

**SELF-MEDICATION: CONCEPT,
MEASUREMENT AND DETERMINANTS**

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Goa University

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in

MANAGEMENT

by

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under the guidance of

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DEDICATION

To **GOD**, the ultimate superpower, one from whom I have received innumerable blessings... through the journey of my work.

To my Family who mean the **WORLD** to me,

My parents **Mr. Tej Bahadur** and **Ms. Jai Kishori Sahib** and my mother-in-law, **Ms. Nirmala Parulekar** who have nurtured me through and made me what I am. My husband **Ajit** and my children **Shreyas** and **Abha** who supported me throughout my journey. They continue to motivate me and enable me to pursue and reach higher summits in learning.

DECLARATION

I, Parulekar Sahib Meena, do hereby declare that this dissertation entitled “Self-Medication: Concept, Measurement and Determinants “is a record of original research work done by me under the supervision of **Prof. Nandakumar Mekoth**, Professor, Department of Management Studies, Goa University.

I also declare that this dissertation or any part thereof has not been submitted by me for the award of any Degree, Diploma, Title or Recognition before.

Parulekar Sahib Meena

Place: Goa University

Date: _____

CERTIFICATE

This is to certify that the Ph.D. thesis titled “Self-Medication: Concept, Measurement and Determinants ” is an original work carried out by **Ms. Meena Sahib Parulekar** under my guidance, at the Department of Management Studies, Goa University.

This dissertation or any part thereof has not formed the basis for the award of any Degree, Diploma, Title or Recognition before.

Prof. Nandakumar Mekoth

Supervisor

Place: Goa University

Date: _____

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ABSTRACT

1.7 Objectives of the study:

The objectives of the study are:

- 1) To identify the determinants of self-medication in a general population
- 2) To understand various dimensions of self-medication

1.8 Research Plan:

Broadly, Literature in the field of marketing and consumer behaviour of OTC medicines was studied in the healthcare sector. It is evident that consumer behaviour towards medicines is very different from the other sectors. Hence, unit of analysis for the present study is the patient/consumer of medicines. Determinants of self-medication from the consumer's perspective was the chosen research area within this framework.

2.2 Research Areas in Self-medication:

As part of literature search, papers and articles were coded and arranged according to the following classification. This classification and the codes accordingly were developed by the researcher based on the literature review conducted for self-medication.

- a. General – These articles necessarily explain the phenomenon in depth including reviews. **(G)**
- b. Health Behaviour (Psychology) - This category included literature based on psychology of health behaviour. **(HB)**
- c. OTC Research- In this classification, research papers dealing with various aspects of information processing and consumer behaviour for over-the-counter medicines were included. **(OTC)**
- d. Specific applications of health behaviour theory- This category included papers dealing with very specific applications of a particular health behaviour theory. **(HBT)**
- e. Surveys- These were covered exhaustively since the objective was to identify the determinants of self-medication in a developing country i.e. India. **(S)**

- f. Theory-This category of literature included thesis, general articles and papers that discussed, explained and sometimes criticised an existing theory of health behaviour. (T)

2.3 Determinants of Self-medication:

In a country like India, where accessibility to a doctor in remote areas is a large concern, people generally tend to ignore the symptoms or wait for them to subside. A large portion of the population also cannot afford primary healthcare and a visit to the doctor's clinic at times.

Cost of consultation at the doctor's clinic is also high at times forcing people to choose alternative options to take care of their health. Accessibility to a primary healthcare provider may also be constrained due to lack of transport facilities. (Zafar Syed; 2008). Long waiting time and the crowd outside a doctor's clinic can also be a strong deterrent, it irritates the patient/consumer thus prompting easier options (Rohit Verma; 2010). In a study (Al Motassem M.;2008) it was interesting to note that non-prescription drug supply pattern is of three kinds-by prescription, by direct Self-medication (OTCs) and indirect self-medication in which people sought advice of pharmacy staff before buying the medicine. In a public opinion survey measuring attitudes of people towards community, pharmacy with respect to OTC drugs (Family Practice 2005) it was found that the most important factor influencing purchase of OTC was recommendation by the pharmacist. In a study (Pahuja Ritu; 2011), 24.7% students learnt self-medication from past prescriptions of doctors. Similarly, in a study (Balamurugan; 2011) it was found that 21.5% respondents learnt to self-medicate based on prescription from previous illness.

3.1 Research Design

A Qualitative study was conducted in 10 patients, which included the young and elderly to have a deep understanding into the patients' experiences about their medication use and opinion towards self-medication. The quantitative component of the study was undertaken in two phases. In the exploratory phase, a questionnaire was prepared and tested on 205 patients and factors influencing the phenomenon were identified using factor analysis in SPSS. The second phase of the quantitative study

was undertaken among 203 patients to explore the dimensions of self-medication and to ascertain determinants of the same.

3.4 Data Collection Tools

For the qualitative study, a semi-structured questionnaire was used during the in-depth interviews. This helped to elicit unique experiences of the consumer/patient with respect to self-medicating habits. For the pilot study and the quantitative study, the scales (DOSMS and SMS) developed by the researcher to measure self-medication were used to collect the data.

5.4 Data Analysis

Internal consistencies of the scales were tested. Descriptive analyses, factor analyses, correlation analyses and multiple regressions were performed. SPSS Version 21.0 was used for data analysis. Pearson correlation analyses were carried out to determine the relationship between determinants and dimensions of self-medication as well as the interrelation among the individual determinants.

6.5 Results of Factor analysis for independent and dependent variables (DOSMS and SMS)

DOSMS: Communalities of all the variables was more than 0.4. Factor analysis resulted in grouping 29 independent items into 8 factors with a total variance explained of 65.215%. **SMS:** Communalities of all the variables was more than 0.4. Two factors were extracted with a total variance explained of 54.153%. The factor loading scores for each item was more than 0.5.

7.4 Hypotheses testing

The most significant determinants of self-medication are identified as: doctor related beliefs, information collection behaviour, risk reduction behaviour and pharmacist related beliefs.

7.6 Theoretical Contribution

This study has been able to identify a number of determinants of self-medication, which are less researched along with a number of moderating variables, which are adding variances to self-medication, prescription self-medication and dosage self-medication. The new scales have been developed to measure belief associated with self-medication in the general population.

7.7 Managerial Implications

The findings of this study will help healthcare professionals to devise and implement intervention strategies around determinants of self-medication. Accordingly, significant beliefs of consumers can be evaluated and influenced to make the consumer/patient more aware about his /her own self-care management practices, thus reducing the burden on healthcare systems.

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ABBREVIATIONS

WSMI	World Self-Medication Industry
WHO	World Health Organization
OTC	Over-the-Counter
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
HBM	Health Belief Model
TTM	Trans theoretical Model
DOSMS	Determinants of Self-Medication Scale
SMS	Self-Medication Scale
PSM	Prescription Self-Medication
DSM	Dosage Self-Medication
IBB	Individual Behavioral Beliefs
KDM	Knowledge of disease and medicine
PUE	Past Usage and Experience
DRB	Doctor related beliefs
PRB	Pharmacist related beliefs
RRB	Risk reduction behavior
KSE	Knowledge of side effects
ICB	Information collection behavior

CHAPTER 1

INTRODUCTION

Carol, a mother of three young children aged 8,10 and 12 years was concerned about the repeated bouts of cold and cough that her children were suffering from in the past few days. Based on her previous experience in similar situations, she chose to ignore the condition for some time and then bought some antibiotics from her local pharmacy to give her children. She also decided to give some local home remedies like kada, kasai along with the allopathic remedy to her children.

Mr. Satish Singh, a patient of coronary artery disease who was operated on his heart 15 years ago chose to reduce the dose of his anti-cholesterol medication since the past year and decided to switch to alternative therapy (Homeopathy). He did not consult his physician about the reduced dosage and the switch to an alternative medicine as part of his new therapeutic regimen.

Iris, a young girl of 22 years had severe complaints of sinus and rhinitis that lasted for weeks. She tried consulting a number of doctors without much relief. Then one day she read about a natural remedy /medicine that was advertised in the newspaper for health conditions like hers. Without thinking too much, she started using this medicine after procuring it from a local pharmacy.

Medicines in India like in other developing and most least developed countries are easily available at local pharmacies. Almost any drug available in the market can be purchased over-the-counter (Van der Geest et al; 1996, Goel et al; 1996). Most of the times, it is the pharmacist who dispenses the medicine at the request of a complaining patient. It is not very uncommon to walk into a pharmacy with a prescription and notice a patient with minor complaints like headache or stomach pain asking the pharmacist for a quick fix or a remedy. In many cases, the pharmacist will dispense the medicine without a prescription and at times, may choose to switch the brand depending on its availability at his/her pharmacy or the price of the medicine.

The above stories highlight a common practice that is fast spreading its roots in the developing world. Commonly known as self-medication, the phenomenon is ambiguous and is increasingly being practiced worldwide for different reasons. According to WSMI (World self-medication industry), Self-medication is one part of self-care and is the responsible selection and use of non-prescription medicines by people to treat self-recognized illnesses or symptoms. As per the WHO (World Health Organization), it has become widely accepted that self-medication has an important place in the healthcare system. As people's general knowledge, level of education and socio-economic status improves in many countries; it forms a reasonable basis for self-medication. (Guidelines for the regulatory assessment of medicinal products for use in self-medication, 2000).

On the one hand, Self-medication is viewed as a large component of Self-care, which relies heavily on the consumer's expertise in terms of experience of the consumer, when it comes to medication use. In recent times, it has been extensively debated in developing countries where the associated risk factors have been highlighted in almost every survey carried out. (Malvi Ritesh; 2011, Pankaj Jain; IJPS 2012). Irrational use of medicines particularly self-medication with antibiotics has been cited by the WHO as a major cause of antibiotic resistance (Kunin et al; 1987, Etkin; 1992). Also, the over-prescription of drugs by doctors, illogical combinations of drugs (multiple forms of antimicrobials within a single medication) and the availability of sub-standard drugs in the market place adds on to the dangerous effects of medicine usage thus causing serious complications (V.R.Kamat;1998). Some of the major problems associated with self-medication are wastage of resources and increased resistance of pathogens (Dr. Darshana Bennadi; 2014). Self-medication poses dangers in the form of drug side effects, allergic reactions and toxic poisoning (V.R. Kamat; 1998). It can also lead to drug addiction and abuse if not managed properly. Self-medication in some cases also masks symptoms of the underlying condition in a patient and can result in overdose because of inappropriate use of the substance (www.ascendrecovery.com)

1.1 Background of the Study:

The phenomenon of self-medication is unique as a health behaviour and may manifest itself in various forms in different contextual situations. In the developed world, self-medication is mostly practiced with relatively simple over-the-counter medicines (OTC's) which are highly safe and effective in the doses as prescribed to the consumer. Self-medication research in the west is mainly focussed on understanding consumer behaviour towards OTC medicines (Colin Bradley;1998, Christine T. Chambers; 1997). On the other hand, the developing world sees a plethora of issues around the phenomenon, making this a cause of social concern (Sjaak Van De Geest; 1990, P.R. Shankar; 2002). It is important to know that in the developing world, along with OTC products many prescription products also get consumed by self-medication (Pankaj Jain; 2012). The consumer in most cases is not aware of the potential side effects of the medicine thus exposing himself/herself to greater risks while consuming the more complex prescription category of medicines. This makes this area an interesting field to research from a health behaviour perspective. This research is focussed on identifying factors that lead to self-medication, and studying relationships among the factors to explore the inherent complexities associated with the phenomenon.

1.2 Theoretical Background:

The feeling of being healthy and free from diseases is mankind's foremost challenge since times immemorial. A large number of scientific disciplines have evolved around this core requirement through the ages to meet the basic need of good health. These disciplines have their origins in basic science, technology and social sciences. As technology advances and people become more aware and conscious of their health needs, it becomes important to understand the changing dynamics of healthcare and its management.

Self-Care is what people do for themselves to establish and maintain health, prevent and deal with illness. Self-medication is one part of self-care and is the responsible selection and use of non-prescription medicines by people to treat self-recognised illnesses or symptoms. Medicines for self-medication are often called non-prescription or "over-the-counter" medicines (OTC) and are available without a

doctor's prescription through pharmacies (www.wsmi.org). As societies advance with respect to health needs and interventions, understanding human behaviour with respect to health will be a key determinant of major advances in terms of new medicines and treatments available.

In the last few decades, understanding health behaviour has assumed major importance as it enables the design of better health interventions in needy populations (Peter A. Hall; 2007, Phuong Nguyen;2012).The phenomenon of self-medication can be explained within the health behaviour theory framework. One of the more common theories used to predict health behaviour is the theory of planned behaviour (Icek Azjen; 1985). According to this theory, health behaviour is defined as an activity that persons perform to maintain or improve their health irrespective of whether that objective is actually reached. Health behaviour according to this theory can be explained using the attitude-intention model. The Health Belief Model (Rosenstock; Kirscht et al, 1950) is another theory according to which people are motivated to indulge in preventive health behaviors in response to perceived threat to their health. This theory is guided by four underlying beliefs and in 1988, self-efficacy was added to the original four beliefs of HBM; self-efficacy is the belief in one's own ability to do something (Bandura, 1977).

Besides, there are other theories including the Transtheoretical model or TTM (Prochaska and DiClemente; 1980) which describes six stages of change in adoption of health behaviours. The Social Cognition theory is similar to the Health Belief model except for addition of observational learning and self-efficacy in the model. The Self-Regulation theory(Bandura;1992) and Temporal Regulation theory (Hall; Fong; 2007)are newer theories in current times utilized for studying health behaviour which include coping procedures and understanding of biological basis of self-regulation to predict different health behaviours.

There are a large number of ongoing surveys on self-medication being carried out in the developing world to understand general and specific aspects of self-medication, many of these being specific to a therapeutic category generally antibiotics (Ansam Sawalha;2008, Abubakr Abasaheed;2009) however there is no scale as such developed to measure self-medication practices and beliefs.

1.3 Practical Background:

The prevalence of self-medication varies in different parts of the world but it can range as high as 71% in India, 98. % in Palestinian students to 12.7% in Spain (Abdolreza Shaghghi; 2014).

In developing countries, a consumer can use both prescription as well as over-the-counter medicine (OTC) by self-medication thus exposing himself/herself to the risks of irresponsible medication use. A worldwide review of consumer surveys conducted in developing and emerging economies revealed the following interesting information:

OTC medicines are

- 1) Needed to treat common health problems
- 2) Well respected by consumers worldwide
- 3) Used appropriately, carefully and safely
- 4) Appreciated for their wide availability and
- 5) Seen by many as being as effective as prescription medicines

A high percentage of population in each country surveyed as in the study above read the label/package insert completely before taking the OTC for the first time. It was also found that consumers desire to have more accessible information on labels about side effects (survey carried out in 8 Latin American countries in 2002).

In most of the developing world, similar surveys are carried out to get further insights into the phenomenon. These surveys shed light on the reasons for self-medication along with giving information about demographic trends related to self-medication(Pankaj Jain;2012,S.Kayalvizhi;2010)

Some of the common determinants of self-medication are as listed below: (Reference: Surveys in developing countries)

1. Previous experience with similar symptomsand, Self-perception of trivial nature of problem common symptomsbeing headache, fever and flu. Drugs used accordingly are painkillers, antibiotics, and anti-allergics.

-
2. Sources of drugs are pharmacy, friends, and stocks at home. Perception of saving time, being economical and providing quick relief are among the other determinants that lead to self-medication.
 3. Patients did not need advice for minor ailments. Economic reasons, fear from crowd at clinic are some other determinants of self-medication practices.

Until date there is no scale developed that can be used to measure self-medication beliefs in an individual patient/consumer of medicines. The study is aimed to identify the factors leading to self-medication, which will help healthcare managers, and professionals design policy mechanisms that can help tackle the growing problem of ill effects of self-medication in the developing world.

1.4 Significance of the study:

Self-medication in the developing world is a major health challenge (wsmi.org) that needs to be tackled to overcome the growing menace of antibiotic resistance, drug misuse and abuse. Since healthcare professionals see this as an area of major concern and impact on community being large, the need to design intervention strategies to combat the ill effects of this phenomenon is high. The findings of this study are likely to have policy implications, will help to improve medicine usage and also help reduce the risks associated with the phenomenon.

1.5 Scope of the study:

The study covers the general adult population with no specific reference to a particular health condition. The area of study is restricted to the state of Goa. The study covers exploration of nature and structure of the phenomenon called self-medication and its determinants

1.6 Research Problem:

Since this field of research is multidisciplinary, there is a need to look across research papers, review articles and case studies to find relevant information that can be analysed in totality. Currently, the focus is on consumer behaviour towards OTC medicines in the west where consumers are generally well aware about the medicines they consume. Consumer behaviour towards pharmaceutical products can be quite

complex. For OTC products, since the monetary value is low and they are frequently purchased they are a low involvement category. The sources of information could be internal and/or external. For their purchase of OTC products, consumers often deem interpersonal communication from family, friends and colleagues to be significant. In a paper titled “Consumer learning and brand evaluation: An application on OTC drugs”; M. Tolga Akcura, Elina Petrova; Marketing Science Vol. 23 No.1 (Winter 2004) 156-169), the author found that between two treatments, a consumer’s memory of drug efficacy might fade, application circumstances may change or product quality might be modified., in a paper titled ‘Risk perception of self-prescribed use of OTC cold/flu medicines’, Mariano Lechuga Besne; International journal of clinical and health psychology, Vol.9 No. 1, 2009, the author found that when all variables are applied toward intention as explained by the TPB model , strongest contribution was of subjective norm. In most of the research done, the phenomenon is studied with respect to a particular disease condition or a specific therapeutic category of a medicine, especially antibiotics. Very few studies have looked at the determinants of self-medication or have studied the interrelationships among these determinants. Since self-medication is a multidimensional construct, which is predicted by a combination of these determinants, a deeper understanding of the construct becomes important. Also, there are emerging forms of medicine usage and influences due to this phenomenon in the developing world which demand a multidisciplinary approach in order to explain self-medication better.

This research is aimed at answering the following questions:

- 1) What is the concept of self-medication in the developing world and what are its dimensions?
- 2) What are the factors that lead to self-medication?

1.7 Objectives of the study:

The objectives of the study are:

- 1) To identify the determinants of self-medication in a general population
- 2) To understand various dimensions of self-medication

1.8 Research Plan:

Broadly, Literature in the field of marketing and consumer behaviour of OTC medicines was studied in the healthcare sector. It is evident that consumer behaviour towards medicines is very different from the other sectors. Hence, unit of analysis for the present study is the patient/consumer of medicines. Determinants of self-medication from the consumer's perspective was the chosen research area within this framework.

The first step was to understand the meaning of self-medication in a general population. To achieve this objective self-medication stories were gathered from in-depth interviews conducted on 20 patients in Goa. This generated baseline information and helped to generate themes for analysis. Interpretive Phenomenological Analysis was employed to generate the broad and sub-ordinate themes from patient transcripts. This information was then utilised in the development of the scale for self-medication. The information obtained from in-depth interviews was combined with an exhaustive secondary literature review to develop items for measuring self-medication as a multi-dimensional construct.

The next step was to review literature to know background work done to predict self-medication behaviour. The aim was to identify existing variables that help explain the phenomenon. An initial exploratory study to identify variables for self-medication was carried out on 200 consumers. Exploratory factor analysis on this data was carried out which revealed interesting information. In the final stage, existing scales were also studied, accordingly there were two scales developed. One for dimensions (SMS) of self-medication and the other for determinants (DOSMS) of self-medication. The inter-rater reliability, validity, readability of each scale was tested and final draft of the scales was prepared. A pilot study was performed on 20 consumers before administering the scale to 200 consumers.

The next stage was the quantitative study which involved data collection and analysis. Data was analysed using SPSS 16.0 version. Factor analyses were performed to identify the determinants of self-medication. Multiple regression analyses were performed to identify significant predictors of self-medication behaviour and to test

the interaction effects among these variables. The statistical outputs and the interaction graphs were achieved with the help of Interaction Version 1.7.2211 by Daniel Soper.

1.9 Organization of thesis:

The thesis consists of seven chapters

Chapter 1 Introduction

This chapter includes an introduction, background of the research, significance of the study, scope of study, research problem, objectives of the study, research plan and the organization of the thesis.

Chapter 2 Literature Review

This chapter presents an exhaustive literature search in the multi-disciplinary areas around the phenomenon of self-medication. Accordingly, papers were coded to enable better referencing. Areas covered include health behaviour, OTC consumer behaviour research and Self-medication surveys in the developing world.

Chapter 3 Research Methodology

This chapter provides an outline of the research methodology adopted in the study giving the details about the selection of research designs, unit of analysis, sampling plan, data collection methods and data analysis.

Chapter 4 Development of hypotheses and scales

This chapter gives details about the qualitative study, development of hypotheses, development of scales, inter-rater reliability, content validity, face validity and readability of the scales.

Chapter 5 Pilot study and Quantitative study

This chapter gives details about the pilot study, quantitative study and interaction effects. This chapter indicates the method used for conducting the pilot study which was undertaken to test the final scale. It also gives details about the initial exploratory study, testing of hypotheses and the method for testing interaction effects.

Chapter 6 Analysis and Results

This chapter presents the results of analyses of qualitative, quantitative study and interaction effects. This chapter is divided into three parts. The first part deals with analyses and results of qualitative study. Part 2 provides details of the exploratory study and its analyses. The third part deals with results of the testing of the final scale, interaction effects and results.

Chapter 7 Discussion and Conclusion

This chapter presents the key findings and discussion of this research work. It includes conclusions drawn from the qualitative study and quantitative study. Further, the details of testing the hypothesis, interaction effects, theoretical contribution and managerial implications of the study are provided.

CHAPTER 2

LITERATURE REVIEW

There are three parts to this Literature Review:

2.1 Understanding the Phenomenon of Self-medication

- a. Story of Self-Care- History of Self-Care and Self-medication, Risks and Benefits of Self-medication and Factors affecting Self-medication in developing countries
- b. Rx to OTC switch- Implications for Self-Care and Self-medication

2.2 Research Areas in Self-medication

OTC Research

Health Behaviour theory and its application

Review articles and Qualitative research based on community based interventions by WHO and WSMI

Health Psychology

2.3 Determinants of Self-medication in developing countries through cross-sectional surveys

2.1 Self-care and Self-medication

History

Self-care and self-medication was a part of human existence since the very beginning, however it became less important somewhere in the 1960's when the paternalistic approach to medicine became common (Hughes CM;2002).From this time on, patients gratefully would let doctors prescribe new treatments that were the outcome of scientific discovery in the 19th and 20th centuries. Healthcare began to assume a new dimension as the expert healing physician became responsible for health of patients while the patient continued to be a passive recipient of healthcare services.

Self-care is what people do for themselves to establish and maintain health, prevent and deal with illness. It includes concepts in nutrition, lifestyle and physical fitness. Self-medication on the other hand is one part of Self-care and is the responsible

selection and use of non-prescription medicines by people to treat self-recognised illnesses or symptoms (www.wsmi.org; A worldwide review of consumer surveys)

Over the years, this phenomenon underwent a change and has re-emerged full circle today, only in a different form. In the past 40 years and more there is an increasing trend in terms of Self-care and self-medication reasons for which can be summarised below:

- a. Increased access and availability of healthcare related information making the consumer or patient much more aware about his/her healthcare choices.
- b. Shifting disease burden towards chronic lifestyle disorders as compared to infectious disease burden in the 1900's.
- c. Availability of non- prescription medicines enabling the patient to exercise a choice on his/her own health.
- d. Definitions of health have broadened to include concepts of wellness and preventive care.
- e. Responsible self-medication using over-the-counter medicines.

In a globalising world, the WSMI (world self-medication Industry) was created in 1970 to convey the social and economic value of self-care to global audiences. Since then we have come a long way in promoting the concept of responsible medication which is synonymous with the use of over-the-counter medicines (OTC). These are medicines for self-medication (wsmibro.pdf) that are available over the counter without a doctor's prescription in pharmacies.

Risks and Benefits of Self-medication

While it is true that self-medication has helped reduce the healthcare cost to the consumer and helped reduce the burden on many healthcare systems across the world it is also associated with critical issues some of which are highlighted as:

- 1) Safety of the product being used for self-medication which includes the risk of adverse or side effects being extremely low and the availability of appropriate consumer information.
- 2) Interactions of the product being used by self-medication with other medicines being consumed , for example the use of OTC analgesics and its association with chronic renal failure has been widely reported in patients.

-
- 3) Adverse Drug monitoring (ADR) mechanism for self-medication products is not available in many countries as these conventional ADR reporting schemes operate through healthcare professionals.

(Based on a presentation given by Dr Lembit Rägo, Coordinator, Quality Assurance and Safety: Medicines, World Health Organization, Geneva, to the First Latin American World Self-Medication Industry (WSMI) Conference: "Recognizing and Developing the Vital Role of Responsible Self-medication in Latin America", 29-31 March 2000)

Self-medication in developing countries:

Definitions:

Self-medication has been defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, prescription or surveillance of treatment. (Montastruc et al 1997, Zafar et al 2008)

Self-medication is defined by many authors as the use of medicine by a patient on his own initiative or on the recommendation of a non-professional or a lay person instead of seeking advice from a healthcare provider. (Bushra Ali Sherazi, 2012). This includes acquiring medicines without an authorized prescription, resubmitting old prescriptions to purchase medicines, sharing medicines with relatives or members of one's social circle or using leftover medicines at home. In the same paper the author highlights socio economic factors, lifestyle, and ready access to drugs that lead to increase in self-medication practices.

Depending on how the concept of self-medication is defined and the methodology adopted to measure it, it is estimated that self-medication constitutes 50-90% of all therapeutic interventions (Sjaak Van der Geest, Anita Hardon; 1990)

In a review article (Sonam Jain and Reetesh Malvi, 2011) the authors have highlighted the fact that emergence of human pathogen resistance in the developing world is mainly due to the use of antibiotics without a prescription, these being available freely in these countries. In our country, development of pharmaceutical

companies contributes to the widespread availability of OTC medicines. There is also a wide potential for misuse and abuse of such products.

Factors affecting Self-Medication:

- A. **Medicine Category:** Antibiotics are the most common category that are used by consumers for self-medication. In most of the developing world, the risks of self-medication are highlighted in most surveys carried out. In a descriptive cross – sectional survey done in UAE in April 2006, a structured validated questionnaire was used for 860 participants. Antibiotic usage was classified as Group A: Common use, Group B: restricted use (expensive, toxic meds) and Group C: Antibiotics used in PHC (Primary Health Centres). Amoxicillin was the most commonly used antibiotic, common reasons for SM being influenza, general infection, and toothache, and URT, GI and ear infection. Prevalence was high (44%) which could be attributed to many factors including the fact that this country is composed of many nationalities including India, Philippines and the Arab countries.
- B. **Medicine System:** Another aspect that needs to be taken into consideration is the existence of various systems of medicine in the developing world. For example, the kind of medicine used for everyday symptoms could range from allopathy to homeopathy, Ayurveda or Unani. The problem is compounded by the fact that many of these alternative system medicines are used in combination with allopathic drugs thus leading to potential drug-drug interactions that can be really harmful to the patient.
- C. **Rx and OTC status of medicines;** Judicious usage of medicines essentially is at the heart of health behaviour interventions across the world. In the west, Self - Medication is usually associated with the use of over-the-counter medicines (OTC-these are medicines that do not need a prescription to be purchased) which are safe and proven for their effectiveness over an extended period of time. On the other hand, in most of the developing world prescription (Rx-those drugs/combinations which require a doctor’s prescription) drugs along with OTC are used by consumers during self-medication. This in turn leads to multiple issues like development of resistance, under or over usage of medicines or abuse

of drugs. A common category of Rx drugs that gets used by self-medication is Antibiotics.

- D. Population Segment: Self-medication is more difficult to manage in vulnerable populations. Children, pregnant women and the elderly are at risk when it comes to inappropriate medicine usage. Teenagers are known to misuse medicines like cough syrups especially which can be potentially dangerous in the long run.
- E. Economic- Infrastructural context: In most developing countries accessibility to primary healthcare is still a cause of concern. Primary healthcare is sometimes inaccessible, in other cases even if the patient reaches the hospital, either staff or facilities are unavailable thus limiting treatment or cure (Sjaak Van der Geest, Anita Hardon; 1990) .Cost of modern medicines is on the rise thus prompting patients to choose the easy way out and indulge in self-medication. In rural areas in many developing countries like Cameroon for example, the public health system does not function properly, hence an alternative system develops. Secondly, prescription and sales practices for example private practice by government doctors, overprescribing by doctors and old prescriptions kept by people for future self-medication promote self-medication in general. Associated is the problem of vendors who try to sell as many medicines as they can to people who are scarcely aware of what they really need. Also, in some cases, people who do have prescriptions cannot afford to have them filled completely. There is also a tendency to indulge in symptom related medication and hence a subsequent overuse of analgesics, cough and cold remedies and antibiotics.
- F. Cultural-Cognitive beliefs: There are underlying beliefs that individuals hold when it comes to medicine use and these are specific to communities and regions around the world. This essentially refers to cognitive aspects of medicine usage. For example, Guatemalan villager's categorized meds as hot or cold based on their own classification system. In African cultures illness and healing are often linked to colour symbolism- Black and Red meds are used to expel from the body system all that is bad. This does not necessarily mean good health. White medicines are used to regain good health.

Rx to OTC switch – Implications for self-medication

India's OTC market was worth \$2.6 billion in September 2015 and is expected to grow to \$3.8 billion in 2019 (Nicholas Hall OTC Insight Asia-Pacific Feb 2016). This growth is expected to be driven by both sectors of consumer healthcare namely Rx to OTC switches (Prescription to Over-the-counter) and pure play OTC's. Many of the top Indian companies are setting foot in the consumer healthcare space. Cipla for example, has launched its wholly owned subsidiary Cipla Health, Sun Pharma is leveraging Ranbaxy's consumer healthcare portfolio while RPG Life Sciences is entering the skin care segment as its profits are eroding.

The increasing frequency of lifestyle diseases and the resulting tendency for consumers to self-medicate is a major reason why the OTC market is experiencing greater growth. From the customer's perspective there is increasing consumer awareness and purchases of products in the wellness and nutrition segments.

According to the US FDA, a prescription to OTC switch (Rx to OTC) is defined as over-the-counter marketing of a drug product that was once a prescription (Rx) drug for the same indication, with the same strength, dose, duration of use, dosage form and route of administration. Shown below is the product life cycle for a typical pharmaceutical product including the Rx to OTC switch

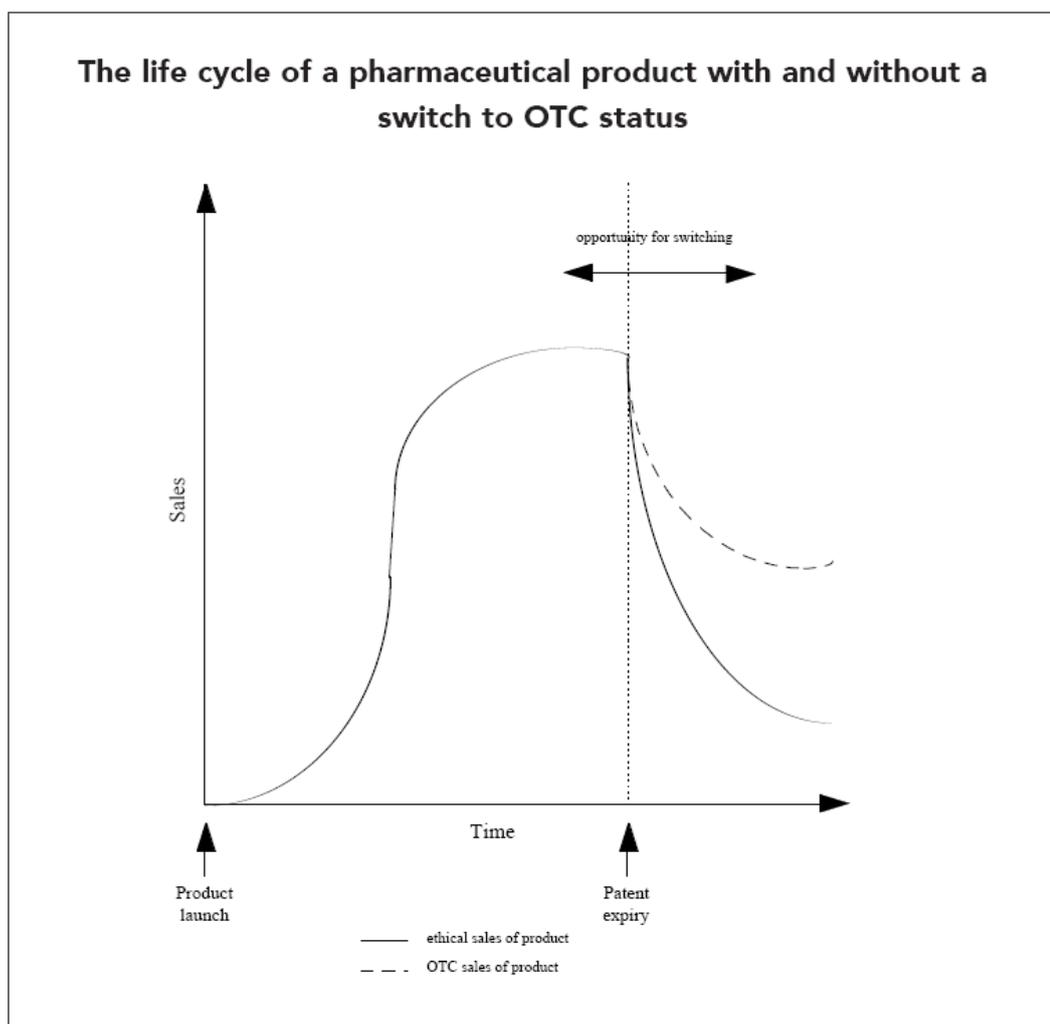


Figure 2: Product –life cycle including Rx to OTC Switch

Table 2a: Notable Rx to OTC switches in the Indian context

THERAPEUTIC CATEGORIES	BRANDS
Cough, cold, fever	Corex, Chericoff, Lemolate, Avil, Metacin
Headaches/Body aches/Sprains	Brufen, Combiflam, Voveran
GI-ailments like hyperacidity/nausea/constipation	Digene, Lomotil, Dulcolax
Skin ailments like rashes, cuts and burns	Caladryl, Betadine, Soframycin
Nutritional supplements	Becosules, Polybion, Ferradol

Source: Presentation by Sorento Healthcare at the IPA (Indian Pharmaceutical Association) Convention, 2007

It is interesting to note that there are a number of factors associated with the success of an Rx to OTC switch as noted by the author (Laura A Mahecha, Nature Reviews, Drug discovery 5, 380-386; May 2006). These can be classified under various stakeholders contributing to the switch namely, product, company, regulatory and market related requirements.

In a review article (Javanmardian and Kandybin 2002), the authors have highlighted the fact that the Rx to OTC strategy cannot really substitute real innovation for pharmaceutical companies. Also, they have analysed the switch as a marketing strategy wherein pharmaceutical companies tie up with consumer healthcare companies to gain a competitive advantage for their products.

The world self-medication industry (wsmi.org) is actively involved in compiling data on the switch including tabulation of selected ingredients that have moved to over the counter status worldwide. For example, in the US, products containing over 80 active ingredients of different therapeutic groups were switched from prescription only to OTC status in the period between 1976 to 2000.

In the switch brochure (wsmi 2009) there are references to general benefits of switches with respect to specific conditions like obesity, tobacco dependence and raised cholesterol levels. There are implications for new areas that can be explored for the Rx to OTC switch.

2.2 Research Areas in Self-medication

The broad areas in self-medication research can be listed as:

- 1) Review articles, qualitative research on emerging trends in self-medication based on community level studies carried out by WHO (World Health Organization) and WSMI (World Self-medication Industry).
- 2) Over-the-counter (OTC) medicine consumer behaviour studies in the developed world including brand loyalty and information processing for this category of products.
- 3) Study of Health behaviour including self-medication which involves the application of a health behaviour theory to explain the phenomenon.

- 4) Studies carried out in the developing world to explain the phenomenon of self-medication and its associated risks and benefits, mainly carried out as surveys.
- 5) Health Psychology

Table 2b: CLASSIFICATION AND CODING OF LITERATURE

Category	Code	Number of articles/studies	Major outcomes
General	G	29	WHO manual for medicine use, wsmi information, policy related and review articles
Health Behaviour (Psychology)	HB	14	Exploring psychological basis of health and diseases.
OTC (Over-the-counter medicines) Research	OTC	33	Consumer behaviour towards over the counter medicines including information processing for this category
Specific applications of health behaviour theory	HBT	26	Useful applications of TPB across different areas including exercise, smoking.
Surveys	S	58	Determinants of self-medication and their influence on the phenomenon
Theory	T	36	Individual health behaviour theories, understanding and critical review

As part of literature search, papers and articles were coded and arranged according to the following classification. This classification and the codes accordingly were developed by the researcher based on the literature review conducted for self-medication. Rationale for each of the categories is explained accordingly.

- a. General – These were articles that necessarily explain the phenomenon in depth including reviews. (**G**)

-
- b. Health Behaviour (Psychology) - This category included literature based on psychology of health behaviour. **(HB)**
 - c. OTC Research- In this classification, research papers dealing with various aspects of information processing and consumer behaviour for over-the-counter medicines were included. **(OTC)**
 - d. Specific applications of health behaviour theory- This category included papers dealing with very specific applications of a particular health behaviour theory. **(HBT)**
 - e. Surveys- These were covered exhaustively since the objective was to identify the determinants of self-medication in a developing country i.e. India. **(S)**
 - f. Theory-This category of literature included thesis, general articles and papers that discussed, explained and sometimes criticised an existing theory of health behaviour. **(T)**

OTC Research (OTC - Over-the-counter medicines)

George N. Lodorfos, Kate L.Mulvana (2006) in their study examined the determinants of consumer's attitudes and intentions to exhibit brand loyal behaviour. Specifically the study determined if beliefs about trustworthiness, price and past experience determine consumer's attitude towards OTC brand choice.

In the article on consumer involvement in non-prescription medicine purchase decisions, the authors Prasanna Gore and Suresh Madhavan (1994) conclude that active information seeking behaviour for this category of medicines is more likely among consumers who are more involved in their non-prescription medicine purchases.

Andrew Paddison and Kine Olsen (2008) through their exploratory qualitative study in 25 female consumers determined how perceptions of involvement and risk influences their information search and product evaluation decision making for OTC pain killers.

Joyce L Grahn (1980) in her study presented an experimental approach to subjective and objective effects of alternative communication formats on information processing of OTC drug label information.

Sujit S. Sansgiry and Paul Cady (1996) in their study compared elderly and young adults in their behaviour and involvement in the decision making process for non-prescription medicine purchases and found that the elderly were more involved, they not only purchase and spend more money on OTC meds, and they also read the labels on these medicines completely.

Betsy Sleath (2001) in her study tried to describe physician –patient communication about OTC medicines using a dataset comprising of audio tapes and transcripts. It was found that less educated patients would ask more questions about OTC medicines as well as physicians would ask more questions to the less educated patients.

Applications of Health Behaviour theory (HBT)

Yap Sheau Fen, Noor Sabaruddin (2008) in their study proposed and tested perceived need in predicting exercise participation using the theory of planned behaviour (TPB). They concluded that attitude components mainly perceived control and perceived need predicted exercise intention and instrumental attitude emerged as the strongest predictor of exercise intention.

Phuong Nguyen (2012) investigated key antecedents of repetitive use of OTC anthelmintic preparations and their relative importance in predicting intention and behaviour of mothers of school going children to use these drugs. The reasoned action model accounted for 32.3% of the variance in intention. In the second part of the study, predictive utility of past use on intention was studied. It was found that addition of past use added 11.7% of the variance in intention after controlling for the original TPB constructs.

Anne Walker, Margaret Watson (2004) applied TPB in their study to explore the psychological variables that influence community pharmacists and the supply of non-prescription medicines in this case it being antifungals for vaginal candidiasis.

Attitude and behavioural intention was found to be strong for the pharmacists however if a customer was elderly, pregnant or if the pharmacist was uncertain of the diagnosis, an antifungal was less likely to be recommended.

Mariano Besne, Angelica Rosas (2009) examined risk perception of using OTC/cold (flu) medicines in Mexico. This study had 900 women participating aged between 20 to 60 years. It was found that risk perception alone was a relatively poor predictor of medication use, intention and behaviour while subjective norm and motivation to please jointly achieved a better predictive level than attitudes.

Michael Housman (PhD thesis, 2006) in his work tried to understand factors that motivate young athletes to consume sports supplements. A TPB model was utilised and 61% of variance in intention was explained by the same, while body image concerns for the young athletes emerged as a primary motivator.

Health Behaviour (HB) Psychology

Campbell, Roland (1996) in their article examined the impact of socio economic and demographic factors on consultation rates with doctors based on the health belief model. These socio economic and demographic factors influence both likelihood of a person getting ill and the response to his/her illness. The other factors that influence consulting behaviour are perceptions or beliefs about the illness, progress of the illness and how the person responds to self-care. Social support and lay advice plays a role and the patient's own knowledge and experience of the illness also influences the decision. Lastly, actual or perceived barriers will determine whether care is actually received.

Peter A. Hall; Geoffrey T. Fong (2007)'s study examined the theory of temporal self-regulation (TST) with respect to human behaviour. This essentially takes into account costs and benefits of particular health behaviours both in the short and long term. TST thus takes into account a biological basis for self-regulatory ability, a temporal basis for understanding behavioural contingencies and an explicit basis for considering the interface between an individual and his social /physical environment.

Theory (T)

Theory of Reasoned Action (TRA/TPB)

It was put forth by Icek Azjen in 1985 and is an extension of TRA (Theory of Reasoned Action). According to this theory, Health Behaviour is defined as an activity that persons perform to maintain or improve their health irrespective of whether that objective is actually reached.

Antecedents to a particular behaviour are **Attitudes** – positive/negative evaluations or appraisal of the behaviour in question, **Subjective Norm**-represents perceived social pressure to perform /not perform the behaviour. **Perceived Behavioural Control (PBC)** -refers to people's appraisal of their ability to perform the behaviour. As the person's attitudes and subjective norm become more positive, the intention to perform a behaviour also increases (Azjen 2002) .These antecedents are in turn guided by underlying beliefs: Behavioural Beliefs- readily accessible beliefs about likely outcomes of behaviour and evaluations of these outcomes. Normative Beliefs-readily accessible beliefs about normative expectations and actions of important referents and motivation to comply with these referents. Control Beliefs-readily accessible beliefs about the presence of factors that may facilitate or impede performance of the behaviour and the perceived power of these factors.

PBC (Perceived Behavioural Control) + Intention -----→Behaviour. Addition of PBC – it would allow prediction of behaviours that were not under volitional control. The TPB model can be used to understand process of health behaviour change and is applied to diverse health behaviours.

Health Belief Model (HBM)

According to the Health Belief Model (Rosenstock,Becker, Kirscht et al, 1950) people are motivated to indulge in preventive health behaviours in response to perceived threat to their health.

This model hypothesizes that health related action depends on occurrence of three classes of factors:

- a. Existence of sufficient motivation to make health issues salient or relevant.
- b. The belief that one is susceptible to a serious health problem or to the sequelae of that illness or condition (Perceived threat) and
- c. The belief that following a particular health recommendation will be beneficial in reducing the perceived threat.

In 1988, self-efficacy was added to the original four beliefs of HBM; self-efficacy is the belief in one's own ability to do something (Bandura, 1977).

The HBM is closely related to the SCT (Social Cognitive Theory). SCT has made two important contributions to explanations of health behaviour that were not included in the HBM. The first is on emphasis for information from several sources for acquiring expectations particularly on informative and motivational role of reinforcement and on the role of observational learning by modelling the behaviour of others.

The second is introduction of self- efficacy as distinct from outcome expectation. This distinction is important because both are required for behaviour.

Trans theoretical Model (TTM)

Put forth initially by Prochaska (1979), Trans theoretical model or stages of change is utilized to understand health behaviour change. This model evolved from research in smoking cessation to treatment of drug and alcohol addiction. According to this theory, behaviour change is viewed as a process occurring in six stages (Pre-contemplation to Termination). Any individual undergoing a health behaviour change could be at various levels of motivation in any one of these stages hence interventions have to be designed accordingly.

Self-regulation theory (TST)

Studied by Bandura, Zimmerman and Baumeister, perceptual-cognitive model of self-regulation involves nature of representations (people's definitions of disease threats)

and coping procedures for threat control and effects of social environment on the above.

Representations are the focus of the model; they have content and organization (acute pattern like flu, cyclical or chronic). They can be activated by stimuli at any level and they evolve over time.

Coping procedures are embedded in IF-THEN rules for disease management. It involves consideration of the following dimensions: Outcome expectations: consequences, time lines and dose-response beliefs and Risks and Benefits associated with specific class of procedures.

Social learning theory or Social Cognitive theory

Rotter (1954) and Bandura (1977) explained human behaviour using a three way reciprocal theory in which personal factors, behaviour and environmental processes continually interact in a process of reciprocal causality. The value-expectancy theory in which behaviour is seen as a function of the subjective value of an outcome and the subjective probability that a particular action will achieve that outcome was also proposed in this theory.

Surveys (S)

Among the surveys carried out in the developing world, antibiotics are studied widely as a therapeutic category when it comes to self-medication practices. (Grigoryan; 2006, Aris Widayati; 2011, Ansam Sawalha; 2008). Many of these surveys are being carried out in the developing world because of the specific infrastructural and cultural contexts (Sjaak Geest; 1990). Most of these surveys were of the cross-sectional, descriptive type. In a study (prevalence survey) conducted in 19 countries in Europe (Larissa, Flora-Journal of emerging infectious diseases 2006) , 1000-3000 adults were studied with respect to their self- medication habits with antibiotics both in urban and rural areas . Penicillins constituted 54% of usage across all countries. Common conditions for self-medication were bronchitis and throat symptoms.

In a cross sectional study carried out in coastal regions of south India (Kayalvizhi; 2010), it was found that almost 71 % of the participants (total 200 in number) indulged in self- medication. This sample consisted of both urban and rural community and 70% of the people were literate. The most common reasons cited for self- medication were lack of time to visit a doctor followed by minor illness and quick relief.

In a different kind of survey done in adolescents in 1998 (S12 Self administration of OTC meds for pain among adolescents; Christine Chambers; APAM 1997) 651 high school students were given a questionnaire to assess the prevalence of self-medication especially with regard to pain management. Widespread self-medication (58.7-95.9%) for pain, was noted.

When we look at surveys done with respect to a common category like antibiotics , for example in Indonesia, (SM with AB's in Indonesia; Widayati et al, BMC Research Notes 2011) a cross sectional survey carried out on 559 adults over 18 years old , multi stage clustered random sampling was done and both intent and actual SM(self-medication) were studied. It was found that there was no significant association between socio demographic variables and practice of SM. However, gender, Marital status and health insurance were significantly associated with intent to self-medicate.

Similarly, in a descriptive cross – sectional survey done in UAE in April 2006, a structured validated questionnaire was used for 860 participants. Antibiotic usage was classified as Group A: Common use, Group B: restricted use (expensive, toxic meds) and Group C: Antibiotics used in PHC (Primary Health Centres). Amoxicillin was the most commonly used antibiotic, common reasons for SM being influenza, general infection, and toothache, and URT, GI and ear infection. Prevalence was high (44%) which could be attributed to many factors including the fact that this country is composed of many nationalities including India, Philippines and the Arab countries.

2.3 Determinants of Self-medication

There is a need to develop scales for measuring attitudes and behaviours towards self-medication. The TPB model has been utilised in health behaviour research to some extent to explain the variance in behaviour (Giles; 2007, Mariano Besne; 2008). As far as self-medication is concerned, scales have been developed for very specific therapeutic categories for example, analgesics for acute pain (Delyth H James; 2008).

Doctor related Beliefs as a determinant of self-medication

In a country like India, where accessibility to a doctor in remote areas is a large concern, people generally tend to ignore the symptoms or wait for them to subside. A large portion of the population also cannot afford primary healthcare and a visit to the doctor's clinic at times.

Cost of consultation at the doctor's clinic is also high at times forcing people to choose alternative options to take care of their health. Accessibility to a primary healthcare provider may also be constrained due to lack of transport facilities. (Zafar Syed; 2008). Long waiting time and the crowd outside a doctor's clinic can also be a strong deterrent, it irritates the patient/consumer thus prompting easier options (Rohit Verma; 2010). In a study (Zafar Syed; 2008) it was found that 82.5% respondents felt that it is necessary to consult the doctor before taking a new medicine.

Pharmacist related Beliefs as a determinant of self-medication

It is a common practice in India to observe people walk into pharmacies asking for a medicine to take care of their daily symptoms. Equally common it is to notice pharmacists recommending a medicine or change a brand of available medicine depending on its availability in his/her pharmacy. In a study (Al Motassem M.;2008) it was interesting to note that non-prescription drug supply pattern is of three kinds-by prescription, by direct Self-medication (OTCs) and indirect self-medication in which people sought advice of pharmacy staff before buying the medicine. In a public opinion survey measuring attitudes of people towards community pharmacy with respect to OTC drugs (Family Practice 2005) it was found that the most important factor influencing purchase of OTC was recommendation by the pharmacist. In some cases, the pharmacist also counsels the patient with respect to the medicine, dosage

and side effects. In the study by (Pahuja Ritu: 2011); the authors have highlighted the fact that people find it convenient to buy medicines from the nearby convenience store/pharmacy rather than consult the doctor.

Risk Reduction Behaviour as a determinant of self-medication

In a multi-centre study (Hector Bolanos; 2005) conducted in Latin America, it was found that non-prescription medicines were perceived safe by Latin Americans, 73% agreed that they were as safe as prescription medicines. This indicates that during self-medication using both prescription and OTC medicines reducing the risk would be of prime concern especially when the patient is unaware about the composition of the product. As such a consumer/patient will indulge in activities that will help build confidence in taking the product (especially when it is a prescription product being taken for the first time). In a comparative study on self-medication in medical students (S.D. Sontakke; 2011) it was found that self-medication was time saving, easy availability of medicines makes it convenient to self-medicate. As part of reducing the risk, patients/consumers spend a lot of time discussing their health condition and symptoms with doctors or healthcare professionals (Pankaj Jain; 2012).

Information Collection Behaviour as a determinant of self-medication

Since consumer involvement for non-prescription medicines as a product category is low, the search for information may not be justified (Judith Lynn Zaichkowsky; Journal of consumer research Vol.12, Dec.1985), however in the case of prescription medicines and sometimes OTC medicines, patients/consumers indulge in information collection from various sources including family, friends, relatives and healthcare professionals. This information includes an understanding of others experiences with their medicines and gathering information about medicine usage from friends and relatives. In a study (Malvi Reetesh; 2011) it was found that friends and family individually constituted 18.9% of the total information sources for self-medication.

Knowledge about disease and medicine as a determinant of self-medication

As conscious consumer of medicines, people today indulge in a number of activities to keep them abreast with developments in diseases and their corresponding treatments. In a study (Pankaj Jain; 2012), it was found that from 1905 respondents in

a community pharmacy survey 14% read the product information on the pack/label of the medicine. In a study (Yousef Bakri; 2008) it was found that 91% of the respondents read labels the first time they buy a medicine and they understand these labels. Information processing from medicine labels by consumers has been studied by researchers accordingly (Gray et al; 2005, Joyce L. Grahn; 1980; Douglas B. Grisaffe; 1997).

Past Usage and Experience

One of the major findings in self-medication experiences as reported by researchers is that consumers have learnt about the effectiveness of the medicine and its suitable use to cure the symptoms from their past which makes self-medication possible for them. In a study (Pahuja Ritu; 2011), 24.7% students learnt self-medication from past prescriptions of doctors. Similarly, in a study (Balamurugan; 2011) it was found that 21.5% respondents learnt to self-medicate based on prescription from previous illness. Similarly for older people (Fernando Ruiz; 2009), 11% medicines were taken to self-medicate in hypertension. This could be because patients remembered their past prescriptions and decided to continue these without prescriber control.

Individual Behavioural Beliefs

These are underlying beliefs unique to every individual that govern behaviour to a particular health situation (Icek Azjen; TRA/TPB, 1985). There are certain factors that guide medicine use at the individual or household level in consumers these being perceived need for medicines for example, people take medicines not only to treat symptoms but because they believe that medicines are also needed to stay healthy (WHO guideline ; 2004). Similarly, ideas about safety and efficacy of the drug governs its use. Ideas about efficacy and safety of a drug vary depending on colour, route of administration and compatibility between the drug and person taking it. For example, in Africa black and red are considered bad while white medicines are considered good for the body (Sjaak Geest; 1990).

In a study (RohitVerma; 2010), fear from crowd at a clinic was cited as one of the reasons for self-medication. Similarly, (Malvi Reetesh; 2011) in his survey has highlighted the importance of avoiding crowds for medicine buyers. Sometimes, it

could be the belief of feeling independent and being able to take a self-decision with respect to medicines and health (Fernando Ruiz; 2009, Girma Belecha Gutema;2011) . On the other hand it could also refer to the belief of keeping the illness a secret or an underlying fear towards medicine usage.

Knowledge about side effects of the medicine

This is one of the most important areas which requires properly designed interventions to educate consumers about medicine usage especially in a country like India. Most of the times, self-medication occurs without thorough knowledge of the risks in terms of side effects of the medicine. The situation is aggravated when we use a combination of therapeutic systems like Ayurveda, homeopathy along with Allopathy. In a study (Pankaj Gupta; 2011) it was found that not one student had complete knowledge of the medicine profile being consumed by self-medication though the prevalence rate was very high in the sample taken for the study. In a study (Girma Belecha Gutema; 2011) it was found that people believed that only safe medicines are sold OTC and that OTC medicines do not usually have side effects.

The above categories of determinants have been developed based on an exhaustive secondary research and inputs from surveys conducted in the developing world. The objective of the literature review was to bring together various issues around self-medication in the developing world and develop a better understanding of the phenomenon.

CHAPTER 3

RESEARCH METHODOLOGY

The dangers of self-medication across different therapeutic categories pose significant challenges to the patient. The previous chapter highlighted the fact that despite extensive literature there is scope to develop measurement scales for self-medication and to explore additional determinants of the phenomenon. This chapter outlines the details of the research methodology adopted in the study. It gives details of the underlying basis for research design and data analysis.

3.1 RESEARCH DESIGN

Since the present topic is complex a combination of both approaches is adopted.

1. Qualitative component using in-depth interviews
2. Quantitative component using scale for determinants of self-medication

Qualitative research (Daniel Kojo; Ananda Mohan Das, 1996) is useful for understanding individual's and group's subjective experiences of health and disease. Social, cultural and political factors in health and disease and interactions among participants and healthcare settings can also be studied using qualitative research.

Applied Qualitative methods are useful for investigating a wide range of drug use problems. These methods contribute by exploring a topic about which little is known in order to provide insights for intervention, developing appropriate questionnaires at the early stage of a study and complement the quantitative component of a study by providing concrete examples or explaining observed practices.

A Qualitative study was conducted in 10 patients, which included the young and elderly to have a deep understanding into the patients' experiences about their medication use and opinion towards self-medication. These were transcribed as self-medication stories which were used to develop research instruments. The research instruments were then developed to measure the determinants and dimensions of self-medication. Pre-testing of the scale was done through a pilot study on 20 patients.

The quantitative component of the study was undertaken in two phases. In the exploratory phase, a questionnaire was prepared and tested on 205 patients and factors influencing the phenomenon were identified using factor analysis in SPSS. The second phase of the quantitative study was undertaken among 203 patients to explore the dimensions of self-medication and to ascertain determinants of the same. Regression analysis was done to understand the effects of determinants on varying dimensions of self-medication. Interaction effects of moderating variables was tested on determinants of self-medication and the relationship between determinants and dimensions of self-medication.

3.2 UNIT OF ANALYSIS

The unit of analysis for the present study is the patient/consumer of medicines. Irrespective of the health situation we may encounter, many of us have very specific and unique behaviours when it comes to consumption of products for our own health. In a worldwide review of consumer surveys (wsmibro.pdf) it was found that people around the world treat symptoms of un wellness (9 out of 10 people suffer from one symptom at least in a 4 week period) in much the same conservative way. 50% people wait for symptoms to subside or use a home remedy, 25% visit a doctor or use a prescription medicine previously obtained for the same condition while the remaining 25% turn to OTC medicines.

3.3 SELECTION OF SAMPLES

For the qualitative study which aimed at exploring the determinants and dimensions of self-medication, 10 patients/consumers representing the young and the elderly population and different socio economic strata in society were selected. Their consent to participate in the semi-structured interview was taken and snowball sampling method was employed.

For the first phase of quantitative study (exploratory), 205 respondents were contacted in Panaji (retail pharmacies and homes). Their consent to participate in the study was taken and their details (names and phone numbers) in some cases were recorded. Convenience sampling technique was utilized in this stage.

For the pilot study, which aimed at pretesting the scale, 20 consumers/patients in Panaji-Goa, who were willing to participate in the study, were selected. Convenience sampling technique was employed.

For the second phase of quantitative study which aimed at identifying the determinants for self-medication, a sample of 203 respondents who were willing to participate in the study were chosen. It was ensured that the sample consisted of adult population (18 years and above) only and had a suitable rural- urban mix.

3.4 DATA COLLECTION TOOLS

For the qualitative study, a semi-structured questionnaire was used during the in-depth interviews. This helped to elicit unique experiences of the consumer/patient with respect to self-medicating habits. For the pilot study and the quantitative study, the scales (DOSMS and SMS) developed by the researcher to measure self-medication were used to collect the data.

3.5 DATA COLLECTION PROCEDURE

For the qualitative study during June and July 2013, each participant was interviewed at their residence or place of work after taking a prior appointment. The participant's willingness to participate in the interview was taken followed by informed consent and with permission to record the narratives.

The purpose of the study was briefed by the researcher to each participant. The identity of the participant was kept confidential and each individual had a number. The questions were asked by the researcher in English, Hindi, Konkani and Marathi. The narratives were audio recorded.

For the quantitative study in the first phase (exploratory) during January to March 2015, 150 Questionnaires were handed out to healthcare management students to be completed out of which 85 were initially returned after due completion by the students. The remaining 120 questionnaires were then handed over to two students from the batch who were trained by the researcher on the procedure for filling the

questionnaire. These were filled by the students at retail pharmacies and respondents homes and returned back in June 2015.

For the pilot study in March 2016, 20 consumers/patients of medicines were contacted personally for their participation in the study. They were first briefed by the researcher about the purpose of the study and the procedure to fill up the responses in the scales. Most of the respondents were well versed with English; hence they filled up the required information in the scales themselves. The researcher was present at all times with the respondent in case of any doubt or queries and the filled –in scales were collected by the researcher on the same day or within a week’s time.

In the second phase of the quantitative study during April to June 2016, 203 consumers/patients were contacted by the researcher at various locations including retail pharmacies, colleges and homes of respondents. The researcher personally contacted 20 of these participants at the pharmacy during filling of the scales. The researcher briefed the purpose of the study and the procedure to fill the scales to each of the participants in English, Hindi, Marathi and Konkani. The filled in questionnaires were collected by the researcher on the same day. Some filled in questionnaires were collected by the researcher in a week’s time as per the respondent’s convenient day, time and place.

3.6 DATA ANALYSIS TECHNIQUES

Qualitative study

The in-depth interviews conducted in 2013 generated valuable information in terms of experiences, feelings and emotions associated with medicine usage across different categories of consumers. IPA (Interpretative Phenomenological Analysis) as a technique has been successfully employed in health psychology related studies (Harris, 2012; Griffiths, 2009; Gambling and Long 2012; Bigger staff and Thompson, 2008). IPA developed by Smith Jonathan A. in 1990’s was used for qualitative research.

Quantitative study

Content validity of individual items and the scales (DOSMS and SMS) was evaluated using the Polit and Beck (2006) method. Cronbach's Alpha coefficient, an indicator of internal consistency of the scale was used for establishing scale reliability of both the scales. Exploratory factor analyses with principal component analyses and varimax rotation method were performed to identify the dimensions and determinants of self-medication. Multiple regression analyses was performed with calculated factor scores to find the predictors of self-medication. SPSS version 16.0 was used for data analysis. For testing interaction effects, multiple regression analyses was performed. The statistical outputs and the interaction graphs were achieved with the help of Interaction Version 1.7.2211 by Daniel Soper.

CHAPTER 4

DEVELOPMENT OF HYPOTHESES AND SCALES

This chapter gives details of the qualitative study for development of hypotheses and development and validation of scales (DOSMS and SMS). For development of hypotheses inputs from secondary research and findings from in-depth interviews were utilized.

4.1 QUALITATIVE STUDY

During June and July 2013, in-depth interviews were conducted by the researcher. 10 consumers/patients of medicines were contacted personally and were interviewed after taking their prior permission to participate in the study. The snow ball sampling method was employed. A semi-structured questionnaire developed by the researcher was used. The duration of the interview ranged from 30 to 60 minutes and was conducted in English, Hindi, Marathi and Konkani. The narratives were audio recorded on a mobile phone. These narratives were later converted into transcripts in English by the researcher.

The semi-structured questionnaire consisted of both general questions related to their overall health and specific questions related to medicines being used for a particular condition. Some of the questions asked are given below:

1. What according to you is a healthy lifestyle?
2. Do you have any underlying ailments?
3. What do you do in case of a mild cold or fever?
4. What do you do in case of pain?
5. Do you keep a first aid kit at home?
6. Do you search for health related information?

Data Analysis

Interpretative Phenomenological Analysis (IPA) was used for data analysis. Each of the recorded narrative was transcribed, read a number of times and the annotations within the scope of study were drawn. This procedure was repeated for all the transcripts. It is to be understood that though each individual's response to self-

medication would be based on varying determinants the researcher has tried to group the viewpoints together so as to get a clearer understanding of the issues raised by the participants. **Appendix I** gives details of the patients' narratives.

The annotations were then grouped into broad and sub-ordinate themes based on the highest to lowest frequency. Further, the subordinate themes were clubbed together to form the broad themes to identify the proposed independent and dependent variables.

The broad themes generated were self-medication, Symptom, Information, Doctors Knowledge, Medicine category, Dosage of medicine and Past Usage and stock of the Medicine.

The sub-ordinate themes were nature, level and relation of symptom, Prescription, OTC and alternative medicines, Discussion of disease, diagnosis and Medicine, medicine advertisements, Completion of medicine course and first-aid kit.

Figure 4a: Conceptual Framework for the study

The process of self-medication is viewed from the systems perspective; accordingly the phenomenon can be described as



The Inputs or antecedents to the process of self-medication can be seen as a composite set of variables including demographic, personality or individual specific and environmental. The process of self-medication includes variables like experiential learning (including risks and benefits) gained through medicine usage over time. The outcome of self-medication can be viewed as treatment, addiction or abuse depending upon the intensity of involvement by the patient over a period of time.

SECONDARY RESEARCH

An exhaustive Literature review (Information from 58 surveys) for determinants of self-medication in developing countries generated some common findings. These findings were then collated into statements for self- medication which were useful for development of the scales for self-medication.

The general findings from the literature review are as mentioned below:

Table 4.1a Survey Findings

General Findings
Analgesics and antipyretics are most commonly used for self-medication followed by cold meds. Common notion -not having to consult doctor for minor ailments. Convenience of buying meds OTC from nearby store.
Perception- saving time, being economical and providing quick relief. Knowledge of benefits and risks not adequate. Time saving, did not need advice for minor ailments. Economic, fear from crowd at clinic
Factors: previous experience with similar symptoms. Self-perception of trivial nature of problem. Symptoms-headache, fever and flu drugs-pain killers, antibiotics, anti-allergy drugs, source-pharmacy, friends ,stocks at home
Type, extent and reason for SM varies from country to country due to socioeconomic and socio demographic factors headache, common cold reasons- prior experience with similar illness, minor illness and avoid long waiting times at the doctor.

(Source: “Insights into Self-medication”: A literature Review; Poster presented at IASSH conference; SRM University, Chennai. MekothNandKumar, Meena Parulekar (2015))

STATEMENTS on SELF-MEDICATION

These statements are derived from literature review, in depth interview findings and secondary research.

Reasons I took a medicine on my own:

- 1) I do not want to waste time going to the doctor
- 2) I need quick relief from the symptom

-
- 3) It is more convenient to buy medicines from a nearby convenience store or a pharmacy
 - 4) It is easier and more convenient to self-medicate
 - 5) Since it can be practiced at home, I need not go out hence avoid crowds
 - 6) I do not have sufficient money to pay for medicines every time so I consume those I already have with me
 - 7) I self-medicate because the cost of consultation of the doctor is quite high
 - 8) I choose the medicine to self-medicate based on past experience with my illness
 - 9) The nearby pharmacy is too far for me to travel so I self-medicate
 - 10) I self-medicate only in case of emergency and for minor ailments
 - 11) I self-medicate when I know the ailment is not too serious
 - 12) I assume that self-medication helps in prevention of known or unknown illness or symptoms
 - 13) I ask for specific drug categories when I self-medicate
 - 14) I choose to self-medicate based on the prior experience I have had with the specific drug product.
 - 15) I self-medicate by showing the pharmacist an old sample of package of the product
 - 16) I self-medicate by describing physical characteristics such as colour and or shape of the drug product
 - 17) I trust allopathic system of medicines and hence self-medicate using allopathic drugs only
 - 18) I do not need advice from doctor for minor illness
 - 19) I learnt to self-medicate based on previous prescription taken from my doctor
 - 20) Self-medication helps in curing my ailment
 - 21) Self-medication helps me feel independent and I can take care of myself
 - 22) Medicines used for self-medication are recognized by their trade or generic names
 - 23) I self-medicate because I do not have health insurance cover
 - 24) I self-medicate because I do not trust a medical doctor
 - 25) I prefer to take home remedies for common ailments, do not take any allopathic remedy

Based on the broad and sub-ordinate themes, literature review (25 items) and proposed conceptual framework for the study eight independent variables, Patients' Knowledge about disease and medicine, Doctor related beliefs, Pharmacist related beliefs, Individual Behavioural beliefs, Information collection behaviour, Risk reduction behaviour, Past usage and experience and Knowledge about side effects and two dependent variables ; prescription medicine and dosage characteristics were generated for development of the scales (DOSMS and SMS) to test self-medication.

4.2 DEVELOPMENT OF HYPOTHESES

Existing scales for self-medication are either disease specific or specific to a therapeutic category like pain killers hence there is a need to develop generic use scales that can help to understand the phenomenon better. The independent and dependent variables generated from qualitative research and secondary research were considered to develop the hypotheses and scales.

The relationships between the determinants of “self-medication” and self-medication are given below:

Among the most commonly cited reason for self-medication in the developing world is the long waiting time both outside the clinic and for doctors consultation and the fees which can be really very high for most of the people who cannot afford primary healthcare in the country (Pahuja Ritu;2011, Verma Rohit; 2010). This forces the common man to take health in his own hands thus self –medication from time to time is the easy way out. Along with this is the trust that some people have in the doctor during their treatment. The following are the extracts from patient's narratives

1. “I avoid any tablet for pain, take only if required. I take the old medicine as prescribed by doctor. I also call up the doctor to confirm.” (Patient No. 1, Female 72 years, chronic pain after knee operation)
2. “Brand names of BP (blood pressure) tablets have changed through the years. Brands of aspirin have changed. Medicines are available through prescription, I don't know about OTC's. I suffer from cough, flu very often but I visit the doctor every time before taking a pain killer or an antibiotic.
(Patient No.3, Male 65 years, BP and diabetes)

Doctor related beliefs among the young have seen a different trend in recent times. While doctor's knowledge is of utmost importance and value for treatment of a disease, it was interesting to note that the young had different opinions, according to one narrative,

1. "I tried everything in allopathy for my allergy till I realized I could not find any relief with whatever medicine was being prescribed to me. It was then that I began to doubt the doctor's expertise and shifted to homeopathy". (Patient No.10, Female 33 years, Severe Allergy)

Therefore, it is hypothesized that

H1: There is a positive relationship between doctor related beliefs and self-medication among patients.

Prior to and sometimes during self-medication, patients undergo a process of comprehensive information search about their health condition. This includes gathering information from close friends and relatives, healthcare professionals and friends (Jain Pankaj; 2012, Girma Belecha Gutema; 2002). This information could also be gathered from advertisements about medicines, internet and other sources which however at times may need validation by discussing with friends or healthcare professionals.

The following are the extracts from the patients' narratives:

- 1."I discuss my diagnosis with friends (who have similar problems), get feedback, makes me feel good. I discuss information about medicines, and look at internet. My pharmacist has no time to counsel "(Patient No. 3 Male 65 years, BP and diabetes)

- 2."Old friends and sisters-in-law advise hot water inhalation, steam for cough and colds .I follow whatever elders say including mother-in-law remedies"(Patient No. 5, Female 72 years, healthy)

- 3."I get most of my information from the doctor, besides the doctor, I google for information, for example, for my father's heart problem I checked reports online for monitoring the levels. I did not believe all that was given on the net" (Patient No.6, Female 37 years, Anaemic)

Therefore, it is hypothesized that

H2: There is a positive relationship between information collection behaviour and self-medication among patients

One of the common finding in self-medication practices is patients have inadequate knowledge about the disease condition and about the particular medicine being consumed by self-medication. Though these medicines are supposed to be inherently safe and efficacious in the doses prescribed, they could still have dangerous outcomes if they are not properly consumed according to the directions prescribed. Sometimes, patients may just not be aware about these risks. This necessitates the requirement for a patient to be knowledgeable about his/her condition (both disease and medicine related) (Zafar Syed; 2008, Henry James 2006). Some excerpts from the patient narratives

1. “I check the expiry date and composition of the medicine. In case of doubts, we don’t know much about composition, but my daughter is a doctor , get an opinion from her regarding the same” (Patient No. 9, Male 65 years, healthy)
2. “I take medicines very rarely, use home remedies in case I have doubts; I read books to get information” (Patient No. 5 Female, 72 years, healthy)

Therefore, it is hypothesized that

H3: There is a positive relationship between knowledge of disease and medicine and self-medication among patients

Having knowledge about the disease and the medicine helps the patient in taking a sound decision when it comes to self-medication. However, there are certain underlying beliefs which govern individual responses to everyday symptoms thus prompting the individual to self-medicate. These beliefs accordingly influence the behavioural response. (Icek Azjen, TPB (Theory of Planned Behaviour); 1985). For example, fear from crowds at a clinic (Malvi Reetesh; 2011), safe medicines are sold without prescription (Girma Belecha Gutema: 2011), feeling of independence (A.O. Afolabi; 2008) and fear of taking medicines explained in the following excerpts from the narratives;

-
1. “I agree with the concept of medicines but I do not like taking them , I’d rather have a healthy regime and use home remedies” (Patient No. 8, Female 31 years, healthy)
 2. “I apply oil when there is pain in the leg, get relief with the same. I drink tea in case of a headache. I do not take medicines for anything(Patient No. 4 , Female 65 years, Blood Pressure only)

Therefore, it is hypothesized that

H4: There is a positive relationship between individual behavioural beliefs and self-medication among patients

Self-medication is becoming an easy and convenient option for individuals in the fast paced lifestyle of today. The easy availability of medicines at a nearby pharmacy enables consumers to buy both prescription and over-the-counter medicines. However, at the same time patients would want to minimize the risk during self-medication (Zafar Syed 2008). This would mean that if the ease of self-medication is high, patients would still consider the risk of taking prescription medicines on their own and this would accordingly influence their behaviour towards self-medication. Again, a patient would try to reduce this risk by discussing his/her condition with a doctor or healthcare professional as is described in the following narrative:

“I will not deny that medicines do help. Body would ache, could not lift hand. Fine while walking, moving. In the horizontal position, I would get heavy, worry about arguing with doctor and tried to reduce the dose, stop the medicines. Actually tried to convince the doctor that half tablet works good” (Patient No.2, Female, 60 years, autoimmune condition, knee problem)

Therefore, it is hypothesized that

H5: There is a positive relationship between risk reduction behaviour and self-medication in patients

Self-medication is based on previous experience with a particular disease symptom in which a particular medicine was effective (P.R.Shankar, Partha and Shenoy 2002). Similarly for self-medication products (prescription or OTC) the consumer learning

only improves over time (George Lodorfos; 2006) and the consumer soon becomes an expert on relating his/her symptoms to a similar previous experience thus facilitating self-medication. The excerpts from these narratives highlight the same:

1. “When my children have throat infection, one child gets, it is passed on to the other, I give novamox 250 based on previous experience , I do not consult the doctor, stopped novamox, started ayurvedic treatment last time because this infection happens every month” (Patient No. 6 Female , 37 Anaemic)
2. “I avoid self medication for pain, even when advised try to take little, avoid most of the time. For back pain, I was already prescribed; take only if required, when I cannot tolerate the pain. I take the old medicine in the cabinet, prescribed two years back. (Patient No.1, Female 72 years, knee operation)

Therefore, it is hypothesized that

H6: There is a positive relationship between past usage and experience of a medicine with self-medication in patients

A significant proportion of the population across the world self-medicates on the advice of their pharmacist. In fact, the pharmacist has an important role to play in educating the consumer about his/her medicines. In a study by (Kayalvizhi; 2010) 64.2% respondents felt that the pharmacist played a major role in self-medication of non-prescribed medicines over the counter. People also tend to select medicines based on advice given by pharmacy staff (Al Motassem M. 2008). Major source of information through which respondents learn to use self-medication is directly from pharmacist (Balamurugan E; 2011). The following excerpts from the narratives explain the same:

- 1.”I discuss information about medicines, and look at internet. My pharmacist at the pharmacy is very busy; he has no time to counsel, so I get the prescription from the clinic. I also keep a first aid kit and a glucometer” (Patient No. 3, Male, 65 years, BP and diabetic)
- 2.”In case of re prescription there is no counselling done by the Pharmacist. If there is a brand change though like in the case of Gemcal by the pharmacist then I only ask the doctor for his opinion”(Patient No.1 , Female, 72 years, knee operation)

Therefore, it is hypothesized that

H7: There is a positive relationship between pharmacist related beliefs and self-medication in patients

During self-medication, the patient is not completely aware of the side effects of the medicine he/she may be taking and this can really pose a huge risk to health. Many students including medical and para medical students who are well versed with the pharmacology of the medicine may not be totally knowledgeable about the side effects of the same (Zafar Syed; 2008, Pankaj Gupta; 2011). The following excerpt from this patient's narrative is useful

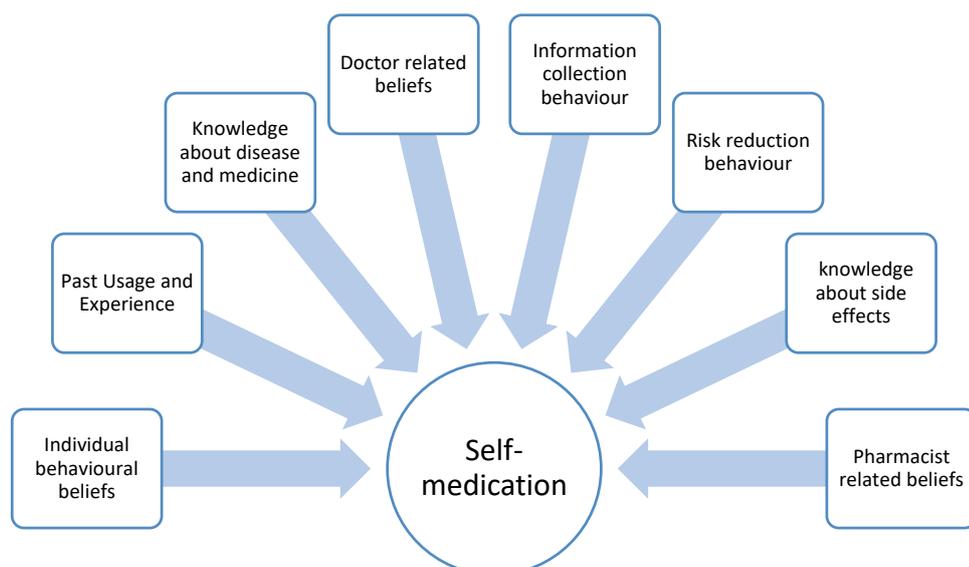
“I discuss side effects about my medicine with my friends and check for these side effects on the internet” (Patient No. 3, Male 65 years, BP and diabetic)

Therefore, it is hypothesized that

H8: There is a positive relationship between knowledge about side effects and self-medication in patients

The hypothesized relationships between the independent variables and dependent variable are shown in figure 4 b

Figure 4 b. Hypothesized Relationships



The dependent variable Self-medication has two components a. Prescription and b. Dosage.

The relationships between the determinants of self-medication and prescription self-medication are given below

In India like in most parts of the developing world, people tend to self-medicate with most prescription and over-the-counter drugs. However, their individual behavioural beliefs govern how each patient or consumer responds to self-medication situations. In a study by (Malvi Reetesh; 2011) it was found that patients did not need advice for minor illness hence they chose to self-medicate. There is a difference in behaviour between the young and elderly when it comes to non-prescription medicine purchases. In their study, (Sujit Sansgiry; Paul Cady; 1996) it was found that the elderly not only purchase and spend more money on OTC medications, they also read the OTC labels completely. According to excerpts from patient's narrative:

1. "I Keep medicine for pain, check the expiry date. Call up doctor before taking the medicine to confirm" (Patient No. 1, female, 72 years, knee operation)
2. "I consult the doctor in case things are beyond control in an infection, (if fever is very high after the initial self-medication dose, there is not much relief, then I go to the doctor). I wait for a minimum of 3 doses, if the condition is still not ok, then go to the doctor for a prescription for my children, same is true for myself. For other conditions, I get a prescription from the doctor and complete the course of medication. (Patient No. 6, Female, 37, Anaemic)

Therefore, it is hypothesized that

H9: There is a positive relationship between individual behavioural beliefs and self-medication using prescription medicines

Self-medication occurs with both prescription and OTC medicines and the pharmacist has a role to play in influencing this decision. This is in turn governed by beliefs that we hold towards the pharmacist as part of our service encounter at the pharmacy. For example, in a study (Pushpa R. Wijesinghe et al; 2012) it was found that higher satisfaction with technical competence of the pharmacy staff increased the likelihood of self-medication. According to excerpts from the patient's narrative

1. "My pharmacist will usually change the brands of my prescription calcium and vitamin preparations. I will accordingly confirm it with my doctor and check for the constitution of the medicine also"(Patient No. 1, Female 72 years, knee operation)

Therefore, it is hypothesized that

H10: There is a positive relationship between pharmacist related beliefs and prescription self-medication

Self-medication with prescription medicines is very common in the developing world because of the easy availability of medicines at local pharmacies. This leads to sometimes consumers bypassing the doctor and buying directly from the nearby pharmacy (Pahuja Ritu; 2011). In a mall intercept survey in Bangladesh (Mujahid Babu; 2008), it was found that there was distrust with the physician as well as people had prior assumptions of the doctor based on previous prescription. From patient excerpts of the narratives

1. “In case of high fever my stamina goes down badly, I first go to the doctor because of my auto immune condition” (Patient No. 2, female , 60 years auto immune condition, knee operation)
2. “In case of allopathic treatment required, follow up on prescription. Will never take an existing medicine for a symptom; consult a doctor before taking it. I had pain in the knees, arthritis problem, I was told by the doctor it is a passing phase. I was advised to work, dip feet in little hot water(fomentation) which I continued” (Patient No. 5 , Female, 72 years , healthy)

Therefore, it is hypothesized that,

H11: There is a positive relationship between doctor related beliefs and prescription self-medication.

During self-medication, there is an exchange of information by the consumers with respect to medicine usage, experience, safety and effectiveness. In a study (Pankaj Jain; 2012) it was found that majority of the respondents (24%) asked advice from their friends and neighbours before self-medication. Some of these included prescribed and self-prescribed medicines before the respondents turned to self-medication and included a vast range of common drugs. In a study (Malvi Reetesh; 2011) it was found that people use the same prescription for the same illness and they prefer asking for information from the chemist because it saves them time and money with utilization higher for allopathic medicines as compared to homeopathy and ayurvedic preparations. From patients excerpts of narratives,

-
1. “Normally, I do not indulge in any information search for prescribed medicines. As long as prescribed, I trust the doctor completely. Sometimes I do check constitution online (especially when abroad)”. No incidence of side effects or interactions till now. In case of any change of brand of prescription medicine, I take advice from the doctor”. (Patient No.1, Female, 72 years, knee operation)

Therefore, it is hypothesized that,

H12: There is a positive relationship between information collection behaviour and prescription self-medication.

When it comes to prescription medicines the risk factor assumes higher importance since these are highly potent in the dosages consumed (as compared to OTC medicines), hence the consumer many a times will indulge in activities to minimize the risk. From the patients excerpts of narratives

1. “Interestingly, I neglected pain in the hand, did not go to the doctor because he might say stop playing tennis, apply some pain balm if pain is more. My doctor had given me this balm some time back. The problem persisted hence was prescribed painkillers. However, I had a gastric problem because of use of the medicine , continued as a result almost over six months, was asked to restrict tea and pungent stuff, hence I finally stopped the medicine”. (Patient No. 9, Male, 65 years , healthy)
2. “In case of allopathic treatment required, follow up on prescription. Will never take an existing medicine for a symptom; consult a doctor before taking it. I make my own decoction of home remedies to treat common symptoms”. (Patient No. 5, Female, 72 years, healthy)
3. “I will not deny that the prescription medicine for my auto immune condition helps. Earlier my body would ache, could not lift my hand. I am fine while walking and moving around. In the horizontal position, I feel heavy and discuss about this often with my doctor”. ((Patient No. 2, female , 60 years auto immune condition, knee operation)

Therefore, it is hypothesized that

H13: There is a positive relationship between risk reduction behaviour and prescription self-medication.

As the consumer is getting more aware about his/her own health and the various options available, it is common to find patients learning more about their own symptoms and treatments available through various sources available in the population. In a study (P.R.Shankar, Partha, Shenoy 2002), it was found that there was a dearth of medical practitioners in rural areas in Nepal, hence people would turn to CAM's for solutions. Also, because of the cultural influence in the use of herbal medicines, people were more knowledgeable about the benefits of herbs and would use them instead of allopathic cures. From the patients' excerpts of narratives,

1. "Besides the doctor, I google for information, for example, in case of my father's heart problem I checked the reports online for monitoring the levels. I did not believe all that was given on the internet".(Patient No.6, Female,37, Anaemic)
2. "I read the information on PIL (patient information leaflet), some of it makes sense. I generally go by word of mouth and tend to collect information about side effects from relatives". (Patient No. 7, Female,33 years, sinusitis)

Therefore, it is hypothesized that

H14: There is a positive relationship between patient's knowledge of disease and medicine and prescription self-medication.

Prescription medicines end up being used continuously over time either through repeat prescriptions or self-prescription. As such, there is sufficient amount of consumer learning about the medicine that develops over time. Most of this is attributed to past usage of the medicine and experience of the patient with a particular prescription medicine. In a study (Pahuja Ritu; 2011) it was found that 24.7% of respondents (110 respondents in total) learnt to self-medicate from doctor's prescriptions provided during their past illness. From the patient's excerpts of narratives,

1. "My children have throat infection often, when one child gets it is passed on to the other. The doctor usually prescribes Novamox 250, hence now I do not consult the doctor and have stopped the same medicine since I have started an ayurvedic remedy for my children".(Patient No. 6, Female,37,Anaemic)

Therefore, it is hypothesized that

H15: There is a positive relationship between Past usage and experience of a patient with prescription self-medication.

The nature of side effects with prescription medicines can be very different and more severe as compared to OTC's. Hence it is important that consumers are aware about the side effects of medicines especially when they consume multiple prescription medicines in the long term. In a study (Rohit Verma;2010) it was found that out of 1022 respondents (students), not one single respondent had complete knowledge of the profile of the drugs being consumed many of which belonged to schedule H category(Corex and Benadryl) and should only be taken after prescriber's advice. From the patients' excerpts of narrative,

1. "Sometimes I skip medicines, very rarely due to side effects.15 years back when I started with two tabs, was told I will get diabetes, today post operation I have diabetes". (Patient No. 3, Male , 65 years, BP and diabetes)

Therefore, it is hypothesized that

H16: There is a positive relationship between knowledge of side effects and prescription self-medication.

The relationships between the determinants of self-medication and dosage self-medication are given below

There are underlying behavioural beliefs in people that govern their response to self-medication. These can also manifest as dosage changes during self-medication. This could mean reducing of dosage, changing of dosage schedule or not completing the entire course of a medicine thus resulting in under dosage. In a study (Sontakke SD; 2011) it was found that though the knowledge about importance of completing dosage was high among the students , the knowledge about for which medicines this becomes most critical was inadequate. From patients excerpts of narratives:

1. "I use home remedies for simple coughs and colds (kasai). When antibiotics are prescribed, I start by smaller dose for kids, then check for treatment signs accordingly". (Patient No.10, Female, 40 years, rural background)
2. "When I have a running nose or an allergy, I know the reasons usually, hence take an anti allergy tablet given by the doctor. I get up and take half tablet

during the daytime (because they are drowsy), so to avoid the side effect. At night, I take full tablet and sleep”. (Patient No. 1, Female 72 years, knee operation)

Therefore, it is hypothesized that

H17: There is a positive relationship between individual behavioral beliefs and dosage self-medication

The pharmacist has a role to play in self-medication habits in individuals. In certain cases, counseling about the frequency of dosage and dosage related requirements can educate the patient so that the risk of adverse effects can be highly minimized. In a study (Pahuja Ritu; 2011) 39.2% of respondents confirmed that they received the information about their medicines from their pharmacist. From patients excerpts of the narrative,

1. “I ask the pharmacist about dose related questions and side effects concerning the antibiotic when prescribed” (Patient No 10, Female , 40 years, rural background)

Therefore, it is hypothesized that

H18: There is a positive relationship between pharmacist related beliefs and dosage self-medication

The doctor-patient interaction or encounter has a large influence on self-medication behavior in consumers. The underlying doctor related beliefs will influence various aspects of behavior including changing dosage of the prescription medicines or modifying the same. According to excerpts from patients narratives,

1. “I argue with my doctor in Vellore regarding dose of, hence reduced dose from 400mg to 200 mg. I tried to take the medicine alternately”. (Patient No.2, Female, 60 years, autoimmune condition, knee problem)
2. “I take tablet only for headache, my son takes this medicine; he will give one I will take half only”. (Patient No. 5, Female, 72 years, healthy)

Therefore, it is hypothesized that

H19: There is a positive relationship between doctor related beliefs and dosage self-medication

There is a lot of information search that happens before and during the process of self-medication. Many consumers will take advice from their friends, relatives and healthcare professionals about the medicines they consume in order to be completely sure of their treatment. According to the theory of planned behavior (Icek Azjen, 1986) this is also termed a subjective norm which has an influence on the intention to behave in a particular health situation. From patients' excerpts of narratives:

1. "I take Calcium for 3 months, then stop for 2 months and start again. I was advised by friend, supposedly Calcium gets deposited in the kidney and this is not good". (Patient No. 6, Female,37,Anaemic)
2. "I look for information about side effects from relatives, no trust in doctor, avoid OTC's. I have changed dosage at times".(Patient No. 7, Female,33 years, sinusitis)

Therefore, it is hypothesized that

H20: There is a positive relationship between Information collection behavior and dosage self-medication

There are certain activities that consumers indulge in to reduce the risk associated with self-medication practices. For example, they will talk to their doctor about their health condition and persisting symptoms, they will also take prescription medicines with precaution. From patients excerpts of their narratives,

1. "An advantage, daughter is a doctor, get an opinion from her, wife's brother is a surgeon, the institute doctor is consulted for final advice, tell her the opinions from others and then decide on the dose".
2. "Used antibiotics in case of injury (external), tooth extraction, very selective, try to avoid, cannot complete a course, affects stomach, causing diarrhea, problem of diarrhea more serious".(Patient No. 9, Male, 65 years , healthy)

Therefore, it is hypothesized that

H21: There is a positive relationship between risk reduction behaviour and dosage self-medication

The patient's knowledge about disease and medicine is crucial in deciding on dosage during self-medication. In a study (P.R. Shankar, Partha, Shenoy 2002) consumers in Nepal preferred herbal medicines over allopathy because they believed that allopathic medicines had side effects as compared to herbal remedies. This is also why antibiotics were the least consumed category by self-medication in this study. From the patient's excerpts of narrative,

1. "I take BP (blood pressure) tablet for last 15 years; other tablets were started 2 years ago. Brand names of BP tablets have changed through the years. Brands of aspirin have changed. Medicines are available through prescription, I feel good after taking medicine, do not like insulin injection, started with 3 daily, doses have decreased over time".(Patient No. 3, Male , 65 years, BP and diabetes)

Therefore, it is hypothesized that

H22: There is a positive relationship between patient's knowledge about disease and medicine and dosage self-medication

Consumer learning for medicine usage evolves over time. Past usage of the medicine for symptom relief influences self-medication practices to a large extent. In a study (Zafar Syed; 2008) it was found that previous experience with similar symptoms was cited as the most popular reason among 50.3% of the respondents. From the patient excerpts of narrative,

1. "Because this infection happens every month, I start medication, in case things are beyond control, (if fever is very high, after dose not much relief, then I go to the doctor. Monitor the dose period, if still not ok, then go to the doctor, same is for myself". (Patient No. 6, Female,37,Anaemic)

Therefore, it is hypothesized that

H23: There is a positive relationship between past usage and experience of the medicine and dosage self-medication

Self-medication has inherent risks more so with consumers not being fully aware about the side effects of prescription medicines. The risk of adverse effects increases with age, in a study (Fernando Ruiz; 2009) where prescription medicines were taken by 245 older people to self-medicate in hypertension and adverse effects were observed in a quarter of the respondents. Similarly in a study (Sontakke SD; 2011) it was found that in medical students knowledge about ADR's and frequency of administration was lacking. From patients' excerpts of narrative,

1."I check expiry date and composition of my medicine. In case of doubts, we don't know much about composition, also not well versed about side effects".
(Patient No. 9, Male, 65 years, healthy)

4.3 DEVELOPMENT OF THE SCALES

It was realized during the literature review that though there is a lot of work done to identify the reasons why people self-medicate, however there is still a need to understand the various forms or types of self-medication and how these determinants are related to these forms of self-medication. There is some mention of responsible and irresponsible form of self-medication in literature (story of self-care_bd page.pdf). Hence, new scales were developed to measure the phenomenon and attain the objectives of the study.

Item generation

From the in-depth interviews conducted in 2013, broad and sub-ordinate themes were generated for self-medication. These along with useful information in terms of issues raised by the participants were utilized to develop statements along with inputs from secondary research. Out of the total 38 statements generated, the items expressing the determinants of self-medication and items indicating self-medication types were separated. A pool of 29 statements expressing determinants of self-medication and a pool of 8 statements indicating self-medication behaviour were generated from the transcripts of narratives and secondary research. The lists of independent and dependent items in the form of statements are given in **Appendix II**.

The first part of the Questionnaire consisted of questions based on the statements generated above which was used to obtain information about self-medication in

general. The second part of the Questionnaire was designed to measure specific incidence of self-medication.

The operational definitions of independent and dependent variables selected for the study

1. **Self-Medication** is the use of prescription medicine by an individual without consulting a registered medical practitioner. This includes both using the medicine for treatment as well as stopping its use and usage of medication from left over stock at home and usage based on an old prescription at home.
2. **Patients Knowledge and Information about disease and medicine:** This refers to activities that a patient will undertake in order to improve his/her knowledge with respect to diseases, medicine and treatments. It includes reading to know more about diseases and reading about medicines prescribed by the doctor.
3. **Patient's Information collection Behavior from External Sources:** It includes information gathering and assimilation from various external sources like discussion with friends, relatives and/or healthcare professionals about patients own condition and sharing of knowledge related to disease symptoms.
4. **Patient's Knowledge about side effects of medicine:** This refers to understanding of side effects of a medicine based on past use and information search.
5. **Patient's perception of Doctor's Knowledge/Doctor related beliefs:** This refers to the patient's perception of knowledge that a doctor possesses with respect to a particular disease/condition. It includes a certain level of skill and expertise that the doctor displays during doctor patient interactions. It includes the ability of the doctor to make a patient feel comfortable and the ability to spend quality time with his/her patients.
6. **Patient's perception of Pharmacist Knowledge/Pharmacist related beliefs:** Pharmacist Knowledge is defined as the knowledge that a pharmacist possesses with respect to disease, medicine and treatments. It includes the ability of the pharmacist to counsel his/her patients with respect to medicine usage. A pharmacist would also be considered knowledgeable if he/she is able

to provide advice to their patients with respect to various brands of medicines available in the market.

7. **Patient –related factors / Individual Behavioral Beliefs:** These are unique to each individual and shape the attitudes that he/she possesses towards self-medication and one’s own health in general. This includes a feeling of independence when using medicine, the need for keeping one’s illness a secret or the need for preventing disease occurrence in people.
8. **Past Use and Experience:** This is related to the expertise that a patient possesses by virtue of using a medicine in the past. This usage could be related to one’s own experience with the medicine or the use of the same medicine by his/her friend or relative. This includes an inherent knowledge gain by the patient regarding a particular medicine and its probable benefits and risks. It thus ensures certain amount of learning and hence builds confidence with respect to medicine usage.
9. **Risk reduction behavior:** It includes the minimization of inherent risks associated with prescription medicine usage during self-medication. This may include the belief that it is risky to take medicines by a patient on his/her own.

Item Selection

The statements as generated from the proposed theoretical framework and those measuring the independent and dependent variables were selected. The statements which were similar in meaning and not coming under any of the variables under study were dropped. (For example, the statement “Cost of prescription medicines is high” was dropped)

Independent Item selection

Out of 38 independent statements, 29 statements explaining the determinants of self-medication were selected and categorized into 8 independent variables. The details are given in Table 4.3 a

Table 4.3 a Category –wise independent statements

Sr. No.	STATEMENTS	INDEPENDENT VARIABLES
<ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 	<p>I think that doctors' fees are high in most cases</p> <p>I think that it is time consuming to consult the doctor</p> <p>I think that a lot of time is spent waiting for the doctor outside his/her clinic.</p> <p>I think that in most cases, doctors do not know much about the disease or medicine</p> <p>I think that doctors do not spend time to explain in detail about the medicine or disease.</p> <p>I think that doctors are generally knowledgeable about diseases and medicines</p> <p>I think that doctors are patient with their patients</p> <p>I think that buying prescription medicines directly from the pharmacy without consulting a doctor is more convenient for me</p>	<p>Doctor related Beliefs</p>
<ol style="list-style-type: none"> 1. 2. 3. 4. 	<p>I tend to believe that my pharmacist knows about diseases and medicines</p> <p>I think my pharmacist counsels me well about my medicine from time to time</p> <p>I think my pharmacist is very knowledgeable about different brands of medicines</p> <p>I think my pharmacist gives me good advice with respect to my medicine</p>	<p>Pharmacist related Beliefs</p>
<ol style="list-style-type: none"> 1. 2. 3. 	<p>I think that it can be risky to take prescription medicines on my own</p> <p>I think self-medication is easy for me</p> <p>When I fall ill, I tend to gather information by discussing about my condition with my doctor or healthcare professional</p>	<p>Risk reduction Behavior</p>

1.	When I fall ill , I tend to know more about the disease by discussing about it with my friends and relatives	Information collection
2.	I tend to learn more about prescription medicines from others experience with them	Behavior
3.	I tend to approach my friends and relatives for specific information related to their illness and medicine	
4.	I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives	
1.	When I fall ill, I tend to gather information about the disease by reading more about it	Knowledge about disease and medicine
2.	I tend to read about the medicine related to my illness	
3.	I tend to talk to my doctor or healthcare professional about medicine related to my illness	
1.	I would like to prevent occurrence of diseases in general	Past usage and Experience
2.	When I fall ill, I tend to relate the symptoms to a previous similar occurrence	
3.	I tend to learn from past use of prescription medicines	
1.	When I fall ill, I would want to keep my illness a secret	Individual Behavioral Beliefs
2.	For me, it is important to feel independent with my prescription medicine	
3.	When I have to get my prescription medicine , I try to avoid crowded chemist shops	
1.	I do not know much about the side effects of my prescription medicines	Knowledge about side effects of medicine

Dependent Item Selection

Out of 12 dependent statements, 8 statements potentially measuring self-medication were selected and categorized into two dependent variables; i.e. prescription self-medication and self-medication dosage. The remaining four statements were dropped since they were repetitive in nature. The details are given in Table 4.3b.

Table 4.3 b Category –wise dependent statements

Sr. No.	STATEMENTS	DEPENDENT VARIABLES
1.	I tend to take prescription medicines without a prescription (on my own)	Prescription self-medication
2.	I tend to use prescription medicines on the advice of a pharmacist	
3.	I tend to take medicines using past prescriptions	
4.	I tend to use prescription medicines from my old stock at home without consulting my doctor	
1.	I tend to change the dosage of my prescription medicine without consulting my doctor	Dosage self-medication
2.	I tend to take alternative system medicines on my own	
3.	I tend to not complete the full course of my prescription medicine	
4.	I tend to change the dosing schedule of my prescription medicine without consulting my doctor	

4.4 VALIDITY, RELIABILITY and READABILITY OF THE SCALES

This stage was carried out in two phases:

Phase I consisted of Inter rater agreement and Content Validity which was carried out to determine whether the individual items to be measured by the scale are appropriate. Content validity concerns the degree to which a scale has an appropriate sample of items to represent the construct of interest—that is, whether the domain of content for the construct is adequately represented by the items (e.g., Waltz, Strickland, & Lenz, 2005).

As stated by Polit and Beck (2006), according to Lynn’s content validity procedure through expert assessment, content validity of each individual item as well as for the entire scale has been evaluated in terms of relevance, clarity and simplicity. The expert panel comprised of six experts: a general practitioner, two professors in general management, two professors in healthcare management and one research scholar in

the field of healthcare. Each panelist was asked to rate each item on a scale of 1-4 as mentioned below:

Relevance 1 - Not relevant 2 - Item needs some revision 3 - Relevant but needs some minor revision 4 -Very relevant

Clarity 1 - Not clear 2 - Item needs revision 3 - Clear but needs some minor revision

4 - Very clear Simplicity (for all scale dimensions) 1 - Not simple 2 - Item needs some revision 3 - Simple but needs some minor revision 4 - Very simple

The content validity document and expert ratings are given in **Appendix IV**.

Face validity

To assess face validity of scales (DOSMS and SMS), the proposed drafts of the scales were reviewed by three experts, a general physician, a healthcare researcher and a medical surgeon.

Phase II consisted of

- 1) Reliability calculations for the scales: Cronbach's Alpha for SMS (8 items) – 0.777 and Cronbach's Alpha for DOSMS(29 items) – 0.728
- 2) Readability Test –It was attempted to draft the statements as simple as possible to read, understand and fill the scales completely. The readability test as per Microsoft word 2013 and Flesch Reading score were calculated.

4.5 FINAL DRAFT OF THE QUESTIONNAIRE

After testing both the scales, i.e. DOSMS and SMS for content validity, reliability and readability, the final draft of the Questionnaire was prepared.

The DOSMS consisted of 29 items to identify the determinants of self-medication and the SMS consisted of 8 items to test self-medication behaviour. The response to each item was scored on a five point Likert scale of two types where: A. 1- Strongly Disagree, 2 - Disagree, 3 - Undecided, 4 - Agree and 5 - Strongly Agree and B. 1- Never, 2 - Rarely, 3 - Sometimes, 4 - Often and 5 - Most of the time.

The final combined draft of the Questionnaire had three parts to it. Part A measured determinants of self-medication and self-medication behaviour. Part B measured a

specific incidence of self-medication and Part C consisted of demographic information which included gender, age, yearly family income, educational qualification, occupation and reimbursement of medical expenses at the work place.

The final combined draft of the Questionnaire is given in **Appendix V**.

Building the hypotheses involved inputs from secondary research and information generated from in-depth interviews. Scale development involved a rigorous procedure of validity testing and reliability check. Existing scales and secondary research was utilized to understand and develop the operational definitions of independent and dependent variables used for the study.

CHAPTER 5

PILOT STUDY AND QUANTITATIVE STUDY

The previous chapter dealt with the qualitative study, development of hypotheses and development of scales. This chapter gives details of the pilot study and the quantitative study undertaken for construct validity and identification of determinants of self-medication. It also includes details about the testing of interaction effects of moderating variables on the dependent variables.

5.1 QUANTITATIVE STUDY (Part 1)

It was a cross-sectional study. Prior permission to conduct the study among patients/consumers was sought from them.

The first part of the study was of an exploratory kind in which data was collected from 205 consumers in two stages: In the first stage (January to March 2015), 150 questionnaires were handed out to students in the healthcare management program to be administered to consumers visiting retail pharmacies in Goa.

Inclusion Criteria:

1. Patients/Consumers above 18 years of age
2. Patients/Consumers who were willing to participate in the study were included.

85 filled in questionnaires were collected back from the respondents (Response rate: 56.7%) and the data collected was analysed in SPSS. The initial responses were thus analyzed. Two students (investigators) who were briefed on the data collection procedure accordingly administered the remaining 120 questionnaires. The data thus obtained from 205 respondents was analysed using SPSS Version 16.0.

5.2 PILOT STUDY

A pilot study was conducted to detect weakness of the scales if any and to make any changes if required before the final study was initiated.

Inclusion criteria

1. Patients/Consumers above 18 years of age
2. Patients/Consumers who were willing to participate in the study were included.

Data collection

During February 2016 and March 2016, 20 consumers were contacted to participate in the pilot study. They were contacted in public places where the researcher had access to including sports clubs and individual homes. The scales developed by the researcher were used. 15 questionnaires were administered by the researcher after explaining the details to the respondents. Some insights on medicine use were also gathered during the process. The remaining five respondents took the questionnaires home and returned the filled –in scales in a week’s time. Convenient sampling method was used.

Data analysis

Data analysis was not conducted since the sample size was not suitable for statistical analysis.

5.3 FINAL QUANTITATIVE STUDY (Part 2)

It was a cross-sectional study. Prior permission to conduct the study among consumers/patients was sought from them. The study sample included 203 respondents. The survey was initiated in the last week of March 2016 and continued until June 2016.

Inclusion Criteria:

1. Patients/Consumers above 18 years of age
2. Patients/Consumers who were willing to participate in the study were included.

Data Collection

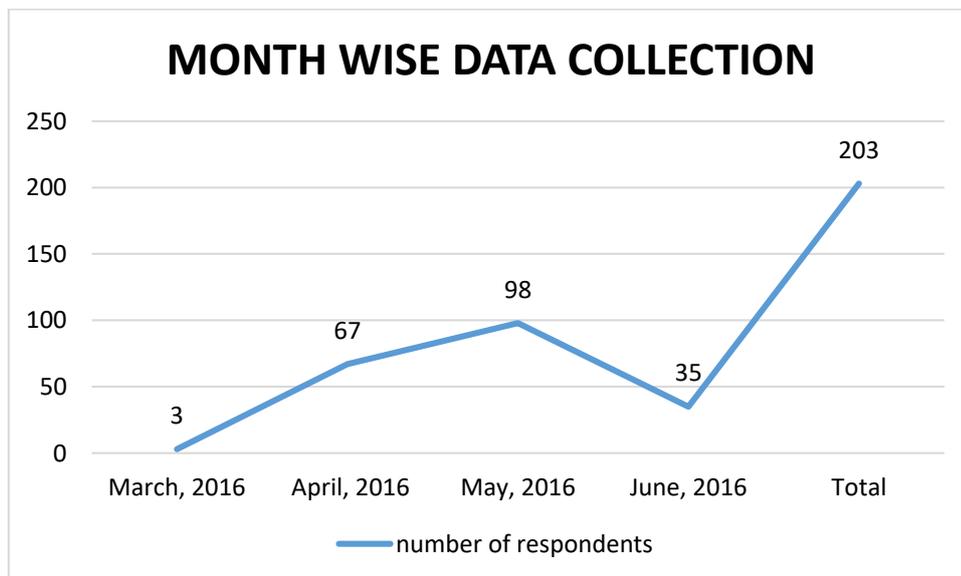
The respondents were contacted in various settings including waiting areas of pharmacies and homes. Initially, 20 consumers were personally contacted in the

pharmacy by the researcher where they were briefed with the purpose of the study and were requested to fill the scale completely. The time required for filling a scale was 20-45 minutes. Filled –in scales were collected by the researcher on the same day. Additional information related to medicine behaviour and usage was gathered from these respondents. This data is enclosed in Appendix 6. The researcher through contacts administered the remaining scales. The researcher collected some scales in a week’s time at the respondent’s convenient day, time and place. The month wise data collection and the line graph representation of data are given in Table 5.3 and Graph 5.3 respectively.

Table 5.3: Month wise data collection (Final Quantitative Study)

Month and Year	No. of Respondents
March, 2016	3
April, 2016	67
May, 2016	98
June, 2016	35
Total	203

Graph 5.3 Line Graph showing month wise data collection



5.4 Data Analysis

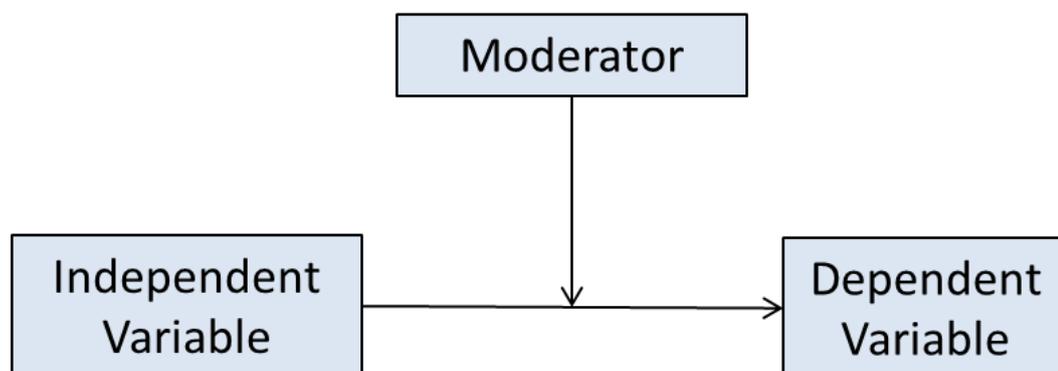
Internal consistencies of the scales were tested. Descriptive analyses, factor analyses, correlation analyses and multiple regressions were performed. SPSS Version 21.0 was used for data analysis.

Pearson correlation analyses were carried out to determine the relationship between determinants and dimensions of self-medication as well as the interrelation among the individual determinants.

5.4 A Testing Interaction effects

Moderator variables were introduced as suggested by Baron and Kenny (1986) as the researcher expected inconsistent relation between the independent and dependent variables across the sub groups. The researcher predicted from theory as well as noticed during data screening of the pilot study conducted that the relationships between determinants of self-medication and dimensions of self-medication (Prescription self-medication and Dosage self-medication) may vary with patients' demographics, social, psychological, geographical and economic factors. The interaction terms may reduce the unexplained variance in the dependent variables, in this case self-medication, prescription self-medication and dosage self-medication. The interaction effects are important for planning intervention strategies to reduce self-medication practices. To explore these possibilities, the interaction terms were introduced in multiple regression analyses. The basic model for testing two-way interaction effect is shown in Figure 5.4.

Figure 5.4: Interaction Effect



The interaction terms were formed as:

- a. Gender by eight independent variables(Factors 1 to 8) for both prescription and dosage self-medication
- b. Age by eight independent variables(Factors 1 to 8) for both prescription and dosage self-medication and
- c. Income by eight independent variables (Factor 1 to 8) for both prescription and dosage self-medication.

Data Analysis

To test the potential two-way interaction effects, multiple regression analyses were performed; the statistical outputs and the interaction graphs were achieved with the help of Interaction version 1.7.2211 by Daniel Soper.

CHAPTER 6

ANALYSIS AND RESULTS

The previous chapter gave the details about the pilot study and the quantitative study. This chapter deals with the data analyses and results. This chapter is divided into three parts. Part I deals with qualitative study analysis and results. Part II deals with pilot study results and Part III deals with the quantitative study (analysis and results) and interaction effects and results.

PART I

6.1 ANALYSIS AND RESULTS OF QUALITATIVE STUDY

The qualitative study was undertaken to get a deeper understanding into the experiences of consumers with respect to self-medication practices. Thus, self-medication stories, which included several aspects on healthy living and treatment of common symptoms, were generated and these narratives were analysed using Interpretative Phenomenological Analysis. The narratives with annotations are given in **Annexure I**.

Tables 6.1a and 6.1b give details about the broad and subordinate themes drawn from the patients' annotations.

Table 6.1 a Broad Themes with frequencies

Sr. No.	Broad Themes	Frequencies
1	Self-medication	10
2	Doctor's knowledge and beliefs	8
3	Pharmacist beliefs	4
4	Information from friends and relatives	6
5	Patients Knowledge about disease and medicine	8
6	Management of side effects	4
8	Past experience and usage of medicine	8
9	Risk reduction behaviour	6
10	Self-medication dosage	5
11	Individual behavioural beliefs	10

Table 6.1 b Subordinate themes with frequencies

Sr. No.	Subordinate themes	Frequencies
1	Doctors waiting time and fees	4
2	Relation to prior symptoms	8
3	Using medicine from old stock	5
4	Check medicine information	6
5	Use of Home remedy or alternative medicines	3
6	Fear of taking medicines	3
7	Lifestyle management	6
8	First aid kit at home	4
9	Discuss with doctors about health condition	8
10	Over-the-counter medicines	6
11	Reducing dosage of medicines	4

Sample Characteristics

A total of 10 respondents participated in the personal interviews, 80.00 % were females. Respondent age ranged from 31 to 72 years, average age was 54 years. The respondents were taking treatment for autoimmune disease (1 participant), chronic knee and back pain (4 participants), Sinusitis, calcium deficiency, anaemia, migraine (1 participant each) representing nine severe conditions. The duration of sickness ranged from one year to 15 years and in one case since childhood (8 years). This indicates that the sample had heterogeneity in terms of patient characteristics.

Results of Interpretative Phenomenological Analysis

The subordinate theme, ‘lifestyle management’, and ‘first aid kit at home’ were outside the scope of the present research, hence not considered in the present research. Other subordinate themes were clubbed together to form main themes for exploring the independent and dependent variables for the development of the hypotheses. Eight independent variables, 3 dependent variables, and 25 items to measure these variables were explored from these annotations.

The lists of independent variables and dependent variables along with broad and subordinate themes are given in Table 6.1c and Table 6.1d respectively.

Table 6.1c Independent variables (with broad and subordinate themes)

Sr. No.	Independent variables
1	Doctor related beliefs Waiting time outside the doctors' clinic
2	Individual behavioural beliefs Fear of taking medicines
3	Pharmacist related beliefs
4	Past usage and Experience Relation to prior symptoms
5	Information collection behaviour
6	Patients knowledge about disease and medicine Check medicine information
7	Risk reduction behaviour Lifestyle management Discuss with doctors about health condition
8	Knowledge about side effects

Table 6.1 d Dependent variables (with broad and subordinate themes)

Sr. No.	Dependent variables
1	Self-medication
1A	Prescription self-medication Using medicine from old stock
1B	Dosage self-medication Reducing dosage of medicines

Inter-rater agreement for the scale (DOSMS)

The purpose of Phase I was to test whether potential items represent the specific variable. The kappa statistic is an important supplement to the Content Validity Index as it yields an index of the degree of agreement beyond chance agreement. The multi-item, multi-rater reliability of the scale was assessed using Fleiss Kappa (Fleiss, 1971).

Inter rater agreement for the items for Determinants of Self-medication (DOSMS)

A list of 15 items representing the constructs: doctor related beliefs (5 items), pharmacist related beliefs (4 items), risk reduction behaviour (3 items) and knowledge about disease and medicine (3 items) was rated by an inter-rater panel of six experts: a general practitioner, one healthcare management professor, three general management professors and one healthcare researcher. Another list of 15 items representing the constructs: information collection behaviour (4 items), past usage and experience (3 items), individual behavioural beliefs (3 items), knowledge about side effects (1 item) and cost and convenience (4 items) was rated by an inter-rater panel of six experts: a medical surgeon, two healthcare management professors, one healthcare researcher, one general practitioner and one general management professor. The experts were informed about the purpose of the study and given a summary of each variable. The expert raters were asked to rate each item, in a category closest to the category of determinants of “self-medication”. The inter-rater agreement documents are given in **Annexure III**.

Inter rater agreement for items for Self-medication scale (SMS)

8 items explaining self-medication behaviour were rated by an inter-rater panel comprised of six experts: a general practitioner, three general management professors, one healthcare researcher and one professor in healthcare management. The experts were informed about the purpose of the study and given a summary of each construct. The expert raters were asked to rate each item, in a category closest to the category of dimensions of “self-medication”.

Content Validity of the scales

As stated by Polit and Beck, (2006) Individual Item Content Validity Index (I-CVI) is calculated as the number of raters giving a rating of 3 or 4 divided by the total number of raters and Scale Content Validity Index (S-CVI) is calculated as total of I-CVI scores divided by the number of items rated by the raters. Polit and Beck (2006) stated that a scale to be judged by six experts, as having excellent content validity should meet Lynn’s (1986) I-CVI and S-CVI of 0.78 and 0.9 or higher respectively.

Content validity of the scale (DOSMS)

The scale's Individual Content Validity (I-CVI), in terms of Relevance ranged from 0.791 to 0.958, Clarity ranged from 0.791 to 0.958 and Simplicity ranged from 0.750 to 0.958; revealing the high individual content validity. The Scale Content Validity Index (S-CVI) in terms of Relevance 0.906, Clarity 0.9166 and Simplicity 0.9123 reveal the high content validity.

Content validity of the scale (SMS)

The scale's Individual Content Validity Index (I-CVI) in terms of Relevance ranged from 0.791 to 0.958, Clarity 0.791 to 0.958 and Simplicity 0.791 to 0.958 reveal high content validity. The Scale Content Validity Index (S-CVI) in terms of Relevance 0.9113, Clarity 0.9114 and Simplicity 0.896 reveal the high content validity.

Results of Face validity

Experts in the medical field evaluated the scales. As per experts' reports, face validity of both the scales was satisfactory.

Results of Readability Test

The scales 'items were entered into the online calculator. The results of readability of the scales (DOSMS and SMS) were achieved with the help of online Flesch- Kincaid Reading Ease Score calculator (Readability-Score.com). Flesch-Kincaid Reading Ease Scores usually range from 0 to 100. A higher score indicates easier readability. The scales' (DOSMS and SMS) readability scores of 78.6 and 79.6 respectively, were very satisfactory.

The final drafts of the scales were prepared which are given in **Annexure VI**.

PART II

6.2 RESULTS OF PILOT STUDY

A total of 20 consumers/patients participated in the pilot study. It was found that, the time required for filling the scales ranged from 20 to 30 minutes. It was decided to select adults from the common population as a unit of analysis for the quantitative study. The scales variables totalled to 37 (29+8) and the total responses totalled to 20. Further data analysis was not conducted, as the variable-observations ratio was less than 1:5 (37:20)

PART III

6.3 ANALYSIS AND RESULTS OF QUANTITATIVE STUDY

Part 1 (Exploratory study, 205 consumers, Year: 2015. SPSS 16.0)

Descriptive analysis of data, given in Table 6.3a, indicates frequency counts and percentages. Frequency tabulations of the characteristics of the respondents were done in order to find out the nature of the sample and to ascertain heterogeneity among respondents.

Table 6.3 a Respondents' Characteristics

Characteristics		Frequency	Percent
Gender	Male	87	42.6
	Female	117	57.4
Educational Qualification	Post-Graduation	48	23.8
	Graduation	97	48.0
	HSSCE	31	15.3
	Below HSSCE	11	5.4
	SSCE and below	15	7.4
Occupation	Professional	18	8.9
	Service	64	31.5
	Business	10	4.9
	Home maker	41	20.2
	Student	66	32.5
	Retired	4	2.0

Respondents' Characteristics

A total of 205 respondents were contacted with respect to their self-medication practices. The sample comprised of 57.4% females and 42.6% males. Most of the respondents were graduates (48.0%) and some were postgraduates (23.8%). In terms of occupation, the sample was heterogeneous with professionals, students, homemakers, businesspersons and retired people filling the questionnaires.

Qualitative Findings

There were some common observations while responses were being noted. These were mainly; the screening question was a little confusing to some, the question on being insured was not completely understood and most respondents did not know the meaning of an OTC (over-the-counter) medicine. The draft of the scale for exploratory study is given in **Annexure V**.

Factor Analysis

Preliminary factor analysis on the data collected was carried out to reveal the following:

- A) Reasons for self-medication- 10 factors were extracted. Extraction method: Principal Component Analysis, Varimax rotation with Kaiser Normalization.

These were accordingly listed as:

Table 6.3b Factor Analysis (Reasons for self-medication)

Sr. No.	Factor	Items
1	Patients Knowledge	4
2	Doctors Knowledge and illness a secret	3
3	Individual behavioural beliefs	3
4	Past usage and others Experience	3
5	Doctor related beliefs	3
6	Fees and Cost	2
7	Time	2
8	Pharmacist Knowledge	1
9	Ease and Convenience	2
10	Relation to symptoms	2

Table 6.3c (%Variance- Reasons for self-medication)

Component/ Factor	Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %
1	2.987	11.063	11.063
2	2.321	8.596	19.659
3	1.975	7.314	26.973
4	1.910	7.073	34.046
5	1.709	6.330	40.376
6	1.672	6.194	46.570
7	1.571	5.819	52.389
8	1.474	5.458	57.847
9	1.303	4.827	62.674
10	1.272	4.712	67.386

B) Forms of Self-medication- 3 factors were extracted

Extraction method: Principal Component Analysis, Varimax rotation with Kaiser Normalization.

These were accordingly listed as:

Table 6.3d Factor Analysis (Forms of self-medication)

Sr. No.	Factor	Items
1	Dosage change and advice of pharmacist	3
2	Past prescription, old stock and alternative medicine	3
3	OTC self-medication and OTC plus prescription self-medication	2

Table 6.3e (%Variance- Forms of self-medication)

Component/Factor	Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %
1	1.864	23.295	23.295
2	1.671	20.884	44.179
3	1.351	16.893	61.072

Linear regression was then performed for each of the factors (reasons) with the forms of self-medication to predict the relationships. The findings are as listed in the table below:

Table 6.3 f Regression Analysis

Sr. No.	Factors/Reasons	Forms	Significance (AdjustedR ²)
1	2 and 9	1	0.056 and 0.061
2	1, 2 and 8	2	0.070, 0.036 and 0.018
3	2, 3 and 9	3	0.024, 0.004 and 0.004

From the above values, it can be concluded that 1) doctors knowledge and ease and convenience influences dosage change during self-medication. 2) Patient's knowledge, Doctors knowledge, and pharmacist knowledge influences taking medicines using old stock or past prescriptions and 3) doctors knowledge, individual behavioural beliefs and ease and convenience governs choice of medicines taken either prescription or OTC.

6.4 ANALYSIS AND RESULTS OF QUANTITATIVE STUDY

Part 2 (Final Quantitative Study, 203 consumers; Year: 2016; SPSS 21.0)

Descriptive analysis of data given in Table 6.4a indicates frequency counts and percentages. Frequency tabulations of the characteristics of the respondents were done in order to find out the nature of the sample and to ascertain heterogeneity among respondents.

Table 6.4 a Respondents' characteristics (n=203 consumers/patients)

Characteristics		Frequency	Percent
Gender	Male	92	45.3
	Female	111	54.7
Educational Qualification	Post-Graduation	96	47.5
	Graduation	81	40.1
	HSSCE	10	5.0
	SSCE	9	4.5
	Below SSCE	6	3.0
Occupation	Professional	18	8.9
	Service	64	31.5
	Business	10	4.9
	Home maker	41	20.2
	Student	66	32.5
	Retired	4	2.0

Table 6.4 b Other details of the consumers/ patients

Other details	Mean	Standard deviation
Medical Expenses (Rs.)	12127.23	49957.64
Age (in years)	40.6188	14.4166
Yearly Family Income(Rs.)	2.4521 lakhs	1.00419

Results of Respondents' characteristics

A total of 203 consumers/patients completed the questionnaires. The average age of the respondents was 40.62 years and standard deviation 14.42. The sample comprised of 54.7% females. Only 3% of the sample had education below SSCE. 31.5% consumers were employed in service while 32.5% were students. Average yearly family income is Rs. 2.4521 lakhs and standard deviation is 1.00419, and average yearly expense for medicines is 12127.23 and standard deviation is 49957.64. This indicates that the sample had heterogeneity in terms of patients' characteristics.

Internal consistencies of the scales (DOSMS and SMS)

“Internal reliability is a measure of how a scale can be relied on to produce similar measurements every time we use the scale” (Nargundkar, 2008 P64). Cronbach's Alpha coefficient, an indicator of internal consistency of the scale was used for establishing scale reliability. A value of Cronbach Alpha above 0.70 is considered as a reasonable test of reliability.

Results of Internal consistencies of (DOSMS)

With 203 valid cases and 29 items, the overall alpha value of DOSMS was 0.741 indicating a high level of internal consistency. Deleting three items would increase the alpha value slightly, but those items were felt necessary to measure self-medication. Therefore, no item was deleted.

Results of Internal consistency of the scale (SMS)

With 203 valid cases and 8 items, the overall alpha value of SMS was 0.770 indicating a high level of internal consistency. No item was deleted since individual alpha values for each of the 8 items would remain unaffected by this change.

6.5 RESULTS OF FACTOR ANALYSIS

For factor analysis, the recommended sample size should be at least 200 participants (Guilford, 1954) and the observations to variable ratio should be at least 5:1 or 10:1 (Gie and Pearce, 2013). In this study, for independent variables the observations to variable ratios of 7:1 and for dependent variables the ratio of 25.4:1 (203:29 and 203:8) indicate that the sample size was adequate for factor analyses.

Results of factor analysis for independent variables (DOSMS)

The details about sampling adequacy, total variance explained and factor loading scores of independent variables are given in **Table 6.5a** and **6.5b** respectively.

Table 6.5a KMO Sampling Adequacy and Bartlett's test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.708
Bartlett's test of Sphericity Approx. Chi-Square	1546.058
Df	351
Sig.	.000

Table 6.5b Total Variance explained

Component	Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %
1	3.269	12.108	12.108
2	2.992	11.082	23.190
3	2.380	8.816	32.006
4	2.074	7.680	39.686
5	2.071	7.670	47.356
6	1.871	6.928	54.284
7	1.552	5.747	60.032
8	1.400	5.184	65.215

Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization. Rotation converged in 13 iterations.

Results of Factor analysis for independent variables (DOSMS)

Principal Component Factor Analysis obtained a Kaiser-Meyer-Olkin Measure of 0.708 sampling adequacy indicated suitability of data for factor analysis. With Bartlett's test of sphericity of 1546.058, which is significant at 1% level, shows a high correlation between items. Communalities of all the variables were more than 0.4. Factor analysis resulted in grouping 29 independent items into 8 factors with a total variance explained of 65.215%. Two statements "I would want to keep my illness a secret" and "I think that buying prescription medicines directly from the pharmacy without consulting the doctor" did not load on any factor. The factor loading scores for each item was more than 0.5.

Factor 1- explained the variance of 12.108%, labelled as 'Doctor related beliefs' measured the extent to which consumer/patients beliefs in the doctor predicted self-medication. Five items loaded on this factor.

Factor 2-explained the variance of 11.082%, labelled as 'Pharmacist related beliefs' measured the extent to which consumers/patients beliefs in the pharmacist predicted self-medication. Four items loaded on this factor.

Factor 3 –explained the variance of 8.816%, labelled as 'Information collection behaviour' measured the extent to which consumers/patients indulged in information search and analysis from others including friends and relatives predict self-medication.

Factor 4-explained the variance of 7.680%, labelled as 'Knowledge about disease and medicine' measured the extent to which consumers/patients efforts to improve their own knowledge through reading and discussing their treatment with healthcare professional or doctor predict self-medication.

Factor 5-explained the variance of 7.670%, labelled as 'Risk reduction behaviour' measured the extent to which consumers/patients indulged in activities to minimize the risk associated with dangers of self-medication. One item loaded negatively on this factor.

Factor 6-explained the variance of 6.928%, labelled as ‘Past usage and experience’ measured the extent to which consumers/patients past usage of the medicine, preventive behaviour and relating symptoms to previous similar occurrence predict self-medication.

Factor7-explained the variance of 5.747%, labelled as ‘Individual behavioural beliefs’, measured the extent to which a consumer/patient’s personal beliefs of convenience, independence predict self-medication. Two items loaded on this factor.

Factor8-explained the variance of 5.184%, labelled as ‘Knowledge about side effects of medicines’ measured the extent to which consumers/patients were knowledgeable about the side effects of prescription medicines that predict self-medication. One item loaded on this factor.

Results of Factor Analysis for dependent variables (SMS)

Table 6.5c KMO Sampling Adequacy and Bartlett’s Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.776
Bartlett’s test of Sphericity Approx. Chi-Square	358.892
Df	28
Sig.	.000

Table 6.5d Total Variance explained

Component	Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %
1	2.181	27.260	27.260
2	2.151	26.893	54.153

Table 6.5e Rotated Component Matrix

	Component	
	1	2
I tend to take medicines using past prescriptions	.796	
I tend to take prescription medicines without a prescription (on my own)	.768	
I tend to use prescription medicines from my old stock at home without consulting my doctor	.661	
I tend to use prescription medicines on the advice of a pharmacist	.638	
I tend to change the dosage of my prescription medicine without consulting my doctor		.759
I tend to change the dosing schedule of my prescription medicine without consulting my doctor		.708
I tend to take alternative system medicines on my own		.691
I tend to not complete the full course of my prescription medicine		.625

Extraction Method: Principal Component Analysis, Rotation method: Varimax with Kaiser Normalization; Rotation converged in 3 iterations.

Results of Factor Analysis for dependent variables (SMS)

Principal Component Factor Analysis obtained a Kaiser-Meyer-Olkin Measure of 0.776 sampling adequacy indicating suitability of the data for factor analysis. Bartlett’s test of Sphericity of 358.8, which is significant at 1% level, shows a high correlation between items. Communalities of all the variables were more than 0.4. Two factors were extracted with a total variance explained of 54.153%. The factor loading scores for each item was more than 0.5.

Factor 1 – explained the variance of 27.26% labelled as , ‘prescription self-medication’, measured the extent to which consumers/patients self-medicate using prescription medicines on their own, past prescriptions, prescription medicines from old stock and using prescription medicines based on the advice of the pharmacist. Four items loaded on this factor.

Factor2-explained the variance of 26.893% labelled as , ‘dosage self-medication’, measured the extent to which consumers/patients make dosage changes during self-medication, changing dosing schedule, not completing the full course of prescription medicine and using alternative medicines. Four items loaded on this factor.

‘Self-medication’, a dependent variable, is calculated as the average of eight dependent statements scores, measured the extent to which consumers/patients self-medicate using prescription medicines and make dosage related adjustments during self-medication.

Construct validity of the scales

Exploratory factor analyses were performed to identify the dimensions of the constructs. Exploratory factor analyses were also aimed at establishing theoretical relationship between the variables. Factor analyses were performed to support the construct validity.

Construct validity of the scale (DOSMS)

For independent variables as expected, eight dimensions of determinants were extracted, confirming the construct validity. The order in which factors emerged is different than expected.

The statement ‘I think that doctors are patient with their patients’ loaded separately instead of Factor 1- ‘Doctor related beliefs’. Factor analysis results supported the construct validity.

Construct validity of the scale (SMS)

For dependent variables as expected, two dependent variables were extracted. ‘Prescription self-medication and ‘dosage self-medication’, confirming the construct validity of the scale.

6.6 RESULTS OF REGRESSION

Regression analyses had been used to examine the impact of the independent variables doctor related beliefs, pharmacist related beliefs, information collection

behaviour, individual behavioural beliefs, risk reduction behaviour, knowledge about disease and medicine, past usage and experience and knowledge about side effects on the dependent variables : self-medication , prescription self-medication and dosage self-medication. The coefficient of correlation (R^2) is used to assess the strength of the relationship between the determinants of self-medication and the dependent variables.

Dependent variable: Prescription self-medication

The Tables 6.6a, 6.6b, 6.6c and 6.6d show the details of regression on the dependent variable: prescription self-medication

Table 6.6a Variables entered/removed

Model	Variables Entered	Variables Removed	Method
1	Knowledge about side effects, Information collection behaviour, Doctor related beliefs, Knowledge about disease and medicine, Individual behavioural beliefs, Risk reduction behaviour, Pharmacist related beliefs ,Past usage and experience		Enter

- a. All requested variables entered.
- b. Dependent variable: **PRESCRIPTION SELF-MEDICATION**

Table 6.6b Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.587	.344	.309	.849

- a. Predictors: (Constant), Knowledge about side effects, Information collection behaviour, Doctor related beliefs, Knowledge about disease and medicine, Individual behavioural beliefs, Risk reduction behaviour, Pharmacist related beliefs ,Past usage and experience

Table 6.6c ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.482	8	7.060	9.784	.000
	Residual	107.520	149	.722		
	Total	164.003	157			

- a. Predictors: (Constant), Knowledge about side effects, Information collection behaviour, Doctor related beliefs, Knowledge about disease and medicine, Individual behavioural beliefs, Risk reduction behaviour, Pharmacist related beliefs ,Past usage and experience
- b. Dependent variable: **PRESCRIPTION SELF-MEDICATION**

Table 6.6d Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.064	.068		.952	.343
	Doctor related beliefs	.198	.068	.194	2.921	.004
	Pharmacist related beliefs	.314	.067	.309	4.649	.000
	Information collection behaviour	-.334	.068	-.326	-4.914	.000
	Knowledge about disease and medicine	.154	.068	.152	2.285	.024
	Risk reduction behaviour	.013	.068	.013	.196	.845
	Past usage and experience	.257	.068	.250	3.761	.000
	Individual behavioural beliefs	-.066	.067	-.065	-.981	.328
	Knowledge about side effects	.089	.068	.087	1.317	.190

a. Dependent variable : **PRESCRIPTION SELF-MEDICATION**

Prescription self-medication is regressed on calculated factor scores. Overall model is fit and statistically significant at F ratio of 9.784. The R² value of 0.344 indicates that 34.4% of the variance in prescription self-medication is explained jointly by all the independent variables in the model. Five factors: Doctor related beliefs, Pharmacist related beliefs, Information collection behaviour, past usage and experience and knowledge about disease and medicine were found to contribute significantly to the variance explained in prescription self-medication.

Dependent variable: Dosage self-medication

The tables 6.6e, 6.6f, 6.6g and 6.6h show the details of regression on the dependent variable dosage self-medication

Table 6.6e: Variables entered/removed

Model	Variables Entered	Variables Removed	Method
1	Knowledge about side effects, Information collection behaviour, Doctor related beliefs, Knowledge about disease and medicine, Individual behavioural beliefs, Risk reduction behaviour, Pharmacist related beliefs ,Past usage and experience		Enter

- a. All requested variables entered.
 b. Dependent Variable : **DOSAGE SELF-MEDICATION**

Table 6.6f: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.412	.170	.125	.870

Table 6.6g: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.028	8	2.878	3.802	0.000
	Residual	112.797	149	.757		
	Total	135.825	157			

Table 6.6h

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.066	.069		-.951	.343
	Doctor related beliefs	.250	.069	.269	3.605	.000
	Pharmacist related beliefs	-.041	.069	-.044	-.592	.554
	Information collection behaviour	-.225	.070	-.241	-3.233	0.002
	Knowledge about disease and medicine	-.036	.069	-.039	-.517	.606
	Risk reduction behaviour	-.056	.070	-.060	-.809	.420
	Past usage and experience	.105	.070	.112	1.496	.137
	Individual behavioural beliefs	.055	.069	.060	.803	.423
	Knowledge about side effects	.113	.069	.122	1.629	.105

Dependent Variable: **DOSAGE SELF-MEDICATION**

Dosage self-medication is regressed on calculated 8 factor scores. Overall model is statistically fit and statistically significant at F ratio of 3.802. The R²value of .170 indicates that 17% of the variance in dosage self-medication is explained jointly by all the independent variables in the model. Two factors: doctor related beliefs and

information collection behaviour were found to contribute significantly to the variance explained in dosage self-medication.

6.7 Part B Data Analyses

The second part of the Questionnaire tried to measure specific incidence of self-medication.

Logistic regression was performed since the dependent variable (self-medication) was measured as a dichotomous variable. This was performed in three parts:

B1: Self-medication (dependent) with four symptom based (independent) variables.

Table 6.7a: Model Summary

Step	-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
1	118.657 ^a	.238	.335

- Estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001.
- 33.5% variance in self-medication was explained by these four variables.

Table 6.7b: Classification Table

Observed	Predicted		% correct	
	Have you self-medicated in the past three months			
	Yes	No		
Step 1	Have you self-medicated in the past three months			
	Yes	78	7	91.8
	No	20	18	47.4
	Overall Percentage			78.0

The cut value is .500

Table 6.7c: Variables in the equation

	B	S.E.	Wald.	df	Sig.	Exp(B)
Step 1 ^a symptoms severe	0.921	.394	5.450	1	.020	2.511
Pain	-.762	.398	3.665	1	.056	.467
Emergency	-.377	.269	1.970	1	.160	.686
Relate symptoms prior	-.909	.233	15.213	1	.000	.403
Constant	2.672	.814	10.765	1	.001	14.469

The severity of symptoms and relation of symptoms to prior similar occurrence were significant with respect to incidence of self-medication

B2: Self-medication (dependent variable) with 8 factors extracted

Table 6.7d Model Summary

Step	-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
1	202.157 ^a	.136	.181

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than 0.001.

b. 18.1% of variance in self-medication was explained by these eight factors.

Table 6.7eClassification Table

Observed		Predicted		% correct
		Have you self-medicated in the past three months		
		Yes	No	
Step 1	Have you self-medicated in the past three months			
	Yes	45	35	56.3
	No	26	57	68.7
	Overall Percentage			62.6

The cut value is .500

Table 6.7f: Variables in the equation

	B	S.E.	Wald.	df	Sig.	Exp(B)
Step 1 ^a FAC1_1	-.397	.172	5.295	1	.021	.673
FAC2_1	-.095	.171	.308	1	.579	.910
FAC3_1	.361	.172	4.416	1	.036	1.435
FAC4_1	-.156	.166	.877	1	.349	.856
FAC5_1	-.199	.167	1.410	1	.235	.820
FAC6_1	-.566	.184	9.481	1	.002	.568
FAC7_1	.118	.169	.485	1	.486	1.125
FAC8_1	-.178	.170	1.104	1	.293	.837
Constant	.047	.169	.077	1	.782	1.048

Factor 1, doctor related beliefs and factor 6, patients knowledge about disease and medicine are significant with respect to incidence of self-medication.

B3: Self-medication (Dependent variable) with forms of self-medication

Table 6.7g Model Summary

Step	-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
1	222.994 ^a	.206	.275

- a. Estimation terminated at iteration number 4 because parameter estimates changed by less than 0.001.
- c. 27.5% of the variance in self-medication is explained by the two forms of self-medication

Table 6.7h Classification Table

Observed	Predicted		% correct	
		Have you self-medicated in the past three months		
		Yes		No
Step 1	Have you self-medicated in the past three months			
	Yes	60	35	63.2
	No	23	75	76.5
	Overall Percentage			69.9

The cut value is .500

Table 6.7i: Variables in the equation

	B	S.E.	Wald.	df	Sig.	Exp(B)
Step 1 ^a FAC1_1	-1.085	.195	31.045	1	.000	.338
FAC2_1	-.288	.164	3.092	1	.079	.750
Constant	-.009	.163	.003	1	.956	.991

Prescription form of self-medication is significant with respect to incidence of self-medication.

Table 6.7j: The variance in dependent variable

Dependent variable	Variance explained
Self-medication	18.1%
Prescription self-medication	34.4%
Dosage self-medication	17%

6.8 Correlation Analysis:(Forms of self-medication with independent variables)

C1

Pearson correlation significant at 0.01 level (2-tailed)	I tend to take prescription meds without a prescription (on my own)
When I fall ill I would want to keep my illness a secret	.203
For me it is important to feel independent with my prescription medicines	-.192
When I fall ill, I tend to gather information by discussing about my condition with my doc or HC prof.	-.213
I tend to talk to my doc or HC prof. about medicine related to my illness	-.192
I think that it can be risky to take prescription medicines on my own	-.155
I think self-medication is easy for me	.463
I think that docs fees are high in most cases	.195
I think that it is time consuming to consult the doc	.274
I think that a lot of time is spent waiting for the doc outside his clinic	.295
I think that docs do not spend time to explain in detail about medicine or disease	.269
I think that buying pres. meds directly from the pharmacy without consulting the doc is more convenient for me	.428

C1 Findings:

Taking prescription meds on one's own is positively, relatively highly correlated with the ease of self-medication and the convenience of buying prescription meds directly from the pharmacy

The tendency of gathering information from HC prof. /doc is negatively correlated with taking prescription meds without consulting the doctor. Similarly, the feeling of being independent with the prescription medicine is negatively correlated with taking prescription meds on one's own without consulting the doctor

C2

Pearson correlation significant at 0.01 level (2-tailed)	I tend to change the dosage of my prescription medicine without consulting my doctor
When I fall ill, I tend to gather info. by discussing about my condition with my doc or HC prof.	-.282
I tend to read about the medicine related to my illness	-.236
I tend to talk to my doc or HC prof. about medicine related to my illness	-.301
I think that it can be risky to take prescription meds on my own	-.219
When I have to get my medicine I try to avoid crowded shops	.191
I think self-medication is easy for me	.233
I think that docs are generally knowledgeable about meds and diseases	-.357

C2 Findings

Tendency of changing dosage is negatively correlated with most determinants, like gathering information by discussing with doc. /HC prof., reading about the medicine, talking to the doc. /HC prof. about medicine and the belief that it can be risky to take prescription meds on one's own.

Only the ease of self-medication and the behaviour of trying to avoid crowded shops is positively correlated with tendency of changing dosage of prescription medicine without consulting the doctor.

C3

Pearson correlation significant at 0.01 level (2-tailed)	I tend to use prescription medicines on the advice of a pharmacist
I tend to learn more about prescription medicines from others experience with them	.216
I tend to believe that my pharmacist knows about diseases and medicines	.253
When I have to get my prescription medicine, I try to avoid crowded shops	.184
I think my pharmacist counsels me well about my medicine from time to time	.301
I think self-medication is easy for me	.362
I think my pharmacist gives me good advice with respect to my medicine	.300
I think that it is time consuming to consult the doctor	.190
I think that doctors do not spend time in detail to explain about the medicine or disease	.223
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.399

C3 Findings

All positive correlations, tendency of using prescription medicines based on the advice of a pharmacist is positively correlated with pharmacist counselling, ease of self-medication, convenience of buying prescription medicines directly from the pharmacy. In addition, learning from others experience of prescription medicines and the fact that doctors do not spend time in detail to explain about the disease or

medicine is positively correlated with tendency of using prescription medicines based on the advice of a pharmacist.

C4

Pearson correlation significant at 0.01 level (2-tailed)	I tend to take medicines using past prescriptions
When I fall ill, I tend to gather information by discussing about my condition with my doc or HC prof.	-.191
I tend to learn from past use of prescription meds	.221
I tend to learn more about prescription medicines from others experience with them	.255
I think that it can be risky to take prescription medicines on my own	-.238
I think self-medication is easy for me	.440
I think that docs are generally know. about diseases and medicines	-.225
I think that it is time consuming to consult the doc	.216
I think that a lot of time is spent waiting for the doc outside his/her clinic	.256
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.445

C4- Findings

Tendency of taking medicines using past prescriptions is relatively highly, positively correlated with the ease of self-medication and the convenience of buying pres. meds directly from the pharmacy without consulting the doctor. The belief that a lot of time is spent waiting outside the doctor's clinic and the learning about prescription medicines from others experience with them is positively correlated with the tendency of taking medicines using past prescriptions.

Risk of taking prescription medicines on one's own, doctor's knowledge about diseases and medicine and gathering information about condition with doctor/HC prof. is negatively correlated with taking medicines using past prescriptions.

C5

Pearson correlation significant at 0.01 level (2-tailed)	I tend to use prescription meds from my old stock at home without consulting my doctor
When I fall ill, I tend to gather info. by discussing about my condition with my doc or HC prof.	-.253
I tend to talk to my doc or HC prof. about medicine related to my illness	-.209
I think that it can be risky to take prescription medicines on my own	-.196
I think self-medication is easy for me	.413
I think that docs are generally know. about diseases and medicines	-.361
I think that it is time consuming to consult the doc	.212
I think that a lot of time is spent waiting for the doc outside his/her clinic	.235
I think that doctors do not spend time in detail to explain about the medicine or disease	.220
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.379

C5 Findings

Tendency of using pres. meds from old stock at home without consulting the doctor is positively correlated with the ease of self-medication and the convenience of buying prescription medicines directly from the pharmacy. The time factor associated with doctors (waiting time at clinic, consulting time and doctors spending time to explain about disease and medicine) is also positively correlated with tendency of using prescription medicines from old stock at home.

Risk factor associated with use of prescription medicines and doctor's knowledge (technical expertise, knowledge about medicine and condition of the patient gained through exchange of information) are negatively correlated with tendency of using prescription medicines from old stock at home.

C6

Pearson correlation significant at 0.01 level (2-tailed)	I tend to take alternative system medicines on my own
I think that docs are generally know. about diseases and medicines	-.285
I think that doctors do not spend time in detail to explain about the medicine or disease	.285
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.198

C6 Findings

The finding that doctors do not spend time in detail to explain about disease and medicine and convenience of buying prescription medicines directly from the pharmacy is positively correlated with tendency of taking alternative system medicines.

Doctor's knowledge is negatively correlated with tendency of taking alternative system medicines.

C7

Pearson correlation significant at 0.01 level (2-tailed)	I tend to not complete the full course of my prescription medicine
When I fall ill I would want to keep my illness a secret	.227
When I fall ill, I tend to gather info. by discussing about my condition with my doc or HC prof.	-.219
I tend to talk to my doc or HC prof. about medicine related to my illness	-.188
I think that docs fees are high in most cases	.226
I think that it is time consuming to consult the doc	.279
I think that a lot of time is spent waiting for the doc outside his/her clinic	.187
I think that doctors do not spend time in detail to explain about the medicine or disease	.275
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.225

C7 Findings

Tendency to not completing the full course of a prescription medicine is positively correlated with doctor related time factors, convenience of buying medicines directly from pharmacy, doctors fees and the belief of keeping illness a secret.

Gathering information from doc. /HC prof. by talking to them about one's condition and talking to the doc. /HC prof. about medicine related to the illness is negatively correlated with not completing the full course of a pres. med.

C8

Pearson correlation significant at 0.01 level (2-tailed)	I tend to change the dosing schedule of my prescription medicine without consulting the doctor
When I fall ill I would want to keep my illness a secret	.232
When I fall ill, I tend to gather info. by discussing about my condition with my doc or HC prof.	-.279
I tend to talk to my doc or HC prof. about medicine related to my illness	-.268
I think that it can be risky to take prescription medicines on my own	-.196
I think self-medication is easy for me	.408
I think that docs are generally know. about diseases and medicines	-.305
I think that it is time consuming to consult the doc	.326
I think that a lot of time is spent waiting for the doc outside his/her clinic	.213
I think that doctors do not spend time in detail to explain about the medicine or disease	.233
I think that it is more convenient to buy prescription meds directly from the pharmacy without consulting the doc	.343

C8 Findings

Tendency to change the dosing schedule of prescription medicines without consulting the doctor is positively correlated with ease of self-medication, convenience of buying prescription medicines directly from the pharmacy and doctor time related factors.

Gathering information by discussing health condition with doc. /HC prof., talking to doc//HC prof. about medicine related to illness and risk of taking pres. meds is

negatively correlated with tendency to change dosing schedule of prescription medicines.

CORRELATION MATRIX

Table 6.8a Analysis of Correlation Matrix

Independent variable	Dependent variable 1 (Prescription) Pearson Correlation coefficient	Dependent variable 2 (Dosage) Pearson Correlation coefficient
Doctor related Beliefs	.197*	.271**
Pharmacist related beliefs	-.333*	-.239**
Information collection behaviour	.160*	-.033
Knowledge about disease and medicine	.018	-.054
Risk reduction behaviour	.264**	.123
Past Usage and Experience	-.065	.059
Individual behavioural beliefs	.084	.122
Knowledge about side effects	1	.000

(*-Correlation significant at 0.05 level, **-Correlation significant at 0.01 level)

6.9 TESTING OF HYPOTHESES

Table 6.9a Hypotheses acceptance/rejection (Self-medication)

No.	Hypothesis	Pearson correlation	Significance	Accepted/ Rejected
H1	There is a positive relationship between doctor related beliefs and self-medication	.197* .271**	.013 .001	Accepted Accepted
H2	There is a positive relationship between information collection behaviour and self-medication	.160* -.033	.000 .561	Accepted
H3	There is a positive relationship between patient's knowledge of disease and medicine and self-medication.	.018 -.054	.045 .684	Rejected
H4	There is a positive relationship between individual behavioural beliefs and self-medication.	.084 .122	.414 .463	Rejected
H5	There is a positive relationship between risk reduction behaviour and self-medication.	.264** .123	.826 .499	Accepted
H6	There is a positive relationship between past usage and experience and self-medication.	-.065 .059	.001 .122	Rejected
H7	There is a positive relationship between Pharmacist related beliefs and self-medication.	-.333* -.239**	.000 .561	Accepted
H8	There is a positive relationship between knowledge of side effects and self-medication.	1 .000	.295 .126	Rejected

Table 6.9b Hypotheses acceptance/rejection (Prescription Self-medication)

No.	Hypothesis	Pearson correlation	Significance	Accepted/ Rejected
H9	There is a positive relationship between individual behavioural beliefs and prescription self-medication	-.065	.414	Rejected
H10	There is a positive relationship between pharmacist related beliefs and prescription self-medication	.310** (0.01 level)	.000	Accepted
H11	There is a positive relationship between doctor related beliefs and prescription self-medication.	.197* (0.05 level)	.013	Accepted
H12	There is a positive relationship between information collection behaviour and prescription self-medication.	-.333** (0.01 level)	.000	Accepted
H13	There is a positive relationship between risk reduction behaviour and prescription self-medication.	.018	.826	Rejected
H14	There is a positive relationship between patient's knowledge of disease and medicine and prescription self-medication.	.160* (0.05 level)	.045	Accepted
H15	There is a positive relationship between Past usage and experience of a patient with prescription self-medication.	.264** (0.01 level)	.001	Accepted
H16	There is a positive relationship between knowledge of side effects and prescription self-medication.	.084	.295	Rejected

Table 6.9 c Hypotheses Acceptance/rejection (Dosage Self-medication)

No.	Hypothesis	Pearson correlation	Significance	Accepted/ Rejected
H17	There is a positive relationship between individual behavioural beliefs and dosage self-medication	.059	.463	Rejected
H18	There is a positive relationship between pharmacist related beliefs and dosage self-medication	-.047	.561	Rejected
H19	There is a positive relationship between doctor related beliefs and dosage self-medication.	.271**(0.01 level)	.001	Accepted
H20	There is a positive relationship between information collection behaviour and dosage self-medication.	-.239**	.002	Accepted
H21	There is a positive relationship between risk reduction behaviour and dosage self-medication.	-.054	.499	Rejected
H22	There is a positive relationship between patient's knowledge of disease and medicine and dosage self-medication.	-.033	.684	Rejected
H23	There is a positive relationship between Past usage and experience of a patient with dosage self-medication.	.123	.122	Rejected
H24	There is a positive relationship between knowledge of side effects and dosage self-medication.	.122	.126	Rejected

6.10 ANALYSIS AND RESULTS OF TESTING INTERACTION EFFECTS

Following interaction effects were tested on prescription self-medication and dosage self-medication:

- a. Gender by eight independent variables (Factors 1 to 8) for both prescription and dosage self-medication
- b. Age by eight independent variables (Factors 1 to 8) for both prescription and dosage self-medication and
- c. Income by eight independent variables (Factor 1 to 8) for both prescription and dosage self-medication.

Some of the significant interactions are listed below:

A. Gender by individual behavioural beliefs interaction on prescription self-medication

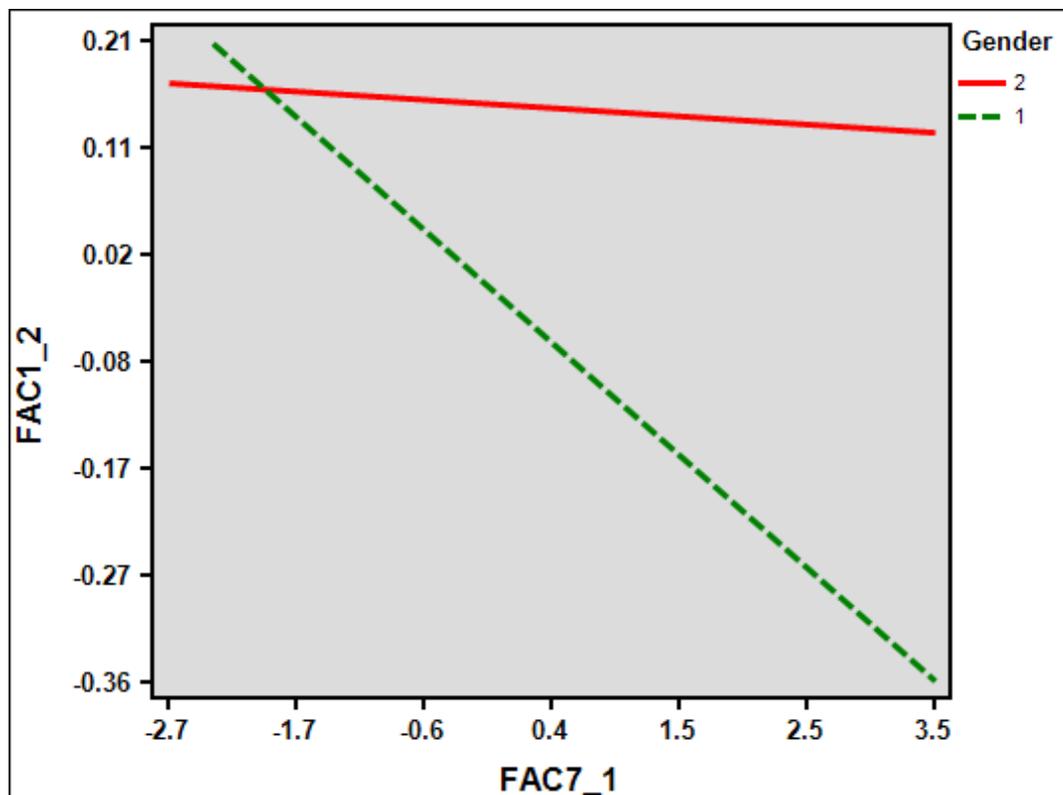
The research model and the interaction graph for testing gender by individual behavioral beliefs interaction on prescription self-medication is given in Table 6.10 a and Interaction graph 6.10-1 respectively.

Table 6.10 a Research model (similar for all analysis)

Research Model	$Y = B_1X_1 + B_2D_1 + B_3X_1D_1 + B_0$ Where, Y= Prescription self-medication X1= Individual behavioral beliefs
Model Summary	R Square: 0.0247 R Square contribution of the interaction term: 0.020
Model Analysis of Variance	F(df, 162) = 1.344 P value < 0.05
Model Coefficients	Interaction term b = 0.293 t = 1.841 P value < 0.05
Effect Size	0.025

The R^2 0.0247, indicates 2.47% variance in prescription self-medication, which is explained by individual behavioral beliefs, gender and gender by individual behavioral beliefs. The R^2 contribution of the interaction term 0.020 indicates 2.0% of the variance exclusively explained by the interaction term. The coefficient for the interaction term is statistically significant, this implies that the slope that predicts the relationship between individual behavioral beliefs and prescription self-medication differs significantly between the male and female groups. The effect size of 0.025 indicates small magnitude of the combined impact of the predictors on the dependent variable.

Graph 6.10-1A. Gender by IBB on PSM



Similarly, the remaining interaction analysis for the other variables is given below in the Table 6.10b followed by the graphs accordingly. The following connotations are used to define the eight independent variables:

PSM-Prescription self-medication

DSM-Dosage self-medication

IBB- Individual Behavioural Beliefs

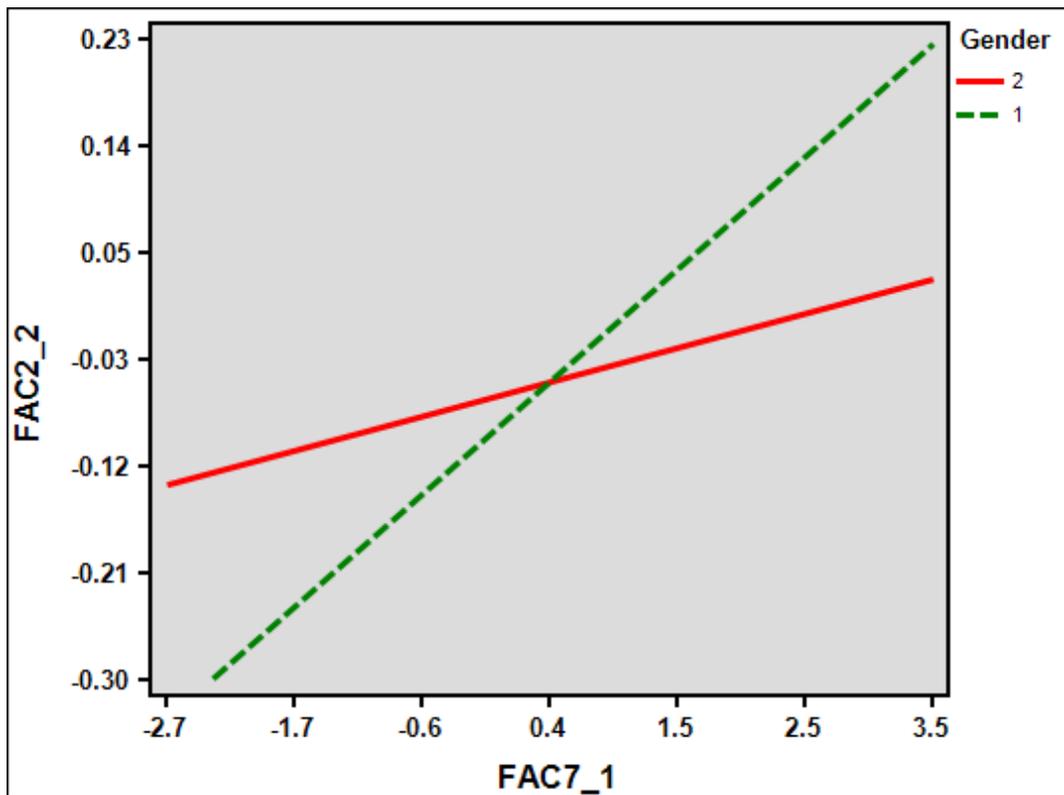
ICB- Information Collection Behaviour

PUE- Past Usage and Experience
 PRB-Pharmacist related beliefs
 RRB-Risk Reduction Behaviour
 KSE- Knowledge of side effects
 DRB-Doctor related beliefs
 KDM-Knowledge of disease and medicine

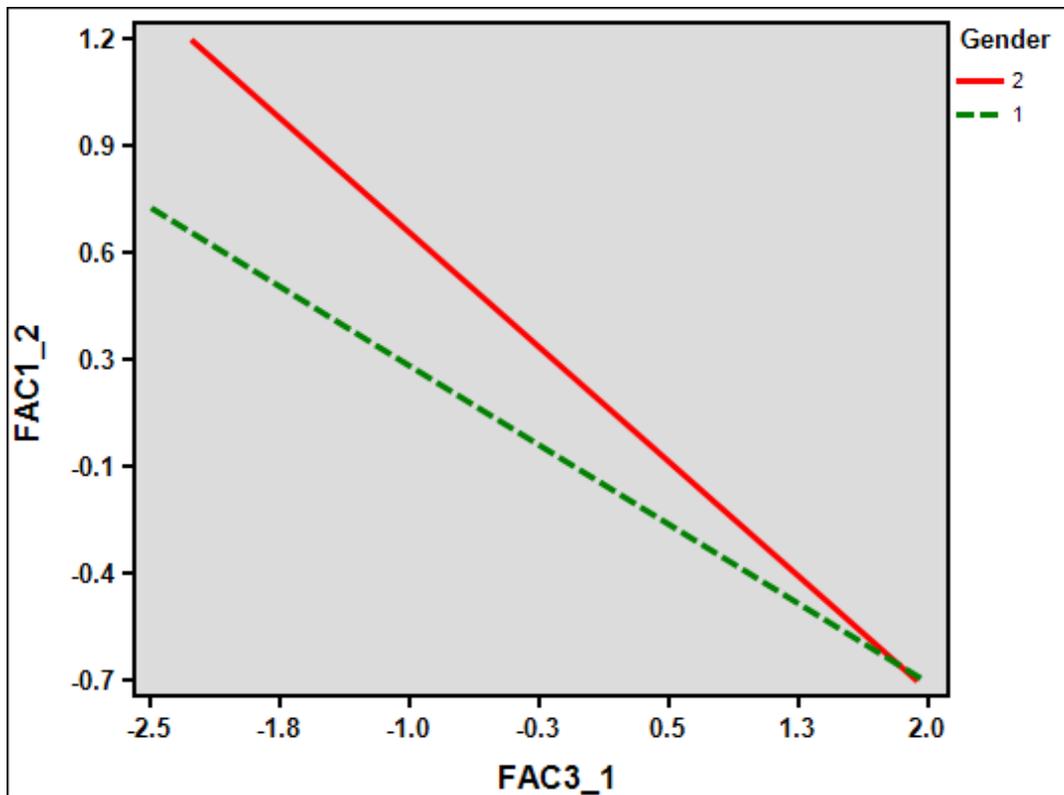
Table 6.10 b Statistical Output of Interaction Analysis

Sr. No.	Interaction variables	R Square	R Square contribution of interaction term	Interaction term (b)	Effect size
B.	Gender by IBB on DSM	0.004	0.001	-.06	0.004
C.	Gender by ICB on PSM	0.12	0.0039	-.013	0.147
D.	Gender by ICB on DSM	0.058	0.0013	0.069	0.062
E.	Gender by PUE on PSM	0.085	0.0079	0.184	0.093
F.	Gender by PUE on DSM	0.018	0.0029	-.101	0.018
G.	Age by PRB on PSM	0.17	0.0033	-.004	0.205
H.	Age by PRB on DSM	0.042	0.03914	0.0127	0.044
I.	Age by RRB on PSM	0.104	0.0048	0.0057	0.117
J.	Age by RRB on DSM	0.005	0.0017	-.0030	0.005
K.	Age by KSE on PSM	0.120	0.0187	0.00977	0.1368
L.	Age by KSE on DSM	0.0148	0.0000032	0.000116	0.015
M.	Income by DRB on PSM	0.0455	0.00604	0.217	0.0477
N.	Income by KDM on DSM	0.0487	0.0149	0.428	0.051

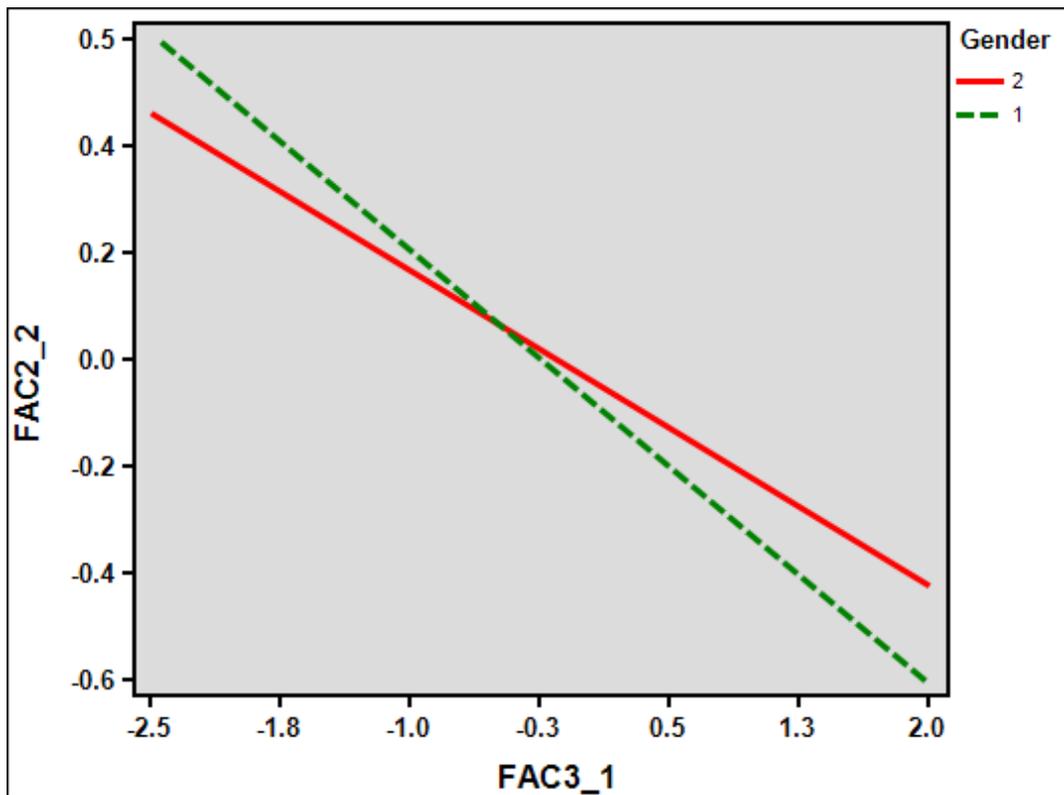
Graph 6.10-2 B Gender by IBB on DSM



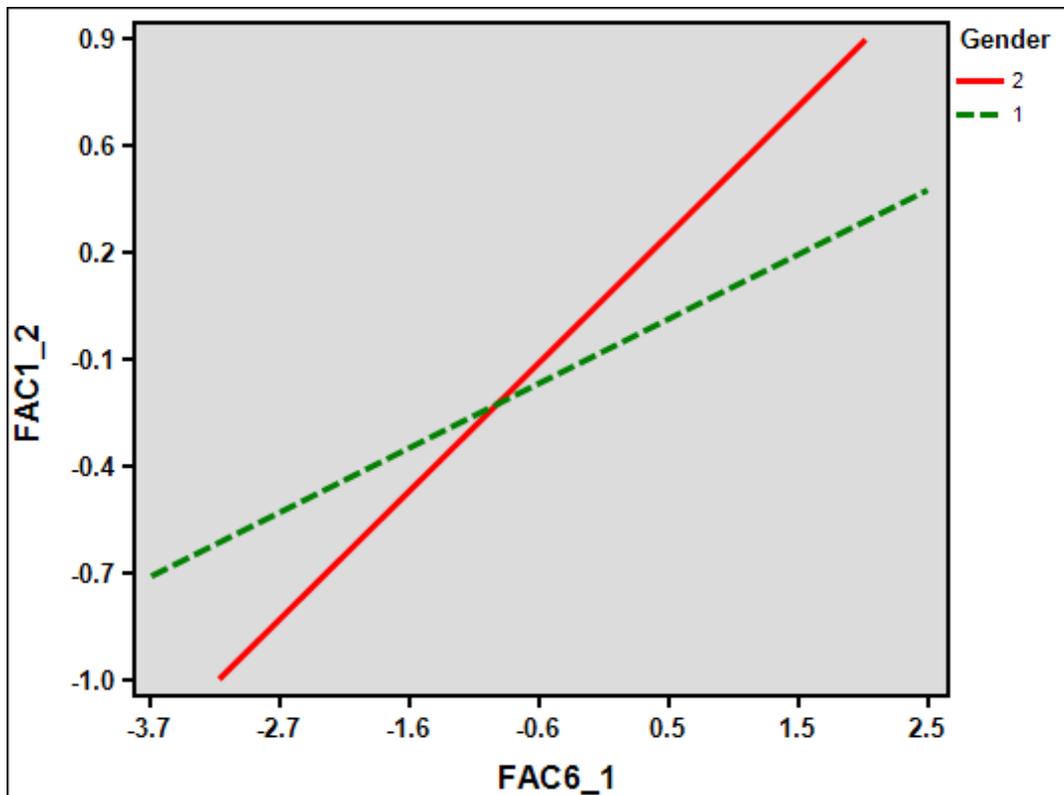
Graph 6.10-3 Gender by ICB on PSM



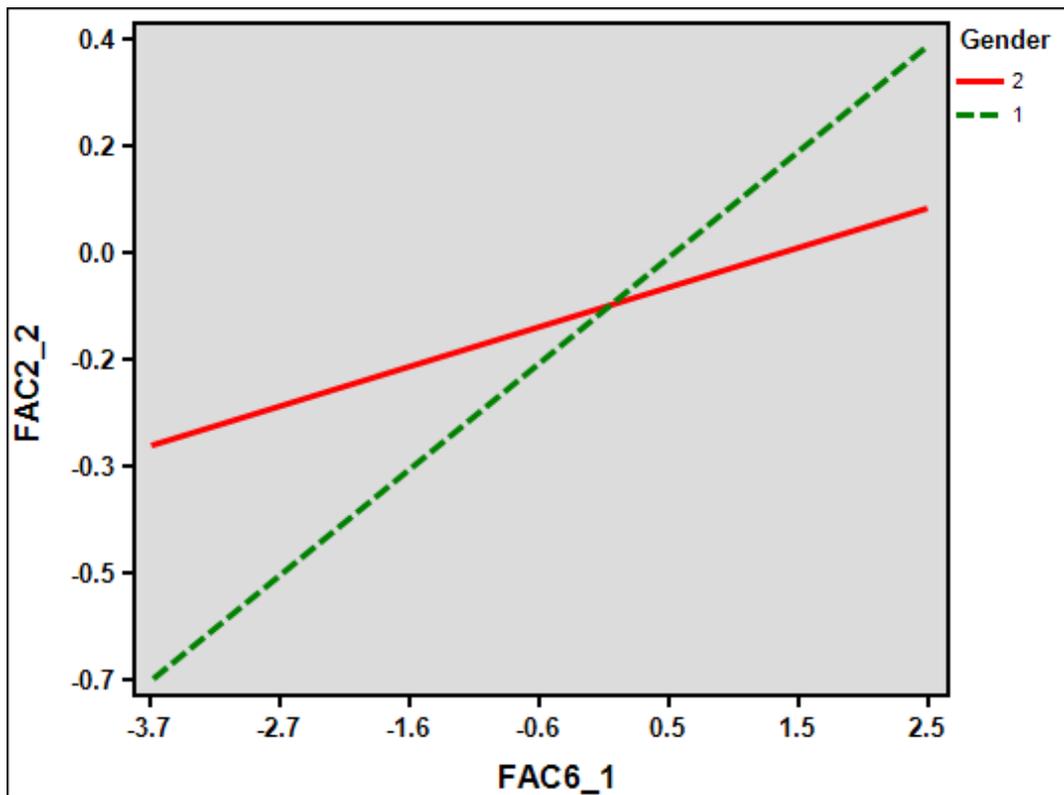
Graph6.10-4 Gender by ICB on DSM



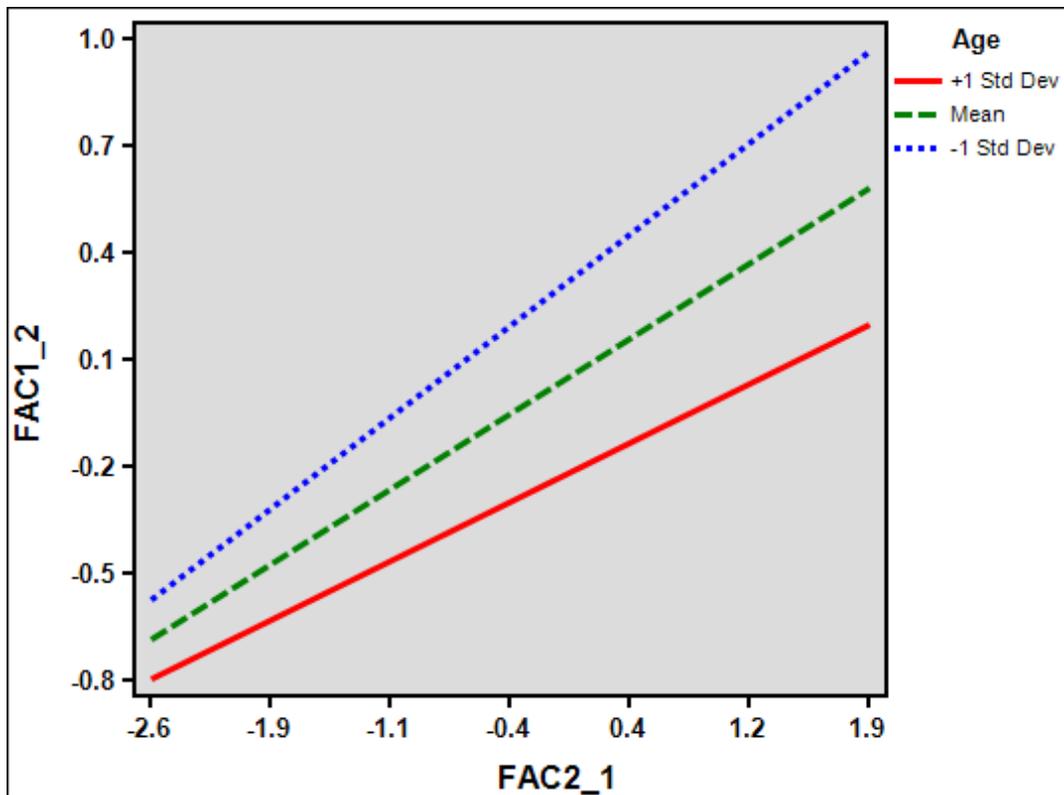
Graph6.10-5 Gender by PUE on PSM



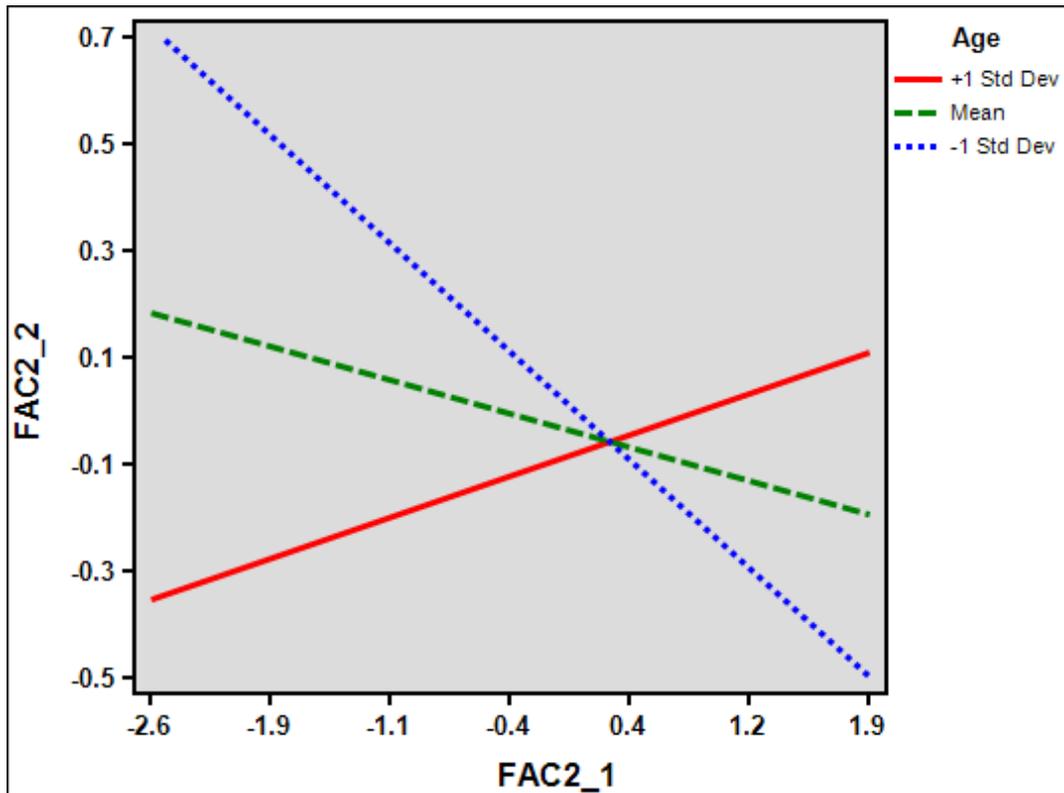
Graph6.10-6 Gender by PUE on DSM



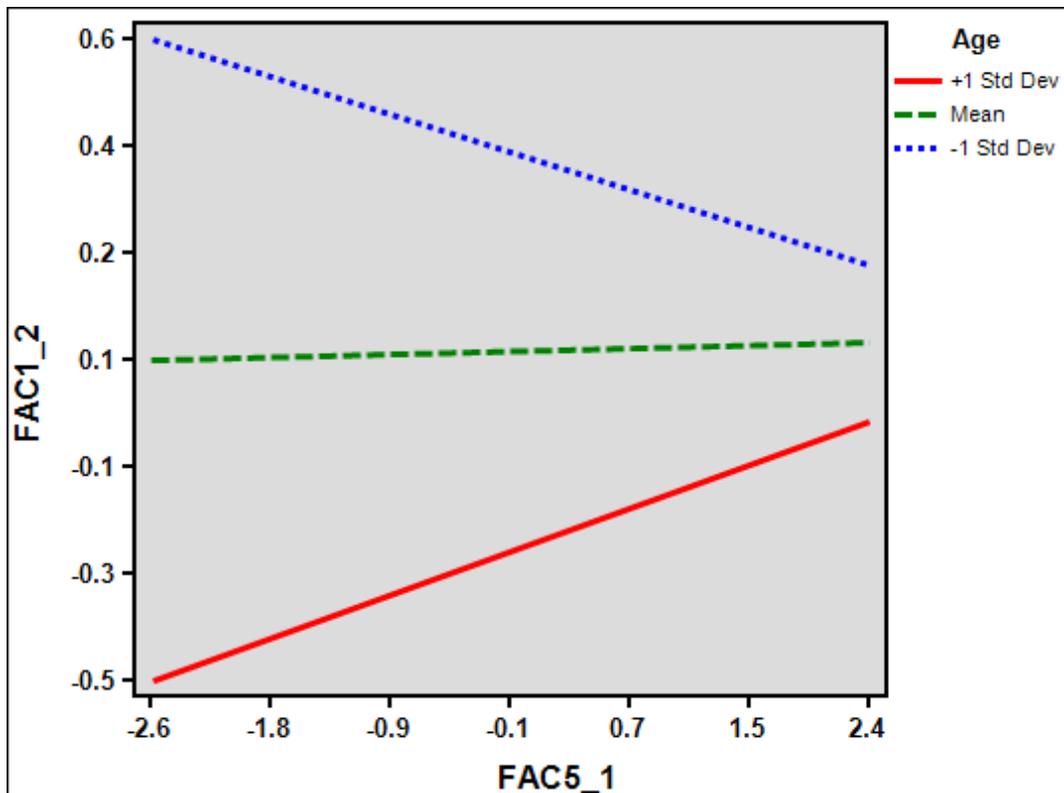
Graph6.10-7 Age by PRB on PSM



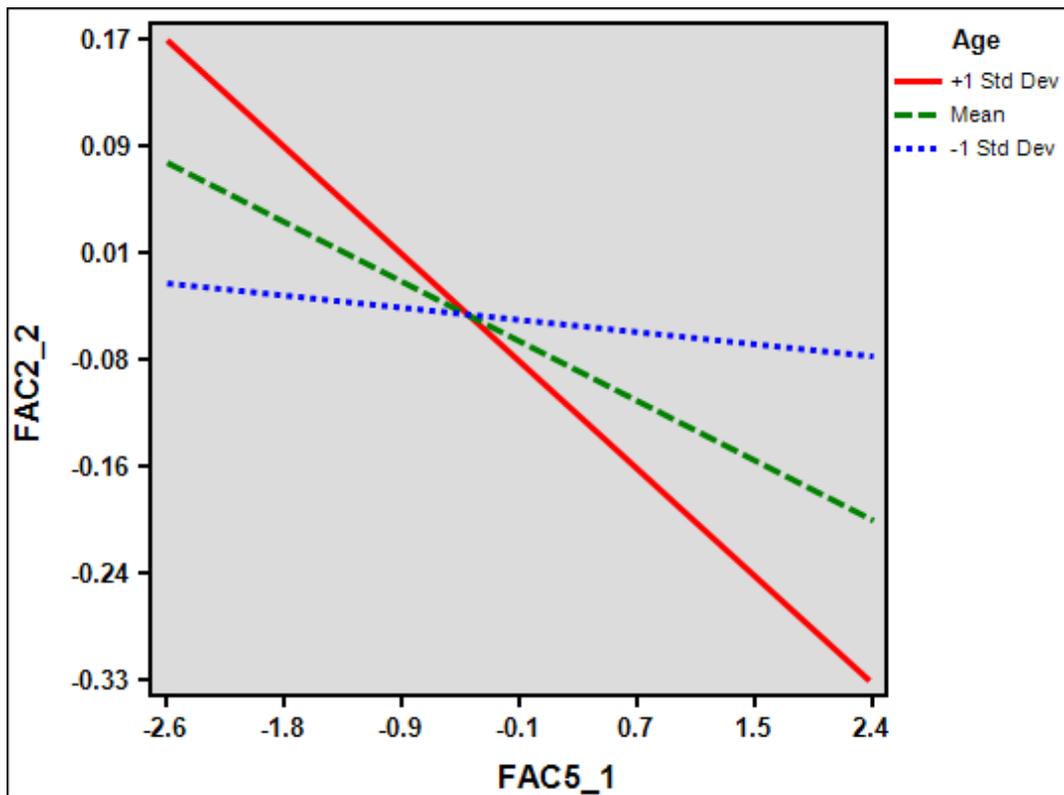
Graph6.10-8 Age by PRB on DSM



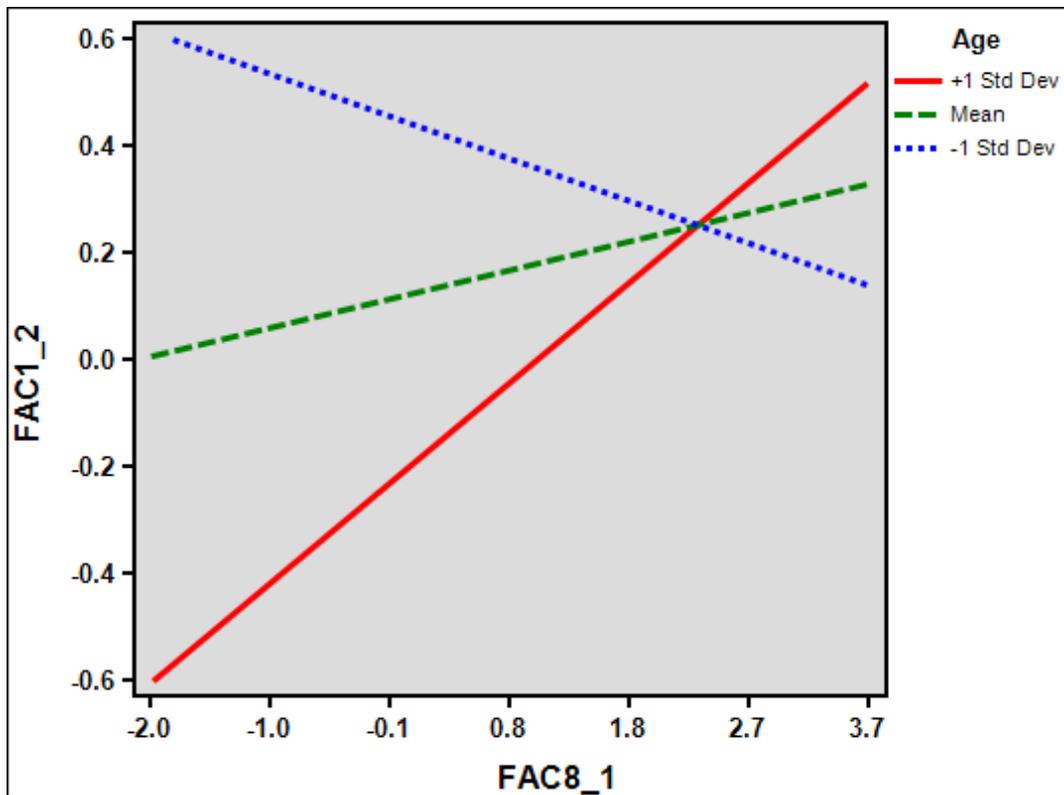
Graph6.10-9 Age by RRB on PSM



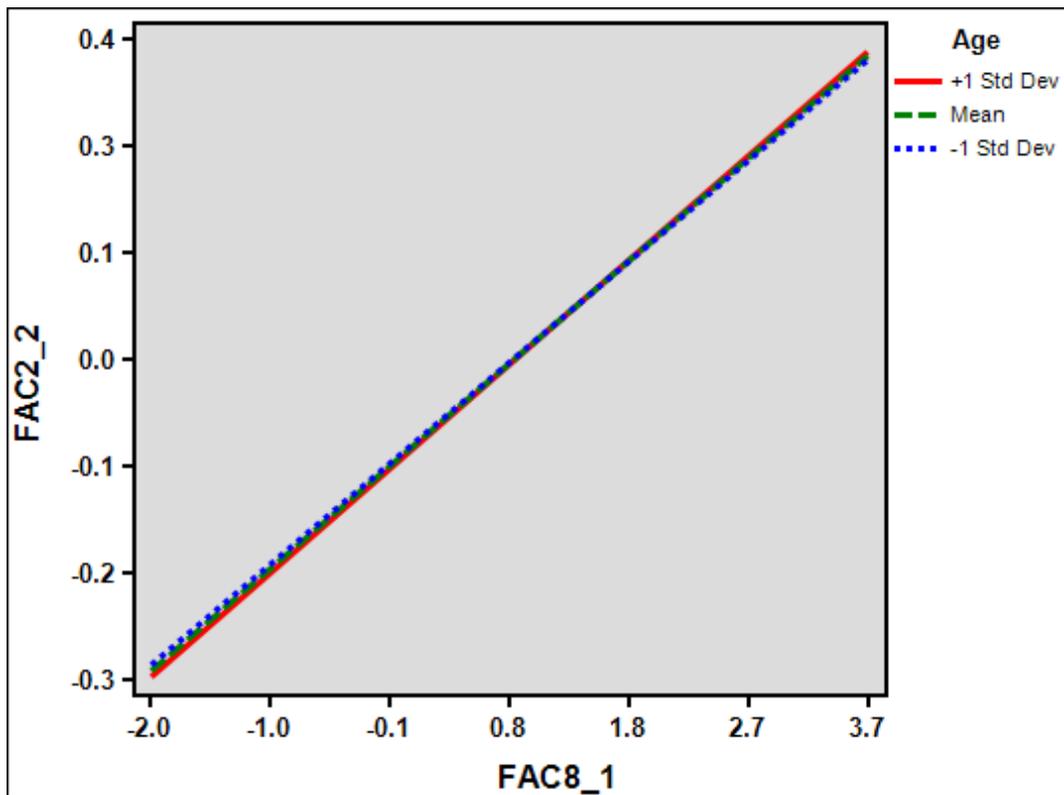
Graph6.10-10 Age by RRB on DSM



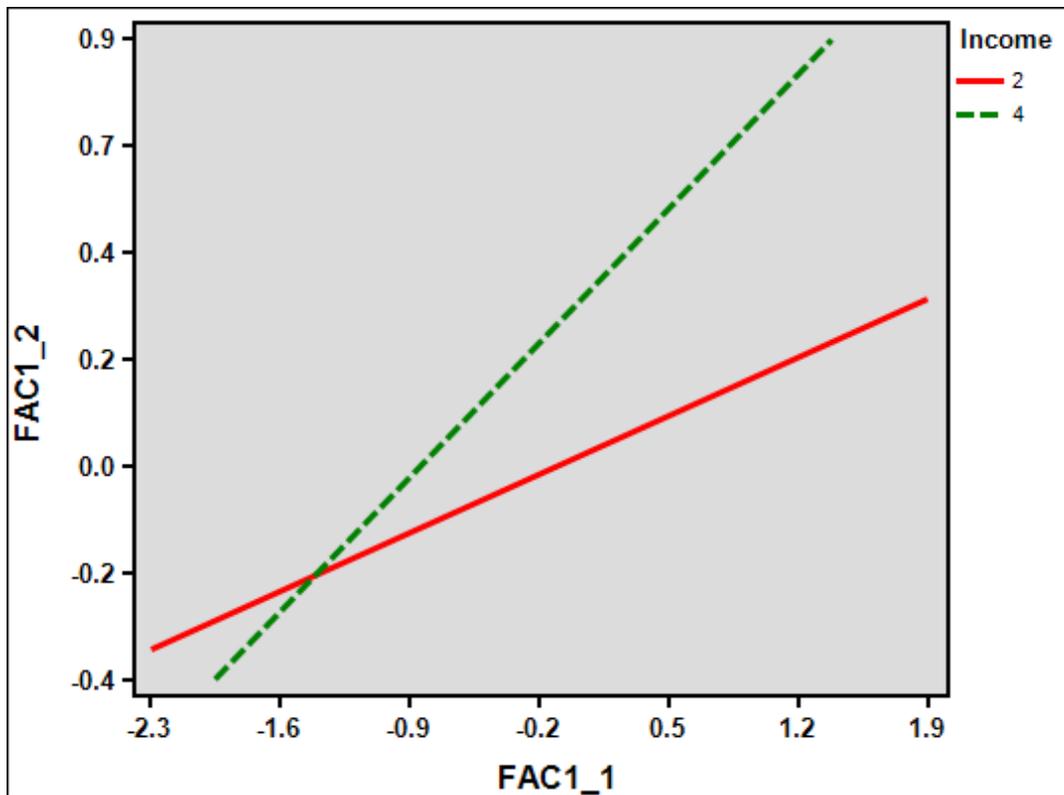
Graph 6.10-11 Age by KSE on PSM



Graph6.10-12 Age by KSE on DSM



Graph 6.10-13 Income by DRB on PSM



Graph 6.10-14 Income by KDM on DSM

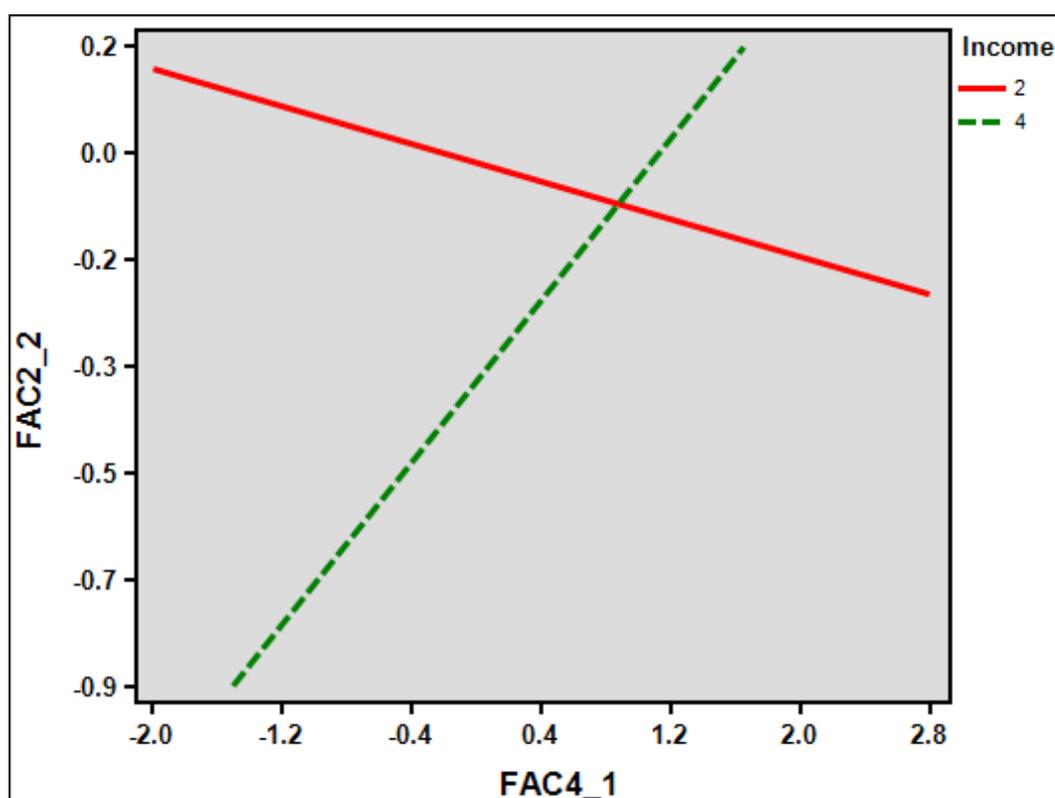


Table 6.10c Results of Interaction Effects

Dependent variable	Interaction term	Variance explained
Prescription self-medication	Gender by Individual behavioural beliefs	2.0%
	Gender by Information Collection Behaviour	0.39%
	Gender by Past Usage and Experience	0.79%
	Age by Pharmacist related beliefs	0.33%
	Age by Risk Reduction Behaviour	0.48%
	Age by Knowledge of side effects	1.87%
	Income by Doctor related beliefs	0.60%
Dosage self-medication	Gender by Individual behavioural beliefs	0.1%
	Gender by Information Collection Behaviour	0.13%
	Gender by Past Usage and Experience	0.29%
	Age by Pharmacist related beliefs	3.9%
	Age by Risk Reduction Behaviour	0.17%
	Age by Knowledge of side effects	0.00032%
	Income by Knowledge of disease and medicine	1.49%

From the interaction graphs, it is evident that gender, age and income moderate the effect of determinants on both types of self-medication observed (Prescription and Dosage) in the sample taken for analysis.

Data analyses as organised in five parts, Descriptive Statistics, Correlation Analysis, Factor Analysis, Regression Analysis and Interaction analyses revealed some interesting findings. Self-medication variable emerged as a composite variable comprising of Prescription and Dosage forms. Both the qualitative and quantitative study findings helped to confirm these findings.

CHAPTER 7

DISCUSSION AND CONCLUSION

The previous chapter covered detailed analyses and results of the qualitative and quantitative studies and interaction effects. This chapter gives details about the key findings and discussion, conclusions of the qualitative study, quantitative study, and hypothesis testing and interaction effects. It also details the theoretical contributions of this work and its managerial implications, limitations of the study and areas for future research.

7.1 FINDINGS AND DISCUSSIONS OF QUALITATIVE STUDY

Surveys carried out both in the developing and developed world have generated some important findings, rather insights with respect to self-medication practices in consumers (wsmibro, 2005). However, self-medication behaviour in itself is a large component of self-care, which in turn is influenced by a large number of factors including good hygiene, appropriate levels of nutrition and physical activity, risk avoidance and responsible use of non-prescription medicines. As such, it becomes necessary to get deeper insights into self-medication habits of consumers before designing interventions for appropriate and rational drug use. In-depth interviews and Interpretative Phenomenological Analysis has been helpful in exploring the important themes and items measuring these themes. These themes and items measuring them have been useful in development of hypothesis and the development of scales. The qualitative study results have revealed the probable nature and structure of self-medication. Self-reported, structured, reliable, valid, easy to read, multidimensional scales: Determinants of self-medication scale (DOSMS) and Self-medication scale (SMS) have been developed and pre-tested on 20 patients.

7.2 FINDINGS AND DISCUSSIONS OF PILOT STUDY

Pilot Study findings have helped in designing quantitative study related work and selecting the appropriate unit of analysis for quantitative study. In addition, certain queries and qualitative observations during filling of the pilot questionnaires have been useful in terms of findings.

7.3 FINDINGS AND DISCUSSIONS OF QUANTITATIVE STUDY

The survey of 203 patients/consumers from Goa has revealed the nature and structure of self-medication. The factor structure has indicated the patient's perception towards their self-medication behaviour. Factor analyses have confirmed the construct validity for both the scales.

Multiple regression results and correlation analyses have demonstrated that different combinations of determinants predict self-medication, prescription self-medication and dosage self-medication.

Regression model has explained 18.1% of the variance in self-medication. The available evidence indicates that during the last decade (2000-2016), researchers (Partha P; 2002, Husain et al; 2011, Pahuja Ritu; 2012) have tried to quantify the prevalence rates of self-medication across therapeutic categories including antibiotics. The prevalence rates range from 68% in European countries to as high as 92% in India. Various models including TPB (Theory of planned behaviour) have been used specifically to evaluate variance associated with behaviour towards a particular category of non-prescription medicines. In a study (Anne Walker; Margaret Watson 2004), the TPB framework was utilized to study behavioural intention for treatment of vaginal candidiasis in 76 women. The variance reported was 14-19% in behavioural intention. In a study (Mariano A. Lechuga-Besne; 2009) risk perception of self-prescribed over-the-counter(OTC) use of cold/flu medicines was studied(TPB framework) and it was found that though risk perception was little for all categories of treatment(Rx, OTC and home remedy) , the perceived risk was higher for OTC medicines.

In a study (Phuong Nguyen; 2012), consumer behaviour towards OTC medicine (anthelmintic preparations) use in children was studied using the TPB framework. The TPB model explained 32.3% of total variance in intention to give anthelmintic medications.

The higher reported value of variance in behaviour can be attributed to the fact that a single category of medicine has been studied. Self-medication being a multi-dimensional construct, it becomes imperative to explore different variables that have an underlying influence on this phenomenon.

7.4 HYPOTHESES TESTING

Self-medication

The study findings support hypotheses H1, H2, H5 and H7. The most significant determinants of self-medication are identified as: doctor related beliefs, information collection behaviour, risk reduction behaviour and pharmacist related beliefs. Pharmacist related beliefs are significant, but negatively correlated with self-medication practices. In a study (Al Motassem M.;2008), it was interesting to note that non-prescription drug supply pattern is of three kinds-by prescription, by direct Self-medication (OTCs) and indirect self-medication in which people sought advice of pharmacy staff before buying the medicine. Past usage and experience, though a significant determinant is negatively correlated with self-medication. In a study (Phuong Nguyen; 2012) it was found that 21.2% of variance in intention to give anthelmintic medicines was influenced by past behaviour. The hypotheses H3, H4 and H8 are not supported. Patient's knowledge of disease and medicine, knowledge of side effects and individual behavioural beliefs did not predict self-medication practices. Doctor related beliefs and information collection behaviour were common determinants like in other studies (S.Kayalvizhi; 2010, Zafar Syed; 2008, Rohit Verma; 2010, Pahuja Ritu; 2011).

Prescription self-medication

The study findings support hypotheses H10, H11, H12, H14 and H15. The most significant determinants of prescription self-medication are identified as: pharmacist related beliefs, doctor related beliefs, information collection behaviour, patient's knowledge of disease and medicine and past usage and experience. Only information collection behaviour was negatively correlated to prescription self-medication. As the information collection behaviour increases, prescription self-medication decreases for an individual. Doctor related beliefs, pharmacist related beliefs, patient's knowledge of disease and medicine and past usage and experience are the predictors of

prescription self-medication. These findings are similar to other studies (Partha P; 2002, Husain et al; 2011, Pahuja Ritu; 2012). Fernando Ruiz;2009 in his study on older people found that past prescription was a major source of prescription self-medication for chronic illness in a quarter of the population studied. The hypotheses H9, H13 and H16 are not supported. Knowledge of side effects and risk reduction behaviour could influence self-medication with prescription drugs mainly because this category is known to have serious side effects when compared to OTC medications used during the process of self-medication. In contrast, Hector Bolanos; 2005 found that non-prescription medicines were perceived safe by Latin Americans, 73% agreed that they were as safe as prescription medicines. This indicates that during self – medication using both prescription and OTC medicines reducing the risk would be of prime concern especially when the patient is unaware about the composition of the product.

Dosage Self-medication

The study findings support hypotheses H19 and H20. The most significant determinants of dosage self-medication are: doctor related beliefs and information collection behaviour. This suggests that consumers/patients do not very easily resort to changes in dosage, only after thorough consultation with their doctor or family, friends and relatives they will indulge in changes in dosage quantity or frequency of dosing. These findings are similar to other studies, in a study (Al Motassem M. Yousef;2008) it was found that people misused prescription medicines against their doctors' or pharmacists advice, which included under dosage and over dosage especially for dermatological and gynaecological preparations.

The hypotheses H17, H18, H21, H22, H23 and H24 are not supported. This implies that individual behavioural beliefs, pharmacist related beliefs, risk reduction behaviour, knowledge of disease and medicine, past usage and experience and knowledge of side effects does not predict dosage self-medication. Knowledge of disease and medicine does not significantly predict self-medication, this finding is similar to a previous study (S.D. Sontakke et al; 2011) in which the prevalence rates of self-medication were similar for first year and third year medical students.

It is interesting to note that individual behavioural beliefs and risk reduction behaviour do not predict dosage self-medication. This may be because this category of product (prescription category) being highly complex, consumers would not want to make serious decisions based on their individual beliefs only. They would rather consult their healthcare provider and be convinced before making this major change.

7.5 FINDINGS AND DISCUSSION OF INTERACTION EFFECTS

Gender has interaction effects on the relationship between individual behavioural beliefs and self-medication, Information collection behaviour and self-medication and Past usage and experience and self-medication. The study results show that prescription self-medication and dosage self-medication is higher in males with respect to gender interaction with individual behavioural beliefs. However, for information collection behaviour interaction with gender, the graph is negatively sloped indicating that as information collection behaviour decreases, self-medication increases. This is higher with respect to women for prescription self-medication. For dosage self-medication, interaction of gender with information collection behaviour is higher for men, indicating that men are more prone to making dosage changes when it comes to self-medication.

Similarly, gender interaction for past usage and experience with self-medication is positively sloped and hence as past usage and experience increases ,prescription self-medication increases in women and similar is the case for men in case of dosage self-medication. This suggests that there are distinct differences in how men and women self-medicate, however this is in contrast to few studies where there was no significant difference found between men and women when it came to self-medication habits.

With respect to age interactions with pharmacist related beliefs, the graph is negatively sloped (-1 standard deviation) indicating that in younger people, lower pharmacist beliefs leads to higher dosage self-medication. In addition, the slope at +1 standard deviation is positive indicating that in older people, as pharmacist related beliefs increase, dosage self-medication also increases.

Age with risk reduction behaviour is different for prescription self-medication and dosage self-medication. For older people, as risk reduction behaviour increases (slope is positive), prescription self-medication also increases. In younger people, lower the risk reduction behaviour (negatively sloped) higher is prescription self-medication. With respect to risk reduction behaviour and age interaction for dosage self-medication, it is negatively sloped for older people suggesting that as risk reduction behaviour increases, dosage self-medication decreases. Similarly, in younger people, as risk reduction behaviour increases, it leads to slight decrease in dosage self-medication.

Increasing knowledge of side effects of medicine in older people leads to increase in prescription self-medication (positively sloped). For younger individuals, the negative slope indicates that little knowledge of side effects is associated with high levels of prescription self-medication.

It is interesting to note the effect of age and knowledge of side effects on dosage self-medication. For both young and old people, the slope is positive indicating that as knowledge of side effects increases, dosage self-medication also increases.

In case of income interaction with doctor related beliefs, it is positively sloped for both higher and lower income groups indicating that as doctor related beliefs increase, prescription self-medication increases accordingly. For income interaction with knowledge of disease and medicine, it is positively sloped for higher income groups, suggesting that they are more knowledgeable about diseases and medicines, as this increases, dosage self-medication also increases. In lower income groups where the knowledge levels are lower, higher dosage self-medication may be observed.

These findings are consistent with earlier studies where demographic variables were used to assess self-medication practices (Preshth Bharadwaj; 2011, S.D. Sontakke; 2011, Pushpa Wijesinghe; 2012).

The only additional contribution was in terms of the interaction effects (moderating effects) of demographic variables with determinants of self-medication practices.

7.6 THEORETICAL CONTRIBUTIONS

This study has been able to identify a number of determinants of self-medication, which are less researched along with a number of moderating variables, which are adding variances to self-medication, prescription self-medication and dosage self-medication. The new scales have been developed to measure belief associated with self-medication in the general population. The idea underlying the development of these scales was that self-medication is a multi-dimensional construct, which is influenced by multiple factors, and thus understanding its various forms (dosage change in self-medication for example) is of concern to healthcare professionals and health policy makers. The scales are easy and can be employed in research and clinical fields. The conceptual framework derived from the study is a result of many factors including social, psychological, health system related factors and economic factors.

7.7 MANAGERIAL IMPLICATIONS

Self-medication with both prescription and OTC drugs has seen an enormous growth in the past few decades. While on the one hand, responsible self-medication can reduce the burden on healthcare systems, the risks with irresponsible self-medication are high and can lead to drug abuse, misuse and drug resistance (WHO manual, 2004). Unless the important and specific determinants of “self-medication “are not explored and addressed, routine intervention programs to manage problems associated with self-medication may not be useful. The scales developed in this study will be of generic use to medical practitioners and managers of healthcare facilities to measure self-medication.

Given the high prevalence rates of self-medication in developing countries like India(up to 90%), the study results suggest that considering geographical, socio-economic , gender and age based interventions like pharmacist counselling , awareness and educational campaigns on self-medication risks and benefits to the illiterate section of society and restricted availability of all medicines (Rx and OTC) at the pharmacy may help to reduce self-medication, prescription self-medication and dosage self-medication.

The findings of this study will help healthcare professionals to devise and implement intervention strategies around determinants of self-medication. Accordingly, significant beliefs of consumers can be evaluated and influenced to make the consumer/patient more aware about his /her own self-care management practices, thus reducing the burden on healthcare systems.

7.8 LIMITATIONS OF THE STUDY

This study has its own limitations. The design of the study being cross –sectional , results may not be appropriate as compared to a longitudinal design considering that self-medication is a behaviour that evolves over time. The study used self-reported scales hence is limited by selection bias and response bias, which may affect the accuracy of the measurements. The convenience sampling method used could be another limitation. In addition, it is not an all-inclusive study of all components of prescription self-medication and dosage self-medication. Only two-way interactions of moderating variables are tested.

7.9 DIRECTIONS FOR FUTURE RESEARCH

Self-medication is affected by many variables and hence a longitudinal study in which patients experiences are captured over an extended period with a large sample size will add on considerable knowledge in self-medication research. Research to assess dosage changes during self-medication as well as other forms of self-medication (irresponsible self-medication) are required to be undertaken. Further additional three way interactions with more moderating variables can be studied to predict associations between the independent and dependent variables.

7.10 CONCLUSIONS

The study is aimed to explore the determinants of self-medication, prescription self-medication and dosage self-medication among the general population with or without underlying conditions.

Qualitative approach and Interpretative Phenomenological Analysis are effective methods to explore deeper insights into patient experiences. Qualitative research findings are also helpful in developing the scales. The scales are unique as they

measure majority belief based components of self-medication unlike the existing self-medication scales, which are specific to a particular therapeutic category.

The quantitative study findings are notable in identifying the determinants of self-medication, prescription self-medication and dosage self-medication and testing the moderating variables' interaction effects.

Both the qualitative and quantitative study demonstrated two important aspects of self-medication in Goa. First self-medication is prevalent in the sample taken for the study, and multiple determinants are predicting self-medication. The variance in prescription self-medication is high, followed by self-medication and dosage self-medication. This is one among the first studies to report variances in self-medication and the first to examine interaction effects of demographic variables on self-medication in the study population.

Self-medication is higher when doctor related beliefs, pharmacist related beliefs, and information collection behaviour and risk reduction behaviour are higher in consumers/patients. Individual behavioural beliefs do not impact on self-medication.

Prescription self-medication is higher when doctor related beliefs, pharmacist related beliefs, information collection behaviour, patient's knowledge of disease and medicine and past usage and experience are higher in consumers/patients. Information collection behaviour is negatively correlated with prescription self-medication. Risk reduction behaviour, Individual behavioural beliefs and knowledge of side effects do not predict prescription self-medication.

Dosage self-medication is higher when doctor related beliefs and information collection behaviour is higher in patients/consumers. Information collection behaviour is negatively correlated with dosage self-medication. Pharmacist related beliefs, Individual behavioural beliefs and knowledge of side effects do not predict dosage self-medication.

The demographic variables like gender, age and income have been able to explain additional variances in the sample beyond that explained by the independent variables.

Self-medication management is a growing concern because of the increasing burden of risks associated with it. It is being increasingly viewed as an important element of public health policy. Policies need to be effectively designed to identify and implement effective interventions to reduce incidences of self-medication.

A multi-disciplinary approach, which revolves around educating the patient/consumer about the medicines they consume by self-medication, is required to improve the overall self-medication scenario in the country. Considering the multiple determinants and moderating variables predicting self-medication behaviour, there is a need to identify various segments of population, which is at a higher risk of being vulnerable to ill effects of the phenomenon. Accordingly, intervention strategies can be designed to tackle self-medication issues in the long term.

The study has highlighted the importance of understanding self-medication as a phenomenon from the health behaviour perspective. Being a multi-dimensional construct, we have to apply knowledge from different health behaviour theories in order to explain it better.

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ANNEXURE I

Narratives and Annotations

Patient No. 1 (Narrative)

“I avoid self-medication for pain, even when advised try to take little, avoid most of the time. For back pain, doctor has already prescribed medicine; I take only if required when I cannot tolerate the pain. I take old medicine in the cabinet, prescribed two years back. Keep the medicine, check expiry date. Call up doctor before taking the medicine to confirm.

In case of allergy, I know the reasons that trigger such a response. Running nose, allergy-asked, sneezing-I know the reasons, hence take an anti- allergy tablet given by doctor. I take half tablet during the daytime (because they are drowsy), so to avoid the side effect. At night, I take full tablet and sleep.

Tablet for controlling Blood pressure for the past 10 years, to be continued, multivitamin and calcium–doctor says one tablet per day, I take alternate day calcium (important), alternate day vitamin (supplement)

Normally, no information search. As long as prescribed, trust the doctor completely. Sometimes check constitution online (especially when abroad). Once relieved of pain, generally discontinue the medicine. Not same for antibiotics, complete the course usually. Side effects / Interactions-No incidence, any change of brand take advice from the doctor.

Recommend meds (OTC) –No, tell this gives relief, but use with precaution. Re prescription-any counseling to the Pharmacist, No, any change only ask the doctor, ex. Gemcal.

Annotations- Trust in the doctor with respect to all medicines, avoiding self-medication, changing the dosing schedule and dosage and check for constitution of medication. Does not recommend medicines even OTC to anyone.

Patient No. 2 (Narrative)

“Not a sick child, I was born with asthma (7-8) yrs. Stayed in hostel, thinner side, and irregular habits. Knee problem, from eighth std. conscious while walking. When it will slip, distracted then it can be dangerous”.

“Between 40’s-50’s, the pain increased, exercise, 10 years back, every alternate year , manifested–autoimmune disease-body aches, continued medication, did not take medicines initially, sporadic episodes-losing hair, 7-8 patches, brother (doctor) consulted specialist, tablet -not a hormone, manifested in spine, right hand got affected-nodules in thyroid. Muscle weakness, turn cannot lift leg, can walk, bout of herpes last year. Took medicine, November 2012 onwards-. My doctor in Vellore-I argue regarding dose, reduced dose 400mg-200 mg, tried to take alternately. Very rarely 1/10000 patients suffer from this-eye testing .Not very strict about follow up 3months can become 5 months at times”.

“Fractured leg in 1986, calcification not proper, drinking milk, no effect, take calcium did not take, osteoporosis –take calcium supplements now. Medicines prescribed by NIO used”.

“Biopsy-hip to confirm. Blood level of Rh monitored. Checked on internet, realized it goes unnoticed. Monthly one tablet. Helps, besides side effects, you need to take it.

Have to be very careful, knock against the table can be dangerous. Clinically, my profile is Ok. Feel weak and chilly, checked thyroid lately, last November, tablet for autoimmune, osteoporosis, checked with doctor about taking autoimmune and thyroid medicines together.

OTC drugs- Not much for it, saw something on tv , free advice, not tried anything, except a body oil, apply, did not use though, bought but no confidence to recommend to someone else.

“In case of fever, stamina goes down badly; first go to the doctor because of my condition. Little imbalance-drained, blackouts -prefer to go, symptomatic attract virus early”.

“Medicines at home, I may take at times, shall I continue ask doctor. Do talk to friends, when I got herpes, thought it was mosquito bite, showed my friend, said see the doctor, patient before me, with same symptoms-told doctor that same as skin specialist said to my friend, doctor confirmed, 7 days course. Second opinion-also taken. Took the antibiotic also. Feel second opinion was beneficial”. “I will not deny that medicines for my autoimmune condition help. Body would ache, could not lift hand. Fine while walking, moving. Horizontal position- heavy, worry about arguing with doc-can I reduce the dose, stop meds- try to convince doctor about how half tablet works good”.

Annotations- High requirement of medicines because of autoimmune condition and its subsequent manifestations. Not taking medicines regularly, engage in information search with doctors regarding the medicine. For simple symptoms, prefer to go to the doctor because of previous history of complications. Try to reduce the dose at times, not strict about follow up with the doctor. Prefer taking a second opinion at times and aware about side effects of medicine regimen. Take medicines from old stock kept at home.

Patient No. 3 (Narrative)

“Before breakfast -2 tablets for sugar, acidity. Breakfast –Blood pressure (BP), diabetes, acidity, prostrate, uric acid and blood thinner”.

“BP tab for last 15 years, other tabs 2 years back. Brand names of BP tablets have changed through the years. Brand of aspirin have changed. Medicines available through prescription. I don’t know about OTC medicines, Cough, flu very often –antibiotic, painkiller, every time visit the doctor”.

“Self-medication –negligible, consultation in most cases even the smallest ailments, discuss diagnosis with friends (similar problems), get feedback, and makes me feel good. Discuss information about medicines, and look at internet. Counselling pharmacist has no time to counsel. Prescription from clinic. First aid kit-glucometer at home”.

“Consume vitamin C, Hb content low-take hemoglobin tonic (Renerve tabs). Sometimes I skip medicines, very rarely due to side effects. 15 years back when I started

with two tabs, was told I will get diabetes, today post operation I have diabetes. Reddish tablets, Feel good after taking medicine, do not like insulin injection,- started with 3 daily, doses decreased over time”.

“Self-medication with crocin sometimes-headache full tablet. Advertising on TV-Vicks is fine; otherwise don't buy medicines based on seeing those ads”.

Annotations: Not aware about OTC medicines, for any symptom of flu or cold and cough prefer to visit the doctor. Engage in information search with friends and discuss about diagnosis of condition and medicines. Pharmacist does not counsel much about medicines. Does skip medicines at times and does little self-medication with a safe tablet like Crocin. Aware about brand names of his medication and prefers to be updated on the same.

Patient No.4 (Narrative)

“Blood pressure medicine once in the morning. Apply oil when there is pain in the leg. Get relief with same. Drink tea in case of headache. Do not take medicines for anything. When advised about cholesterol trusted the doctor and started the medicines. Use only coconut oil for massage. For backache, started medicines. Believe in Natural healing.

Annotations:

Averse to taking medicines, use home remedies to get relief from common symptoms of pain. Started medicine for cholesterol only after the doctor advised. High amount of trust in the doctor.

Patient No. 5 (Narrative)

“Hypothyroidism, no BP no Sugar. Fell down once , Pain in the knee, arthritis problem –told it is a passing phase, advised to work, dip feet in little hot water (fomentation) advised by doctor”.

“Don't worry, how much work you can do, do as per doctor instructions. Stomach ache-ova, methi and home remedies. Very rarely take medicines, 1 tablet or 1/2 tablet crocin in case of pain. Reading books to get information. Old friend and sister-in-law advise, cold cough-hot water inhalation, steam “.

“In case of allopathic treatment required, follow up on prescription. Will never take an existing medicine for a symptom; consult a doctor before taking it”.

“Symptoms subside with home remedies, slowly they will go take time with medicines they will go but come again in some time. When I do meditation, it helps. I make my own decoction of home remedies to treat. Tablet only for headache, my son takes this medicine; he will give one I will take half only.

“Meditation, control over food is needed, do not take more when you know body can’t handle”.

“Plaster, Dettol, headache tab, ova mix ready for stomach upset, never bring from outside, make powder from seeds. Daughter-in-law will not take, they will say do not advise me, will not take, Headache and neck pain use tablet. Whenever I am taking antibiotic, I complete the course for sure”.

Annotations: Does not take medicines for most symptoms, believe in home remedies. Reads books to gather information about the medicine and listens to advice given by close family. Believes that with allopathic treatment symptoms will go but will resurface in some time. Takes only Crocin by self-medication when son gives but that too at a reduced dose. In case a doctor prescribes an antibiotic, the course is completed for sure.

Patient No. 6 (Narrative)

“During pregnancy, advised Calcium, fluid in knees-16 years. No need of surgery for the knees, all three children are by caesarean, exercise. Take Calcium for 3 months, stop for 2 months, and then start again. Advised by friend, supposedly Calcium gets deposited in the kidney and this is not good”.

“Evion LC prescribed by ortho surgeon. Children have throat infection, one child gets, passed on to the other, give Novamox 250, do not consult the doctor, stopped Novamox, started ayurvedic medicine because this infection happens every month. Consulted the doctor, in case things are beyond control, (if fever is very high, after dose not much

relief, then I go to the doctor. 3 dose period, if still not ok, then go to doctor same for myself”.

“For other conditions, get prescription from doctor, complete the course. In case of indigestion, pain relief I use crocin. Besides doctor, google for information, example, for father, heart problem checked reports online for monitoring the levels. Did not believe all that was given on the net”.

Annotations: Does self-medicate for both children and herself from time to time. Uses alternative system of medicine for relief. Engages in information search with doctor, internet. Consult the doctor only in case things go beyond control (fever does not subside). Pays heed to advice given by friends regarding medicine use.

Patient No. 7 (Narrative)

“Use home remedies for simple coughs and colds (kasai) when antibiotics are prescribed, start by smaller dose for kids, and then check accordingly. Ask the pharmacist about dose related questions and side effects concerning the antibiotic when prescribed. Choose both allopathy and Ayurveda. Ask questions to the doctor; find out information from others who have used the medicine.

Annotations: Usage of home remedies for common cold and cough. In case of stronger medicines like antibiotics, start by a small dose for children, observe the effects and act accordingly. Ask for information related to the medicine from doctor and other people who have used the medicine.

Patient No.8 (Narrative)

“No specific condition. Healthy regime. Do hot water gargling for cough and cold. Rest for migraine. Use OTC’s like zandu balm and crocin. Yes, confident about using OTC’s”.

“I don’t like taking tablets, agree with concept however. Let the body decide, take its own course. Health conscious”.

Annotations: Healthy individual, does not like taking tablets, prefers to let the symptom take care of itself. Does self-medication for relief from pain using Crocin and Zandu balm. Confidence when using these medicines.

Patient No.9 (Narrative)

“Once in a while get a cold, normally don’t take medicine, wait to see what happens, do gargling, take vicks, manage, rarely go to doctor, habit – wait to see it go by itself, ex, allergic cough- physician(ENT), took anti allergic tabs as prescribed.

“Neglected pain in the hand did not go to doctor because he might say stop playing tennis, apply some pain balm if pain is more. My doctor had given me this balm some time back. Problem –took painkillers, gastric problem almost over six months, asked to restrict tea and pungent stuff, hence stopped the medicine”.

“Paracetamol, Dettol, pain balm, etc. kept in case of emergency, help neighbors sometimes. Only balm, brufen, once bought, kept when throw expired, keep during travel, in case needed, not used so far”.

“Advantage, daughter is a doctor, get an opinion from her, wife’s brother is a surgeon, institute doctor-final advice, tell her the opinions from others”

“Not happy with advertisements on medicines, liver is safe, all is safe. Encourage people to take alcohol. Not quite convinced about advertisements, Horlicks for mother, child, pregnant lady and complain. The message communicated is not right. People can go to court. Advise friends about paracetamol, disprin use for throat however, paracetamol equally good, tell people don’t take medicines”.

“I have seen doctors advise elderly patients to take vitamins, calcium, half a dozen tabs in the evening. I see no reason why people take this, preventive medicine, tell people close to me do not take medicine, a healthy diet should suffice. Calcium absorption poor-its ok to take, more of fashion today to take supplements”.

“Used antibiotics in case of injury (external), tooth extraction, very selective, try to avoid, cannot complete a course, affects stomach-diarrhoea, problem of diarrhea more

serious. 6 months back in US, had to take some Antibiotic, cannot buy without prescription, carried my stock of medicines. Wide spectrum antibiotic on prescription from doctor. Check expiry date, and composition. In case of doubts, we don't know much about composition, hence not well versed with side effects”.

Annotations: Avoid going to the doctor unless the condition warrants it. Bothered with side effects of most medicines, diarrhea for example with use of antibiotics. Does not recommend usage of wellness products like vitamins, a healthy diet should take care of everyday symptoms. Does find the advertising with OTC category of medicines quite misleading. For most medicines, checks the expiry date, however since the composition is not known, may not be aware of the side effects.

Patient No.10 (Narrative)

“For sinusitis, took allopathic medicines initially for a year with no result now shifted to homeopathy. Read information on PIL (Product information leaflet), some of it makes sense. Go by word of mouth, information about side effects from relatives”.

“No trust in doctor, avoid OTC's. Have changed dosage at times”.

Annotations: Changed to alternative system of medicine. Engage in information search through product leaflets, word of mouth with respect to medicine usage and knowledge about side effects acquired from relatives. Does not trust the doctor, and has changed dosage at times at will.

ANNEXURE II

LIST OF DEPENDENT AND INDEPENDENT ITEMS

DEPENDENT ITEMS

1	I tend to take prescription medicines without a prescription (on my own)
2	I tend to change the dosage of my prescription medicine without consulting my doctor
3	I tend to use prescription medicines on the advice of a pharmacist
4	I tend to take medicines using past prescriptions
5	I tend to use prescription medicines from my old stock at home without consulting my doctor
6	I tend to take alternative system medicines on my own
7	I tend to not complete the full course of my prescription medicine
8	I tend to change the dosing schedule of my prescription medicine without consulting my doctor

INDEPENDENT ITEMS

1	When I fall ill, I tend to gather information about the disease by reading more about it
2	When I fall ill, I would want to keep my illness a secret
3	When I fall ill , I tend to know more about the disease by discussing about it with my friends and relatives
4	For me, it is important to feel independent with my prescription medicine
5	When I fall ill, I tend to gather information by discussing about my condition with my doctor or healthcare professional
6	I would like to prevent occurrence of diseases in general
7	I tend to read about the medicine related to my illness
8	When I fall ill, I tend to relate the symptoms to a previous similar occurrence
9	I tend to learn from past use of prescription medicines
10	I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives

11	I tend to learn more about prescription medicines from others experience with them
12	I tend to talk to my doctor or healthcare professional about medicine related to my illness
13	I tend to approach my friends and relatives for specific information related to their illness and medicine
14	I tend to believe that my pharmacist knows about diseases and medicines
15	I think that it can be risky to take prescription medicines on my own
16	When I have to get my prescription medicine , I try to avoid crowded chemist shops
17	I think my pharmacist counsels me well about my medicine from time to time
18	I think self-medication is easy for me
19	I think my pharmacist is very knowledgeable about different brands of medicines
20	I do not know much about the side effects of my prescription medicines
21	I think my pharmacist gives me good advice with respect to my medicine
22	I think that doctors are generally knowledgeable about diseases and medicines
23	I think that doctors are patient with their patients
24	I think that doctors' fees are high in most cases
25	I think that it is time consuming to consult the doctor
26	I think that a lot of time is spent waiting for the doctor outside his/her clinic
27	I think that in most cases, doctors do not know much about the disease or medicine
28	I think that doctors do not spend time to explain in detail about the medicine or disease
29	I think that buying prescription medicines directly from the pharmacy without consulting a doctor is more convenient for me.

ANNEXURE III

INTER-RATER AGREEMENT AND FLEISS KAPPA

Dear Expert,

I have designed the below scale for determinants of self-medication in consumers. Kindly classify the items into categories specified below as per your best judgement

Self-medication has been defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, prescription or surveillance of treatment. (Montastruc et al 1997, Zafar et al 2008)

Self-medication is defined as the use of medication by a patient on his own initiative or on the advice of a pharmacist or a lay person instead of consulting a medical practitioner. (WHO guidelines for the regulatory assessment of medicinal products for use in self-medication 2000, available from www.who.int/medicines/library/qsm/who-edm-qsm-2000-1/who-edm-qsm-00_1.htm)

B. Determinants of Self-medication

Patients Knowledge

This refers to activities that a patient will indulge in in order to improve his/her knowledge with respect to diseases, medicine and treatments.

It includes information gathering and assimilation from various sources like reading, internet, discussion with friends or healthcare professionals and sharing of knowledge related to disease symptoms.

Doctors Knowledge

This refers to the knowledge that a doctor possesses with respect to a particular disease/condition. It includes a certain level of skill and expertise that the doctor displays during doctor patient interactions.

It includes the ability of the doctor to make a patient feel comfortable and the ability to spend quality time with his/her patients.

Pharmacist Knowledge

Pharmacist Knowledge is defined as the knowledge that a pharmacist possesses with respect to disease, medicine and treatments.

It includes the ability of the pharmacist to counsel his/her patients with respect to medicine usage. A pharmacist would also be considered knowledgeable if he/she is able to provide advice to their patients with respect to various brands of medicines available in the market.

Patient –related factors

These are unique to each individual and shape the attitudes that he/she possesses towards self-medication and one's own health in general.

This includes a feeling of independence when using a medicine, the need for keeping one's illness a secret or the need for preventing disease occurrence in people. It may also include the ability to relate disease symptoms to similar previous occurrences thus prompting self-medication.

Past Use and Experience

This is related to the expertise that a patient possesses by virtue of using a medicine in the past. This usage could be related to one's own experience with the medicine or the use of the same medicine by his/her friend or relative.

This includes an inherent knowledge gain by the patient regarding a particular medicine and its probable benefits and risks. It thus ensures certain amount of learning and hence builds confidence with respect to medicine usage.

Time

This refers to the time taken to obtain a particular medicine from the healthcare professional.

It essentially refers to the time spent waiting outside the doctor's clinic for a prescription as well as the time taken during a particular consultation with the doctor.

Cost

Cost is an important determinant as most medicines today are increasingly becoming more and more expensive.

Affordability of medicines remains a question, to add to this, the consultation fees at the doctor's clinic can also be high most of the times.

Ease and Convenience

Patients today are looking for easy and quick solutions when it comes to medicines. One of the important factors would include the easy availability of medicines at pharmacies which is more convenient for them.

It also includes the ease with which self-medication can be done, in the comfort of one's own homes without having to move out in crowded places to get access to medicines.

Risk

It includes the inherent risks associated with prescription medicine usage during self-medication.

This may include the risks due to side effects of the medicine or effects due to improper medicine usage when it is done by a patient on his/her own. It could be related to under usage or over usage of the medicine.

Tick mark (✓) in only one of the columns which would be the most appropriate category for the item.

B. Determinants

Sr. No.	Statements	Patients Know.	Doctors Know.	P'cist Know.	Patient –related factors	Past use and Exp.	Others Exp.	Cost	Time	Ease and conv.	Risk
1	When I fall ill, I tend to gather information about the disease by reading more about it										
2	When I fall ill, I would want to keep my illness a secret										
3	I think that doctors are generally knowledgeable about diseases and medicines										
4	When I fall ill, I tend to read about the medicine related to my illness										
5	I think that cost of most prescription medicines is high										

6	When I have to get my prescription medicine , I try to avoid crowded places										
7	I tend to believe that my pharmacist knows about diseases and medicines										
8	I think self-medication is easy for me										
9	I think that doctors are patient with their patients										
10	I do not know much about the side effects of my prescription medicines										
11	When I fall ill, I tend to relate the symptoms to a previous similar occurrence										
12	When I fall ill , I tend to know more about the disease by discussing about it with my friends and relatives										

13	I think my pharmacist counsels me well about my medicine from time to time										
14	I think that in most cases, doctors do not know much about the disease or medicine										
15	I tend to learn from past use of prescription medicines										
16	I tend to approach my friends and relatives for specific information related to their illness and medicine										
17	I tend to learn more about prescription medicines from others experience with them										
18	I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives										

19	I think that doctors' fees are high in most cases										
20	For me, it is important to feel independent with my prescription medicine										
21	I think that a lot of time is spent waiting for the doctor outside his/her clinic.										
22	I think that buying prescription medicines directly from the pharmacy without consulting a doctor is more convenient for me.										
23	I think that doctors do not spend time to explain in detail about the medicine or disease.										
24	I think my pharmacist gives me good advice with respect to my medicine										

25	I tend to talk to my doctor or healthcare professional about medicine related to my illness										
26	I think that it is time consuming to consult the doctor										
27	I would like to prevent occurrence of diseases in general										
28	I think my pharmacist is very knowledgeable about different brands of medicines										
29	I think that it can be risky to take prescription medicines on my own										
30	I tend to gather information by discussing about my condition with my doctor or healthcare professional										

Dear Expert,

I have designed the below scale for self-medication in consumers. Kindly classify the items into categories specified below as per your best judgement

Self-medication has been defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, prescription or surveillance of treatment. (Montastruc et al 1997, Zafar et al 2008)

Self-medication is defined as the use of medication by a patient on his own initiative or on the advice of a pharmacist or a lay person instead of consulting a medical practitioner. (WHO guidelines for the regulatory assessment of medicinal products for use in self-medication 2000, available from www.who.int/medicines/library/qsm/who-edm-qsm-2000-1/who-edm-qsm-00_1.htm)

A. Dimensions of Self-medication

Dosage

During self-medication, a patient may choose to change the dosage of the medicine at will as may have been prescribed to him/her earlier. A dosage can be defined as the specific amount of medicine that is to be consumed at specific dosing intervals.

This includes two main alterations with respect to dosing considerations. One is with reference to the amount of medicine (200 mg instead of 500 mg, half a tablet etc.) and the second would be with reference to the dosing interval. The dosing interval is the time period between two successive doses. (4 hourly, six hourly, etc.)

Prescription

A prescription is the doctor's evaluation including diagnosis and medicine prescribed for a particular health condition.

This type will include taking medicines without prescriptions and prescriptions given by a pharmacist.

Availability of medicine

This includes usage of medicines stocked at home with or without prescription and usage of earlier prescriptions.

It also includes stocking and consumption of alternative medicines.

Tick mark (\checkmark) in only one of the columns which would be the most appropriate category for the item.

A. Self-medication

Sr. No.	Statements	Dosage	Prescription	Availability of medicine
1	I tend to take prescription medicines without a prescription (on my own)			
2	I tend to change the dosage of my prescription medicine without consulting my doctor			
3	I tend to use prescription medicines on the advice of a pharmacist			
4	I tend to take alternative system medicines on my own			
5	I tend to use prescription medicines from my old stock at home without consulting my doctor			
6	I tend to change the dosing schedule of my prescription medicine without consulting my doctor			
7	I tend to take medicines using past prescriptions			
8	I tend to not complete the full course of my prescription medicine			

ANNEXURE IV

I-CVI And S-CVI

Dear Expert,

I have designed the below scale for determinants of self-medication in consumers. Kindly classify the items into categories specified below as per your best judgement

Self-medication has been defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, prescription or surveillance of treatment. (Montastruc et al 1997, Zafar et al 2008)

Self-medication is defined as the use of medication by a patient on his own initiative or on the advice of a pharmacist or a lay person instead of consulting a medical practitioner. (WHO guidelines for the regulatory assessment of medicinal products for use in self-medication 2000, available from www.who.int/medicines/library/gsm/who-edm-gsm-2000-1/who-edm-gsm-00_1.htm)

B. Scale for Determinants of Self-medication

Patients Knowledge

This refers to activities that a patient will indulge in in order to improve his/her knowledge with respect to diseases, medicine and treatments.

It includes information gathering and assimilation from various sources like reading, internet, discussion with friends or healthcare professionals and sharing of knowledge related to disease symptoms.

Doctors Knowledge

This refers to the knowledge that a doctor possesses with respect to a particular disease/condition. It includes a certain level of skill and expertise that the doctor displays during doctor patient interactions.

It includes the ability of the doctor to make a patient feel comfortable and the ability to spend quality time with his/her patients.

Pharmacist Knowledge

Pharmacist Knowledge is defined as the knowledge that a pharmacist possesses with respect to disease, medicine and treatments.

It includes the ability of the pharmacist to counsel his/her patients with respect to medicine usage. A pharmacist would also be considered knowledgeable if he/she is able to provide advice to their patients with respect to various brands of medicines available in the market.

Patient –related factors

These are unique to each individual and shape the attitudes that he/she possesses towards self-medication and one's own health in general.

This includes a feeling of independence when using a medicine, the need for keeping one's illness a secret or the need for preventing disease occurrence in people. It may also include the ability to relate disease symptoms to similar previous occurrences.

Past Use and Experience

This is related to the expertise that a patient possesses by virtue of using a medicine in the past. This usage could be related to one's own experience with the medicine or the use of the same medicine by his/her friend or relative.

This includes an inherent knowledge gain by the patient regarding a particular medicine and its probable benefits and risks. It thus ensures certain amount of learning and hence builds confidence with respect to medicine usage.

Time

This refers to the time taken to obtain a particular medicine from the healthcare professional.

It essentially refers to the time spent waiting outside the doctor's clinic for a prescription as well as the time taken during a particular consultation with the doctor.

Cost

Cost is an important determinant as most medicines today are increasingly becoming more and more expensive.

Affordability of medicines remains a question. To add to this, the consultation fees at the doctor's clinic can also be high most of the times.

Ease and Convenience

Patients today are looking for easy and quick solutions when it comes to medicines. One of the important factors would include the easy availability of medicines at pharmacies which is more convenient for them.

It also includes the ease with which self-medication can be done, in the comfort of one's own homes without having to move out in crowded places to get access to medicines.

Risk

It includes the inherent risks associated with prescription medicine usage during self-medication.

This may include the risks due to side effects of the medicine or effects due to improper medicine usage when it is done by a patient on his/her own. It could be related to under usage or over usage of the medicine.

Rating guidelines for scale:

As per the above description of the scale items, the statements below are to be rated for their relevance, clarity and simplicity.

Relevance

Indicate on the scale ranging from 1 to 4 whether the specified item is relevant as a measure for which it is intended. The quantifiers are given as under:

- 1 - Not relevant
- 2 - Item needs some revision
- 3 - Relevant but needs some minor revision
- 4 - Very relevant

Clarity

Indicate on the scale ranging from 1 to 4 whether the specified item has Clarity in understanding. The rating may be represented thus:

- 1 - Not clear
- 2 - Item needs revision
- 3 - Clear but needs some minor revision
- 4 - Very clear

Simplicity (for all scale dimensions)

Indicate on the scale ranging from 1 to 4 whether the specified item is simple to understand. The rating may be represented thus:

- 1 - Not simple
- 2 - Item needs some revision
- 3 - Simple but needs some minor revision
- 4 - Very simple

Relevance	Clarity	Simplicity
1-Not relevant	1-Not clear	1-Not simple
2- Item needs some revision	2- Item needs some revision	2- Item needs some revision
3 – Relevant but needs minor revision	3 –clear but needs minor revision	3 - Simple but needs minor revision
4- Very relevant	4- Very clear	4- Very simple

Kindly rate the below statements on the scale of 1 to 4 for its relevance, simplicity and clarity on the basis of the above stated guidelines.

Patients Knowledge

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	When I fall ill, I tend to gather information about the disease by reading more about it			
2	When I fall ill , I tend to know more about the disease by discussing about it with my friends and relatives			
3	When I fall ill, I tend to gather information by discussing about my condition with my doctor or healthcare professional			
4	I tend to read about the medicine related to my illness			
5	I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives			
6	I tend to talk to my doctor or healthcare professional about medicine related to my illness			

Doctors Knowledge

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I think that doctors are generally knowledgeable about diseases and medicines			
2	I think that in most cases, doctors do not know much about the disease or medicine			
3	I think that doctors are not as friendly with their patients			
4	I think that doctors do not spend time to explain in detail about the medicine or disease.			

Pharmacist Knowledge

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I tend to believe that my pharmacist knows about diseases and medicines			
2	I think my pharmacist gives me good advice with respect to my medicine			
3	I think my pharmacist counsels me well about my medication from time to time			
4	I think my pharmacist is very knowledgeable about different brands of medicines			

Patient –related factors

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I would want to keep my illness a secret			
2	For me, it is important to feel independent with my prescription medicine			
3	I would like to prevent occurrence of diseases in general			
4	When I fall ill, I tend to relate the symptoms to a previous similar occurrence			

Past use and Experience

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I tend to learn from past use of prescription medicines			
2	I tend to approach my friends and relatives for specific information related to their illness and medicine			
3	I tend to learn more about prescription medicines from others experience with them			

Time

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I think that it is time consuming to consult the doctor			
2	I think that a lot of time is spent waiting for the doctor outside his/her clinic.			

Cost

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I think that cost of most prescription medicines is high			
2	I think that doctors' fees are high in most cases			

Ease and Convenience

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I think that buying prescription medicines directly from the pharmacy without consulting a doctor is more convenient for me.			
2	I think self-medication is easy for me			
3	When I have to get my prescription medicine , I would want to avoid crowded chemist shops			

Risk

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I think that it can be risky to take prescription medicines on my own			
2	I do not know much about the side effects of my prescription medicines			

Dear Expert,

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A. Scale for Self-medication

Dosage

During self-medication, a patient may choose to change the dosage of the medicine at will. Dosage can be defined as the amount of medicine that is to be consumed at specific dosing intervals.

This includes two main alterations with respect to dosing considerations. One is with reference to the amount of medicine (200 mg instead of 500 mg, half a tablet etc.) and the second would be with reference to the dosing interval. The dosing interval is the time period between two successive doses. (4 hourly, six hourly, etc.)

Prescription

A prescription is the doctor's evaluation including diagnosis and medicine prescribed for a particular health condition.

This will include taking medicines without prescriptions and prescriptions given by the pharmacist.

Availability of medicine

This includes usage of medicines stocked at home with or without prescription. It also includes the usage of earlier prescriptions.

It includes stocking and consumption of alternative medicines at home.

Rating guidelines for Scale

As per the above description of the scale items, the statements below are to be rated for their relevance, clarity and simplicity.

Relevance

Indicate on the scale ranging from 1 to 4 whether the specified item is relevant as a measure for which it is intended. The quantifiers are given as under:

1. Not relevant
2. Item needs some revision
3. Relevant but needs some minor revision
4. Very relevant

Clarity

Indicate on the scale ranging from 1 to 4 whether the specified item has Clarity in understanding. The rating may be represented thus:

1. Not clear
2. Item needs revision
3. Clear but needs some minor revision
4. Very clear

Simplicity (for all scale dimensions)

Indicate on the scale ranging from 1 to 4 whether the specified is simple to understand. The rating may be represented thus:

1. Not simple
2. Item needs some revision
3. Simple but needs some minor revision
4. Very simple

Relevance	Clarity	Simplicity
1-Not relevant	1-Not clear	1-Not simple
2- Item needs some revision	2- Item needs some revision	2- Item needs some revision
3 – Relevant but needs minor revision	3 –clear but needs minor revision	3 – Simple but needs minor revision
4- Very relevant	4- Very clear	4- Very simple

Kindly rate the below statements on the scale of 1 to 4 for its relevance, simplicity and clarity on the basis of the above stated guidelines.

A .Self-medication

Sr. No.	Statements	Relevance {1-4}	Clarity {1-4}	Simplicity {1-4}
1	I tend to take prescription medicines without a prescription (on my own)			
2	I tend to change the dosage of my prescription medicine without consulting my doctor			
3	I tend to use prescription medicines on the advice of a pharmacist			
4	I tend to take medicines using past prescriptions			
5	I tend to use prescription medicines from my old stock at home without consulting my doctor			
6	I tend to take alternative system medicines on my own			
7	I tend to not complete the full course of my prescription medicine			
8	I tend to change the dosing schedule of my prescription medicine without consulting my doctor			

ANNEXURE V

SCALE FOR EXPLORATORY STUDY

Date: / /

PART A

General Questions: Please encircle the correct option/number as provided.

Those who answer “Yes” to Question No. 1 can skip questions 37 to 49.

1.	I do not take any medicine without consulting a doctor	1. Yes 2. No
2.	I read a lot about diseases	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
3.	I discuss a lot about diseases with friends and relatives	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
4.	I read a lot about medicines	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
5.	I have good knowledge about diseases	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

6.	I gather information about medicines from friends and relatives	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
7.	Consulting doctor is time consuming	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
8.	Waiting outside the doctor's clinic is boring	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
9.	Most symptoms are easily recognizable	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
10.	I learn from past use of medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
11.	I learn from the experience of others about medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

12.	I have limited knowledge about diseases	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
13.	I trust my doctor	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
14.	It is convenient to buy medicines directly from the pharmacy	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
15.	The pharmacist is knowledgeable	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
16.	Saving time is important for me	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
17.	It is easy to self-medicate	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

18.	I want quick relief from illnesses	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
19.	I want to feel independent	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
20.	Alternative medicines do not have side effects	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
21.	I don't like crowds	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
22.	I like to prevent occurrence of diseases	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
23.	I cannot afford to miss work	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

24.	The healthcare facility is far away	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
25.	Medicines are costly	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
26.	Doctor's fees are high	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
27.	Doctors do not know much	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
28.	Doctors are not friendly	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
29.	Doctors do not explain	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

30.	Only doctors know about diseases	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
31.	Only doctors know about medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
32.	Healthcare facilities are not affordable	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
33.	I am not insured	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
34.	I want to keep my illness a secret	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
35.	I am scared of taking medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

36.	I think it is risky to self-medicate	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
	PART B: Please think of a recent health problem you had and answer the following:	
37.	The ailment was minor	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
38.	The pain was unbearable	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
39.	The health problem had occurred to me previously	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
40.	It was an emergency situation	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
41.	The symptoms were severe	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

42.	I self –medicate only with OTC medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
43.	I self-medicate both with prescription drug and OTC medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
44.	I self-medicate using past prescriptions at home	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
45.	I use medicines from old stock of prescription medicines at home to self-medicate	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
46.	I self-medicate only with alternative medicines	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
47.	I change the dosage at will.	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

48.	I change the dosing schedule	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree
49.	I consume medicines based on the advice of a pharmacist	1. Strongly disagree 2. Disagree 3. No opinion 4. Agree 5. Strongly agree

PART C: Background Information: Please encircle the correct option/number as provided

Sr. No.	Particulars	Options & Response
1.	Gender	1. Male <input type="checkbox"/> 2. Female <input type="checkbox"/>
2.	What is your Age?	_____ years
3.	What is your monthly family Income?	_____ per month
4.	What is your educational qualification?	1. Post- Graduation 2. Graduation 3. HSSCE 4. Below HSSCE 5. SSC and below
5.	What is your occupation?	1. Professional 2. Service 3. Business 4. Home maker 5. Student 6. Retired

Thank You !

ANNEXURE VI

FINAL DRAFT OF SCALES

DOSMS (DETERMINANTS OF SELF-MEDICATION SCALE) And SMS (SELF-MEDICATION SCALE)

Dear Sir/Madam,

This questionnaire has been designed to understand self-medication practices in consumers and to study the determinants that influence this behaviour.

I would be grateful if you could spare some time to answer the questions in the following pages of this document. All the information provided by you will be kept strictly confidential. The data will be only used for academic purposes.

I request you to kindly put a tick mark (√) in the column provided depending on your response. I request you to answer all the questions.

1. General Questions:

Sr. No.	Items	Never	Rarely	Sometimes	Often	Most of the time
1.	I tend to take prescription medicines without a prescription (on my own)					
2.	I tend to change the dosage of my prescription medicine without consulting my doctor					
3.	I tend to use prescription medicines on the advice of a pharmacist					
4.	I tend to take medicines using past prescriptions					

Sr. No.	Items	Never	Rarely	Sometimes	Often	Most of the time
5.	I tend to use prescription medicines from my old stock at home without consulting my doctor					
6.	I tend to take alternative system medicines on my own					
7.	I tend to not complete the full course of my prescription medicine					
8	I tend to change the dosing schedule of my prescription medicine without consulting my doctor					

1. A

Sr. No.	Items	Never	Rarely	Sometimes	Often	Most of the time
1.	When I fall ill, I tend to gather information about the disease by reading more about it					
2.	When I fall ill, I would want to keep my illness a secret					
3.	When I fall ill , I tend to know more about the disease by discussing about it with my friends and relatives					
4.	For me, it is important to feel independent with my prescription medicine					

Sr. No.	Items	Never	Rarely	Sometimes	Often	Most of the time
5.	When I fall ill, I tend to gather information by discussing about my condition with my doctor or healthcare professional					
6.	I would like to prevent occurrence of diseases in general					
7.	I tend to read about the medicine related to my illness					
8.	When I fall ill, I tend to relate the symptoms to a previous similar occurrence					
9.	I tend to learn from past use of prescription medicines					
10.	I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives					
11.	I tend to learn more about prescription medicines from others experience with them					
12.	I tend to talk to my doctor or healthcare professional about medicine related to my illness					
13.	I tend to approach my friends and relatives for specific information related to their illness and medicine					

1. B

Sr. No.	Items	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	I tend to believe that my pharmacist knows about diseases and medicines					
2.	I think that it can be risky to take prescription medicines on my own					
3.	When I have to get my prescription medicine, I try to avoid crowded chemist shops					
4.	I think my pharmacist counsels me well about my medicine from time to time					
5.	I think self-medication is easy for me					
6.	I think my pharmacist is very knowledgeable about different brands of medicines					
7.	I do not know much about the side effects of my prescription medicines					
8.	I think my pharmacist gives me good advice with respect to my medicine					

1. C. I tend to consult the doctor because:

Sr. No.	Items	Never	Rarely	Sometimes	Often	Most of the time
1.	I think that doctors are generally knowledgeable about diseases and medicines					
2	I think that doctors are patient with their patients					

1. D. I tend to not consult the doctor because:

Sr. No.	Items	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	I think that doctors' fees are high in most cases					
2.	I think that it is time consuming to consult the doctor					
3.	I think that a lot of time is spent waiting for the doctor outside his/her clinic.					
4.	I think that in most cases, doctors do not know much about the disease or medicine					
5.	I think that doctors do not spend time to explain in detail about the medicine or disease.					
6.	I think that buying prescription medicines directly from the pharmacy without consulting a doctor is more convenient for me.					

2: Incidence of Self-medication: Have you self-medicated (taken a medicine on your own without consulting a doctor) in the past three months?

Yes No

Please answer the questions below based on what your response was during that situation. Please answer all the questions.

2. A. Situation Description:

Sr. No.	Items	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	I thought that the symptoms were severe					
2.	I could not bear the pain					
3.	I thought it was almost an emergency					
4.	I could relate to the symptoms based on prior experience					

2. B. Action Taken: Please mark $\sqrt{\}$ in the column provided accordingly.

Sr. No.	Items	Yes	No
1.	I used medicine from my old stock of prescription medicines to self-medicate		
2.	I decided to self-medicate using a past prescription at home		
3.	I took medicine based on the advice of the pharmacist		
4.	I decided to change the dose of my medication		
5.	I chose to take an alternative medicine		
6.	I chose to take a home remedy for the ailment		

3. Demographic Details:

Sr. No.	Particulars	Options & Response
1.	Gender	1.Male <input type="checkbox"/> 2.Female <input type="checkbox"/>
2.	What is your Age?	_____ years
3.	What is your yearly family Income?	1. Above 10 lakhs 2. 5 to 10 lakhs 3. 2 to 5 lakhs 4. less than 2 lakhs
4.	What is your educational qualification?	1. Post- Graduation 2. Graduation 3. HSSCE 4. SSC 5. Below SSC
5.	What is your occupation?	1. Professional 2. Government Service 3. Business 4. Private firm 5. Home maker 6. Student 7. Retired
6.	How much expenses on medicines does your workplace reimburse?	Upto _____per month/year

Thank you for your time and attention!

ANNEXURE VII

FACTOR ANALYSIS

QUANTITATIVE STUDY (FINAL)

Table 6.5b Rotated Component Matrix

Rotated Component Matrix								
	Component							
	1	2	3	4	5	6	7	8
I think that a lot of time is spent waiting for the doctor outside his/her clinic	.818							
I think that doctors do not spend time in detail to explain about the disease or medicine	.779							
I think that doctors fees are high in most cases	.747							
I think that it is time consuming to consult the doctor	.697							
I think that in most cases, doctors do not know much about the medicine or disease	.634							
I tend to believe that my pharmacist knows about diseases and medicines		.809						
I think my pharmacist gives me good advice with respect to my medicine		.793						

I think my pharmacist counsels me well about my medicine from time to time		.783						
I think my pharmacist is very knowledgeable about different brands of medicines		.733						
I tend to learn more about prescription medicines from others experience with them			.687					
When I fall ill, I tend to know more about the disease by discussing about it with my friends and relatives			.673					
I tend to gather more information about the medicine related to my illness by discussing with my friends and relatives			.671					
I tend to approach my friends and relatives for specific information related to their illness and medicine			.668					
When I fall ill, I tend to gather information about the disease by reading more about it				.789				
I tend to read about the medicine related to my illness				.642				
I tend to talk to my doctor or healthcare professional about medicine related to my illness				.524				
I think it can be risky to take prescription medicines on my own					.789			
I think self-medication is easy for me					-.584			

When I fall ill , I tend to gather information by discussing about my condition with my doctor or healthcare professional					.577			
When I fall ill , I tend to relate the symptoms to a previous similar occurrence						.677		
I tend to learn from past use of prescription medicines						.618		
I would like to prevent occurrence of diseases in general						.614		
For me , it is important to feel independent with my prescription medicine							.601	
When I have to get my prescription medicine, I try to avoid crowded shops							.596	
I do not know much about the side effects of prescription medicines								.680
I think that doctors are patient with their patients								-.753