioned very often from the physicians. From their perspectives, they tended to avoid the drugs that easily caused hypoglycemia. This side effect was considered as negative for the treatment. For instance, if the patients developed hypoglycemic symptoms, they might not comply with the treatment and feared to take the drugs later on. The studies have shown that hypoglycemia was related to higher mortality. Therefore, this adverse event was one of their top priorities.

“Hypoglycemia is one of major problems that can cause severe complications. Some patients might not have adherence with the drugs because this complications. Many patients also fear about having hypoglycemia.” (9)

“I consider the risk of hypoglycemia. If patients are likely to have hypoglycemia, I will use the drugs with low hypoglycemic effects.” (16)

4.2.2.3 Affordability. The priority towards costs of the drugs was different among the interviewees. Some physicians prioritized the costs in the top three concerns while some did not. Some of them mentioned the costs of the treatment as the first priority while some preferred the efficacy and hypoglycemic risk over the costs. Certain physicians did not come up with the costs as the top three main aspects. They thought about the costs later when getting asked. However, majority of the physicians talked about the reimbursement system in Thailand. There were three

healthcare coverage schemes for Thai citizens provided from the government including the Universal Coverage Scheme (UCS) for everyone, Social Security Scheme (SSS) for the private employees as well as Civil Servants Medical Benefit Scheme (CSMBS) for the government officers. Apart from these government healthcare schemes, there was private insurance from which the patients received coverage. Due to the fact that the diabetes was the chronic disease and the patients had to take the medicines lifelong, the physicians also considered their affordability. The affordability had two meaning which were the patients' abilities to afford the drug costs out of pocket apart from getting covered from the healthcare scheme as well as total self – payment. At times, if the drug costs did not get covered with the coverage, the patients had to pay by themselves lifelong. Therefore, the medical expenses and affordability were the important aspect. If the patients were able to afford the high cost drugs with extra – benefits, the physicians did not hesitate to prescribe them. If they cannot afford these groups of the drugs, the physicians preferred the drugs in the healthcare coverage.

“I consider the reimbursement system that they get. If they can get reimbursed from the government, I choose the most appropriate drugs. For some patients, I talk about the benefits they can gain and ask if they can pay by themselves. If they cannot pay, I will prefer the standard drugs that the universal coverage covers. (6)

“It depends. If the patients have to pay by themselves, prices are major concern whether it is affordable. Because, the diabetes has to be treated lifelong. If they can afford by paying themselves or get reimbursed from their institutes, the prices do not have effect much. (7)

4.2.2.4 Promotions. The promotions from the drug companies were perceived as one of the means that the physicians received the drug information. All of physicians received the drug information by self – studying through reading medical journals, literatures, publications and guidelines. They also attended the conferences held by the hospitals, associations such as Thai Diabetes Association and pharmaceutical companies to keep updating their knowledge.

“There are many ways that I can reach the drug information such as papers, guidelines, meetings or pharmaceutical companies.” (6)

“I got the drug information from multiple sources. From the pharmaceutical companies, reading the literatures, attending the conferences.” (8)

When getting asked about the promotions, there were many approaches that the physicians answered including medical representatives, meetings or conferences and drug samples. First, majority of physicians said that they obtained the drug information directly from the medical representatives. They came visit the doctors to give the drug information to the physicians relating to the names, how to use and key messages. They also provided the doctors with the updated clinical trials both via email and papers. Certain physicians stated that if there were many drugs in the same class and the medical representatives kept reminding the products’ names, the physicians can be more familiar with them. Consequently, they can recall the names and prescribe them.

“Yes. I got the drug promotion from the medical representative and conferences. The medical representatives remind the names and key messages of the drugs.” (7)

“I received the information from the pamphlets or the brochures or personal contact. The medical representative came to me and gave the brief information about their products.” (8)

The second mentioned approach was the drug samples. Certain physicians thought that the drug samples were useful. They gave the drug samples to the suitable patient to see how they worked. Moreover, the drug samples should be given to the patients who cannot access the drugs. Therefore, it helped compensate their medical expenses.

“I received the drug samples from the companies and used for the patients who were suitable.” (11)

“Giving drug samples to the doctors is also good way. If the patients need the medications that they cannot access and the companies give them the drug samples, it can help them a lot.” (17)

Third, the meetings or conferences were also mentioned relatively often from the physicians. They also called it “*symposiums, lectures or drug dinners*”. This kind of event was arranged by inviting a lecturer to give a talk about the

drug information. The owners can be the companies themselves or other stakeholders such as hospitals and associations with the company support. If the companies selected the lectures who were famous and informative, the physicians thought that they can obtain the new drug information and the updated practices to treat their patients. They also found it useful for their practices. This approach also allowed the physicians to know how to use the drugs and to increase confidence to prescribe them more appropriately. The contents of the meetings were also important. Some physicians thought that if the speakers had direct experiences from using the drugs, this can allow attendees to select the appropriate patients and realize how the drugs actually worked. This, consequently, rose their confidence. Other contents that they would like to know about the drugs were both advantages and disadvantages involving names, efficacy, how to use, dosage, overall safety profiles, results from the clinical trials and costs.

“I attended the meetings because I wanted to get the new knowledge for treating my patients.” (21)

“They have to tell the truth about the advantages and disadvantages of the medications. We will judge whether the medications are appropriate for our patients.” (1)

Moreover, some physician suggested that the companies should organize small group meeting. This method allowed the physicians to seek more information and ask more questions. If there was a big symposium, the physicians would hesitate to ask questions.

However, there were some physicians who talked about the bias information. They perceived that if the companies owned the meetings, the contents were likely to be bias. In order to reduce the bias, the companies should provide the physicians with neutral information. They should not only provide the information on the individual drugs but also the whole classes. In addition, the lecturer who gave talk was also important. They advised that the companies should invite informative speakers.

“I think it is difficult to promote other drugs when the companies organize the meetings. If the companies can share information in neutral way of every drug in the class to reduce bias, it might be better.” (7)

“I think it is very helpful. It provides with not string – attached meaning that the specialist doctors who give talk do not have to say what the companies ask them to say. It is helpful for learning. Because if the attendants do not perceive bias from the lecturers, it has more influence on the attendees.” (14)



CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study provides additional knowledge concerning the prescribing behaviors towards the specific drug classes which are the oral anti – diabetic agents. According to the findings, there are two main approaches that the physicians employ to treat the type 2 diabetes patients including providing the education about the disease, diet control, and physical activities as well as prescribing the medications. However, it is difficult for the patients to control the disease with only practicing healthy lifestyle. Thus, prescribing the medications is mostly performed. Selecting one of the oral anti – diabetic drugs is multifactorial. Many aspects are taken into consideration involving patient conditions, properties of the oral anti – diabetic drugs and affordability. The patient conditions play a significant role in the physicians' decisions whether the drugs should be initiated. Moreover, the costs of treatment are also considered as an important component due to the fact that the patients have to take them lifelong. The medical costs should be affordable. The last aspect, the promotions from the drug companies, is perceived as one of the sources of the drug information. In this study, it is found that the sufficient information and the confidence towards prescribing the drugs have the relationship with the prescribing behaviors. These can be achieved by the delivering the drug information by the medical representatives, providing drug samples and organizing academic meetings.

5.2 Theoretical implications

This study explored the perceptions of the physicians on prescribing behaviors of the oral anti – diabetic drugs. The conceptual framework was developed from the previous studies. The marketing mix including product, price and promotion

are related to the prescription behaviors of physicians (Gonul et. al., 2001; Stros & Lee, 2015). It can be seen that the main aspects are the product, price and promotion.

From the results, the new framework of how the physicians working in the government hospitals in Bangkok select the oral anti – diabetic drugs was newly created. It was found that certain aspects are different from the existing studies. First, apart from the product – related perspective, the patient conditions are taken into account that they are appropriate for which medications. The severity of the disease, weight, comorbidities including cardiovascular and renal diseases, fragility, lifestyles as well as economic status are also considered. If the drugs are compatible with the patient conditions, the physicians tend to prescribing them. Second, it was found that the product aspect is named the properties of the oral anti – diabetic drugs. This angle includes efficacy, extra – benefits and hypoglycemic risk. It can be seen that this aspect is totally different from the previous studies which indicates that the quality of drugs and corporate reputation are relevant to the prescribing behaviors (Narendran & Narendranathan, 2013). For the oral anti – diabetic drugs, the efficacy is prioritized, meaning that the drugs have to be able to reduce blood sugar. The extra – benefits on cardiovascular benefits, renal protection and weight reduction are also considered due to the fact that the type 2 diabetes is relevant to other health issues. These also affect negatively to the health of the patients. If the drugs are able to address these problems, they are likely to be selected. Moreover, the hypoglycemic risk is placed an importance on. This specific safety issue occurs only in this context resulting from the certain modes of actions of the drugs. It is prioritized since if this side effect happens, it can contribute to lower adherence and higher rate of mortality. Thus, the physicians always avoid prescribing the drugs with the hypoglycemic risk. In addition, it was found that the corporate reputation is not one of the elements that they are concerned.

For the price, the physicians are likely to prescribe the drugs with higher prices if the efficacy is prioritized (Nelson, 1974; Gonul et al., 2001). Nevertheless, the findings from this study are different. Thus, a new term has been generated. The price is newly named as affordability. Since the oral anti – diabetic drugs have to be taken lifelong, the physicians consider the reimbursement schemes before prescribing the drugs. Some schemes allow the patients to access any type of the drugs while some do

not. There are certain groups of the drugs that the physicians consider as the high cost drugs. They also provide the patients with the extra – benefits including cardiovascular or renal benefits such as SGLT2i and GLP – 1 receptor agonist. The physicians assess whether the patients can afford them. If they cannot, the physicians will shift to other drugs that are covered with their healthcare schemes.

In terms of promotions, they are effectively practiced with personal selling and public relations (Biswas & Ferdousy, 2016). According to the findings, there are three approaches that the physicians find them effective in promoting the oral anti – diabetic drugs including medical representatives, meetings or conferences and drug samples. The findings are somewhat similar to the existing studies. The medical representatives provide the drug information directly to the physicians and make them recall the drug names. They tend to prescribe the drugs that there are familiar with. The most mentioned promotions are the meetings or conferences either held by the companies themselves or by other association with the company support. Majority of the physicians prefer this method since they can gain a new knowledge in terms of the oral anti – diabetic drugs and updated approaches for treating patients. It was also found that providing the physicians with drug samples is also useful for promoting the drugs. It allows them to see how the drugs actually work. If they are impressed with the outcomes of the treatment, they are likely to prescribe later on. Furthermore, this method still benefits the patients due to helping compensate the medical expenses. These three main methods are found relevant to the prescribing behaviors. The practices are mostly informative. These methods can also increase the confidence of the physicians to prescribe the oral anti – diabetic drugs appropriately.

Nevertheless, there are some differences. It was found that performing the public relation by taking part in special occasions such as World Diabetes Day is not related to the prescribing behaviors.

5.3 Managerial implications

From the outcomes of the interviews, there are two major practical implementations to enhance competitiveness of the pharmaceutical companies that market the oral anti – diabetic drugs including increasing affordability and physicians’

confidence. Considering the discovered aspects, the affordability is relevant to the healthcare reimbursement system. Moreover, increasing the physicians' confidence is achieved with the appropriate promotions.

5.3.1 Increasing affordability

In terms of the affordability, the companies should set the prices more reasonably to allow a number of patients who are self – paid to access the medicines. Moreover, with the various healthcare schemes in Thailand and the financial issue, the companies might consider to enlist their oral anti – diabetic drugs into the National Essential Drugs List. This approach allows reaching a large number of patients. The companies might take into account in the case that it is profitable as well as worth reducing the prices.

5.3.2 Increasing physicians' confidence

It was found that the confidence towards the oral anti – diabetic drug information is the key that encourages the physicians to prescribe them. In order to increase the confidence, the promotions play a significant role. With the laws and limitations in promoting the drug information, the promotions should be executed in the proper and efficient ways. Mostly, the promotions should be academic and informative not sponsorship.

To increase the physicians' confidence, developing credibility of the medical representatives and is necessary. Medical representatives are still important in promoting the drug information. In Thailand, the medical representatives are able to meet the physicians and give the information directly in the hospitals. What the physicians would like to know about the drug information includes the names, efficacy, usage, dosage, overall safety profiles, results from the clinical trials and costs. Since the physicians mostly consider the three components concerning the efficacy, extra – benefits and hypoglycemic risk, the firms should emphasize these aspects when promoting the drug information. Moreover, the physicians also keep updating their knowledge all the time. Therefore, to develop credibility of the medical representatives, the companies should arrange the training sessions and examination regularly to ensure that the medical representatives are well – equipped and able to handle the frequently –

asked questions. In addition, the companies should come up with the short messages to be delivered to the physicians in the time – limited situations. The messages should be the differentiating drug properties that are easily remembered and recalled.

Additionally, increasing confidence towards the drug information plays an important role. This aspect can be accomplished with two approaches which are providing the drug samples and organizing the academic meetings. First, the drug samples are still beneficial for many stakeholders including the drug companies, the physicians and the patients. The drug companies should provide the physicians with the drug samples for two purposes. First, it facilitates an initiation of the treatment and allows the physicians to witness how the drugs actually work. This allows the physicians to experience it firsthand. If they are confident and familiar with the drugs, they are likely to prescribe them further. Second, providing the drug samples for the patients who deserve can partially reduce their medical expense burden.

Second, the most useful promotion in the physicians' perspectives is the meeting or conference. The drug companies should arrange the academic meetings regularly to provide the physicians with updated beneficial knowledge for treating type 2 diabetes. The speakers should be well – accepted. The contents should be relevant to the interesting updates towards the diabetes treatment. The drug information should be delivered as whole classes to reduce the bias and increase credibility. The experience sharing is preferable to allow the audiences to see how the drugs actually work. The meetings or conferences can be organized by supporting the main meeting held by the associations to promote the drugs to a large number of attendees. Moreover, the small group discussion is also recommended to allow the audiences to ask questions and obtain the information more deeply. This approach can considerably increase the confidence to prescribe those oral anti – diabetic drugs.

5.4 Limitations

In terms of generalization, there are certain limitations. Majority of the participants were endocrinologists. The opinions may be different from other specialties. Furthermore, the findings are also specific to the government hospitals in urban area and Thai context. The perceptions might be different in other types of

hospitals such as private hospitals. Moreover, it might be different in rural area. The results may cannot be generalized in other countries with different cultures and healthcare systems. Despite the fact that there are some limitations, this study discovers the perceptions towards the selection of the oral anti – diabetic drugs, which is different from those of the general drugs. The knowledge of prescribing behaviors in this group of the drugs is also broadened.

5.5 Recommendations for future research

Future research on perceptions towards prescribing behaviors of the oral anti – diabetic drugs should be conducted other contexts. The perceptions from other specialties should be further explored to fulfill the gap. The future research should also be conducted in other types of hospitals in Thailand such as the private hospitals which is one of the business sources. In addition, in countries' contexts, there may be certain different points of view. The results probably identify variety of perceptions to suit those contexts.

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APPENDIX

Demographic characteristics of the respondents (n = 25)

| No. | Gender | specialties | Years of experiences (years) |
|-----|--------|-------------------------------|------------------------------|
| 1 | Male | Endocrinologist | 12 |
| 2 | Male | Nephrologist | 7 |
| 3 | Female | Endocrinologist | 19 |
| 4 | Male | Cardiologist | 14 |
| 5 | Male | Cardiologist | 5 |
| 6 | Male | Internal Medicine | 7 |
| 7 | Female | Endocrinologist | 7 |
| 8 | Female | Endocrinologist | 7 |
| 9 | Male | Endocrinologist | 7 |
| 10 | Female | Endocrinologist | 4 |
| 11 | Male | Endocrinologist | 7 |
| 12 | Male | Infectious Disease Specialist | 8 |
| 13 | Female | Gastroenterologist | 15 |
| 14 | Male | Endocrinologist | 6 |
| 15 | Male | Cardiologist | 6 |
| 16 | Female | Endocrinologist | 3 |
| 17 | Female | Gastroenterologist | 6 |
| 18 | Female | Endocrinologist | 11 |
| 19 | Female | Endocrinologist | 7 |
| 20 | Female | Endocrinologist | 12 |
| 21 | Female | Endocrinologist | 3 |
| 22 | Male | Cardiologist | 15 |

| No. | Gender | specialties | Years of experiences (years) |
|------------|---------------|--------------------|-------------------------------------|
| 22 | Male | Cardiologist | 15 |
| 23 | Female | Endocrinologist | 11 |
| 24 | Female | Endocrinologist | 5 |
| 25 | Female | Endocrinologist | 4 |

