

A Critical Review; The Quest of Clinical Pharmacist in Pakistan Government Hospital, References USA and China Hospital Setting, to Salvage the Public Health Problems like Diabetes

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ABSTRACT

Objective: The objective of this review mainly is to discuss about health care delivery system of Pakistan in comparison to PR China and USA together with their policies followed by the important role of Clinical pharmacist to provide good health care services that may decrease diabetes prevalence and some recommendations to improve healthcare structure. **Methods:** A literature search in Pub Med, Cochrane, Embase, Google scholar and Official government websites were performed. **Conclusion:** Access to good health care system can exerts positive effect on economic and social progression in any country including Pakistan. The public health status need to be addressed through various set of policy tools constituting short and long term measures to secure improved health outcomes. So far about 387 million diabetes cases have been reported worldwide, 37 million diabetic patients are from the IDF MENA Region, where Pakistan is a member. In 2014 records, Pakistan has 6.9 million cases of diabetes. The team work of Clinical pharmacists and physicians in the hospital under the same purpose to ameliorate and follow the treatment of patient can reduced the public health crisis in Pakistan. The Government of Pakistan needs to introduce clinical pharmacist in government hospitals in order to improve and provide better health status to its citizenry. **Recommendation:** Government needs to introduce clinical pharmacist in government hospital and effectively deploying human resource to grow the career of pharmacy professionals. Proper implementation of National

health policy and appropriate utilization of Government funds to be provided universally to keep proper functioning of good health care. Government should introduce Clinical pharmacist in the public health sector and board in making decision about alarming diseases including diabetes.

Key words: Healthcare setup, impact of clinical pharmacist, health policies, pharmacy education

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BACKGROUND

Pakistan was innate with the health care system setup by the colonial masters since 1947. The health care function from the policies made from Federal and Provincial Governments, primarily responsible for preventing disease and provision of therapeutic services to its citizens. In the constitution, provincial government plays major part; responsible for the provision of healthcare services and the implementation of national policies. Federal government is liable for planning and enacting the national policies, research, training, and looking at foreign assistance.^[1] In Pakistan, the health care services entailed the team of physicians, nurses and medical laboratory technicians in hospital. In USA and China the effective health care service involved Clinical pharmacist in the team. The reason behind is that Clinical pharmacist has versatile knowledge about medication uses; curative and side effect.

Clinical pharmacy is in growing stage in developing countries, especially in densely populated country like Pakistan wherein there is limited number of hospitals that have clinical pharmacist in decision making to patient. Diseases are increasing gradually putting the population at risk. In current situation in countries with good health care, clinical pharmacy plays contributing role in the improvements towards the patient health. Professional authorities and organizations in developing countries should work together in resolving the issues that hinder the standardization of clinical pharmacy practice in hospital.^[2]

In Pakistan, policy maker has been set an informal approach, and health system is overwhelmed with various troubles. Pakistan with its fragile political setup so far has not been capable to come up with a strong health care reform.^[3] It's our conviction that a better health care service will improve the standard of wellbeing of Pakistani, help to improve the growing capacity of labor force, economic stability, and poverty eradication, as well as lengthen the lives of people irrespective of sex and region.

Public health organizations have counted diabetes as one major burden

affecting the lives of many people including the citizens of Pakistan, by 2030 WHO projected diabetes to be the 7th leading cause of death.^[4] Available data revealed that Diabetes Mellitus (DM) is of two types 1 and 2. The type 2 is the leading cause of morbidity and mortality rate,^[5] responsible for about 1.5 million deaths in 2012, of which 80% is from low and middle income countries.^[6] In adults, type 2 diabetes accounts for about 90 to 95 percent of all diagnosed cases of diabetes; the remainder are adult-onset (or adult-diagnosed) type 1 diabetes, a form of diabetes for which the cause is unknown.^[7,8] Generally DM has been related to old peoples, body weight and physical inactivity. But DM-2 is known to be noninsulin dependent, mostly observed in elderly age, and the body in ability to utilize insulin as a result of obesity. Due to sign and similarity with Type I, DM Type II is not easily diagnosed until complications have observed with symptoms. Recently few cases were reported in children.^[9] Genetics and environmental factors are linked to DM. Either of the parents have Type II DM; the inheritance risk is 15% and 75% inheritance risk if both parents have Type 2 DM.^[10]

METHOD OF DATA COLLECTION

A literature search in Pub Med, Cochrane, Embase, Google scholar and Official government websites were performed. The reviewers screened titles, abstracts and do full-text screening of eligible studies. The references from these studies were further screened for additional relevant studies.

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DISCUSSION

Impact of diabetes; morbidity and mortality in Pakistan relative to USA and China

Reports by International Diabetes Federations (IDF) in 2013 indicated that more than 387 million people are living with DM globally, and 90% of these people suffer from Type II DM as estimated by World Health Organization. In 2004, 3.4 million estimated deaths were due to high blood sugar, with more than 8 deaths out of every 10 diabetes related cases in underdeveloped country; low-middle income countries. More than half of the diabetes cases were undiagnosed unfortunately in developing nations. By 2030 WHO postulates that deaths attributed by diabetes would be doubled with the highest in age group 40-59 and 60-79.^[7,8]

In Asian region, diabetes and impaired glucose tolerance (IGT) estimates are high and expected to increase by next 2 decades. This trend indicates that Asia has more than 60% of diabetic population and the huge cases are almost 50% not yet diagnosed. Thus the global diabetes prevalence is higher than claimed.^[9] With the westernized and sudden lifestyle in China, 2010 China National Diabetes and Metabolic Disorder Study Group reported two groups of people with diabetes cases; 49.3 million in urban areas with higher prevalence of diabetes (11.4%) and 43.1 million in rural residence with 8.2% prevalence. It was carry out by the same study that 148.2 million more Chinese are pre-diabetic thus have the higher chance of developing diabetes if they continue with the sedentary lifestyle. Due to improper data from rural public health records, the projected diabetes case in China by 2030 is 500 million, which characterize that diabetes would be a major public health problem in terms of health care delivery in China.^[8,10,11]

In IDF MENA region where Pakistan is, 37 million diabetic patients have been recorded. It is expected that by 2035 diabetic population would rise to 68 million. Records have shown that in 2014 Pakistan has 6.9 million cases of diabetes [Table 1].^[12]

In USA, diabetes remains the 7th leading cause of death in 2010, total of 234,051 death certificates listing diabetes as an underlying or contributing cause of death. About 29.1 million diabetic patients have been discovered, 21.0 million were diagnosed, and 8.1 million were undiagnosed. The percentage of Americans age 65 and older remains high, at 25.9%, or 11.8 million seniors (diagnosed and undiagnosed). The incidence of diabetes in 2012 was 1.7 million new diagnoses per year; in 2010 it was 1.9 million. In 2012, 86 million Americans age 20 and older had pre-diabetes; this is up from 79 million in 2010.^[13]

What is the impact of a clinical pharmacist in providing health care services?

Clinical pharmacists are professionals that provide guidance about the appropriate use of drug compounds for therapeutic benefit,^[13] are knowledgeable about the drug ingredients, dosage for safety and toxicity. Perhaps the patient can be allergic to a drug, the clinical pharmacist know how to do its prevention. They are highly trained and possess clinical competencies to practice in health unit and give advice to physician and patient as well as can work in direct patient care environments.^[14,15]

In most hospital setting clinical pharmacists and physicians work together to ameliorate and follow the treatment of patient. They provide patient history of allergy, guidance to the use of OTC drugs, dietary supplements and alternative systems of medicine. Clinical pharmacists perform review of drug therapy, utilize relevant clinical and laboratory data to find and solve drug related problems such as duplication of therapy, drug-drug and drug-food interactions, contraindications, inappropriate dosage [frequency, strength], lack of basic lab monitoring requirements, potential ADRs, inappropriate drug selection, so medical compound without pre-formation.^[16] Also, they can determine the cost effectiveness of medication.^[16] In some pharmacy setting like community pharmacy wherein only clinical pharmacy is available patient with critical health related problems are advice by the pharmacist to see physician, and the pharmacist will provide information to address specific health problem to achieve wellness.^[17]

For so long and up till now, in many Pakistan government hospitals, physicians solely manage most of the diabetic patients, due to their less time and clinical indolence, they hampers to meet effective treatment strategy. The increment in diabetic populations has called for new treatment strategies. Primary health care clinics should provide diabetic patient with education and up to date medication management, and have a medical team comprised of Clinical Pharmacist.^[18] Most diabetic patients are on multiple medications. Pharmacists have greater opportunity to provide counseling about medication use and benefit.^[19] In severe diabetic condition detailed observation and review of insulin utilization before dose, the conversion should be done for the patients before assigned for U-500 concentrated insulin therapy. However, detailed patient interview is mandatory to define their perfect treatment strategy. Symphonizing the duties of a clinical pharmacist in the administration of chronic disease such as diabetes can increase patients contact and shorten the follow-up periods, which leads to the upliftment of measurable patient outcomes and clinical goals.^[15,17,19]

The drawbacks for clinical pharmacist in government hospital

Clinical pharmacy is an aspect of Pharmacy, similar to the newly doctor of Pharmacy (Pharm D) program, role is differ from hospital to hospital, generally most clinical pharmacist play important role in hospitals such as drug dispense and advice.^[20] One difficult task the newly graduate with Pharm D in Pakistan face in hospital is how to meet the working conditions which have limitation for pharmacy practitioner as drug dispensary. Agha Khan University Hospital (AKUH), Karachi Pakistan has being praised for the effectiveness of the pharmacy residency programs, which help to made the distinction and useful of clinical pharmacy in hospital setting. It is the first institution that has taken early initiatives to established hospital practice in the 1990s. However, AKUH has amplified that a clinical pharmacy practice should not only limit to drug dispensary but as well involve in health care and routine patient decision making. The coming of AKUH have encourage more staff and student to enrolled as clinical pharmacy, and have improve the major challenges that limit the development of the ideal pharmacy practice. Recently, Punjab Province in Pakistan has announced jobs for pharmacists in government hospitals which is clinical oriented, and to

Diabetes in Pakistan 2014			
Total adult population (1000s) (20-79 years)	102,125	Number of deaths in adults due to diabetes	87,548
Prevalence of diabetes in adults (20-79 years) (%)	6.8	Cost per person with diabetes (USD)	52.7
Total cases of adults (20-79 years) with diabetes (1000s)	6,943.8	Number of cases of diabetes in adults that are undiagnosed (1000s)	3,471.9

Table 1: Diabetes in Pakistan - 2014

work amicably with physician. In many public hospitals there is one post for a pharmacist often to be in charge of the medical store together with MBBS doctor, performing a clerical role in its management. The coming of the Pharm D has played a very important role in hospital especially in Pakistan.^[20]

Pakistan has an increased number of registered pharmacists. The profession is consider to be more related to industry oriented rather than patient oriented and the role of clinical pharmacist is still obscure between the healthcare professionals and community.^[2] With advances in clinical pharmacy, Pakistan Pharmacy Council (PPC) improve the quality of education for pharmacy from Bachelor of Pharmacy (B. Pharm) program to Doctor of pharmacy (Pharm D) program called for the expansion of pharmacy curriculum to 6 year program that lead to a doctorate degree in Pharmacy (PharmD).^[21] The implementation phase of Pharm D program faced a lot of criticism for initial lack of clinical aspects in the study program, this has been a contributor to it slow acceptance to policy maker, thereby seen as unnecessary upgrading of the B Pharm to Pharm D. Currently the pharm D graduates are facing problems to get hospital job due to lateness of policies in health care setup.^[20,22]

Generally, Clinical pharmacy is in growing stage in developing countries. In densely populated country like Pakistan with more number of hospitals and drugs, still chronic diseases increases rapid. The cause has been the lack of Clinical pharmacist in decision making. In current setting, the involvements of clinical pharmacy in the health care services have brought improvements in the patient health service provision. Professional authorities and organizations in developing countries should work together to resolve and improved the standardization of clinical pharmacy.^[23,24]

Comparison of Pakistan health policies to that of USA and China

National health policies, is a tool that play an imperative role in defining a Health policy of Islamic Republic of Pakistan

The Government of Pakistan is responsible for the day today running of the health sector through the health ministry, with its rights, have increased the number of health professionals, providing more facilities, however there is little number of clinical pharmacists in hospital. The health care system in Pakistan has both public and private services. The public service until recently is part of the Ministry of Health. However, under the 18th reforms of the constitution of Pakistan, the Ministry of Health has passed the resolutions in June 2011. The work responsibilities of the ministry have been moved to provincial health departments. The provincial health departments are now responsible for developing health Policies, strategies, needs, programs and public health interventions. The private health service was established base on peoples demand, have extends the primary care and make provision to provide assistance in both urban and countryside. Their medical team comprises a diverse practitioners includes doctors, nurses, pharmacists,

traditional healers and laboratory technicians, each plays their roles as in modernized hospital setting. Most private hospital has nursing homes and maternity clinics. The greater parts of the private hospitals in Pakistan follow either a single proprietorship or a partnership model organization.

Health insurance is present in Pakistan, one of the interventions and benefit, with the intention of improving the right of citizen to use health care services. Funds are generated to lessen medical expenses and to support the health sector through Zakat, Bait-ul-Mal, Welfare Fund, Employees Old Age Benefit and Work health insurance. The Government pledged to control the health system, and hope to fulfill the goal of public health for all by the year 2000 through the principle of social fairness.^[4,11] The perception for the health sector covers a healthy population with sound health, revealing good quality of life by the adoption of a healthy life style. The government provided different facilities and momentous measures towards disease prevention, continuous supply of essential drugs with acceptable therapeutic efficacy, safety and quality as well as economical prices to public irrespective of their socio-economic status or standard of living, immunization, provision of female health worker and family planning. The National Health Policy is the light of the health related Millennium Development Goals (MDGs), lessened child and maternal mortality rate in 2015 as a goal for the government of Pakistan. Health spending has increased constantly over the years as the National Health Policy approved in 2009 focuses to make the population healthier. Some of the important marks of the policy are compiled in Table 2.^[25]

The health policy is being carried out through the following targeted interventions:

- I. Making the health structure more responsive and accountable.
- II. Introducing amendments in the health sector in other to make practical progress in meeting Millennium Development (MDG) Goals targets and tackling adequately the newly emerging and re-emerging health issues.
- III. Firmly, engaging private health sector and civil society organizations to enhance health outcomes.
- IV. Prioritizing vulnerable and deprived groups in society as beneficiary of social uplift programs. Despite these positive attempts, the health indicators have been moderate to improve due to diverse external and natural factors. Communicable diseases still consider as a major cause of death. Maternal health complications are widespread and the current infant death rate at 63/1000 is the highest in South Asia.

Health policy of the United States of America

In 2010, USA, Patient Protection and Affordable Care Acts were presented to provide an economical and quality health insurance as a combined liability of government, owners and individuals. Although there is non-government health care's organization, majority of

Serial No	Indicators	Baseline 2006-07	Benchmarks and Targets					
			2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
I	<5 mortality rate(per 100 lb)	94	78	73	68	65	60	55
II	Infant mortality rate (per 1000 lb)	78	66	62	58	55	48	43
III	Maternal mortality ratio (per 100,000 lb)	276	240	220	200	175	165	150
IV	% of children (12-23 months) fully immunized (disaggregation by gender and income)	76 (47)	78	80	82	84	84	85
V	TB - Case detection rate (SS+) - %	51	74	77	79	80	83	84
VI	TB - Treatment success rate - %	87	87	88	88.5	89	90	91

Table 2: National Health Policy 2009 Note: lb refers to Live Births

health care facilities are provided through the department of Health and Human Services (HHS). HHS covers various organizations including the Centers for Medicare and Medicaid Services (CMS), Disease Control and Prevention center (CDC) that supervise research activities for the protection of public health, the National Institute of Health (NIH) that conduct research based on biomedical and health issues, the Health Resources and Services Administration (HRSA) that assist the accessibility of health care facilities to individuals who are not insured or medically unprotected individuals; Agency for Healthcare Research and Quality (AHRQ)^[26] that assist and conduct research for improving the standards and safeness of health care services; Food and Drug Administration (FDA) that supervise the regulation of food, pharmaceutical drug products, vaccines, medical devices and various other products for the purpose of promoting public health. The Institute of Medicine (IOM) is a self-governing profitless organization that is not under the control of federal government, plays a role of consultant in policy making to refine the nation health Stakeholder associations and pronouncement of such policies which affect the health system.^[27]

There is delegation of responsibilities in USA for health organizations, and within the hospitals wherein it is seen that physician work together with clinical pharmacy as well as other practitioners to attain patients wellbeing. The HHS generated the National Quality Strategy under the Affordable Care Act; it describes national aims and precedence to support quality improvement initiatives at each and every step, in collaboration with public and private stakeholders comprising as a profitless organization that creates standards for performance evaluation and public reporting. The Center for Medicare and Medicaid Innovation is founded by ACA; working on service delivery models for improving quality and reduced expenses also to minimize hospital-acquired infections through collaboration with patients. AHRQ supported by federal government to involved in research activities, result outcomes, clinical effectiveness, clinical guidelines and strategies and Health Information Technology.

PCORI is a Patient Centered Outcomes Research Institute that is created under the Affordable Care Act involved in clinical comparative-effectiveness research activities and managing the resources for research regarding illness and injury. Such research findings are not permitted to be used for denying coverage. CMS has improved the quality by maximizing public reporting. Hospital Compare is an important initiative and refers to the service that analyzes the process of care, resultant outcomes and patient experiences for more than 4,000 hospital settings. These initiatives are taken to ensure the availability of Medicare data to “qualified entities” comprising of health organizations and health institutions so that they can record the performance, generating data on payment to physicians by Medicare and reporting the data of payments compensated by pharmaceutical companies to hospitals and physicians. Various pay-for-performance programs are implemented by Medicare along with other private insurance givers.^[28]

People’s health cares are funded by private insurance companies as well as government. The National Health Care Disparities by AHRQ highlights the health care discrepancies at various levels and the areas requiring attention. Federally Qualified Health Centers (FQHCs) present various ways of public remuneration and presents a mean of providing basic and preventive care to the patients irrespective of their ability to pay. Initially it was a source of providing health care services to the desired population. FQHCs provide services to uninsured population. Medicaid and CHIP are involved in providing services to population with less income. The ACA provides subsidies on purchasing insurance to low income Americans thereby reducing discrepancies and improving health care facilities in undeserved population.^[28]

The “patient-centered Medical Home” has been design to provide and

target constant, collaborated and family oriented care to a patient from a personal physician, has emerged as a point of interest in US experts and policy-makers to improve health care services. Accountable Care Organizations (ACOs) serve as another mean among private and public payers. ACOs comprising of hospitals and physicians are playing an important role in providing health care services to the defined population according to quality standards thereby saving the amount spent on health care by the population. CMS supports various local programs that are focused on the provision of better health and social services. Such programs include Massachusetts General Hospital Care Management Program where a nurse case manager collaborates with the patients having chronic illness and with patient’s caregivers to improve the social and medical care. Medicaid ACOs are also playing role in primary as well as behavioral health. ACOs also discover financing models apart from providing clinical and social facilities. Despite of all these initiatives and efforts of many policy-makers several deficiencies in health care services are still there.

The American Recovery and Reinvestment Act of 2009 have established financial incentives for hospitals as well as physicians leading to remarkable investment in HIT. HIT has established Regional Extension Centers for providing direction and enlightenment on best practices; by providing funding and thereby assistance in improving quality of health services and population health; and also providing guidance to research networks. One major and important initiative is development of electronic record system for setting standards as well as measure of the success.

The Patient Protection and Affordable Act signed by president Obama in March 2010 served as another step towards health system reform. This reform has various aims including 1- Gain wide-spread coverage. 2- Improve the availability of coverage. 3- Reducing undesired cost thereby improving quality of services. 4- Enhance basic and primary care services. 5- Increasing investment in public health to achieve these targets. With all these initiatives and efforts of ACA from July-September 2013 to April-June 2014 there are number of uninsured individuals by almost 9.5 million. Medicare ACOs also played a vital role in quality improvement and savings.^[28]

Health policy of People’s Republic of China

The Ministry of Health (MOH) is largely accountable within the Government for health matters. It has central committee that design health care system reform from the Communist Party and the State Council. Through these committees the government pledges to provide all health services by 2020. The State Council also issued the Implementation Plan for the Recent Priorities of Health Care System Reform (2009-2011).^[31] In 2011 the China Health delivery system announces their versatile health-care facilities which consist of government hospitals, public health care systems and other health amenities. The hospitals is the primary care system, is of two types; district hospital health centers and provincial city hospitals. The public health care system includes maternal and child health centers; bid inpatient medical care.^[29] China has a Health insurance system arrange in categories based on urban and rural; Urban Employee Basic Medical Insurance (UEBMI), Urban Residents Basic Medical Insurance (URBMI) and the New Rural Cooperative Medical System (NRCMS). However, refugees often do not have medical insurance in the place of work. An urban-rural medical assistance system has been conventionally built, which make available health facilities to those who are severely ill and have low income, disabled, senior citizens from low-income families, and several other fractions with special difficulties.^[30]

The national essential medicine is observed as an important characteristic of China health reform scheme. In August 2009, the National Essential Medicine Effectual management report is used

in selection, production, distribution, use, pricing, reimbursement, monitoring, evaluation and other aspects of essential medicines. Since July 2011, essential medicines have been used in the government-run primary health-care services with zero markup drug sales. Medicine safety and regulation are main issues in China. However, the laws and regulations have been put in place to improve the safety and management regulated by Chinese national drug regulatory authority and the State Food and Drug Administration (SFDA). Also, China has built up an online reporting system for national communicable disease and public health emergencies. This covered 100% of centers for disease control and prevention, 98% of country complex hospitals and 94% of parish hospitals. In June 2011, China developed a structure for health information system progress to build a health information podium that composed of national, provincial and prefectural levels, comprised of five application i.e., public health, medical care, health insurance, drug management and integrated management. And also two databases i.e., resident electronic health records and hospital electronic medical records. But still, the development of a regional health information system podium has been slow. There is a deficiency of resource integration and information sharing.

If all the policies are similar? Then objective will be where Pakistan lacks? Is there any problem with the implementation of the health policy?

All of these policies are not similar; there is a big difference between Pakistan and USA Health policy and as well as some difference with Chinese health policy. Practically in Pakistan, the center of attention is delegation of responsibility, involvement of clinical pharmacy role within the government hospital and in public health policy, and the extension and expansion of hospital in some areas.^[6,25] However much consideration shall be given to current research spearheaded by Chinese pharmaceutical scientists in combating current public health issues in other to salvage the diabetes, malaria and other disease that are of public health emergency in Pakistan.^[31]

USA health policy is feasible for adoption into Pakistani health care delivery system. However it depends on the availability of resources like funding, health professionals and health facilities. Given the limitations of resources only the basic health care delivery strategies can be marginalized for adoption.

CONCLUSION

Good health policy and delegation of responsible are necessary for advancement in health sector, and is responsible for the smooth functioning health organization including hospital, that is prerequisite for salvage public health emergency and to foster economic and social progression in a country.

The health system in Pakistan need modernization when compare to china and USA. The government needs involve clinical pharmacist in public hospital to ascertain good curative for all patient irrespective of sex, race, ethnic or region. The high prevalence of diabetes in Pakistan and it's environ have great chance to reduce if hospital clinical team involve clinical pharmacist in making drug decision, sensitization and counseling.

Clinical pharmacists play a vital role together with other medical health professionals including Physicians, Nurses and laboratory scientists. Importantly, a clinical pharmacist knows more about combination drugs therapy which is appropriate for some pathological disease, and can provide counseling to patients about medicines use and effect. It is necessary for the government of Pakistan to involve clinical pharmacist in hospital, encourage internship programs for doctor of pharmacy students.

Furthermore government should provide scholarship with good incentives to enhance more knowledge and skills in clinical pharmacy and it related areas. Also, to expand the clinical set up in every hospital, bring in advance technological and software that can facilitate online dispensary and for check the drug- interaction.

Recommendations:

- I. Strength and empower the role of Clinical pharmacist.
- II. Proper implementation of National health policy and appropriate utilization of Government funds to be provided universally good health care to public.
- III. Improve the capacity of clinical pharmacist and effectively deploying human resource to grow the career of pharmacy professionals.
- IV. Provide an incentive to staff and initiating measures that health care team; work collectively in delivering health services to public.
- V. Introduce health insurance schemes as part of comprehensive health care delivery systems.
- VI. Effective management and monitoring of healthcare system should be owned by bringing clinical pharmacy set up in hospitals to improve public health.
- VII. Government should introduce Clinical settings and policies for research and development in medical sciences to further their knowledge, creation and growth.
- VIII. Establish primary health care centers with cost effective strategies for increasing number of population to sustain long term positive impact on health status on the public.
- IX. Availability of clinical pharmacists in hospitals with effective health care delivery strategies will sustain long term positive impact on health status on the public.
- X. Government should give more priority to clinical pharmacists in health sector so that the clinical pharmacist have chance to deliver good health services.
- XI. Government need to increase their health budget for the provision of quality health care services to the public.
- XII. Government should create health awareness for the betterment of its citizenry.

REFERENCES

1. Meghani ST, Sehar S, Punjani NS. Comparison and analysis of health care delivery system: Pakistan versus China. 2014;2:46-50.
2. Bhagavathula AS, Sarkar BR, Patel I. Clinical pharmacy practice in developing countries: Focus on India and Pakistan. Archives of Pharmacy Practice 2014;5:91.
3. Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. Journal of Public Health 2005;27:49-54.
4. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med 2006;3:e442.
5. Fowler MJ. Diabetes treatment. Part 2: Oral agents for glycemic management. Clinical Diabetes 2007;25:131-4.
6. WHO. Global Health Estimates: Deaths by Cause, Age, Sex and Country, 2000-2012. Geneva, WHO, 2014. The WHO Global Health Estimates provide a comprehensive and comparable assessment of mortality and loss of health due to diseases and injuries for all regions of the world 2015.
7. Wong K. A Perspective of One Important Risk Factor of Type 2 Diabetes in Hispanic and Asian Minorities. Global J of Immun and Aller Dis 2015;3:1-5.
8. Simmons R, Unwin N, Griffin S. International Diabetes Federation: An update of the evidence concerning the prevention of type 2 diabetes. Diabetes Res and Clin Pract 2010;87:143-9.
9. Akhter J. The burden of diabetes in Pakistan: the national diabetes survey. J Pak Med Assoc 1999;49:205-6.
10. Stratton IM, Adler AI, Neil HAW. Association of glycaemia with macrovascular and microvascular

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- complications of type 2 diabetes (UKPDS 35): Prospective observational study. *BMJ* 2000;321:405-12.
11. Xue W, Wang J, Niu H. Assessment of air quality improvement effect under the national total emission control program during the twelfth national five-year plan in China. *Atmos Envi* 2013;68:74-81.
 12. Ali I, Khan J, Khan AU. Need of advance clinical pharmacy services: A case study from Pakistan. *Archives of Pharma Prac* 2015;6:64.
 13. Barry MJ, Edgman-Levitan S. Shared decision making-the pinnacle of patient-centered care. *New Eng J of Med* 2012;366:780-1.
 14. Mitchell P, Wynia M, Golden R. Core principles and values of effective team-based health care. Washington, DC: Institute of Medicine 2012.
 15. Who Are A. What is Clinical Pharmacy. *Pharmacotherapy* 2008;28:816-7.
 16. Yee GC, Haas CE. Standards of practice for clinical pharmacists: the time has come. *Pharmacotherapy* 2014;34:769-70.
 17. Cotter SM, Barber ND, McKee M. Survey of clinical pharmacy services in United Kingdom National Health Service hospitals. *Am J Health Syst Pharm* 1994;51:2676-84.
 18. Hudson K, Taylor LA, Kozachik SL, Shafer SJ, Wilson ML. Second Life simulation as a strategy to enhance decision-making in diabetes care: a case study. *J of Clin Nurs* 2015;24:797-804.
 19. Sonnett TE, Galloway T. Impact of a clinical pharmacist regarding correction of insulin use before possible conversion from traditional insulin to U-500 regular insulin in a patient with uncontrolled type 2 diabetes. *Clin Diabetes* 2013;31:171-4.
 20. Hussain K. Unstandardized and defective evaluation practices in the examination system in pharmacy institutes of Pakistan. *Am J Pharm Educ* 2010;74:16c.
 21. Basak SC, van Mil JF, Sathyanarayana D. The changing roles of pharmacists in community pharmacies: perception of reality in India. *Pharma World and Sci* 2009;31:612-8.
 22. Hameed A. Pharmacoeconomics and outcomes research in Pakistan. *ISPOR 2nd Asia-Pacific conference* 2006:5-7.
 23. Khan T. Challenges to pharmacy and pharmacy practice in Pakistan. *The Aus Med J* 2011;4:230.
 24. Yang W, Lu J, Weng J. Prevalence of diabetes among men and women in China. *New Eng J of Med* 2010;362:1090-101.
 25. Siddiqi S, Haq I, Ghaffar A, Akhtar T, Mahaini R. Pakistan's maternal and child health policy: Analysis, lessons and the way forward. *Health Policy* 2004;69:117-30.
 26. Health UD, Services H. Agency for Healthcare Research and Quality (AHRQ). 2014 National Healthcare Disparities Report.
 27. Rice T, Rosenau P, Unruh LY, Barnes AJ, Saltman RB, van Ginneken E. United States of America: Health system review. *Health Systems in Transition* 2012;15:1-431.
 28. Rosenbaum S. The Patient Protection and Affordable Care Act: Implications for public health policy and practice. *Public Health Reports* 2011;126:130-5.
 29. Gong P, Liang S, Carlton EJ. Urbanisation and health in China. *The Lancet* 2012;379:843-52.
 30. Wu G. Diabetes in China.
 31. WHO. The world health report 2003: shaping the future. World Health Organization; 2003.