CHAPTER 11

GENERAL DISCUSSION AND CONCLUSIONS

This chapter has five sections as follows:

1) Consistency and discrepancy between the two studies

2) Specific key findings and discussions

3) Implications of the thesis

4) Strengths and limitations of the thesis

5) Recommendations for further research

1. Consistency and discrepancy between the two studies

The two studies in this thesis support each other. The first one explained that attitude is more influential than subjective norm and perceived behavioral control in explaining the intention to dispense antibiotics for URI, behavioral beliefs emerged as important predictor of attitude. Whereas, the second study demonstrated that client gender and SES appearance had no significant effect on the decision to dispense antibiotic. Non-antibiotic dispensing was consistently reported in both studies, such as combination of antihistamines and decongestants and NSAIDs. The SCM study, however, found more dispensing of very harmful drugs, such as corticosteroids.

The two studies, on the other hand, provide different results on frequency of antibiotic dispensing by pharmacists. In questionnaire survey, only 17.4% of pharmacists reported that they would dispense antibiotics for URI. From SCM study, 87.5% of pharmacists did in fact dispense antibiotics. The discrepancy of drug dispensing may be explained by several reasons. Firstly, the samples in the surveys are different. The sample in study 1 consisted of every community pharmacists who practised in 14 provinces in the southern Thailand, whereas those in the second study were community pharmacists practising in only one city of one selected province. We identified pharmacists in the SCM study who also participated in the questionnaire

study. Their data were extracted and analyzed. 14.6% of these pharmacists reported that they intended to dispense antibiotics which was close to the 17.4% of the total sample in study 1. Thus, the intention to dispense antibiotics in community pharmacists is not associated with the locations of the studies. Secondly, the questionnaires present the entire history of patient in case study, while in the SCM study, the pharmacists obtained information from the patient by asking questions. Furthermore, SCs normally present a few major symptoms to pharmacists without any further information unless they are asked. The way SCs present symptoms may affect the practice of pharmacists. For example, the presentation of sore throat rather than running nose may lead pharmacists to focus on URI and bacterial infection rather than allergy or common cold. Study 1 measures intention, but study 2 measures behaviors. Even though, intention is the best predictor of behavior according to the theory of planned behavior, however, there may be many unidentified factors that modify the relationship. Uncertainty about patient diagnosis may encourage antibiotic dispensing. However, having inadequate information should not justify the use of antibiotics among the pharmacists.

The result from self-report may be biased from social desirability effect, whereas the result from SCM study reflects real practice without such bias.

2. Specific key findings and discussions

2.1 In study 1

Finding 1: The theory of planned behavior fits well to the data obtained from the community pharmacists.

Plianbanchang (1999) also identified factors affecting practising behaviors for URI (i.e., the common cold) of Thai community pharmacists using the theory of reasoned action, which poorly fits to the data, as mentioned by the investigator. Indeed, practice patterns of the pharmacists may be related to external, non-psychological factors (e.g., income, patient demand, SES of patients) beyond internal, psychological factors (e.g., attitude, subjective norm, intention). The theory of planned behavior used in this study adds an additional variable to the theory of reasoned action to capture the external factors, known as perceived behavioral control. The theory of planned behavior has improved the accuracy of behavioral prediction in circumstances where

target behavior was partially volitional (Ajzen, 1991). On explaining the pharmacist behaviors that are influenced by both internal and external factors, the theory of planned behavior is more suitable than the theory of reasoned action for understanding and interpreting such behaviors. This theory fits well with our data.

The methods to analyze data of study 1 in this thesis and Plianbanchang (1999)'s study are different. The relationships between components of the theory of planned behavior in study 1 were evaluated by SEM, whereas those of the theory of reasoned action in her study were tested by path analysis. Path analysis, a series of regression analysis, unrealistically assumes perfect reliability or no error in measuring each variable (called measurement error) (Maruyama, 1998). All variables in the equations are observed. Path analysis does not allow for representations of constructs in the tested model (Musil, et al., 1998). The SEM has advantages over path analysis. The statistical procedure of SEM does permit the specification of measurement error, thus each measure is viewed as an exact manifestation of an underlying theoretical variable (Maruyama, 1998). It simultaneously examines a series of interrelated dependence relationships among indicators and constructs as well as between constructs (Hair, et al., 2006). The hypothesized model can be determined the extent to which it is consistent with the data (Byrne, 1998), but not for path analysis. Hence, parameter estimated obtained from SEM analysis should be more realistic than those obtained from path analysis.

Finding 2: The pharmacists have low intention to dispense antibiotics for viral URI. Attitude is the strongest determinant of intention, compared with subjective norm and perceived behavioral control. The attitude is highly influenced by behavioral beliefs.

The theory of planned behavior postulates three different determinants of intention, i.e., attitude toward the behavior, subjective norm and perceived behavioral control. The relative importance of these three determinants in the prediction of intention is expected to vary across behaviors and situations (Ajzen, 1991). In the context of drugstores in Thailand, pharmacists have high autonomy in decision making. For that reason, the personal part of the model (i.e., attitude and behavioral beliefs) was a stronger predictor for the pharmacists' intention than the social influence part (i.e., subjective norm and normative beliefs) and external non-psychological influence part (i.e., perceived behavioral control and control beliefs). Our finding

supports this interpretation.

2.2 In study 2

Finding 3: The level of history taking and advice giving for patients with URI among the community pharmacists are low.

These results agree with an earlier study by Ratanajamit and Chongsuvivatwong (2001) on knowledge and practice on oral contraceptive and emergency contraceptive pills among pharmacists in Thailand. In secret shopping, the researchers revealed that history taking and advice giving on both oral contraceptive and emergency contraceptive pills were generally poor.

Finding 4: Pharmacy practice is not consisted to the existing guidelines. Pharmacists irrationally dispensed antibiotics for URI in 87.5% of all encounters. Corticosteroids (12.5%) and NSAIDs (7.8%) were also dispensed against the guidelines.

The irrational drug dispensing by the pharmacists can be harmful to the patients. Antibiotic overuse and misuse has an impact on the emergence of pathogen resistance that puts the patient at enhanced risk for serious disease due to increased period of infectivity, length and severity of illness and adverse drug reactions (McNulty, 2001). Adverse effects include skin (e.g., rash, urticaria, pruritis, erythema multiforme), gastrointestinal tract (e.g., nausea, vomiting, anorexia, diarrhea, gastritis), liver (e.g., hepatic dysfunction), kidney (e.g., acute interstitial nephritis) and blood organ (e.g., anemia, leukopenia, neutropenia, thrombocytopenia, and agranulocytosis) (McEvoy, et al, 2004; Salvo, et al., 2007).

Adverse reactions to corticosteroid therapy, especially when consumed in high doses for prolonged periods, can cause central nervous system (e.g., insomnia, nervousness), gastrointestinal (e.g. increased appetite, indigestion), endocrine and metabolic (e.g., diabetes mellitus), neuromuscular and skeletal disturbance (e.g., arthralgia) and adenocortical insufficiency (Lacy, et al., 2002; Melillo, et al., 2007).

The major adverse effects associated with NSAIDs involve gastrointestinal (e.g., peptic ulceration, small and large bowel erosive disease), renal (e.g., acute renal failure, fluid and electrolyte disturbance) and cardiovascular systems (e.g., exacerbation of hypertention, exacerbation of congestive heart failure). Moreover, NSAIDs can cause exacerbation of asthma

(Brooks, 1998; Emery, et al., 2002).

In accordance with the problems with drug use, there is a need for health providers to improve their practice, including drug dispensing behaviors.

Finding 5: Gender and SES of clients could not explain variations in pharmacists' practising behaviors regarding URI management.

In an earlier study, Gonzales, et al. (2006) evaluated physician prescription rates of antibiotics for acute respiratory tract infections. The study found that patient gender was not associated with antibiotics prescribed by practitioners. It is possible that in the treatment of URI, the use of antibiotics by health providers is not affected by gender of patients.

We identified only one study from Canada which determined whether patient SES had any effect on provider's decision to use antibiotics for URI (Kozyrskyj, et al., 2004). The study showed that children from lower household income received more antibiotics for viral respiratory infections. This contrasts with our data that clients' apparent SES was not an influential factor for antibiotic dispensing among pharmacists. Most clients are from a lower socio-economic group and have rather little power over the pharmacists' practice. Pharmacists in our studies dispensed antibiotics very frequent to both male and female patients. There was no difference between gender regarding this. A larger study is needed to further clarify gender effect on antibiotic dispensing.

Finding 6: Female pharmacists ask more questions about URI and charge more than their male counterparts.

Previous studies have shown that women are more adept in communicating feelings and emotions (Stillman, et al., 1991) and that same-gender counseling is more comfortable than opposite-gender counseling. From medication-history interviews, female patient was satisfied by female pharmacy students. Male patient was less satisfied when interviewed by female students, but more satisfied emotionally by male students' interviews (Gettman, et al., 1996). In contrast, the present study focused on only the behaviors of experienced community pharmacists, not pharmacy students. Patient gender may be a weak influence for these pharmacists, compared to other factors.

3. Implications of the thesis

Drugstores in developing countries are important sources of health advice for people with common diseases (Goel, et al., 1996). The results in study 1 provide information to develop interventions for changing pharmacists' behaviors. The interventions should focus on factors that were the strong predictors of pharmacists' intention. The high level of influence of attitude indicates that it should be targeted in intervention. Pharmacists' attitude is influenced by the existing behavioral beliefs. These practitioners will benefit from the educational intervention. However, type or technique of intentions is a critical factor for the success in improving practitioners' behaviors. Mere education emphasizing on clinical knowledge, such as lecture may not be effective. Face-to-face educational outreach has been shown to be successful in changing providers' practice (Ross-Degnan, et al., 1996). Educational outreach is academic detailing conducted by an educator who is trained with techniques of effective communication. An educator meets provider at their practice setting to give information with the intention of changing the providers' behaviors. Follow up and reminding is very critical for effective intervention.

On pharmacists' intention not to dispense antibiotics to adults with URI is higher influenced by attitude. Subjective norm and perceived behavioral control in this context are less influential. Referents who were found to influence pharmacist behavior, such as physicians or well accepted community pharmacists, may be invited as speakers for education programs. However, study 2 found that the quality of health care among the pharmacists was generally poor, particularly history taking and drug dispensing. Improvement in good pharmacy practice is urgently needed.

Our two studies give different conclusions regarding intention to dispense antibiotics and actual dispensing. Study 1 determines intention to dispense antibiotics. Although intention is the best determinant of behavior, there may be many factors that cannot be identified and are able to change this relationship. But study 2 evaluates real practice of providers. The pharmacists were more likely to dispense antibiotics due to uncertainly diagnosis.

4. Strengths and limitations of the thesis

4.1 Strengths of the thesis

We used two methods in the thesis in order to answer one common research question, what are factors influencing antibiotic dispensing for URI among community pharmacists? The findings clearly provide a better understanding of the pharmacist behaviors and validate the study results, particularly those on antibiotics dispensed by the practitioners.

The strength of study 1 (postal questionnaire survey) is in its large sample size and the high response rate (78.8%). The number of subjects in this study was 656 compared to 27 and 202 in similar previous studies (Lambert, et al., 1997; Plianbangchang, 1999). The use of SEM allows in-depth examination of various constructs in the theory. SEM provides the parameter values more realistic than path analysis. SEM determines measurement error, but no error in path analysis.

In study 2, systematic manipulation of SES appearance coupled with structural observation allowed us to test the impact of apparent SES on the pharmacist practice. The crossover design also reduced the need for a large sample size of SCs and drugstores in the study. Had the SCs been selected from their real SES, there would be no problem due to quality of faking but the problem of difference among individual personality of SCs will arise (Madden, et al., 1997).

Using two different research designs also allows cross-validation and better insight into the practice of this group of care providers. Discrepancy between our two results in frequency of antibiotic dispensing warns health system researchers about the limitation of one method alone.

4.2 limitations of the thesis

A number of data collection methods have been used to evaluate the quality of health care in drugstores, such as focus groups, external observers and questionnaires (Caamano, et al., 2002). Due to the limitation of this study, only two substantial methods (two studies) were employed to answer the research question. Both studies confined the investigation to URI only, thus the findings may not be generalizable to other diseases. Furthermore, variation of samples in

these studies makes comparisons difficult.

In study 1, subjects were limited to community pharmacists in the southern part of the country. These results should be generalizable only to this group of health care practitioners. Self-report was the method used to collect data, which may be related to the willingness of respondents to participate and the accuracy of information obtained. The absence of a measure of actual behaviors of pharmacists is another limitation. This leaves the crucial question of whether intention does predict the practising behaviors in this setting.

On study 2 using SCM, although the SCs were well-trained as having moderate and low SES, the pharmacists might not perceive the differences, thus treated them in the same way. Moreover, this study was based on repetition of SC-pharmacist pairing. There is a possibility that pharmacists were able to recognize the same clients. The sample size in this study is small and power of the test may not be enough to test the difference of practice, according to gender and SES of clients. Larger sample size is needed for definite conclusion on the issues.

5. Recommendations for further research

The following issues should be concerned for future research to provide a better understanding on factors influencing behaviors of community pharmacists.

1) The questionnaire survey in study 1 was conducted in only one part of the country. In order to produce better generalizability to other areas, further studies on the same topic in other areas are important.

2) Other psychological constructs that were reported to be important in predicting the provider practice were excluded in this study, such as self-efficacy and past behavior. Future studies should add these constructs into the hypothesized model to clearly explain the behaviors of pharmacists.

3) Future studies should examine the actual practice of pharmacists. Consequently, the relationship between intention and actual behaviors can be established that leads to better explaining pharmacists' behaviors. The simulated client method may be used to measure actual behaviors.

4) Pharmacists' practice may differ according to their status or characteristics. Future research

should assess the other predictors of health care, such as being owner of drugstore, independent vs. chain drugstores, low-volume vs. high-volume shops, or terminal degrees of the pharmacists (e.g., Bachelor Degree vs. higher than Bachelor Degree).

5) To gain more understanding of the effects of client gender and SES on pharmacists practice, a larger sample size is needed.

6) The results in this study showed the quality of service was generally poor. Further improvement is essential and the evaluation of pharmacist behaviors should employ SCM that is able to measure behavior accurately, when the SCs are well-trained in presenting the symptoms, answering the providers' questions and filling the information in the data collection forms.