ASSESSMENT OF A PHARMACIST INITIATED HEALTH EDUCATION PROGRAMME IN IMPROVING HYPERTENSION PATIENTS' HEALTH RELATED QUALITY OF LIFE, DISEASE STATE KNOWLEDGE AND MEDICATION ADHERENCE IN QUETTA CITY, PAKISTAN

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by

FAHAD SALEEM

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DEDICATION

This thesis is dedicated to beloved Prophet Mohammad (peace be upon him). As regards all standards by which human greatness may be measured, we can say it for sure; there is no man greater than him.

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As this is the only part of a thesis that perhaps 95% of those who get a copy of it will ever read, I decided to put it at the beginning. First, and foremost, I would like to thank almighty Allah for giving me the strength to complete my PhD studies. I would like to express my deepest gratitude to my supervisor Associate Prof. Dr. Mohamed Azmi Ahmad Hassali. He stood beside me when I missed a family member, was always available as a friend and was exceedingly supportive even in times when I was going off in directions.

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LIST OF ABBREVIATIONS

Terms	Abbreviation
Hypertension	HTN
Healthcare providers	HCPs
Quality of Life	QOL
Health Related Quality of Life	HRQoL
Simple randomization	SR
Non communicable disease	NCD
Non communicable diseases	NCDs
Focus group discussion	FGD
World Health Organization	WHO
Common Sense Model	CSM
Health Belief Model	HBM
The Transtheoretical Model	TTM
Self Regulation Model	SRM
Medication Event Monitoring System	MEMS
The Contextual Model	CM
Interventional group	IG
Control group	CG
Restricted randomization	RR
Randomized Control Trials	RCTs

GLOSSARY OF KEY TERMS

Terms	Definition
Patient education	Patient educations are the planned and organized learning experiences aimed to assist controlled adoption of behaviours, skills, or beliefs advantageous to health.
Health literacy	The extent to which individuals attain, practice, and appreciate basic health information and services needed to make apposite health decision.
Hypertension	Hypertension is defined as a repeatedly elevated blood pressure; a systolic pressure above 140 mmHg with a diastolic pressure above 90 mmHg.
Quality of life	The quality of life is the degree to which the experience of an individual's life satisfies that Individual's wants and needs.
Health Related Quality of Life	A person's perceived quality of life representing satisfaction in those areas of life likely to be affected by current health status.
Adherence	The extent to which a person's behaviour, taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider
Compliance	Compliance is the degree to which a patient correctly follows medical advice
Concordance	Concordance is the process by which a patient and clinician make decisions together about treatment
Self-management	The ability to manage symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition.
Intervention	Intervention is an influencing force or act that occurs in order to modify a given state of affairs. An intervention may be any outside process that has the effect of modifying an individual's behaviour, cognition, or emotional state.

LIST OF APPENDICES

LIST OF PUBLICATIONS

1. Saleem, F., Hassali, M. A., & Shafie, A. A. (2010). Hypertension in Pakistan: time to take some serious action. *British Journal of General Practice, 60*(575), 449-450.
2. Saleem, F., Hassali, M. A., & Shafie, A. A. (2010). Patients' perceptions of hypertension management: a concern for healthcare practitioners. *British Journal of General Practice, 60*(578), 691-692.
3. Saleem, F., Hassali, A. A., Shafie, A. A., & Atif, M. (2011). Education and health-related quality of life: Are interventions always beneficial? *Journal of Pharmacy Practice and Research, 41*(4), 333.
4. Saleem, F., Hassali, A. A., Shafie, A. A., Bashir, S., & Atif, M. (2011). Perceptions of disease state management among Pakistani hypertensive patients: Findings from a focus group discussion. *Tropical Journal of Pharmaceutical Research, 10*(6), 833-840.
5. Saleem, F., Hassali, M. A., Shafie, A. A., Awad, A. G., & Bashir, S. (2011). Association between knowledge and drug adherence in patients with hypertension in Quetta, Pakistan. *Tropical Journal of Pharmaceutical Research, 10*(2), 125-132.
6. Saleem, F., Hassali, M. A., Shafie, A. A., Muhammad, A., & George, A. (2011). Predictors of Medication Adherence in a Hypertensive Population of Pakistan. *Latin American Journal of Pharmacy, 30*(9), 1714-1719.
7. Saleem, F., Hassali, A. A., Shafie, A. A., & Atif, M. (2012). Drug attitude and adherence: a qualitative insight of patients with hypertension. *Journal of Young Pharmacists, 4*(2), 101-107.

8. Saleem, F., Hassali, M. A., & Shafie, A. A. (2012). A cross-sectional assessment of health-related quality of life (HRQoL) among hypertensive patients in Pakistan. *Health Expectations*. doi: 10.1111/j.1369-7625.2012.00765.x
9. Saleem, F., Hassali, M. A., Shafie, A. A., Atif, M., Haq, N., & Aljadhey, H. (2012). Disease related knowledge and quality of life: a descriptive study focusing on hypertensive population in Pakistan. *Southern Med Review, 5*(1), 47-52.
10. Saleem, F., Hassali, M. A., Shafie, A. A., Awad, G. A., Atif, M., Haq, N., . . . Farooqui, M. (2012). Does treatment adherence correlates with health related quality of life? findings from a cross sectional study. *BMC Public Health, 12*(1), 318.
11. Saleem, F., Hassali, M. A., Shafie, A. A., Haq, N. Predcitors and corleates of HRQoL in a hypertensive population of Pakistan. Arcieves of Pharmacy Practice (accepted)
12. Saleem, F., Hassali, M. A., Shafie, A. A., Haq, N. Pharmacist intervention in improving hypertension related knowledge, treatment medication adherence and health-related quality of life: A non clinical randomized controlled trial. Health Expectations (in review).

CONFERENCE PRESENTATIONS

1. Saleem F, Hassali MA, Shafie AA. Adherence to antihypertensive medications: a qualitative study among outpatients visiting public hospitals in the city of Quetta, Pakistan. ISPOR 4th Asia Pacific Conference, September 2010, Phuket, Thailand.
2. Saleem F, Hassali MA, Shafie AA, Bashir S. Association between knowledge and drug adherence in patients with hypertension in Quetta, Pakistan. ISPOR 13th Annual European Congress November, 2010. Prague Congress Centre, Prague, Czech Republic.
3. Saleem F, Hassali MA, Shafie AA, Bashir S. Perception towards disease state management among Pakistani hypertensive patients: Findings from a focus group discussion. Health Services Research and Pharmacy Practice, May 2011, Norwich, UK.
4. Saleem F, Hassali MA, Shafie AA, Bashir S. Health Related Quality of Life in hypertensive patients visiting public hospitals of Quetta, Pakistan. ISPOR 16th Annual International Meeting May 2011, Baltimore, MD, USA.
5. Saleem F, Hassali MA, Shafie AA. Predictors of medication adherence in a hypertensive population of Pakistan. Health System Reform in Asia, 2011, Hong Kong.
6. Saleem F, Hassali MA, Shafie AA, Aljadhey H, Haq N, Atif M. Does medication adherence correlate with Health-Related Quality of Life? Findings from a descriptive analysis. ISPOR 5th Asia Pacific Conference, 2012, Taipei, Taiwan.

7. Saleem F, Hassali MA, Shafie AA, Aljadhey H, Haq N, Atif M. Association between knowledge and Health Related Quality of Life? Is patient education always beneficial? ISPOR 5th Asia Pacific Conference, 2012, Taipei, Taiwan.
8. Saleem F, Hassali MA, Shafie AA, Aljadhey H, Haq N, Atif M. A non-clinical randomized controlled trial assessing impact of pharmacists led intervention programme for enhancing medication adherence and health-related quality of life. Second Global Symposium on Health System Research, 2012, Beijing, China.
9. Saleem F, Hassali M, Shafie A, Haq N, Chua G, Masood I, Aljadhey H, Widodo R, Farooqui M. Improving medication adherence and Health-Related Quality of Life among hypertensive patients in Pakistan. 17th ISPW Conference, 2012, Phuket, Thailand.

PENILAIAN PROGRAM PENDIDIKAN KESIHATAN TERAJUI OLEH AHLI FARMASI DALAM MENAMBAH BAIK KESIHATAN PESAKIT HIPERTENSI BERKAITAN KUALITI HIDUP, PENGETAHUAN TENTANG PENYAKIT DAN KEPATUHAN TERHADAP UBAT- UBATAN DI BANDAR QUETTA, PAKISTAN

ABSTRAK

Peranan ahli farmasi dalam pengurusan penyakit kronik sudah menjadi suatu norma, terutamanya di negara maju. Dalam konteks negara membangun, peranan ahli farmasi dalam pengurusan penyakit kronik seperti hipertensi giat diterokai. Justeru, matlamat penyelidikan ini adalah untuk menilai impak intervensi ahli farmasi dalam pendidikan bagi menambah baik klinikal dan kualiti hidup dalam kalangan pesakit hipertensi di Bandar Quetta, Pakistan.

Suatu pendekatan metodologi bercampur yang menggunakan kedua-dua kaedah kualitatif dan kuantitatif digunakan dalam penyelidikan ini. Bagi penyelidikan kualitatif, 16 orang pesakit hipertensi ditemu bual dan analisis kandungan bertema mengenal pasti lima tema utama. Dalam usaha memperoleh gambaran tentang pengurusan diri hipertensi, suatu perbincangan kumpulan berfokus dijalankan dengan 19 orang pesakit hipertensi. Kajian mendapati bahawa strategi pengurusan diri dipengaruhi oleh sumber sosial, rakan sebaya atau ahli keluarga dengan sedikit maklumat diperoleh daripada profesional penjagaan kesihatan. Latihan pengurusan diri mempunyai kaitan yang kuat dengan perbandingan kebaikan dan keburukan daripada penggunaan ubat-ubatan dalam jangka panjang.

Dalam penyelidikan kuantitatif, suatu analisis pra-intervensi daripada pesakit hipertensi berkaitan pengetahuan, kepatuhan terhadap penggunaan ubat-ubatan dan status semasa daripada Kesihatan berkaitan Kualiti hidup dijalankan dengan menggunakan peralatan dan kaedah yang disahkan. Seramai 385 orang pesakit hipertensi terlibat dalam ketiga-tiga objektif kajian ini. Analisis ini menunjukkan bahawa purata hipertensi berkaitan pengetahuan (skor min 8.03±0.41 daripada 15) dengan kesihatan berkaitan kualiti hidup yang tidak baik (skor min 74±28.44 daripada 100). Kepatuhan terhadap ubat-ubatan juga dilaporkan negatif (skor kumulatif daripada -1.74±2.15, berjulat di antara -10 hingga 10).

Fasa penilaian pra-intervensi diikuti dengan pemilihan pesakit kajian secara rawak dan melaksanakan intervensi pendidikan. Data pasca intervensi diperoleh daripada 120 pesakit daripada kumpulan intervensi dan 144 pesakit daripada kumpulan kawalan. Hipertensi berkaitan pengetahuan, kepatuhan terhadap penggunaan ubat-ubatan dan skor Kesihatan berkaitan Kualiti Hidup adalah signifikan ($p<0.001$) apabila dibandingkan di antara kumpulan intervensi dan kumpulan kawalan pada penamatan intervensi. Terdapat peningkatan dalam skor min pengetahuan (10.26±1.11) dan juga kepatuhan terhadap penggunaan ubat-ubatan (3.24±0.93). Namun demikian, dilaporkan bahawa kumpulan intervensi menunjukkan pengurangan dalam status kesihatan dibandingkan dengan analisis awalan.

Sebagai kesimpulan, intervensi pendidikan oleh ahli farmasi hospital secara signifikannya boleh meningkatkan tahap pengetahuan pesakit tentang hipertensi dan membenkan impak yang positif terhadap pematuhan ubat- ubatan. Justeru, peranan

ahli farmasi dalam mendidik pesakit hendaklah diterima sebagai bahagian penting daripada sistem penjagaan kesihatan.

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ABSTRACT

The role of pharmacists in chronic disease state management is becoming a norm especially in the developed nations. In developing countries context, the role of pharmacists in chronic disease state management such as hypertension is yet to be fully explored. Therefore the aim of this research was to assess the impact of a pharmacist led educational intervention for improving clinical and quality of life outcomes among hypertensive patients in Quetta city, Pakistan.

A mix methodological approach using both qualitative and quantitative methods was used to conduct the research. For the qualitative arm of the research, sixteen hypertensive patients were interviewed and thematic content analysis identified five major themes. In order to gain an insight of self management of hypertension, a focus group discussion was conducted with 19 hypertensive patients. The study found that the self management strategies were influenced by social sources, peers or family members with little information received from healthcare professionals. Exercise of self-management was strongly linked to the comparative advantages and disadvantages of long term medication use.

In the quantitative arm of the research, a pre-interventional analysis of patients' hypertension related knowledge, medication adherence and current status of Health Related Quality of Life was undertaken using validated tools and methods. A total of 385 hypertensive patients were included for exploring all the three objectives. The pre-interventional analysis revealed average hypertension related knowledge (mean score of 8.03±0.41 out of 15) with poor Health Related Quality of Life (mean score of 46.74±28.44 out of 100). The medication adherence was also reported negative (a cumulative score of -1.74±2.15, ranging from -10 to 10).

The pre-interventional assessment phase was followed by randomization of the study patients and implementation of the educational intervention. The post-interventional data were available from 120 patients of interventional group and 144 patients of control group. Hypertension related knowledge, medication adherence, and Health Related Quality of Life scores were significantly associated ($p<0.001$) when compared between interventional and control group at the completion of the intervention. There was an increase in mean knowledge score (10.26±1.11) as well as medication adherence (3.24±0.93). The interventional group however reported a noteworthy reduction in health status compared with the baseline analysis.

In conclusion, the educational intervention by hospital pharmacists led to a significant increase in the patients' levels of knowledge about hypertension and a positive impact on medication adherence. Therefore, the role of pharmacists in patient education must be formalized and acknowledged as an official part of the healthcare system.

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background to research

Since centuries, life on earth has faced its greater adversary; '*communicable diseases*'. Life expectations and standards were deprived due to the uncontrolled and unforeseen epidemics. However, the end of World War II started a new era for human beings. The progression of medical research, development of high end medicines (antibiotics and vaccinations) and incorporation of hygienic measures into treatment regimens uplifted the standards of managing communicable diseases (Omran, 1971). The urbanization of the society resulted in improved social and economical standards, however; resulted in another menace of '*non communicable diseases* (NCDs)'. Diabetes, cardiovascular diseases, cancer, mental illnesses and respiratory disorders started becoming a burden in the developed countries (Khuwaja et al., 2011). By the dawn of the third millennium, NCDs were seen far-reaching the entire world, with an increasing ratio in developing countries. Within this context, NCDs represented 43% of the total disease burden in 2011 worldwide (World Health Organization, 2011). A rise of 60% in the frequency of NCDs with a projected death rate of 73% worldwide was also anticipated by year 2020 (World Health Organization, 2011).

In addition to the mortality crisis, NCDs also have severe economic consequences. Patients spend their capital for medical care, governments spend it for public care and agencies spend it for the indemnity care. Findings from The World Bank revealed that China, India, and Britain will lose $558 billion, $237 billion, and $33 billion, respectively, in national income as a result of largely preventable NCDs in the next 10 years (The World Bank, 2011). In addition, NCDs often ends either as

permanent disabilities or mortality, resulting in the loss of skilled and trained human resource which is another important economical loss.

Within this context, NCDs are again reported as a major healthcare burden in Pakistan. Forty six percent of all deaths were accounted to NCDs in 2008 (World Health Organization, 2011). Cardiovascular diseases and mental illnesses were counted as major while respiratory diseases, cancers, and diabetes were reported as minor NCDs affecting population of Pakistan (The World Bank, 2011). Similar to what is reported around the world, hypertension (HTN) in Pakistan holds its prominent place among NCDs (Pakistan Medical Research Council, 1998). The treatment and management of HTN still poses severe challenges for the healthcare providers (HCPs) as HTN control around the world and as well as Pakistan is still far from optimal (Chobanian et al., 2003; Mohan & Campbell, 2009; Pakistan Medical Research Council, 1998; Shaikh, 2005; Svetkey et al., 2004).

Effective treatment and management of HTN requires amalgamation of both pharmacological and non-pharmacological therapy (Katzung, Masters, & Trevor, 2009; Taranikanti, Alriyami, & Banerjee, 2011). Whereas patients have no control over treatment regimen prescribed by the HCPs, they can manage the progression of HTN through lifestyle modifications (Svetkey et al., 2004; Whelton et al., 2002). In order to be indulged into self-management of HTN, patients need rational information and up-to-date education for effective self-management (Dubbert, 1995). The information sources that hypertensive patients can consult for lifestyle modifications are diverse (HCPs, healthcare centres, electronic, print or social media, friends and family members and peers). Among all, healthcare centres and HCPs are

the only reliable and unbiased source of information (Shiri, 2007). Unfortunately in developing countries, these two sources are not readily available to the general population. In addition, there is a shortage of healthcare centres and HCPs in most of the developing countries. This produces an additional burden on the existing healthcare resources. The available HCPs are therefore unable to give sufficient time to the address health care needs and patient education (World Health Organization, 1998a).

To overcome such issues, a number of patient education programs are advised both at the clinical and community level. Patient education programs are effective in increasing patients' knowledge about their illnesses, modifying their beliefs towards medication use, alter the medication taking behaviour and thus improve health related outcomes. These programs can be built upon discussions, distribution of written information, e-learning, and oral presentations addressing patients as individuals, in groups or the community as a whole.

1.2 Justification of the study

In literature, a number of interventional strategies targeting patient education for the management of HTN are presented and reported. However, such exercises are developed and implemented in developed countries (Côté, Moisan, Chabot, & Grégoire, 2005; Gusmão, Mion Jr, & Pierin, 2009; Haynes, Ackloo, Sahota, McDonald, & Yao, 2008; Kripalani, Yao, & Haynes, 2007). Difference of socio-economical status, lifestyle, habits, and cultural norms makes it nearly impossible to apply the reported measures in a developing country like Pakistan. Therefore, a

number of culturally-appropriate approaches were needed in Pakistan to educate patients about treatment and management of HTN.

This study reports the outcomes of an educational interventional program offered to hypertensive patients through hospital pharmacists. For this interventional study, the role of pharmacist as an educator is defined, executed, evaluated and prioritized to meet the specific needs of the hypertensive patients. However, the role was defined with an intention that the intervention could be generically applied to other healthcare units. The basic philosophy was to elaborate advantages of integrating a pharmacist into a healthcare team and to serve as a stepping stone toward other clinically related investigations.

1.3 Overview of thesis

Chapter 2, the literature review, starts with definitions of patient education followed by an in-depth discussion about the theoretical models of patient education. The chapter continues with an overview of the medication adherence and its importance in patient reported outcomes. Further discussion in this chapter involves the aetiology, treatment, management of HTN. The literature review finishes with the discussion of Health Related Quality of Life (HRQoL), its conception and current status among hypertensive patients. A thorough review of literature relevant to the study, looking at patient education, medication adherence and HRQoL among hypertensive patients in Pakistan and elsewhere in the world forms the bulk of this chapter.

Chapters 3, 4, and 5 are consolidated as qualitative phase. Chapter 3 comprises a thorough discussion of the methodology used for the qualitative studies undertaken. Chapter 4 presents the findings from interviews conducted with hypertensive patients about their perceptions of medication use and treatment adherence in HTN. Chapter 5 presents the findings from the focus group discussion (FGD) with hypertensive patients on the issues related to self-management of HTN.

Chapters 6, 7 and 8 are consolidated as quantitative phase. This phase describes the pre- and post- interventional assessment of HTN related knowledge, medication adherence and HRQoL. Chapter 6 starts with a systematic discussion of the methodology used for conducting the study. The tools used for data collection, development of the interventional package, training of the pharmacists, randomization of the patients and implementation of the intervention are thoroughly discussed. Chapter 7 describes the pre-interventional findings i.e. the current level of HTN related knowledge, medication adherence and HRQoL. In chapter 8, the impact of the intervention is evaluated as post-interventional assessment. Chapter 9 draws the thesis to a conclusion with an overall summary and a set of recommendations for further research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The role of pharmacist in the healthcare system from product orientation to patient care had developed over the past two decades (Pronk et al., 2002; Tipnis, 2012; Whaley, 1999). Within this context, pharmacist role in primary care is becoming more eminent in developed world (Starfield, 1991). Ideally, primary care is a coordinated matrix system provided by a mix of healthcare professionals and offers a holistic approach towards prevention, treatment, management and prevention of illness. In addition, primary care also addresses other determinants (social and economical influences) of health (Care, 2003).

Over the last decade, many publications have been published to support the role of a pharmacist as medication counsellor and educator in primary health care systems (Gandhi et al., 2003; Gilbody, Whitty, Grimshaw, & Thomas, 2003; Schnipper et al., 2006). A number of trials had reported a positive and economical effect from hospital pharmacy services on patient reported outcomes, particularly in the areas of chronic disease management (Benavides, Rodriguez, & Maniscalco-Feichtl, 2009; Chisholm-Burns et al., 2010; Finley, Crismon, & Rush, 2003; Salgado, Moles, Benrimoj, & Fernandez-Llimos, 2012). Furthermore, addition of pharmacy services in education related to quality use of medication at the primary care level resulted in better patient safety, improved disease and drug therapy management, as well as improved adherence and quality of life (QOL) (Hammond et al., 2003; Kaboli, Hoth, McClimon, & Schnipper, 2006).

2.2 Patient education

According to the charter of World Health Organization (WHO), "*patients have the right to be given factual, supportable, understandable and appropriate information, to be provided in such a way as to allow them to decide whether they wish to receive therapy*" (World Health Organization, 1994). Under this charter, HCPs are responsible to educate their patients in order to enable them to understand their conditions and the role of the prescribed therapy (Kessler, 1991; Kim, Ram, Klaukka, Alanko, & Kessler, 1992). Patient education is a basic component of healthcare and is being applied in clinical as well as non clinical settings (Falvo, 2004; Hamad, 2009; Lorig, 2000).

Patient education is defined as "*planned and organized learning experiences aimed to assist controlled adoption of behaviours, skills, or beliefs advantageous to health*" (Ryan, 2007). It is an important constituent of the healthcare system and is categorized into two components (Lorig, 2000):

i. Clinical patient education (teaching and learning provided to patients in clinical settings).

ii. Health education (wellness, prevention, and health promotion provided to individuals, groups, and communities)

The objectives of patient education encircle patient's assessment, appraisal, diagnosis, prognosis and requirements related to a specific intervention (Lenz, Steckelberg, & Muhlhauser, 2008). On the other hand, health education contemplates on wellness, prevention, and health support for the individual or the community.

Whatever the nature of patient education is, the motive encompasses changing and improving societal health behaviours. Patient education results in improving health literacy which is a considerable societal issue. Improved health literacy is crucial at every level of illness management but is highly significant for persons living with chronic diseases because of more recurrent and complex interactions at all levels of healthcare system (U.S. Department of Health and Human Services, 2000).

Health literacy is defined as *"the extent to which individuals attain, practice, and appreciate basic health information and services needed to make apposite health decisions"* (U.S. Department of Health and Human Services, 2000). The WHO defines health literacy as "*the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and manage good health*" (World Health Organization, 1998b).

Health literacy is crucial in the present era, as patients are actively involved in healthcare decisions and are eager to know 'more' about their conditions (McQueen, 2001). Today, the illness-based approach is replaced with risk-based strategies thus enabling patients as associates of concern along with their HCPs (Dreeben-Irimia, 2010). However, the extent to which these risk taking activities are abridged depends upon patient's own understanding of risk and change. Within this context, several health behaviour models and theories have been proposed to understand an individual's health-related behaviour. Therefore, patients' belief and perception towards illness are important to consider before developing and implementing an educational package both at the institutional as well as community level.

2.2.1 Health Belief Model

Perhaps, the best known model in public health is the Health Belief Model (HBM). Introduced in early 1970s, HBM helps in understanding human behaviour towards health services (Becker, 1974). The model's four key components are conceptualized as perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. ‘Cues to action’ is another construct of HBM which helps in the understanding of actions that trigger human behaviour (Weinstein, Rothman, & Sutton, 1998). The model assumes that an individuals’ health behaviour depends upon the belief about the impact of the illness and its consequences, provided that the individual has a distinct course of action by which to proceed. It is important to understand how vulnerable a person considers him- or herself in getting a disease, how serious the disease symptoms are for an individual, and how beneficial the suggested course of action is considered to be. A lack of emphasis on these factors may result in a poor response towards patient educational programs and hence can shape up as a complete failure. According to the HBM, an individual will always indulge into a cost benefit analysis and based on the analysis, he/she will select the most suitable option available (Becker, 1974). Demographic, cultural, psychological, and personality have a strong influence on an individual while coming up to a decision. For example, even though the benefits of regular exercise in HTN and cardiovascular diseases are universally accepted (Buttar, Li, & Ravi, 2005), many barriers prevent individuals from exercising (no time, expensive, non-appropriate settings). In addition to the extrinsic barriers outlined earlier, there are intrinsic barriers to exercise (difficulties, pain, limited interest etc) which are responsible for a specific behaviour towards exercise (Buttar et al., 2005). Likewise, among patients who perceive their treatment as ‘vulnerable to complications’ can decide not they

take their medication which decreases their adherence to therapy and overall HRQoL (Vermeire, Hearnshaw, Van Royen, & Denekens, 2002). Therefore, it is vital to highlight illness perception of the population before designing and implementation of the educational program. Within this context, the use of qualitative research can provide in-depth knowledge concerning perceptions, beliefs and values of an individual or groups and have proved to be valuable (Curry, Nembhard, & Bradley, 2009; Kotzeva et al., 2010). In addition, qualitative methods extract out the reasons that why individual or groups hold the particular views and ideas. Consequently, conducting a qualitative inquiry before designing and implementation of educational interventions can provide rich information on the patient's needs for designing of such interventions.

2.2.2 The Theory of Planned Behaviour

Icek Ajzen in 1991 presented the possibility of a relation between an individual's attitudes and behaviour (Ajzen, 1991). The theory is widely used to demonstrate the correlation among beliefs, attitudes, behavioural intentions and behaviours in social and health sciences. The theory also highlights that societal approaches and norms are the influencing factors that forces individual to opt an action which in turn is reflected in shape of behaviour (Ajzen, 1991). For example, Faber and Kruger highlighted a common belief that when a married woman in Africa starts losing weight, the intention is to attract the attention of other men besides her husband (Faber & Kruger, 2005). In addition, Puoane et al reported that weight gain among females is a reflection of husband's excellent care for his wife and family (Puoane et al., 2012). Therefore, as maintaining weight is a societal norm, weight loss is

considered a bad practice even in the presence of HTN, diabetes, obesity and other cardiovascular disorders.

Within this context, Peters and colleagues employed the theory of planned behaviour as a guide to explore perceptions and beliefs of African Americans towards prevention of HTN (Peters, Aroian, & Flack, 2006). The authors mentioned that healthcare professionals should be cognizant of the influence of societal and cultural factors on individual behaviour. Elaboration and influences of societal and cultural norms should be expanded to family and community members before designing patient's educational plans in order to improve HTN control. The interventions should particularly target the cultural and societal norms so that such interventions can improve preventive behaviours and decrease the disparity in HTN control and outcomes (Peters, Aroian, & Flack, 2006).

Nevertheless, it is not a simple task to alter societal and cultural beliefs as long as the community is not well informed about the health risks and hazards. In addition, individuals interested opting a particular behaviour can find it difficult because of the societal pressure and cultural hindrance. One possible method to overcome the societal and cultural pressure is by bringing along the involvement of influential community members, religious leaders or social workers that can disseminate the message which is the core objective of the educational campaign.

2.2.3 The Common Sense Model of Illness Representation

The common sense model (CSM) highlights individual himself/herself as a problem solver. The CSM is centred on the perceived reality of the health hazard and

emotional reactions to this threat (Cameron & Leventhal, 2012; Diefenbach & Leventhal, 1996). According to CSM, a stimulus evoking illness illustrations can be either internal or external. In both cases, the toning process circulates around five discrete characteristic of illness: identity, timeline, cause, controllability, and consequences. The identity reflects general know how of the disease/condition and associated signs and symptoms. The timeline connects the disease/condition to a predictable timeframe. These two fundamental traits than defines the expected cause of the disease/condition. The professed controllability of the stimulus than defines the *common sense* meaning followed by a set of imagined consequences or predictable ramifications of the disease/condition which is the actual reason for the specific behaviour (Cameron, Leventhal, & Leventhal, 1993; Hagger & Orbell, 2003; McAndrew et al., 2008).

A classical example of CSM is provided by Meyer and colleagues by interviewing 230 hypertensive patients (Meyer, Leventhal, & Gutmann, 1985). The respondents were sufficiently aware of the sign and symptoms of HTN and suggested a developmental progression in the condition over time. This is against to the general ideology of HTN where in major cases, HTN is considered as an asymptomatic condition. Majority of the patients were familiar with the chronic model of HTN and reported “lifetime treatment” for their condition. Seventy five to 80% of the patients had ideas about the cause of their condition. Majority of the patients perceived their condition as controllable and were in favour of continuing treatment. Therefore, the authors concluded that when an individual develops intrinsic beliefs about disease threats; these threats are responsible to guide to a specific behaviour representing HTN as chronic yet controllable condition (Meyer et al., 1985).

2.2.4 Structure of patient education

Patient education package depends on patients' perceptions of their illness, understanding of the cause, prognosis, medication (treatment and management) and lifestyle elements (Koo, Krass, & Aslani, 2003; Wade, Weir, Cameron, & Tett, 2003). For instance, it is now known that patients who are less aware of chronic diseases like diabetes and HTN can develop complications as compared to those with better understanding of (El-Shazly, Zeid, & Osman, 2000; Zafar, Gowani, Irani, & Ishaq, 2008). In another study among hypertensive patients, patients who were less knowledgeable about their condition were found non adherent to the therapies and vulnerable to the impediments (Patel & Taylor, 2002). Therefore, information provided to the patients/persons on medical therapies must contain the name, intention, directions, storage instructions, possible side effects, adverse effects that necessitate medical consideration, duration of treatment and contraindications (Dyck, Deschamps, & Taylor, 2005; Hermann, Herxheimer, & Lionel, 1978). Lack of sufficient information in these areas can lead to inappropriate use of medications resulting in the development of further complications (Oparil & Calhoun, 1998). However, such incidences are avoidable through a comprehensive and detailed patient educational programme (Hornung, Kieserg, Feldmann, & Buchkremer, 1996; Saounatsou et al., 2002; Zwaenepoel et al., 2005). In addition to medication related information, education on lifestyles modifications also helps the patients/persons to avert their conditions from aggravation. For example, hypertensive patients are often encouraged to quit tobacco use, unhealthy diets, excessive alcohol and adopt some kind of physical activity (Botelho, 2004; Duangtep, Narksawat, Chongsuwat, & Rojanavipart, 2010; Woolf, Jonas, & Kaplan-Liss, 2007).

There are varieties of methods of providing patient education programmes. Patients can be involved by the use of oral presentations or discussions as an individual, groups or the community as a whole (Fitzmaurice & Adams, 2000; Hacihasanoğlu & Gözüm, 2011; Mazzuca et al., 1986). Such educational measures are also improved with written information which enables patients/persons to maximum information (Buck, 1998; Vander Stichele, Van Haecht, Braem, & Bogaert, 1991). Audiovisuals and online methods are also used to educate patients (Kripalani et al., 2007; Misono et al., 2010).

An important yet neglected aspect of patient education is its continuous nature. Healthcare providers should provide incessant teaching to the patients as the later is not a once-off procedure. This strengthens the guidance patients received during their previous visits. Another important feature of providing patient education is the timing of information provision. For example, an anxious patient on the first visit can never comprehend to the instructions and information provided by the HCPs (Goold & Lipkin, 1999). The repetition of information during the following visits can help in recalling the missed information and can help the patients in better understanding, management and control of their condition (Shiri, 2007).

2.2.5 Patient education and the role of HCPs

Patient education is a basic right of the patients and healthcare members are bound to provide such information. Healthcare providers should provide pertinent yet enough information to the patients thus avoiding the development of confusion. Failure in providing ample edification will result in obtaining information from other sources, such as mass media, friends and peers, family members and internet. However, the

authenticity of such information is always questionable. Therefore, to avoid such calamities, healthcare professionals must educate their patients so they can receive appropriate information (Kreitzer, Kligler, & Meeker, 2009).

Within this context, pharmacists are best suitable for the role of educating patients. Being custodian of medicines, a pharmacist is the last healthcare professional which will be seen by patients before heading home (Awofisayo, Awofisayo, Iferi, & Akpan, 2008). Therefore, it is vital that pharmacists should be well prepared and trained in providing education to the patients. Other than described, following competencies are expected from pharmacists in providing patient education (Burke et al., 2008):

i. Converse caringly with patients.
ii. Identify the needs of patients.
iii. Consider the patients' emotional state, their understanding and account of the disease and its treatment.
iv. Help patients to learn and understand their diseases.
v. Educate patients in managing their treatment within available health, social and economic resources.
vi. Help patients to handle their way of life.
vii. Educate and advise patients on the management of catastrophe and of issues that hamper with the normal management of their condition.
viii. Select patient education tools and procedures.
ix. Periodically assess and advance the educational performance of health care providers by means of continuous medical educational campaigns.

2.2.6 The role of patient education in HTN

The lifelong nature of HTN places a number of challenges for the HCPs. Difficulty in designing a superlative treatment regimen for the patient, minimization of side effects, and non adherence to medication are the most frequent problems faced during the course of treatment (World Health Organization, 2009). Furthermore, the biggest confrontation faced by the HCPs is to motivate patients to espouse lifestyle modifications and to continue with it (Appel et al., 2003; Elmer et al., 2006). Therefore, patient education is an important tool to empower hypertensive patients to make decisions about their condition. This helps the patients to draw value for treatment adherence as well as supportive therapies.

Within this context, patient education also helps to alter perceptions and beliefs of the patients. Patient education is responsible in an increase in patient's understanding of their condition. This in result builds a more productive and positive attitude towards HTN, prescribed therapy and management (Viswanathan, Anderson, & Thomas III, 2005). When patients' beliefs and perceptions are altered, the implemented interventions results in adequate health outcomes. However, establishing patients' beliefs and perceptions is not an easy task, as some are hesitant to express their views and opinions. In such cases, family members, peers or friends should be involved in the educational program so they can influence the patients reluctant to change and adopt new behaviour and lifestyle modifications.

2.2.7 Barriers to patient education

Certain barriers are faced by the HCPs that can make the flow of education difficult for the patient or the community. Factors such as lack of resources, competency,

financial constrains and workforce is the most commonly faced barriers in providing patient education (Ling, Brereton, Conklin, Newbould, & Roland, 2012; Penz et al., 2007). In addition, healthcare members sometimes are not willing to educate the patients. For instance, pharmacist can have reservations in informing their patients about potential side effects, which in turn can decrease the adherence to the regimen (Kessler, 1991). Often at times, patient education is provided by healthcare members that lack proper training, with little experience, poor communication skills or deprived knowledge which again act as a barrier in providing education to the patient (Dickson, Hargie, & Morrow, 1996). Another obstacle which is commonly observed is the lack of coordination and collaborative care among healthcare members (Baggs & Schmitt, 2007). Furthermore, HCPs from different institutes can have different views which can hinder the benefits of patient education (Deccache & Aujoulat, 2001). Another important barrier to patient education is the language differences between HCPs and patients (Flores, 2006). All of the mentioned barriers can have deleterious effects on overall therapy and results in decreased patient satisfaction. Therefore, it is vital to overcome all such barriers before implementing an educational plan for the patients.

2.3 Adherence

The term adherence is defined as " *the extent to which a person's behaviour, taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider*" (World Health Organization, 2009).

In general, the word '*adherence*' depicts that healthcare providers and patients are in agreement when it comes to disease related decisions (Osterberg & Blaschke, 2005). The terms compliance and concordance are also used as a synonym with adherence. However, adherence is an active approach and suggests positive association as compared to compliance which portrays patients as passive recipients of instructions (Friberg & Scherman, 2005). Concordance on the other hand, involves equal partnership between healthcare providers and patients in building medication-taking behaviour (World Health Organization, 2009). Nevertheless, patients do not always participate actively during consultations and leave everything on the HCPs. In both cases, the word compliance and concordance are less impressive and adherence is more suitable because of the patient's correspondence which makes an active participation of all players of the healthcare system (Osterberg & Blaschke, 2005).

2.3.1 Theoretical explanations for medication adherence

In literature, certain models have been proposed that attempt to explain adherence among patients and are discussed subsequently:

2.3.1(a) Health Belief Model and its connectivity with treatment adherence

According to HBM, patient's adherence to the treatment plan is based upon their inclination in such a manner that results in the improvement of their conditions (Maiman & Becker, 1974). Nevertheless, this action is highly related to the beliefs and perceptions regarding the condition which patients carry. Therefore, perception and beliefs have a greater inventive influence as compared to the reality which in actual constructs the explanation of a particular behaviour (Hurley, 1990).

Cerkoney and Hart stated that behavioural change is a three stepped process (Cerkoney & Hart, 1980). The first step is readiness for change which is followed by a comparison of pros and cons. This comparison is only made when an individual is equipped with enough information to understand that why a behavioural change is needed. Finally, cues (either internal or external) are developed which results into a particular behaviour change. Within this context, hypertensive patients visiting HCPs will always compare the recommendations against their perceived outcomes which in return can affect medication adherence. This readiness of change depends upon the level of motivation (internal and external) but necessitates a noteworthy support from the surroundings. Hence to initiate a positive shift in adherence among hypertensive patients, it is vital to address patients' perceptions about their illness and treatment regimens. Only then, a positive shift in treatment adherence will be observed which can improve patients' HRQoL and improvement in treatment and management of HTN.

The HBM is further extended by Rosenstock who connected treatment adherence to six different attributes. The first trait is motivation (i.e. individuals are aware of their condition and are interested in improving their health and health related behaviours). The second characteristic is perceived vulnerability to a disease or illness. Third, the individual should have information about the nature (severity) of their condition. This is followed by involvement in an intervention based upon its perceived benefits. The fifth attribute is the individual's perceived barriers to taking action. Lastly, the individual must have knowledge of the condition and the treatment prescribed to him.

After a review of the current literature, HBM is predominantly applicable to adherence issues in individuals with HTN (Garfield & Caro, 1999; Ross, Walker, & MacLeod, 2004). The authors declare that not only HCPs have to provide direct treatment interventions, but they should also address patients' concerns, beliefs and potential barriers to adherence regarding their medication regimens.

2.3.1(b) Transtheoretical model and its connectivity with treatment adherence

The best connection among adherence and human beliefs and perceptions is provided by the transtheoretical model (TTM). The TTM evaluates an individual's willingness to act on a new healthier behaviour, and provides strategies, to guide the individual through the stages of change (Prochaska et al., 1994).

The TTM is basically an integration of other health related models. It was reported that TTM was highly efficient in promoting health behaviours when coupled with other models (Prochaska et al., 1994). This model attempts to conserve ideologies that are effective in behaviour change by encouraging treatment programs to be inventive and modified. This is achieved by concentrating upon patient's individual needs. One aspect of TTM revolves around processes of change, which are behaviours performed by individuals to change their thinking and behaviour. In quintessence, TTM suggests that tailoring to individual needs will be achieved by matching the individual's process of change. The process includes stage of pre-contemplation, where the patient is not thinking about behaviour change. This is followed by contemplation where the patient begins to think about behaviour change. The next stage is preparation where patient prepares to make the behaviour change.

Lastly, in order to continue the modifications, patients enter into the maintenance phase (Prochaska & Norcross, 2009).

With this context, Chang and colleagues discussed the behavioural change for blood pressure control among hypertensive patients in Taiwan (Chang, McAlister, Taylor, & Chan, 2003). The authors reported that rural population faced more difficulties than the urban population in avoiding smoking and engaging in physical activity. One possible reason proposed is the probability of process of change being used by the rural population was significantly lower than the urban population. Furthermore, after HTN diagnosis, individuals in the urban area shifted from the pre-contemplation stage to the maintenance stage for HTN control. Similar to what is reported earlier, Johnson et al reported about the capability of a theoretically driven, TTM-based computerized system to improve adherence in hypertensive patients (Johnson et al., 2006). The authors reported that cost-effective, evidence-based interventions should be offered to all patients at all level of readiness for change.

2.3.1(c) Self regulation Model and its connectivity with treatment adherence

The self regulation model (SRM) in relation to social learning theory defines the position and means of an individual's behaviour when presented with health advice (Haynes et al., 1982). The SRM consists of the following components:

i. Extraction of information from the environment.
ii. Creating a depiction of the illness danger to oneself.
iii. Planning and acting to handle the problem and to take selective measures.
iv. Observing and monitoring the reaction of the problem

The SRM assures understanding and modifying adherence among patients (Haynes et al., 1982). According to the postulations of the SRM, sign and symptoms are an important variable for development of illness representations and action behaviours. When a disease is present, patients normally will try to search for cause of illness and correspond accordingly (Leventhal, Brissette, & Leventhal, 2003). From a biomedical viewpoint, HTN being asymptomatic requires long term adherence to treatment to avoid cardiovascular events. However, it was reported that because hypertensive patients do not report symptoms, such experiences negatively affects treatment adherence (Kjellgren, Svensson, Ahlner, & Säljö, 1998; Kyngäs & Lahdenperä, 2001). Moreover, some patients are in position of describing their symptoms based upon the level of increased degree of blood pressure and can change their medication taking behaviour (Chen, Tsai, & Lee, 2009).

Symptoms and core ascriptions play an important role in psychopathological processes, adaptation of health behaviours such as adherence and can effect illness representation. Chen and colleagues reported that hypertensive patients are more likely to be motivated to adhere to prescribed medications if they believe that treatment may bring beneficial effects to their situation (Chen et al., 2009). In addition, perception of a patients' aptitude to manage illness representation is also a key determinant of adherence to health recommendations (French, Cooper, & Weinman, 2006). In the light of above findings, SRM provides a constructive framework for understanding and explaining adherence to therapeutic regimens of patients with HTN.