

**FACTORS INFLUENCING UTILIZATION OF PRIMARY
HEALTH CARE FOR CARDIOVASCULAR DISEASE
PREVENTION AND CONTROL IN NEPAL
-A LITERATURE REVIEW**

A thesis submitted for the partial fulfillment of the requirement
for the degree of Master's in Public Health at
Royal Tropical Institute, Amsterdam,
Netherlands

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53rd International Course in Health Development,
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DECLARATION

Factors influencing utilization of primary health care for cardiovascular disease prevention and control in Nepal-a literature review

This thesis is submitted for the partial fulfillment of the requirement for the degree of Masters in Public Health at Royal Tropical Institute, Amsterdam, Netherlands

By:

Bandana Neupane
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Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis "Factors influencing utilization of primary health care for cardiovascular disease prevention and control in Nepal-a literature review" is my own work.

Signature:



53rd International Course in Health Development (ICHD)
September 19, 2016 - September 7, 2017

KIT (Royal Tropical Institute)/ Vrije Universiteit Amsterdam,
Amsterdam, The Netherlands

Organized by:

KIT (Royal Tropical Institute), Development Policy & Practice
Amsterdam, The Netherlands

In co-operation with:

Vrije Universiteit Amsterdam/Free University of Amsterdam (VU)
Amsterdam, The Netherlands

DEDICATION

*To my respected parents Narayan Prasad Sharma and Tulasa Sharma,
beloved sisters Bhawana Neupane, Sambriddhi Neupane*

&

all my readers

“Special dedication to my Late grandfather who died of Heart Attack”

ACKNOWLEDGEMENT

My deepest respect and appreciation goes to my parents; who are not less than a god to me, for rearing, caring, educating, motivating, up-bringing and helping me to reach this stage of my life. I am no one without them.

I am grateful to my sisters for supporting me and being there always, for me in my hard times.

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My special appreciation goes to my thesis advisor and back stopper for their time, continuous patience, support, contribution and critical feedbacks to give this shape to my thesis.

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TABLE OF CONTENTS

| | |
|--|------|
| DECLARATION | i |
| DEDICATION | ii |
| ACKNOWLEDGEMENT | iii |
| LIST OF TABLES | vi |
| LIST OF FIGURES | vii |
| ABBREVIATIONS USED | viii |
| GLOSSARY | x |
| ABSTRACT..... | xi |
| INTRODUCTION | xii |
| CHAPTER ONE: BACKGROUND INFORMATION OF NEPAL..... | 1 |
| 1.1 Geographic, administrative and demographic characteristics | 1 |
| 1.2 Socio-cultural, educational and economic characteristics | 2 |
| 1.3 Major development partners | 2 |
| 1.4 Health situation | 2 |
| 1.5 Health care delivery system | 3 |
| 1.6 History of primary health care in Nepal | 5 |
| 1.7 Cardiovascular disease and scope of PHC..... | 5 |
| CHAPTER TWO: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES AND METHODOLOGY | 6 |
| 2.1 Problem statement and justification..... | 6 |
| 2.2 Research questions..... | 7 |
| 2.3 Objectives | 8 |
| 2.3.1 General objective | 8 |
| 2.3.2 Specific objectives | 8 |
| 2.4 Methodology..... | 8 |
| 2.4.1 Study method | 8 |
| 2.4.2 Search strategy and Key words..... | 8 |
| 2.4.3 Search strategy flow chart..... | 9 |
| 2.4.4 Inclusion and exclusion criteria | 9 |
| 2.4.5 Methodological limitations | 9 |
| 2.4.6 Conceptual framework..... | 10 |
| CHAPTER THREE: FINDINGS ON SUPPLY SIDE FACTORS | 12 |
| 3.1 Health System Factors | 12 |

| | |
|---|----|
| 3.1.1 Policies..... | 12 |
| 3.1.2 Resources | 13 |
| 3.1.3 Organization..... | 17 |
| 3.2 External environmental factors | 17 |
| CHAPTER FOUR: FINDINGS ON DEMAND SIDE FACTORS..... | 19 |
| 4.1 Predisposing factors | 19 |
| 4.1.1 Demographic factors..... | 19 |
| 4.1.2 Social Factors..... | 20 |
| 4.1.3 Health beliefs | 21 |
| 4.2 Enabling factors | 22 |
| 4.3 Need factors | 23 |
| CHAPTER FIVE: FINDINGS ON EVIDENCE BASED BEST PRACTICES IN LMICS ... | 25 |
| 5.1 Evidence based best practices targeted on supply side factors | 25 |
| 5.2 Evidence based best practices targeted on demand side factors | 28 |
| CHAPTER SIX: DISCUSSION | 29 |
| 6.1 Supply side factors..... | 29 |
| 6.2 Demand side factors..... | 31 |
| 6.3 Limitations of literatures..... | 33 |
| 6.4 Reflection on conceptual framework..... | 33 |
| CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION | 34 |
| 7.1 Conclusion | 34 |
| 7.2 Recommendation | 34 |
| APPENDICES | 36 |
| References..... | 36 |
| Miscellaneous | 44 |
| Figure no. 6: Original Conceptual Framework of Anderson, 1995 | 44 |
| Table no. 6: The search terms and websites used in searching literatures for the study .. | 45 |
| Table no. 7: Evidence based best practices in LMICs /HICs/summary table:..... | 47 |

LIST OF TABLES

| No. | Heading | Page No. |
|--------------------|---|----------|
| Table no. 1 | Trends on major indicators of Nepal over 60 years | 3 |
| Table no. 2 | Search strategy flow chart | 9 |
| Table no. 3 | List of basic medicines required for essential CVD interventions in PHC according to WHO protocol | 14 |
| Table no. 4 | Basic instruments and tools that should be available in PHC according to WHO protocol | 14 |
| Table no. 5 | Availability of tests and procedures in PHC in a survey conducted by WHO in 2015 | 15 |
| Table no. 6 | The search terms and websites used in searching literatures for the study | 45 |
| Table no. 7 | Evidence based best practices in LMICs/HICs summary table | 48 |

LIST OF FIGURES

| No. | Heading | Page No. |
|---------------------|--|----------|
| Figure no. 1 | Map of Nepal | 1 |
| Figure no. 2 | Population distribution of Nepal in the year 2000 and the estimated increase of ageing population by 2025/World Bank | 2 |
| Figure no. 3 | Department of Health Services Organogram, updated version | 4 |
| Figure no. 4 | Proportionate mortality of CVD among all communicable and non-communicable diseases/WHO-Nepal,2014 | 6 |
| Figure no. 5 | Conceptual framework; the adapted version of Anderson ,1995 | 11 |
| Figure no. 6 | Original conceptual framework of Anderson, 1995 | 44 |

ABBREVIATIONS USED

| Abbreviation | Full Form | Abbreviation | Full Form |
|---------------|--|---------------------------|--|
| CBS | Central Bureau of Statistics | NCDs | Non-Communicable Diseases |
| CDC | Centers for Disease Control and Prevention | NHIECC | National Health Information Education Communication Center |
| CDIs | Community Directed Interventions | NHRC | National Health Research Council |
| CHW | Community Health Worker | NHTC | National Health Training Center |
| DALY | Disability Adjusted Life Years | NPC | National Planning Commission |
| DFID | Department for International Development | OGTT | Oral Glucose Tolerance Test |
| DFTQC | Department of Food Technology and Quality Control | OPD | Out-Patient Department |
| DHS | Demographic Health Survey | PEN | Package for Essential Noncommunicable Diseases Interventions |
| DoHS | Department of Health Services | | |
| EBBP | Evidence Based Best Practices | PHC PHCC | Primary Health Care (Approach) Primary Health Care Center (Facility) |
| EDPS | External Development Partners | PHCRD | Primary Health Care Revitalization Division |
| FCHVs | Female Community Health Volunteers | PIQIP/PINNACLE | P-India Quality Improvement Program/ Practice, Innovation and Clinical Excellence |
| FCTC | Framework Convention for Tobacco Control | RCT | Randomized Control Trials |
| GDP | Gross Domestic Product | SDG | Sustainable Development Goals |
| GNI | Gross National Income | SEAR | South East Asian Region |
| HEARTS | Health Promotion, Evidence Based Practice, Access to Essential Medicines, Risk Assessment, Team Based Care & Supervision | SHI | Social Health Insurance |
| HICs | High-Income Countries | Sim-Card Trial | Simplified-Cardiovascular Trial |
| HIV | Human Immuno-Virus | SSA | Sub-Saharan Africa |
| KIT | Koninklijk Instituut voor de tropen | TB | Tuberculosis |
| LMICs | Low and Middle -Income Countries | UN | United Nations |

| | | | |
|-------------|-----------------------------------|---------------|--|
| MDG | Millennium Development Goals | UNFPA | United Nations Fund for Population Activities |
| MeSH | Medical Subject Headings | UNICEF | United Nations International Children's Emergency Fund |
| MICS | Multiple Indicator Cluster Survey | VU | Vrije University |
| MOHP | Ministry of Health & Population | WHO | World Health Organization |

GLOSSARY

| S. N | Terms | Glossary |
|------|-------------------------------------|--|
| 1. | Primary Health Care | “Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination” (Alma Ata 1978). |
| 2. | Utilization | “The outcome of the interaction between health professionals and patients” (Donabedian 1973). |
| 3. | Cardiovascular Disease (CVD) | <p>“Cardiovascular diseases (CVD) are a group of disorders of the heart and blood vessels” (WHO 2017).</p> <p>“Heart attacks and strokes are two acute events caused by cessation of blood to heart or brain. Most common risk factors are: unhealthy diet, tobacco use, physical inactivity and harmful use of alcohol” (WHO 2017).</p> |
| 6. | WHO – “Best Buys” | “Set of affordable, feasible and cost-effective intervention strategies for NCDs” (WHO 2011). |
| 7. | Prevention | <p>Primary prevention - “People with risk factors who have not yet developed clinically manifest cardiovascular disease” (WHO 2007).</p> <p>Secondary prevention - “People with established CHD, CeVD or peripheral vascular disease” (WHO 2007).</p> <p>Tertiary prevention – “Measures aimed at providing appropriate supportive and rehabilitative services to minimize morbidity and maximize quality of life after a long-term disease or injury is present” (MeSH 2009)/PubMed.</p> |

ABSTRACT

Background: The uptake of cardiovascular services through PHC is essential to achieve national target of 25% reduction of CVD by the year 2020 & SDGs target of reducing NCDs related premature deaths by one-third by 2030. However, most LMICs including Nepal, are facing growing burden of CVD but factors influencing utilization of PHC for CVD are unexplored in Nepal. Thus, this study was to explore and analyze those factors that increase uptake in order to give recommendation to MOHP and other important stakeholders.

Methodology: Literatures from Nepal and LMICs through various sources like PubMed, Google Scholar were reviewed and analyzed with the help of Anderson, 1995-conceptual framework.

Findings: Study found lack of CVD guideline, absence of NCD department, gaps in multi-sectoral action plan, scarcity of essential medicines, inadequate skilled human resources, freezing of budget, lack of data registries, low health literacy, perceived low quality of services & insufficient research as major factors that may influence uptake of PHC for cardiovascular services in Nepal.

Conclusions/Recommendations: Despite having good policies & programs, there are gaps in its implementation. This study recommends the following: Establishment of a separate operational NCD department, make evidence based CVD guideline, review multi-sectoral action plan, timely implement programs & prevent freezing of budget, increase research on prevention of CVD, maintain data registries, increase health promotion, community engagement & out-reach care, shift the task & train human resources & lastly, increase multi-sectoral collaboration.

Keywords: Utilization, primary health care, cardiovascular disease, prevention/control, Nepal.

Word count: 13,085

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INTRODUCTION

Globally, almost 70% of entire deaths are caused by non-communicable diseases (NCDs) each year (1). World Health Organization has mentioned cardiovascular disease (CVD), diabetes, chronic respiratory disease, certain cancers and mental health as most common NCDs (2). Unhealthy diet, physical inactivity, use of tobacco and harmful use of alcohol are the prime risk factors (1). Cardiovascular disease; mainly heart attacks and strokes are killing people worldwide more than any other cause, as high as about 80% of all deaths and almost three-quarters of this mortality is taking place in low and middle-income countries (3).

In Nepal, it is estimated that NCDs are responsible for 60% of total deaths and 22% of premature mortality (4,5). Within 2010 to 2014, Department of Health Services, has reported an increase of NCD deaths from 51% to 60% of all deaths (6). In 2016, 83% of all deaths were caused by NCDs (6). CVD alone shares one quarter of national mortality (7). Along with it, communicable diseases are equally persisting and in such scenario, the country is facing “double-disease” burden and extra pressure on its existing health system (8). Furthermore, the disease is expected to increase and the condition may further worsen as studies predict the rise of figure by 35% by 2030 (7,8). The impact of this situation on socio-economic aspects of the population in the country is high and even disproportionate among poor and marginalized clusters within the country (7,9).

This has highlighted the importance of accessible, affordable, comprehensive and sustainable care for such chronic diseases in Nepal. Hence, the concept of primary health care (Alma-Ata 1978) has now re-emerged after nearly 40 years of its initiation (10,11). Primary health care (PHC) is important in preventing these avoidable deaths and also achieving universal health coverage (12). There is increasing evidence that, morbidity and mortality due to CVD can be reduced if people utilize services at the primary healthcare centers and health post (13). In order to achieve sustainable development goals (SDGs) target 3.4 of reducing premature deaths due to NCDs by one-third in Nepal, there is the need to increase efforts on preventing CVD through the approach of PHC (4,10,14). Positively, in line with this need, the integration of NCDs has already been started (6). However, exploring existing evidences in Nepal and other low-income countries on factors that influence use of services by people in PHC is equally important in order to increase uptake of such services provided through integration in PHC (15,16).

Besides, the motivation and zeal that have been developed within me from my years-long professional experiences in clinical and public health sector, can be an added advantage on articulation and understanding of the subject matter. Therefore, with knowledge, exposure, interest and current need; I selected this topic in thesis for partial fulfillment of Masters in Public Health in Royal Tropical Institute, Netherlands. The dissertation comprises of 7 major headings; namely: Chapter 1- Country’s Background, Chapter 2- Problem Statement, Justification, Objectives and Methodology, Chapter 3 & 4- Findings (on objectives 1&2), Chapter 5- Findings on Evidence Based Best Practices, Chapter 6- Discussion, Chapter 7- Conclusion and Recommendation and lastly, Appendices.

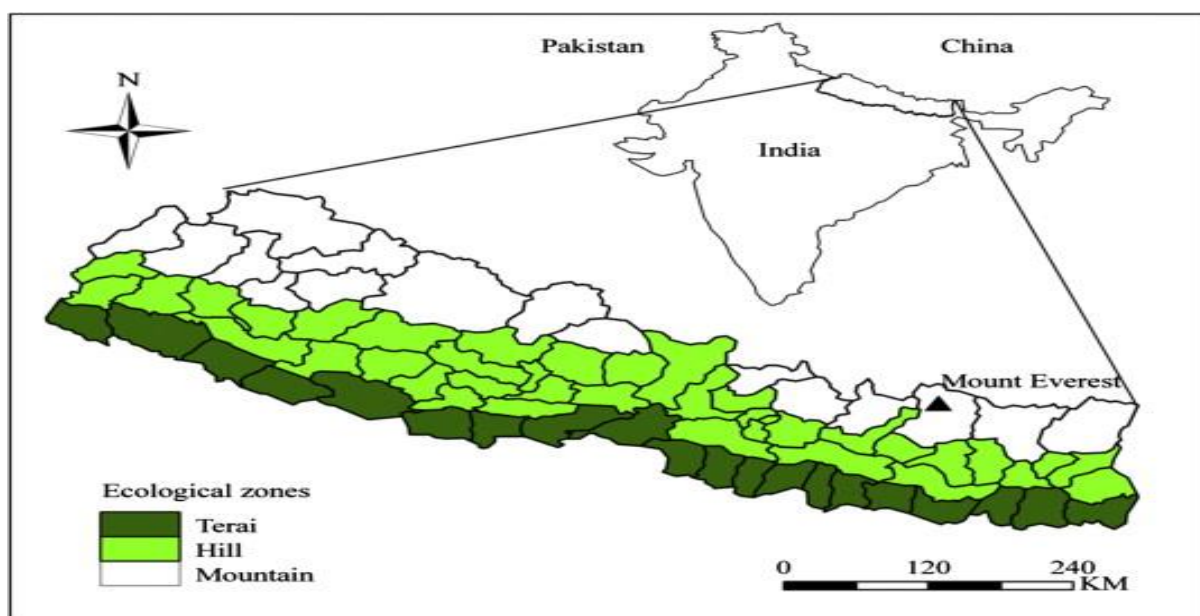
CHAPTER ONE: BACKGROUND INFORMATION OF NEPAL

1.1 Geographic, administrative and demographic characteristics

Nepal is a small, mountainous and a land locked country situated in South-Asia with an area of 147,181 square kilometers. It is surrounded by China to its north and India to its east, west and south. There are three different ecological regions, namely Himalayan in the north, Hilly in the central and Terai with flat land in the south as shown in figure no. 1 below. Natural disasters like landslides, floods and earthquakes are common in the country due to land topography, making life more difficult at times. Recent earthquake in 2015 has taken life of many people. Large number of survivors are now homeless, suffering from chronic stress, mental illness and disability(6). Transportation & communication facilities are limited and often face challenges due to these disasters. Road networks are poor and motor vehicle accidents are even more common in rainy seasons (6).

Figure no.1: Map of Nepal

Source: (17)



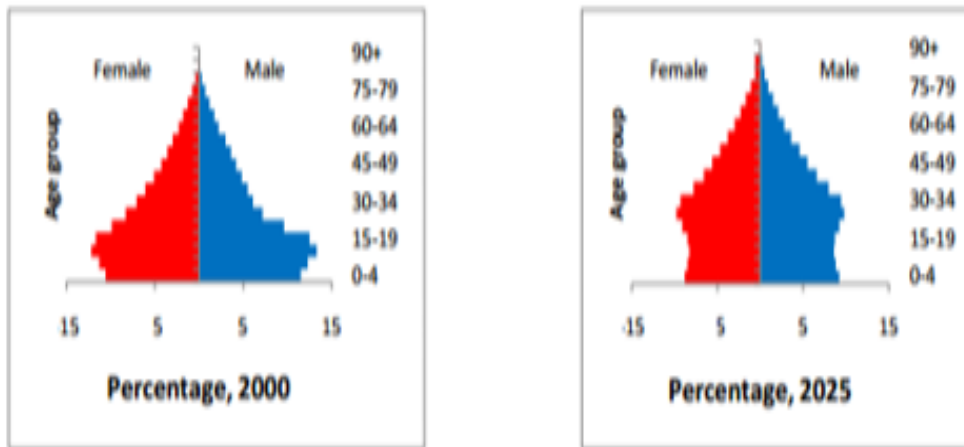
Nepal suffered 10-long years of internal conflict between Maoist and government forces. Later, newly formed constitutional assembly declared it as a Federal Democratic Republic by abolishing the monarchy. The President is the head of the state and the Prime Minister is the administrative head (6).The country is divided into 5 administrative development regions; Eastern, Central, Western, Mid-western and Far western regions. The proposed 7 administrative states in upcoming Federal changes in the country is yet to be implemented. Kathmandu is the capital city which lies in Central region.

Population has increased more than twice in last 4 decades and recently estimated figure is around 28,851,000 (18). Only 17% people live in urban cities while rest live in rural areas (19).

The following figure shows population distribution of Nepal in the year 2000 and the World Bank’s estimate of increasing number of ageing population by the year 2025.

Figure no. 2: Population distribution of Nepal in the year 2000 and the estimated increase by 2025/World Bank

Source: (20)



1.2 Socio-cultural, educational and economic characteristics

Nepal is a country with diversity. People from several castes and 125 ethnic groups who speak 92 languages live here. Nepali is the official national language. Majority of the people follow Hindu religion (84%) while others are Buddhists, Muslims and Christians. About 76% of the people are farmers. The rest are engaged in service, business and animal husbandry. Literacy rate is 65%. Education is free up to the secondary school in public schools. Government has given emphasis on reservation seats and priority programs for women and children on education, scholarships and vocational training (6,19).

Nepal is a low-income country with a GDP of 21 billion US\$ and GNI per capita of 730US\$ (18).It has an average annual GDP growth of 2.7% (18). About 25.2% of population live below poverty line (21). Health care expenditure is 5.3 % of GDP and out of pocket expenditure is 47.7% of Total Health Expenditure (22). Nearly 50% health budget rely on International Aid (23). Pilot studies on implementation of Social Health Insurance are ongoing (6). Nepal is rich in timber, copper, jute, tobacco, natural herbs, agricultural products, and water. Many tourists visit the country each year due to its scenic beauty. The country has considerable scope to grow from its high yielding hydropower and tourism sector (21).

1.3 Major development partners

According to recent report of Department of Health Services, UNICEF, DFID, German Development Cooperation, World Bank and UNFPA were the major development partners providing financial support in the year 2015/2016 to the country (6).

1.4 Health situation

Over the years, Nepal has made significant progress in health sector. Ranging from extension of PHC services to engagement of private sectors and from production of human resources to manufacture of drugs; various responsible bodies have been operational. Nepal is now capable of producing 40% of drugs that are required for the country. Similarly, there are increasing number of diagnostic services, laboratories and specialized care centers established within the

country. Infectious diseases like Malaria, HIV, Tuberculosis are under control. Filariasis control is underway. Leprosy and Maternal-Neonatal Tetanus are in state of elimination. Most of the mortality indicators have been improved significantly (6). Table no. 1 below, shows the trend recorded on major indicators over the past 60 years in health sector.

Table no. 1: Trends on major indicators of Nepal over past 60 years

Source: (6)

| INDICATOR | 1950 | 1991 | 2011 | SOURCE |
|--|-----------|--------------|-------------|---|
| Infant mortality Rate (per thousand live births) | 200 | 107 | 46 | DHS, 2011 |
| Maternal mortality rate (per 100000 live births) | 1800 | 850 | 170 | MDG, Progress report, 2011 |
| Average life expectancy (year) | 32 | 53 | 68.8 | Nepal Human Development Index report, 2014 |
| Under 5 children mortality (per thousand) | 280 | 197 | 54 | DHS, 2011 |
| Total fertility rate | 7 | 5.8 | 2.6 | DHS, 2011 |
| Fully immunized children (%) | 70 DHS | 88/87 DHS | 88.0 DHS | UNICEF, Multiple Indicator Cluster Survey (MICS) 2014 – Dropped to 82.4 |

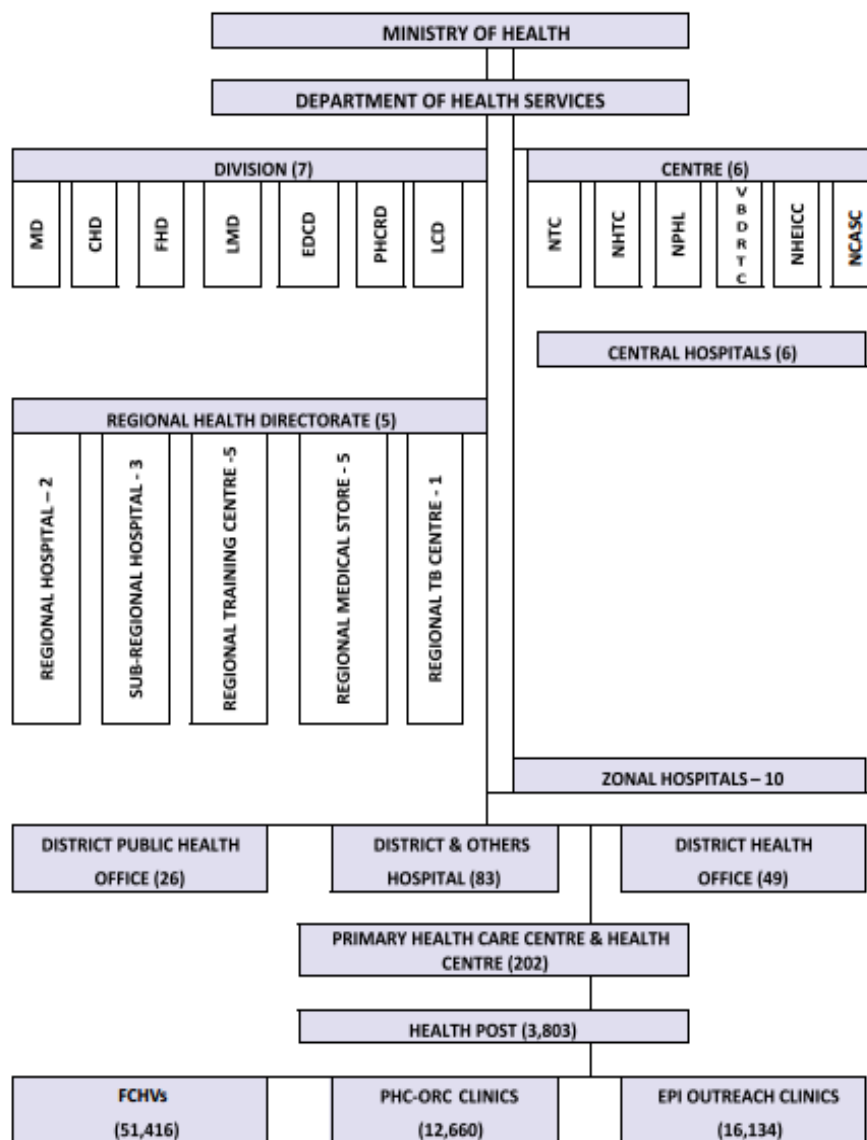
Nepal often face issues regarding access to quality drugs and diagnostic services. Non-Communicable diseases are rising. Road accidents and traumas due to poor roads, old vehicles and other transportation related problems are increasing. NCDs and adolescents' reproductive health are the major areas that are lagging behind in terms of priority in PHC. Quality Human Resources production, distribution, absorption and retention have been a major issue. Private sectors including medical colleges are mostly concentrated only in urban cities. There are challenges on effective regulation of health care market. Priorities are needed to strengthen the surveillance system for emerging diseases, outbreaks and natural disasters (6).

1.5 Health care delivery system

Ministry of Health and Population (MOHP) undertakes the major responsibility to carry out and control all health-related programs, projects and activities in Nepal. MOHP collaborates with other line ministries, external development partners (EDPs) and various stakeholders to achieve its programs. MOHP also makes policies, plans activities, arranges budgets, implements programs, coordinates, supervises, monitors and evaluates activities. Department of health services (DoHS) is the biggest department under MOHP which carries out all the health care related services throughout the country with the help of health care delivery system(6,24,25). Further detail of DoHS is provided in the figure no.3 below.

Figure no. 3: Department of Health Services Organogram, updated version

Source: (6)



Indices:

[National Tuberculosis Center (NTC), Primary Health Care Revitalization Division (PHCRD) National Health Training Center (NHTC), Management Division (MD), National Public Health Laboratory (NPHL), Child Health Division (CHD), Vector-borne Disease Training and Research Center (VBDRTC), Family Health Division (FHD), National Health Education Information and Communication Center (NHEICC), National Center for AIDS and STD Control (NCASC), Logistic Management Division (LMD), Female Community Health Volunteers (FCHVs), Leprosy Control Division (LCD), Expanded Program on Immunization (EPI), Epidemiology and Disease Control Division (EDCD), Primary Health Care Centers (PHCC)].

1.6 History of primary health care in Nepal

Nepal signed Alma-Ata declaration in 1978 with a motto of “Health for all by 2000” (10). The major principles highlighted in the declaration are: Universal access and coverage of essential services and technologies, intersectoral co-ordination, health promotion, prevention and community participation (10).

Primary Health Care Revitalization Division (PHCRD) under Department of Health Services, is the responsible unit to run PHC programs. Currently, this division is looking after four program components of PHC. They are: National Free Health Services, Social Health Protection, Urban and Environmental Health and Non-Communicable Diseases.

For the management of NCDs, Nepal has implemented three tier referral system (7).

- Super specialty centers -3rd tier
- District and Zonal hospital -2nd tier
- PHCC and Health Posts -1st tier

Health Post (HP) is the first facility level contact. It focuses more on preventive and promotive services. It also conducts PHC out-reach clinics and immunization programs with the help of Axillary Nurse Midwife (ANM) and Female Community Health Volunteers (FCHVs) (6). FCHVs help linking people in the community to health facility in need. FCHVs also conduct home visits, organize health prevention and promotional activities, perform basic recommended national programs like distribution of drugs, nutritional activities and some curative services for newborn (26).

Primary health care centers (PHCC) are the facilities above health posts. The cases are referred from Health Posts to PHCC and are seen by general practitioner. In need of border diagnostic screening and curative services, PHCC refers cases to district level hospitals. More sophisticated curative services are available as the chain goes up and more preventive services as it goes down. Prevention is the “cornerstone” of PHC (6,11).

1.7 Cardiovascular disease and scope of PHC

One fourth of all national deaths are due to CVD in Nepal. The leading two causes mentioned were heart attacks and strokes which are modifiable (7). Scope of PHC for CVD prevention and control ranges from preventing occurrence of these diseases through risk stratification and screening as primary prevention, preventing person with history of CVD from recurrence as secondary prevention and managing timely referral to higher level in acute manifestations in order to prevent complications as tertiary prevention (3).

CHAPTER TWO: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES AND METHODOLOGY

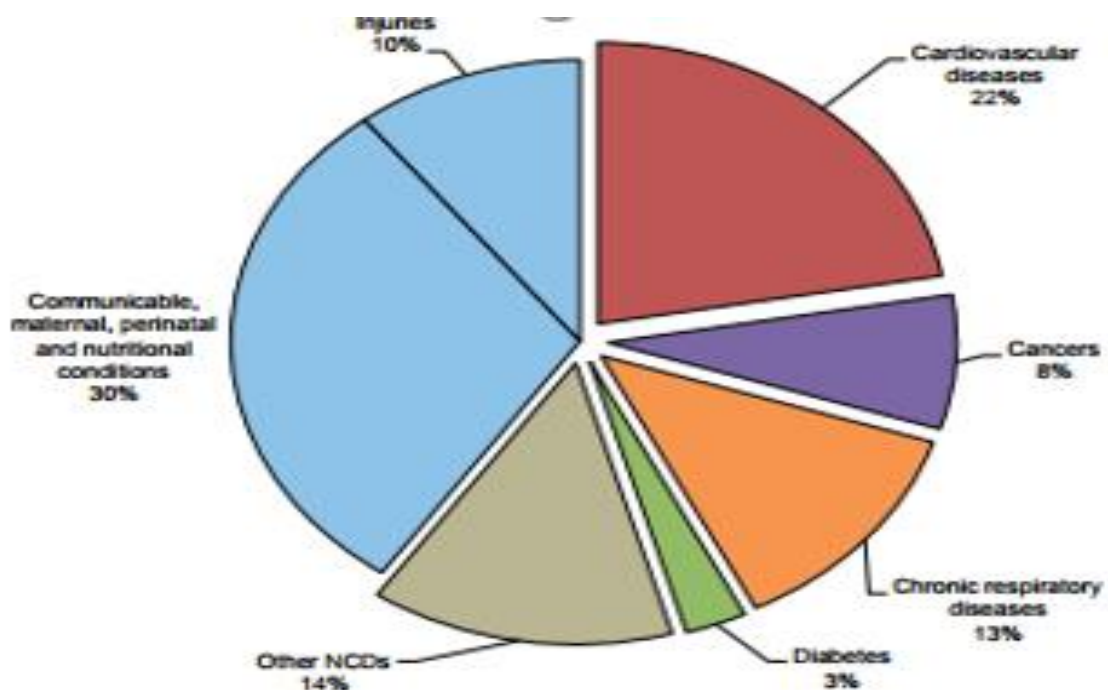
2.1 Problem statement and justification

Over the past two decades, CVD (especially heart attacks and strokes), has been the leading cause of mortality in Nepal and is responsible for one-fourth of all national deaths (3,7). It is accountable for the biggest share of chronically ill and disabled people (DALY increased by 20% in last 20 years) resulting in heavy economic and social burden to the country (20,27). Furthermore, (although it is relative) it is projected that, the current figure of proportionate mortality (22.4% as shown in figure no. 4) for CVD will rise as high as 35% by 2030 (7). Increasing unhealthy diet, inadequate physical activities, increasing prevalence of smoking and harmful use of alcohol are the four prime risk factors (7). These are modifiable and hence, can be prevented (2,28).

The risk of CVD increases with age (29). Increasing ageing population also contributes to the rise in CVD cases in Nepal (30). The country is in early phase of demographic transition (8). The World Bank has projected that 5.8% of total population will be over 65 years in 2025 (20). This gives the estimate on frequency of disease in near future.

Figure no. 4: Proportionate mortality of CVD among all communicable & non-communicable diseases

Source: WHO-Nepal, 2014(7)



CVD comes with huge financial and social costs and have impact on country's growth and development (31). Estimated cost of outpatient treatment of CVD per person in Nepal is 134.38\$ per year and specialist care is much higher which can be a catastrophic expenditure for most Nepalese, where 25.2% population are living under poverty line (32). CVD clients with low socio-economic status; often sell their land and properties in order to access health

care. This goes in a cycle (such as hunger, school drop-outs of their children and loss of job or income) and thereby; leads to impoverishment, degradation of health status and other social consequences. It further contributes to the inequalities already existed between rich and the poor in such communities (33).

The prevention and control of chronic disease like CVD requires frequent follow-up care; (some even last throughout life) (34). The success of it depends on patient-centered care, which is community based, responsive and sustainable (34). Providing such services in PHC addresses these aspects and, eventually, can cover large group of people in an equitable manner (3). In long run, better health outcomes can be achieved in less expensive way (3). Such cost effective and integrated approach helped in reducing burden of chronic diseases in many low and middle income countries; which is also believed to be successful in Nepal (35).

Thus, government has given priority to PHC in its current policy (7). It has also shown the national commitment to the global target 3.4 (reducing premature mortality due to NCDs by one-third by 2030) and 3.8 (achieving universal health coverage through the pathway of PHC) of sustainable development goals (4,6,10). Access and utilization of services by the population in PHC are essential components to achieve this commitment (36). Use of services by people depends on system side and demand side variables (37).

Hence, identifying supply side factors which include health system factors and elements outside health system that can influence health system to function properly is very essential to know whether the existing system is addressing supply side need. Similarly, recognizing demand side factors that influence people's individual needs, their perceived and real needs and enabling elements that help them to use health services, aid in proper planning of resources and services according to the demand side need (38). Gaps in either corner of supply or demand side affect the system and hence, those gaps should be addressed well with the help of evidenced based interventions in order to run programs smoothly and scale up the services. The same concept is true to primary health care system (10,38,39).

Given the existing disease burden in Nepal, it has been crucial to review national capacity and policy response to CVD in PHC and examine factors that influence utilization of PHC for CVD prevention and control in order to improve the situation (40–42). In addition, choosing this topic is also a response to the need mentioned and guided by, the recent study done in Nepal, on uptake of NCD services from the health care providers perspective (43). Hence, this study will contribute to an understanding of present context on both demand and supply side variables and supports planners to update national policy mandate. Results will also contribute to the limited present insight on utilization of services for CVD in Nepal and enrich the existing knowledge among stakeholders, which directly helps this integration process.

2.2 Research questions

This study aims to answer the following four research questions:

1. How are supply side factors (health system factors and elements outside health system) influencing population to use PHC for CVD prevention and control in Nepal?
2. How are demand side factors (people's individual characteristics, their need, social context and enabling determinants) interplaying with each other to influence people to use PHC for CVD prevention and control in Nepal?

3. What are the best practices undertaken in other low and middle-income countries (LMICs) to enhance utilization of PHC in their countries for CVD prevention and control?
4. What recommendation can be given to MOHP and other stakeholders based on findings?

2.3 Objectives

2.3.1 General objective

The objective of the study is to explore the factors influencing utilization of primary health care for CVD prevention and control in Nepal, in order to make recommendation to Ministry of Health and Population and all other important stakeholders based on findings.

2.3.2 Specific objectives

- To identify and analyze supply side factors (health system factors and elements outside health system) that influence utilization of PHC for CVD prevention and control in Nepal
- To examine and analyze demand side factors (predisposing factors, perceived and real needs of people and enabling factors) that influence utilization of PHC for CVD prevention and control in Nepal
- To review evidence based best practices that are undertaken by LMICs to enhance utilization of PHC for CVD prevention and control
- To make appropriate recommendations based on findings to MOHP, Nepal and all other important stakeholders

2.4 Methodology

2.4.1 Study method

The study was a literature review based on published articles and gray literatures. PubMed, VU library and Google Scholar were used to find published articles, while gray literatures (conferences papers, reports, policy documents) were assessed through google and websites of various institutions (MOHP, UN, WHO, FAO, World Bank, NPC, NHRC, DoHS and CBS). Literature review was carried out in 5 steps, by: a) Identifying the research question b) Searching relevant studies c) Selecting studies among them d) Charting of data and e) Assembling, summarizing, and reporting findings.

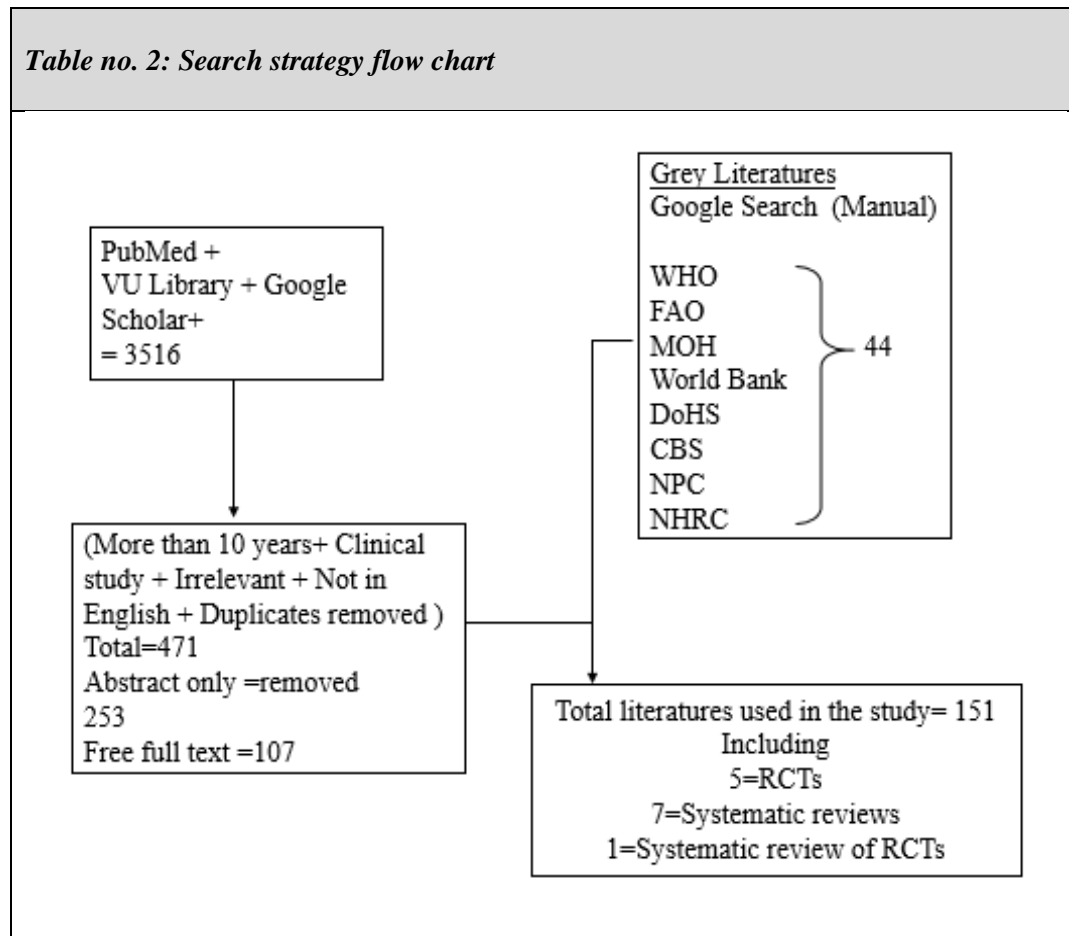
2.4.2 Search strategy and Key words

Literatures for the study were searched from various sources indicated above by using keywords. Details on keywords, that were used for the study is shown in table no. 6 in annex.

Keywords were used in dual or in multiple combinations of the different subjects from 1 to 12 as mentioned in the table with connectives 'OR' or 'AND' or asterisk '*' for e.g. prevent*, cardio*, etc. (that covers possible words like preventable, preventive, prevention, cardiac, cardiovascular, etc.) to get the desired articles. Title and abstract [Ti/Ab], Title [Ti], [All fields] and [MeSH] terms (in PubMed) were searched. Some examples of search combination are shown in the same table that is attached in annex. More details are available on request.

2.4.3 Search strategy flow chart

The process of selection of articles is shown below.



2.4.4 Inclusion and exclusion criteria

Published articles relevant to the subject from January 2007 to July 2017 were used in the study. The literatures that contain keywords either in the title or in the abstract were included in the study. Only the articles from Nepal and other LMICs (for evidence based best practices) were included in the study. They had to be published in English or Nepali. Clinical studies and articles with only abstract were excluded.

2.4.5 Methodological limitations

The specific studies related to CVD and PHC were very limited in Nepal. Most of the guidelines and policy documents address CVD through overall NCDs package. So, data and information were extracted from these documents in the context of CVD. This study was a quick review, done in limited time frame. The findings only facilitate further research. This has limitation on generalization. Only the public PHC facilities are discussed in the study.

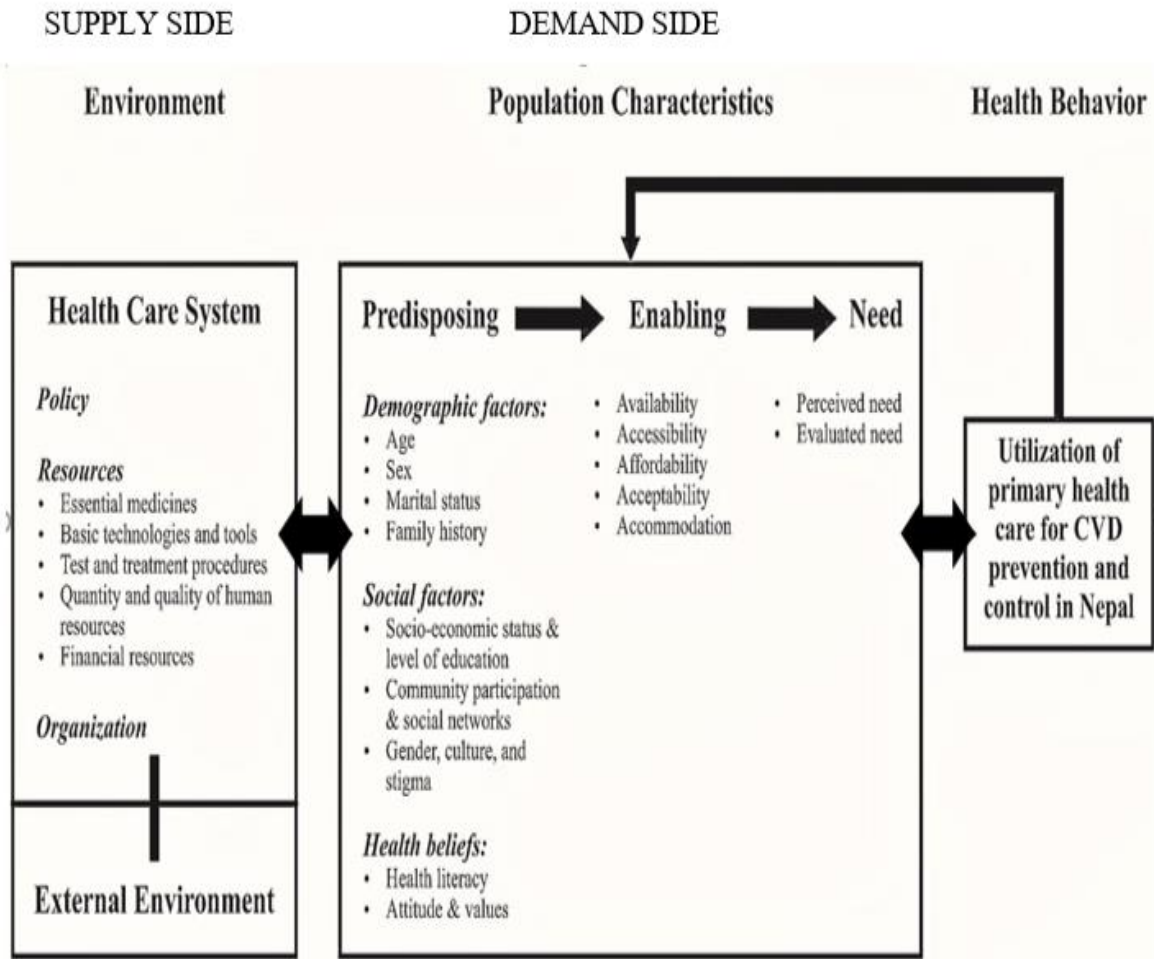
2.4.6 Conceptual framework

Various conceptual frameworks related to health service utilization and social determinants of health were reviewed. Socio-ecological model used by CDC for health promotion and primary prevention, Health belief model by Sheeran-1996 with demographic and psychological variables, Peter-2008 model for access barriers, Anderson and Newman model and Anderson model for service utilization, it's multiple iterations (1970, 1983, 1990, 1995 and 2005) were studied. Most recent model is the 6th iteration and applied in the studies of United States health care system.

Anderson-1995, framework was found to be most suitable for this study (38). It includes both demand side factors and supply side variables interconnected with each other that influence utilization of health services which is in line with study objectives. However, few modifications were done. Last part of the model and personal health practices in health behavior section were removed. It was out of the scope of this study. This activity is clearly supported by the theoretical details given by Anderson (38). From literatures, it was found that family history is very important aspect in cardiovascular study and so it is added. This is also supported by upcoming 7th iteration of this model. The generic version of this model is attached in annex. The modified model used in the study is shown below in the figure no. 5.

Use of services by people depends on wider environmental dimension of both health and outside health system variables like resources, policies, organization, political environment, physical environment and wider economic context (38). Similarly, predisposing factors of people like age, education, gender, socio-economic status, family history etc., enabling factors like accessibility, affordability, availability of services, acceptability and accommodation; all play the role. Lastly, the need factors which include both perceived need of the client and the evaluated need are important aspects that influence peoples' health behavior. These predisposing factors, enabling factors and need factors are called population characteristics by the model (38). Ultimately, model describes utilization as "health behavior" of people which is the core interest of this study. Figure no. 5 shows the conceptual framework used in this study:

Figure no. 5: Conceptual framework; the adapted version of Anderson et al. 1995



CHAPTER THREE: FINDINGS ON SUPPLY SIDE FACTORS

This chapter examined the first objective with the help of conceptual framework used in this study. Health system factors (policies, resources, organization) and elements outside health system (external environment) are presented below.

3.1 Health System Factors

3.1.1 Policies

Major policy concerns related to CVD are mentioned below.

National Health Policy – 2014

Nepal has a new National Health Policy-2014, which is focused on strengthening PHC and decentralizing health sector in order to increase access among general population. Policy has a plan to increase access to healthcare by adding facilities at a maximum distance of 30 minutes from village all over Nepal (44).

Basic essential health services (emergency and inpatient services) are free up to the district hospitals for target groups (poor, helpless people, senior citizen, disabled people and FCHVs) and free to all citizens at the health post (44). Policy has supported certain chronic disease curative services through chronic disease support program which includes CVD (6). Among estimated total population, government reported 73.40% of people used free health OPD services last year (6).

However, literature mentioned inequity in access of such services. In a study, very few (8.4%) of people among marginalized groups who seek care, got free services. Such services are often poorly monitored and misused by staffs resulting in unavailability to target groups (45). People should go through a lot of administrative procedures and validation before getting free service which has further decreased utilization (43).

Multi-Sectoral Action Plan (MSAP) for NCD (2014-2020)

CVD was not high in the agenda before. CVD received attention in Nepal after endorsement of MSAP in 2013 (7). The plan came with aim to reduce the burden of NCDs through prevention and control. It has addressed prevention and control of major risk factors of NCDs including CVD in-line with WHO-“Best Buys” (7).

But, the targeted time frame and some programs in MSAP are not corresponding to each other (7). For e.g. Helping people who are interested to stop smoking is targeted for 2020, while BCC message from NHEICC/focal point started at 2015 (7). The program implementation of MSAP looks slow and it lacks focus on vulnerable groups like adolescents (7,46). Most of the indicators were set without a baseline data; which has implications on progress monitoring (7).

The action plan has following initiatives on CVD prevention and control:

Policies on tobacco control

Nepal has ratified Framework Convention on Tobacco Control (FCTC) and implemented Tobacco Products Act 2011. Smoking was banned in public places since 1992 (7). More than 90% (in Nepal) display of anti-tobacco message on tobacco packaging and banned advertising, sponsorship and promotion is in place (47). To add, Nepal is the first country in implementing “Health Tax” in South East Asian Region (SEAR) (48).

However, tax collection is poor (4). Increase in “tobacco-product tax” is not steady each year. Nepal has no uniform tax on different tobacco brands (e.g. like in Vietnam, Mexico) and budget available for “MPOWER” (monitor, protect, offer, warn, enforce and raise) implementation is stated as insufficient (48)(49). Nepal lacks trained teachers/physicians and cessation centers to help people quit smoking (48).

Policies on reduction of harmful use of alcohol

Advertisement of alcohol in radio and television was banned from 1999. Later in 2001, new provisions were made on alcohol sale, distribution and consumption (7). Awareness programs, media messages, prohibition on drink-driving, breath testing by traffic police, cessation of driving licenses upon violation of drink-driving rules, taxation of alcoholic products and restriction on uncontrolled alcoholic behavior in the community is actively under practice (7,50). In addition, recently in February 2017, government proposed new National Policy on alcohol regulation and control (51). Also, some targets in MSAP like enforcement are set for 2020, but Nepal has implemented many activities related to it already (7).

Policies on increasing healthy diet and physical activity

Department of Food Technology and Quality Control (DFTQC) is in place. Nepal has regulation related to sale of animal products and pesticides (7). However, there is no any national operational guideline on increasing healthy diet and physical activity (52). Only few activities were done related to food marketing for children, salt consumption by population and reduction of trans-fat/saturated fatty acid (43,52). For instance, India and China has already started activities on decreasing salt consumption but Nepal hasn't (52).

3.1.2 Resources

Resources that are needed to run cardiovascular services in PHC according to WHO are: essential medicines, basic technologies and tools, test and treatment procedures, quantity and quality of human resources and finance as presented below (3).

Essential medicines

Government has been supplying list of basic essential drugs, free of cost in health post, PHC centers and district hospitals (6). In 2016, in response to growing NCDs burden, it has decided to add NCD related drugs in the list of 70 free essential drugs for PHC. Drugs according to WHO core list are also in national list of essential medicines as available drugs since 2009 (3,53). Please refer to table no. 3 for the core list.

Source: (3)

Table no. 3: Core list of basic medicines required for essential CVD interventions in PHC according to WHO protocol

Thiazide diuretic, Calcium channel blocker (Amlodipine), Beta-blocker, ACE inhibitor, Statin, Insulin, Metformin, Glibenclamide, Isosorbide dinitrate, Glyceryl trinitrate, Furosemide, Spironolactone, Aspirin, Paracetamol, Ibuprofen, Morphine, Epinephrine, Heparin, Diazepam, Dextrose Infusion, Glucose Injectable Solution, Sodium Chloride Infusion and Oxygen

However, study shows poor management, low availability of these drugs in health post and PHC centers (6). WHO capacity assessment of Nepalese PHC in 2015 and 2013 also reported that there was critical deficit of essential CVD drugs. Even some important drugs (Aspirin, Statins, CC blockers, ACE inhibitors) that were present in 2013 were reported as not available in 2015, showing the deteriorating situation (54).

Inequity in supply of drugs, frequent stock outs, lack of good recording and reporting system, issues on sustainability, lack of monitoring and supervision, lack of trained health workers in rational use of drugs and problems on quality of drugs were mentioned as challenges (55,56). Due to these problems in drugs, addition of NCD drugs is also facing debates on sustainability and effectiveness in patient care (55).

Basic technologies and tools

The following basic instruments and tools should be available in PHC for essential CVD interventions:

Source: (3).

Table no. 4: List of basic instruments and tools that should be available in PHC according to WHO protocol

Basic instruments: Thermometer, Stethoscope, Blood pressure measurement device, Measurement tape, Weighing machine, Glucometer, Blood glucose test strips, Urine protein test strips & Urine ketones test strips

Tools: Risk prediction chart, evidence based clinical protocols, flow chart with referral criteria, patient clinical record, medical information register and audit tools

These instruments were available in majority of PHC (57). But, there were no any evidence based clinical protocol and tools for CVD intervention in PHC in Nepal (58,59).

Large number of Nepalese, seem to prefer use of technology in treatment nowadays (60). New simple technologies like Electronic diagnostic algorithms (e-algo); that was once studied on clients with chronic disease in Nepal, also often rely on values of blood pressure, blood glucose,

blood cholesterol etc. primarily. Availability of above mentioned basic technologies and tools also affect promotion of such modern technologies in treatment and may affect utilization (60).

Tests and treatment procedures

Regarding tests, most of them were available in PHC. However, CVD risk stratification to identify high risk clients in PHC was not available in more than 50% of PHC facilities. Similarly, there was no any provision of community based palliative care for chronic CVD.

Study mentioned, lack of free screening activities for CVD in PHC resulting in low utilization (43). A qualitative study done on health providers mentioned that:

[“There is no well-equipped laboratory in rural settings”. “Patients are also scared of cost of lab test- this may start from 300NRS to even exceed 4000NRS” (43)]

The table no. 5 below shows the availability of CVD tests and procedures in Nepalese PHC.

Source: (61)

| <i>Table no. 5: Availability of CVD related tests and treatment procedures in PHC in a survey done by WHO in 2015</i> | |
|--|-----|
| Availability of diabetes testing (Blood glucose, OGTT) | Yes |
| Urine albumin test | Yes |
| Measurement of total cholesterol | Yes |
| Availability of CVD risk stratification in 50% or more PHC facilities | No |
| Management at higher level system | |
| General availability of coronary bypass (stenting) in public health system | Yes |
| General availability of thrombolytic therapy in public health system | No |
| Care of acute stroke and rehabilitation in 50% of public facilities | No |
| Palliative care in public health care system | |
| Availability of palliative care in community or home-based care | No |
| Availability of palliative care in PHC facility | Yes |
| Existence of evidence based CVD guideline for management of CVD through approach of PHC | No |

Quantity and quality of human resources

World Health Organization has identified Nepal as one of the 57 countries with serious deficit of human resources for health (62). Although, most of the human resources needed for the country are now produced within the country, maldistribution and retention has been the problem (63). Nepal has doctor to population ratio of 0.37/1,000 people (as low as 0.008 in rural district and 1.5/1,000 people in Kathmandu; the capital) (64). In total, it is 0.29 /1000 population among all health care providers (65).

[This is very less than recommended requirement of WHO of 2.3/1000 population (65)]

Around two-third staffs are working in urban areas, mostly in Kathmandu valley. This situation made peripheral PHC facilities run out of staffs (36,62). The use of cardiovascular services in PHC is also affected due to existing human resource challenges.

There is low motivation among health workers to retain in rural PHC. Situation improved after medical students' exposure to peripheral PHC during study period (66) (67). To solve the rural scarcity, Nepal started bonding on government sponsored medical students to work in rural areas for at least 2 years (68).

Moreover, out of total public health facilities, 73% facilities provide cardiovascular services. But, only around 5% health care providers had received training for cardiovascular services within 24 months prior to health facility survey in 2015 (57).

Study shows the poor patient-centered communication, inadequate knowledge, skills and capacity of PHC providers in chronic care and clinicians may not follow uniform CVD management guidelines (15,69,70). Community often perceive teaching hospitals as training hospitals which has, reduced trust among providers (71).

With all these, a study indicates that, female community health workers in Nepal have limited understanding on management of CVD but are very motivated to be involved in its management at PHC, if they are provided with basic training and skills (72).

Financial resources

PHC in Nepal is suffering from improper financial management (15). It is said that, for effective investment of health budget, the total health expenditure should be divided into different headings like prevention, promotion, cure and rehabilitation programs (73). But, such distinct separation of budget on different CVD activities is lacking (59).

However, according to annual reports 2014, 2015 and 2016, the recorded trends on total percentage of health sector budget were 5.89%, 5.42% and 5% respectively in 3 consecutive years (6,25,74). Only 23.70 % was allocated for PHC revitalization division, 2.15% for National Health Training Center and 1.47% for National Health Information, Education and Communication Center, out of total budget last year. To add,

[In the year-2016, NHTC and NHIECC spent only 86% and 56% of their district budget respectively (6)]

The funding sources for CVD are General Government Revenues, International Donors and Earmarked taxes (from alcohol, tobacco) (20). But, the exact contribution from each of these sources were not available. The earmarked tax is collected under "Health Tax Fund" (20). As fiscal interventions, government is imposing 30% tax on alcohol and tobacco but tax on high-salt foods is not yet started in Nepal. Subsidies for healthy foods and incentives on promoting healthy behavior like physical activity do not exist until today (59). Evidence shows no any low-income country has implemented subsidies on healthy food and intervention on saturated fat (1).

Like many chronic diseases, CVD and its treatment can impoverish people. For this, health insurance often protects people from such spending and increases people's access to health services (6). Many countries have started social health insurance policy (SHI), community health insurance schemes (CHI), as a part of social protection. Such schemes are meant to protect people from catastrophic expenditures. For e.g. Philippines, Thailand, Ghana, Vietnam & Rwanda (75). But, Nepal is not yet there. The SHI is just piloted (6).

3.1.3 Organization

Organizational aspects like accountability, coordination and management are the important areas that can have direct effect on available services and thus influencing people on whether or not to use those services. These are presented below:

As for accountability, Curative Services Division under Ministry of Health and Population, is undertaking the main responsibility for issues related to NCDs in Nepal although multiple sectors are responsible for its management. Under it, Primary Health Care Revitalization Division (PHCRD) of Department of Health Services (DoHS) is working for CVD management through Non-Communicable Diseases component; one in four components (76). The responsibility of non-communicable disease has been given to PHCRD division (74). However,

[There is no separate operational department in MOHP for NCDs (77)]

Oversee mechanism with a steering committee is in place for NCDs (7). For the surveillance, periodic risk factor surveys in every 5 years is recommended by WHO. However, steps survey was done in 2003, 2005, 2007 and 2013 which shows, it is not periodical. Sustained surveillance system for non-communicable diseases is yet to be established in Nepal (59). Vital/civil registration system has not been reliable and systematic for mortality by cause data (78). Also,

[Nepal doesn't have any evidence based national protocol for management of CVD through PHC approach (59)]

Package of essential non-communicable diseases (PEN) pilot programs are running in two districts; namely Kailali and Illam (6). In 2016, WHO has published “**HEARTS -Technical package for CVD management in PHC**”, with some additional components; which is focused on PHC that makes it more specific than PEN package (3,79). This guideline is targeted for low-resource settings like that of PEN package but it is yet to be introduced in Nepal.

No gatekeeping system exists until today resulting in over utilization of tertiary care centers and underutilization of primary care facilities (6). Formal referral forms and financial help for transportation during referral is available but lack of evidence based national protocol on CVD management and referral has affected quality care and timely access to services (80,81).

Community participation in supervision and monitoring activities of PHC is increasingly getting recognition in places where vertical inspection is not periodic but it is lacking in Nepal (15). Supervision and reporting on health promotional activities are even rare. As mentioned that,

[Health promotional activities that were carried out in a PHC suffered irregular and inconsistent supervision, reflecting a lack in strong leadership and community engagement (69)]

Inadequate research studies in CVDs have created dearth of evidences particular to the country and its context, which have influenced national plans and its implementation (7). Very few studies were found on CVD in relation to PHC in Nepal.

3.2 External environmental factors

Given the scenario of Nepal's geographical situation in the background section; supply of essential drugs, other necessary equipment, tools and retention of health workers have been

difficult to most of the rural PHC (42). Clients are facing problems in moving from one place to another while seeking care. Referral to district hospitals and PHC centers from health post and the community is even harder in rainy seasons when natural disasters like floods and landslides frequently blocks the already fragile roads (82). Only 41% of Mountain region, 56% of Hilly region and 70% of Terai region facilities have readiness for emergency transportation for clients (57). Physical infrastructures of many PHC facilities are poor and are even more destroyed due to devastating earthquake in 2015 (83).

Global economic prospects statistics stated, an estimated drop of GDP growth rate of Nepal from 6.0% in 2014 to 0.6% in 2016 due to devastating earthquake in 2015 (84). The trends on health sector budget from 2014 to 2016, shows the drop of health sector budget as shown previously in financial resources section (6,24,74). Also, in 2016, much of the donor money went to earthquake response resulting in lack of sufficient fund for CVD programs (6). Reporting, reimbursement of fund from donors, program approval and disbursement of “donor-non-release” fund due to different formats of bookkeeping of EDPs and inadequate manpower with financial skills influenced economic activities (6).

Factors related to politics and governance has influenced CVD services in PHC (7,15,85,86). Elements like: irresponsive system with its low accountability, poor domestic growth, improper resource allocation, imprudent management of donor money/aid and transparency in Nepal have affected healthcare and created hindrances on people’s access to health services (85,86). On top of that, absence of effective leadership for the community due to frequent shift of local elections, has affected PHC development in Nepal (15).

CHAPTER FOUR: FINDINGS ON DEMAND SIDE FACTORS

This chapter presents the findings on the second objective. It covers predisposing factors, enabling factors and need factors.

4.1 Predisposing factors

4.1.1 Demographic factors

This section examined role of sex, marital status and family history of clients.

Age

Different age groups of people need different types of CVD services (87,88). The need of curative health services rises as people grow older due to disease condition (29). However, young and middle-aged people need more preventive, and screening services for CVD in order to prevent them from developing disease and detect timely the risk factors (89).

Older people in Nepal were using more curative services because of their disease condition but most of them go for private facilities (90,91). Although having peripheral hospitals nearby, most of them travel to central cities for CVD services (92). Studies have reported perceived low quality, lack of trust, unavailability of services and ignorance as major reasons for not using public PHC services (90,93). Use of traditional healer's services was also common among older age groups (94). Relatively, older people have less income in Nepal and they believe that traditional healers are cheaper (90). Details on attitude and belief of people is presented in health belief section.

Similarly, young and middle-aged people less often used PHC for prevention, promotion and screening of CVD. Lack of awareness, unavailability of screening and counselling facilities, perceived stigma towards harmful habits, low perceived need, risk-taking attitude of young people, lack of time and short opening hours were major drivers behind low uptake in this age group (40,95–97).

Sex

Males suffer more from CVD than females in Nepal (28). In general, it is seen that, males use more consultation services (i.e. 89%) than females (123). However, no any evidences were found on being born as a male or a female as such, and having association between uptake of PHC for CVD in Nepal and LMICs; except some explanation on hypertension during pregnancy due to changes in biology of a woman and use of services (98).

Marital status

A study done on CVD patients mentioned that, use of PHC became easier after they got married. The financial support from partner helped them to access health care (87). However, no more evidences were found in this matter during the search. The more extended search may find some articles.

Family history

Perceived severity of disease is found high among those who have family history (38,87,99,100). Its genetic transferability increases perception of severity of disease. Once people are aware that behavior modification helps to decrease progression of disease, it motivates them to adopt healthy lifestyle (87,101).

4.1.2 Social Factors

Social factors cover socio-economic status of clients, education level, community participation, social networks, gender, culture and stigma.

Socio-economic status and level of education

Low socio-economic status, education level of clients and access to health services are usually interlinked (38). Low level of education and low-socioeconomic status have negatively influenced uptake of CVD services in PHC. More than 50% people who present late than the date of appointment in the health facility, or who missed follow up care were illiterate and poor clients (Baseline: Nepal constitutes 65% literate people and 25.2% people live under poverty line) (19,21,80).

Example available from alcohol users (risk factor of CVD) mentioned; people with high socioeconomic class are utilizing professional alcohol counselling service more in the community. Seeking advice and enrolling in such treatment facility were high among educated and high-income users (95). Study also shows that illiterate (46.3%) and low-income people (76.3%) are increasingly the alcohol drinkers (47.8%) in Nepal (102). **Other CVD related services other than counselling, may have similar findings; but this result should be taken with caution.**

Community participation and social networks

Access to health care has been influenced by the participation of community people in health-related activities in Nepal (13). Involving community members in planning and decision-making process has increased utilization of PHC in other services like maternal health, family planning and newborn care in Nepal (103).

Now, the current global agenda of integration of chronic care with maternal and other services in PHC gives a common ground for comprehensive management of different diseases together which is also applicable to community participation for CVD (7,104). A study done on NCDs in Nepal mentioned, importance of involving teachers & local leaders for health promotion (43).

Also, the social support and networks have positively influenced the use of services by people in the country (95,105–107). The social networks help people in financial arrangement, emotional support & emergency transportation when needed. It motivates people to seek treatment and change unhealthy behaviors (smoking, drinking, eating unhealthy foods) which can increase access and utilization of health services (108,109).

Such support has been weaker recently, affecting people's health and access to healthcare (106). Family structures have been changed recently from joint family to nuclear ones and from nuclear to living at their own. This has changed family cohesion and social support system making people isolated (106). People are more likely to seek health services when they are living with family in comparison to the situation where they live alone. This is also true in chronic care like CVD among older citizens and prevention / screening / rehabilitation services among younger and middle age groups (95,106,107). In this sense, social support and family networks are influencers in utilization of PHC for CVD in Nepal.

Gender, culture (beliefs, norms, taboos and practices) and stigma

Different gender roles as assigned by the societies, existing cultural practices and stigma are found to be the influencers in use of CVD services in PHC in Nepal. This has been shown by the number of evidences mentioned below.

Nepal being a country with patriarchal society, males are given preferences to utilize services in PHC (110,111). In fact, males are utilizing health services (89.4%) more, as previously said. Females, seek services late in health care facility due to their gender roles and responsibilities in households. Rearing and caring children, cooking, cleaning including professional work outside makes them busy and unable to seek care timely (105,107).

Also, some families restrict females to seek health services in facility in order to prevent them from exposure to male health care providers which is an example of gender discrimination in utilization of health services (86,105,107,111–113). Participation of females in professional alcohol rehabilitative service is quite low. Despite of having high remarkable number of female drinkers (7.1% out of total drinkers i.e.17.4%), who are willing to be involved in such programs, there is lack of formal channel to involve both males and females in such services in public primary health sectors (95).

Communities at large, implement home remedies for CVDs like drinking juice of “Bitter Gourd”, “Aloe Vera”, escaping meals in the evening and taking “Cold Showers” for lowering blood pressure (70,72,114). These have strong cultural component to it. Obese children are often considered “sign of wealth” and as “healthy children” in different cultures in Nepal. Such socio-cultural beliefs have influenced uptake of health promotion activities in Nepalese society (72,115). Some families are accultured in drinking alcohol (risk factor of CVD) as a part of their tradition. So, seeking professional alcohol service for counselling and participating in health promotional activities by such groups of people in PHC is highly unlikely unless specifically targeted to them (95).

The existence of stigma influences access to health care for CVD prevention and control (116). In the detoxification and rehabilitation services, stigma among female service users has influenced their participation. The study reported their negligible involvement instead of having increasing number of female drinkers and smokers (95). Social stigma has also affected teens in use of health services. Even though teens are willing to be involved in health promotional activities, society often treats them in a judgmental way that makes them hesitant to go for it (95).

4.1.3 Health beliefs

Health beliefs talk about health literacy, attitude and values of client towards health services and health care providers.

Health literacy

Knowledge among clients about the available services in the health facilities, their understanding of the diseases and its complications, awareness programs in the community, effective communication between service providers and the clients, are all health literacy parameters that influence clients to either use or not to use services in PHC in Nepal (64).

Those people who have knowledge and are aware of importance of healthy diet, exercise, regular blood pressure screening, weight control, harmful effects of smoking and alcohol in CVD are more likely to be health conscious and adopt preventive measures to avoid the disease

(117). Also, those who are already on medications are more likely to adhere to treatment regimen if provided with adequate knowledge (16,87,118).

Health literacy has a potential role on NCDs in the country (43). Improving health literacy has benefits not only on clients at their individual level but also towards their wider social context and has positive implications on service utilization and health outcomes of people (64). Number of other literatures have identified similar role of health literacy with regard to chronic disease like CVD (14,70,72,87,119).

Attitudes and values

Client's attitude towards curative services are more emergent in nature and people perceive it as a threat/ a real need (87,101). Such different attitudes towards type of CVD services influence people to use PHC differently in Nepal. Use of curative services for CVD are higher in PHC than that of preventive services like screening and counselling (6).

Study found that people were having less trust towards allopathic medicine and so they were using services from traditional healers (120). They believed services in PHC are costly in comparison to services offered by traditional healers. Also, many people seek services in private facilities even though they are far from them than government PHC with a preexisting thought that services in public health facilities are poor (94).

4.2 Enabling factors

Although having services from the supply side, there can be certain barriers from demand side that influence people's access to use of CVD services. Availability, accessibility, affordability, acceptability and accommodation factors are reviewed here.

Availability

The availability of CVD related services in PHC is an important factor that influence PHC in Nepal. Talking about services in general, evidence mentioned that, one hospital serves 168,000 clients, one hospital bed is entitled to 4,000 clients in rural area, one physician for 92,000 clients and one health post is serving every 24,000 rural clients. This shows the shortage of human resources in Nepal, especially in rural areas (35).

Due to lack of drugs, none of the 118 participants received free anti-hypertensive drugs from PHC (70). Lack of availability of proper information and advice from health care providers on follow-up visit, eventually decreased follow up and increased irregularities on utilization of CVD services (70,110). Another reason for low use of government primary health services by people was unavailability of staffs (19%) in PHC centers (110). Availability of rehabilitation centers is also very limited in peripheral primary health facilities as explained by clients which has influenced service utilization (95).

Availability of healthy fruits and vegetables, low salt in instant foods, enough parks and clean open places to jog and exercise (usually in cities), bicycling lanes, regularity of screening services and out-reach clinics and youth friendly counselling services for youngsters to quit alcohol and smoking are rare (14,121–124).

Accessibility

Access and utilization of PHC for quality services were affected by distance. The clients from village with health facility within 2 km, exhibited higher utilization of PHC i.e. 48% in contrast to the other village outside 2 km, where only 21% of clients utilized PHC (125). About 22% of

the clients in the study did not use government PHC due to inaccessible distance and negligible patients went for follow-up in PHC centers due to distance (110).

Affordability

A study in Kathmandu reported no participants mentioning cost of medicine and follow up services as a financial barrier for treatment of hypertension in PHC (70). However, another study, 7% of clients in the study mentioned that money affected access to health care (110). Three studies mentioned financial barrier among clients as a major factor for low utilization of health care (94,114,126). Clients presented late in facility due to financial constraints. It affected transportation arrangement, management of medications and admission procedures resulting in 14% mortality among those clients who need referral services (80).

People don't go for follow up visit for NCDs due to lack of money (43). Although few services and drugs are free, even the transportation and other medicine costs are unaffordable; making people not to use medication at all and use self-medication at home. Not a surprise that,

[Some even use expired prescriptions from previous PHC visits- that were done long ago and buy drugs without consultation from locally reachable drug sellers (43)]

Acceptability

Perceived good quality of services, community engagement in CVD services, patient-centered communication, existence of feedback mechanism is likely to be positive influencers that increase acceptability of service and promote utilization of PHC (15,69,70,127).

There are no any formal channels that look after client's feedback and complaints. Instead, clients often express dissatisfaction verbally to staffs and it ends there only. Clients being unaware of the entitlement of services and absence of proper feedback mechanism with systematic complaints record system, were major identified reasons to this broken linkage between health system and the community; thereby resulting in low quality of care (40).

Also, perceived quality influences acceptability of services among clients, which finally, determines utilization of PHC. In a study, client's perception towards care provided to them by nurses were positive. This has increased acceptability of nursing service among clients in those hospitals (127).

Accommodation

Long waiting time in the facility makes clients reluctant to continue follow-up visit which is an essential component of chronic non-communicable disease management (70). Short opening hours of health facilities, limited number of staffs and their frequent absence have demotivated clients to use PHC (Gurung et al.2016).

4.3 Need factors

There are two types of need that influence service utilization. They are perceived need and evaluated need as mentioned below.

Perceived need (Need of health services viewed by clients)

Client's perceived need for seeking CVD services arises from their perceived severity of illness caused by the disease (38). Having seen someone in family who has/had disease or having had

the disease by themselves can influence perception of people towards illness and services. Once they have someone in the family who has disease, other members will be aware of disease and are more likely to follow lifestyle advices (128). Usually, perceived need for preventive services are lower than that of curative services for CVD in Nepal (87).

A study done on clients who are hypertensive, showed that out of 118 participants, only 2 of them visited PHC to seek advice (70). As CVD in early stages seems usually asymptomatic, clients often present in late stage with severe symptoms (3,43). Presence of severe symptoms increases their perceived severity and so, utilization of services is high (101).

Evaluated need (Need of health services to clients based on assessment and judgement of health professionals)

According to Anderson 1995, standard guidelines and protocols on the subject, govern the judgement of health care providers for the need of certain health services to the clients after assessment. People utilize health services when there is evaluated need after assessed by health professionals (38).

But CVD prevention and control has to do with both high-risk approach (secondary and tertiary prevention: after the occurrence of disease) and blanket approach (primary prevention like: lifestyle modification/physical exercise, healthy diet, etc.) where all the people whether healthy or sick have the need to use services either preventive or curative (129) .

However, utilization of PHC for CVD services is seen high among those clients in Nepal who have already developed CVD symptoms and need higher level of care than others (87). No evidences were found in regard to concept of evaluated need in preventive CVD services.

CHAPTER FIVE: FINDINGS ON EVIDENCE BASED BEST PRACTICES IN LMICS

There were enough evidences in high income countries (HICs) like Australia, Canada and UK on best practices to increase utilization of PHC for CVD services. There were examples for monetary incentives for health providers for health promotion services, phone reminders, multiple screening, after hour service etc. (shown in table no. 7: annex). But very few evidence based best practices were found for uptake of PHC for CVD in LMICs. Those that were found are presented here.

5.1 Evidence based best practices targeted on supply side factors

5.1.1 Human Resources

a. Task shifting (In response to problem of retention and maldistribution)

Task shifting has been tried successfully in other programs like HIV, TB & Maternal Health in many developing countries like Sub-Saharan Africa (SSA), Nepal (130–132). The increasing burden of CVD in developing countries have created an extra demand of health workforce to tackle it. Many countries lack adequate human resources(133). Considering the already existing shortage, LMICs have tried shifting some clinical work of doctors to non-physician clinicians (NPC) like nurses, community health volunteers and other paramedics (134–136). Now it has been taken as a feasible as well as a cost-effective option (137). Even with less specialization; given certain trainings, NPC can carry out responsibilities effectively (138). The health promotion activities for CVD, counselling, screening, communication and self-care, handling follow-up visits; can be done effectively by NPC (135). In Ethiopia, NPC were given some training beforehand, and kept under constant supervision of higher staffs. The difficult cases were solved by consulting with senior staff in the facility (139).

An RCT done in China and Nigeria for task shifting on CVD suggest it as a strategy that LMICs have to implement without delay to address emerging CVD epidemic (135,140). Cluster -RCT was done in China and Nigeria for 12 months. Result was decrease in systolic BP among patients in two intervention sites: site A ($P<0.0001$) and site B ($p<0.0002$) than among patients in control group.

Remarks

This study had some limitations. The health care providers had received training in taking BP in control site and patient in intervention side knew about healthy diet before trial thereby; adding possibility of overreporting. However, this study was done in large scale, in LMICs by WHO. Result was significant. Many socio-demographic characteristics of Chinese match with Nepalese. So, could be a feasible option to Nepal. But, NPC should be under supervision and their work load should be monitored.

b. Training (In response to problem of production and skill)

Many health care workers lack skills to manage CVD in PHC (138). For that, giving training to them is a good option. Evidence from Africa shows, NCDs training can also be given as a refresher course to those staff who have recently graduated so that they can handle such cases efficiently (138,141). Countries have incorporated re-training into their interventions like in

Cameroon (141). As said, training should be a continuous process; also known as “Train and Retrain”. Such ongoing training makes every new staff trained on NCDs management by the time they come to work and makes them capable of delivering services at their start even though the staff turnover rate is high (138).

As an evidence, there are successful examples on Nurse-led PHC for non-communicable diseases in resource-poor settings (141,142). The example from Cameroon, where nurses were trained in NCD management in PHC handled the cases well as shown by coverage. The intervention was effective and uptake of PHC was high (142).

Remarks

This example from LMICs (Cameroon) where access was increased to 68.5%; can be piloted in Nepal. Nepal has the similar scenario in human resource and adding responsibility to health workers (e.g. nurses) by giving special training was already successful in maternal health programs in Nepal.

c) Use of technology in task shifting

Although medical field should not solely rely on technology, some form of simplified technology can assist community health workers in effective screening of high risk cases (143). Evidence shows improved quality of care in India and China, when involved community health workers by giving them assisted technology in cardiovascular care in PHC. This study, also called “SIM-Card Trial” i.e. “Simplified Cardiovascular” management shows, the feasibility of using non-physician workers in low resource settings with the help of simple technology (144).

Here, the community health workers were provided with mobile application on smartphones, for simple cardiac support and decision making which increased service uptake and improved health outcomes (144). A cluster-RCT was done for one year in 47 villages. High risk cases for CVD were study participants. CHW used mobile-app in intervention group and result showed 25.5% ($p<0.001$) net rise in reporting on use of anti-HTN medication in comparison to control group and also, BP dropped by 2.7 mm of Hg ($p=0.04$) showing possibility to task-shift with simple technology (144).

Remarks

Although looks like a feasible option, may not be easy to use in Nepal, as many FCHVs are of the age over 50 with only basic education and not so friendly with use of mobile applications. In addition, mobile networks in rural areas are poor.

5.1.2 Essential medicines

a) Supervision visits for drugs

Randomized control trial (RCT) was done in Zimbabwe, for supervision visit twice in 3 months period. Stock management and adherence to standard treatment guidelines were supervised in two different groups. Before the study, staffs were trained on stock management and adherence to standard treatment guidelines for each of the two groups respectively. The third (control) group didn't receive any supervision. Results in 12 months duration show significant improvement in multiple indicators of stock management and availability of medications in

first-stock management group(145). This shows training and supervision on stock management improves the availability of drugs and other stock management indicators.

b) Community directed interventions (CDIs)

Study conducted in two-years' time in two groups in seven sites of research [from Cameroon, Uganda and Nigeria] mentioned increased coverage of patients and availability of drugs in intervention group after the introduction of community directed interventions (CDIs). The similar result was shown by the study in Tanzania (146). In this program, members of the community, health facilities and partner organizations have a participatory meeting for making decisions on matters related to supply of drugs, its accountability, oversee mechanisms, monitoring, reporting and feedback to make drugs available to health facilities (145,147).

Remarks

This is an example from general essential drug management. **“It is not specific to CVD drugs”**. This search couldn't find any intervention studies done on CVD drug management in PHC in LMICs. May be more broad keywords can find literatures on it. Could not say much about this example on using it in CVD management in Nepal.

5.1.3 Monitoring and maintaining data registries

Monitoring and data management go hand in hand. In a PHC, UNRWA/ Jordan, quarterly cohort monitoring was done based on reports and cumulative case findings of hypertensive clients for a year. The report mentioned total of 4,130 patients were registered in the system. Out of which, 76% were retained. Nearly a quarter, (21%) did not attend facility and the remaining either died or lost to follow up. Study highlighted the findings of low performance of health workers in measurement of blood pressure. It equally showed that, as high as 8 to 15% hypertensive patients were diagnosed as having heart disease and stroke. This monitoring also facilitated in finding new advanced cases. It helped in proper planning and management of diseases, future need of trainings for health workers and estimating resources like: drugs, tests and equipment (148). Hence, effective monitoring can check many aspects and improves services in PHC which has implication on utilization.

Maintaining data registries is very essential in CVD management through PHC (136). Lack of proper recording and reporting framework has also influenced monitoring of CVD programs (148). India started its first P-India Quality Improvement program (PIQIP) registry for CVD out-patient department, in 2011. Evidence shows, establishing such registries and collecting data are quite helpful in estimating burden, quality assessment of services provided to clients and its associated barriers to do so. Data were collected from OPD cards of clients which explored less use of evidenced based medicines by doctors in high risk clients. Such under reporting in documentation can result in improper planning of treatment and resources. Study mentioned feasibility of establishing such registration and collect data for quality improvement of health services in low income setting which influence service utilization (149).

Remarks

Jordan: BP was not controlled, attendance was not high but performance of staff was improved and case load was detected early & possible complications were reduced.

India: Although data collection was difficult due to duplication of cards in each OPD visits, the study managed this barrier by having the option to scan OPD cards and keeping records of

cards. As these examples were more specific to CVD and study was effectively done in LMICs, Nepal can try this option. Also, characteristics of people in India and scenario of high volume OPD visits can be compared with Nepal as these things are somehow similar.

5.2 Evidence based best practices targeted on demand side factors

5.2.1 Enabling factor

(Community based interventions)

Health promotion and screening

Intervention trials were conducted in New Delhi-India and West Java- Indonesia by increasing health promotion and screening through health education campaigns and set-up clinics (150,151). This intervention was a combine program of community groups, facilitated by academic institution and WHO. This was a large intervention carried out by engaging with stakeholders, training volunteers and teachers, conducting advocacy programs, carrying out camps for risk assessment and programs for communication. Evaluation was done based on baseline standardized- NCD risk survey. Participation of people in health facility was limited before the intervention. However, results after intervention showed 25% program -reach among population in India while 32% in Indonesia. The health system interventions helped to increase diagnosis and risk modification along with the involvement of community.

Remarks

But, this study highlighted the fact that community based interventions cannot be solely run by community volunteers. For sustainability, technical support is needed from a credible institute. Also, community ownership, sustained political and administrative commitment, capacity to intervene and resources are needed for services to be effective and increase utilization (151). This example from India and Indonesia is a large-scale study done by a credible institute. Study characteristics matches with Nepal. This seems feasible to be piloted in Nepal.

CHAPTER SIX: DISCUSSION

Literature review identified some major factors that can potentially influence utilization of PHC for CVD prevention and control in Nepal. The key findings are discussed below. Evidenced based best practices that looks feasible to Nepal in previous chapter are discussed here.

6.1 Supply side factors

Policy

Having Multi-Sectoral Action Plan, National Health Policy, Free Health Policy, newly proposed Alcohol Policy-2017 and activities like FCTC ratification, have reflected active interest of government in NCDs currently. Having national commitment seems a good sign for CVD programs and uptake of PHC in Nepal. Ongoing PEN piloting looks like a good start. To add, WHO- “HEARTS” guideline for CVD management in PHC could possibly give further directions on program implementation of CVD in PHC.

In contrast, from the example of free health services, it can be seen that, the policy which lacks strong monitoring during its implementation may not be effective. Further, such gaps may even make the situation worse. Formal regulatory mechanism, with less complicated paper works, perhaps by using some identification to provide free services may be beneficial to the target group. Also, lack of awareness could be the reason behind low use of free health services by the targeted people.

MSAP ends in 2020 and it is already the half way. The slower implementation could be due to devastating earthquake in 2015, which diverted the focus area. Also, possibly because the action plan has multiple areas to work on with less clear focus, within limited time. Having target set for 2025, without clear focus areas and some indicators in absence of baseline, make this plan looks like an ambitious and vague document.

Example from alcohol and tobacco give a sense that enforcement of strict rule in harmful practices are more likely to succeed in Nepal. Similar approach may help in tax collection, too. Healthy diet and exercise related concerns are not getting needed attention. Possibly, the planners and even advocators are more diverted to other issues. Examples from neighboring countries China and India; on salt reduction plan could reorient them.

Resources

Results show critical scarcity of five key resources in PHC for CVD in Nepal. This has negatively influenced uptake.

Essential medicines

Reasons mentioned in findings could be the cause of unavailability of essential medicines. But this may not always be the case. At times, geographical condition of Nepal and natural disasters can bring unforeseen situation in procurement, storage & transportation, making logistics supply harder; which is very common in Nepal.

As said, there is lack of trained manpower in stock management, future estimation of stock outs can have errors and number of drugs supplied according to calculation for months may finish before time. Countries like Zimbabwe, Cameroon, Uganda, Nigeria, India faced similar challenges in drugs (145,147). India and Zimbabwe tried training of staffs but the program did not sustain. However, supervision visits and community directed interventions as discussed in previous chapter, improved stock management significantly in Zimbabwe and coverage in Nigeria, Uganda and Cameroon. But, evidences are lacking on essential NCD drugs. Whether or not; the strategies applied to general drugs, could also work for CVD drugs in Nepal; is still a mystery.

Basic Technologies and tools

Lack of evidence based clinical protocols already reflected poor quality of CVD services in Nepal. Study done by Mendis et al. 2012 showed a number of other countries in LMICs with similar findings. Lack of such tools could be due to low knowledge of its use among health care providers. Most often, peripheral PHC lacks physician and the services are provided by either staff nurses, auxiliary nurse midwives or health assistants in Nepal, who usually have limited knowledge. Also, very less percentage of budget was allocated for NHTC. It seems hard to train everybody with that limited budget. In practice, peripheral staffs receive less priority for trainings in such situation. Academic institution can integrate such practical skills in curriculum; as tried in Cameroon, so that, every new graduate will know how to use it (138).

Test and treatment procedures

Not having risk stratification in PHC is not a surprise where, there is high deficit of skilled manpower to use it. Similar explanation given above applies here too. In addition, simply strengthening rural laboratories look like a far sensible approach than thinking of sophisticated high -tech services. NRS 4000 for laboratory test, is half a month's salary to large number of Nepalese families. People cannot afford such high cost in search of laboratory services.

Quality and quantity of human resources

Maldistribution, migration, low motivation and lack of training among human resources could be due to a number of reasons. Most of the medical colleges in Nepal are in cities. Those health workers who are already in rural settings also often migrate in cities in search of opportunities and those who are in cities travel abroad for new options. Students who grown up in cities are less likely to adjust in rural settings. For this, medical colleges can possibly offer scholarships to rural students from their local area which may motivate students to work in their own hometown after graduation. Similarly, unskilled human resources could be due to irregular medical schools, low standard curriculum and inadequate training itself.

Looking at the present CVD burden of the country and its future prediction of increase, Nepal; a low-income country with GDP growth rate of 2.7%, people under poverty line of 25.2% and leaders with diverse political interest in the parliament; is less likely to fulfill this shortage in allocated standard ratio unless major economic changes transform the country. The similar scenarios were explored in other LMICs. Options like task shifting to non-physician clinicians (NPC) and training of available cadres in CVD management were tried. Similar evidence based best practices as attempted by China, Nigeria and Cameroon, that looks feasible to Nepal as discussed in earlier chapter can be tried.

Financial resources

Limited budget allocated for NHTC (1.47%) and NHIEC (2.15%) could simply be due to lack of funding. It was just few years ago that the non-communicable diseases received attention from donors. Country's domestic fund alone is not sufficient for disease prevention and control activities at present.

Whereas on the other hand, prevention activities are not yet high on political mandate. Possibly, many people could be unaware of importance of health promotion, screening, early detection and timely referral in CVD prevention and control. Also, Nepal is now piloting SHI scheme, for which; possibly government may be planning to establish some fund by cutting budget on other headings.

But interestingly, even that small percentage of budget freed previous year, reflecting imprudent planning. Fiscal intervention is a way to increase domestic fund. Except tax on tobacco and alcohol products, government has not been able to implement tax on high salt containing food, subsidies for healthy food and incentives for promoting physical activity. None of the LICs have implemented subsidies and incentives. This situation offers a food for thought. Either, this is too hard to implement in resource poor settings or it is not receiving needed attention from concerned authority.

Fluctuations on tax rate almost each year and non-uniform tax on different tobacco brands has created uncertainties in fund collection and affected proper planning. The possible reasons could be: industrial resistance, unstable government, lack of financially skilled manpower and transparency. However, available budget can still be used efficiently with proper planning and prioritization (133).

Organization

Lack of active/operational NCD department in Nepal has negatively influenced planning and program management. Study shows gap in timely supervision and monitoring of CVD programs from steering committee. Periodic surveillance of risk factors, maintenance of vital registration, data registries & research are likely the areas that need attention. It might as well be true that, Nepal lacks skilled manpower to conduct supervision and fund for such activities may not be adequate.

External environment

Natural disasters, poor road networks, donor dependency, poor accountability and untimely local elections are found as negative influencers in study. The solution to these problems lie with multi-sectors. Hence, inter-sectoral partnership may improve the situation.

6.2 Demand side factors

Predisposing factors

Study found no any significant link between marital status, sex of the client and use of CVD services in PHC. Possibly, more vigorous search with different keywords may help to find evidences. But, some other factors are likely having some link between uptake of PHC and CVD. Only important ones are discussed.

Having someone with CVD in family seems influencing to other members in family due to perceived fear of getting diseases by own-self.

Likewise, older and younger people's different perception towards PHC for CVD could be due to previous unpleasant experiences. Probably, long waiting time, harsh communication of staff, inaccessible facilities may be some reasons behind perceived low quality among older people. Similarly, there may be lack of youth friendly services which could have hampered service utilization by youths. This seems logical as counselling adolescents and youths for CVD risk factors like smoking and drinking is a sensitive issue and such services should be youth friendly, easy to access and comfortable to them.

Similarly, factors like good socio-economic status, higher education, presence of community participation, and good social networks are found influencing positively in uptake. Good economic condition increases people's ability to pay for services, education helps people to take right decision, community participation increases trust for services and a good social network can help people in need; financially and technically. It also enforces people to visit PHC during appointments.

Whereas, gender roles, culture and stigma are found as negative influencers. Existence of gender disparities, unscientific cultures and stigma may be due to lack of knowledge and awareness among people. Such things are less commonly practiced in educated families.

High health literacy increases people's knowledge about disease process, service availability, risk factors and can eventually make people aware of the situation. Such people are more likely to follow instructions, advices and adhere to treatment.

Attitude towards services and providers could be both negative and positive. Negative attitude specially; could discourage uptake. People may develop negative attitude towards services and providers due to bad experiences in the past. It could also be that, someone may be repeatedly informing about the services in a negative way, so that people do not want to use that service. Due to scarce resources and work load, staffs may not as well respond politely to clients.

Enabling factors

Access to health facility, community engagement in planning CVD programs, good communication between client and health care provider, proper feedback mechanism, perceived good quality of CVD services, appropriate opening hours of PHC may positively influence uptake. These elements increase ability to access services.

Need factors

Due to different perceived need among curative and preventive services, CVD programs targeted separately to these two types of services seem to be successful. Evaluated need looks influencing to curative services only. Evaluated need in preventive services looks like an abstract concept and thus; study faced difficulties in conceptualizing it due to lack of literatures on it.

6.3 Limitations of literatures

The scarcity of literatures related to CVD in PHC in Nepal may be because, it is a relatively new concept. Similar screening and health promotion activities were already there from time being but not with such specific focus to CVD. There were articles related to maternal and neonatal health like antenatal visits, institutional delivery, safe motherhood, post-natal care and mental health in PHC. However, articles particular to CVD were few. On that account, this study tried to extrapolate from articles that talks about use of health services in general, health promotion, some risk factors like: hypertension, alcohol users, smokers and from some chronic diseases in general with clear indication in areas where these articles were used to generate findings. Therefore, as the scope of this paper was to bring out the evidences from Nepal, gray literatures were also used.

Intervention studies were limited for evidence based practices to increase uptake of PHC for CVD. There were very few literatures on old and young people and their different reasons of using PHC for CVD. Rural and urban differences on use of PHC for CVD were not much studied. These scarcities have consequences on this paper. So, examples from risk factors of CVD like: alcohol rehabilitation services, evidence based practice from general essential medicines have been extrapolated to present potentially similar ideas on CVD in PHC.

6.4 Reflection on conceptual framework

The applied framework was useful in examining major factors influencing uptake of PHC for CVD services in Nepal. The last arrow that originates from health behavior and goes back to population characteristics, makes this framework useful to study uptake. This was because, many literatures have explained that, previous experiences on use of CVD services in PHC may determine people's willingness to utilize it again. However, it would have been better if one additional arrow joins the total box of population characteristics from environmental factors. This would mean that, the environmental factors alone can also influence the overall need and use of CVD services in PHC by people.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 Conclusion

Nepal has made some significant progress in terms of national commitment in the prevention and control of CVD. It has initiated free health policy, enforced laws on alcohol/tobacco and the piloting of social health insurance and PEN.

However, the lack of CVD guideline and operational NCD department, lack of essential drugs, scarcity of human resources, freezing of program budget, lack of monitoring, improper data registries, lack of research, low health literacy, lack of access to CVD services and low quality of services influence utilization of PHC for CVD services.

Strengthening PHC system and increasing community engagement are essential to improve utilization of PHC service for CVD prevention. The adaptation and implementation of successful interventions from LMICs such as task shifting, training to unskilled health workers, monitoring and maintaining data registries, community based interventions, health promotion, screening and on-site care could improve utilization of PHC service for CVD prevention. Also, Nepal could use its own successful example from maternal and child health, TB, immunization to the utilization of PHC for CVD programs.

7.2 Recommendation

The following recommendations are proposed based on the study to MOH and other important stakeholders:

Policy

- Review of existing multi-sectoral action plan in terms of target set, time frame, indicators, action areas and incorporate priorities for vulnerable groups like adolescents, youths and senior citizens.
- Establish a separate operational NCD department and make an evidence based CVD guideline.
- Prevent freezing of budget by planning and timely implementing proposed program activities each year.
- Establish a system to monitor and maintain CVD related data registries.
- Prioritize NCD related research activities in Nepal which includes CVD.

Practice

- Conduct community based interventions like health promotion, risk assessment, screening and out-reach.
- Shifting some of the feasible non-invasive task to community health volunteers and local leaders can be done.
- Phase-wise training can be given to health workers to address shortage of skilled human resources in CVD program management.
- New evidence based interventions should be actively studied, piloted and if feasible, implemented for CVD management e.g. PEN Package and WHO - HEART protocol.

Partnership and collaboration

Ensure active collaboration at national and international level such as: with other ministries, research institutions, advisory committees, NGOs/INGOs, civil societies, youth clubs,

Future Research Examples

1. Capacity assessment of both public and private PHC for CVD management in Nepal-Primary Research
2. Factors influencing uptake of PHC for CVD services in Nepal-Primary Research (comparison: rural/urban, young/old people, CVD clients -mapping)
3. Intervention studies to generate evidences in Nepalese context (e.g. task shifting for CVD, Monetary and non-monetary incentives for health workers in health promotion for NCDs etc.)

APPENDICES

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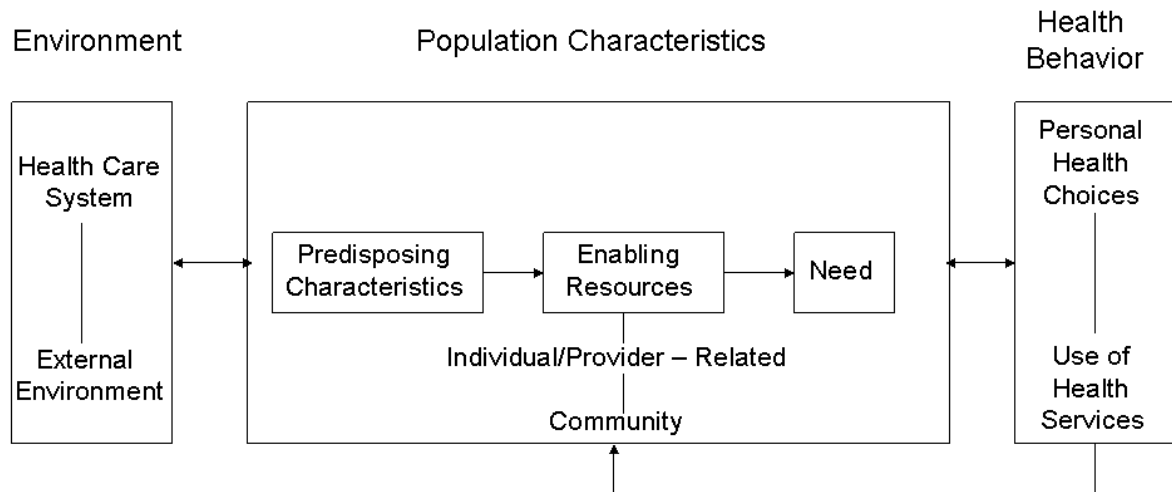
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Miscellaneous

Figure no. 6: Original Conceptual Framework of Anderson, 1995

The Andersen Model of Health Care Utilization



RM Andersen. Revisiting the behavioral model and access to medical care: does it matter?
J Health Social Behavior 1995;36:1-10.

Table no. 6: The search terms and websites used in searching literatures for the study

| PubMed Search strategy: | | | | | | |
|--|---|--|---|--------------|------------|------------|
| Keywords were either used in pairs or in multiple combinations of words from different subject box with the help of AND/OR/* | | | | | | |
| For objectives one and two, following keywords were used: | | | | | | |
| Subject 1 | Subject 2 | Subject 3 | Subject 4 | Subject 5 | | |
| Determinants/ Factors | Enabling/ Influencing / Contributing/ Barriers/ Associated/ Use/ Utilization/ Uptake/ Access | Primary health care [MeSH]/ Primary health care [Ti/Ab]/ District Hospital [MeSH]/ Health post/ Home care services [MeSH]/ Community health center [MeSH]/ Community based care/ Referral/ Ambulatory care | Non-communicable diseases [Title]/ Cardiovascular disease (CVD) [Ti/Ab]/ Heart disease/ Heart attacks/ Stroke/ Hypertension/ Prevention / Health Promotion/ Counselling/ Primary prevention/ Control Chronic disease | Nepal [MeSH] | | |
| For objective three, following keywords were used: | | | | | | |
| Subject 6 | Subject 7 | Subject 8 | Subject 9 | Subject 10 | Subject 11 | Subject 12 |

| | | | | | | |
|--|---|------------------------------|--------------------------|----------------------|----------------------|--|
| Evidenced-Based | Successful/ Best / Proven Practices/ Interventions/ Strategies | Increase/ Accelerate/Enhance | Uptake/ Utilization /Use | Words from subject 3 | Words form subject 4 | Nepal/South Asia/ LMIC/ LIC/ Low and middle-income countries/ Low income countries/ Asia/Asian countries/ South-East Asia/ Sub-Saharan-Africa/ Developing countries/ Low-resource settings/ SEAR |
| <p>For e.g. Search (((((((primary health care) OR cardiovascular disease) OR nepal) OR south east asia) OR south asia) OR low-income country) OR SEAR) OR prevention) AND service utilization Filters: Free full text; published in the last 10 years, ((((((primary health care[Title/Abstract]) OR nepal[MeSH Terms]) OR utilization[Title/Abstract]) OR cardiovascular disease[Title/Abstract]) AND (free full text[<i>sb</i>] AND "last 10 years"[<i>PDat</i>))), (((("primary health care") AND ((determinants OR factors OR aspects))) AND ((barriers OR related OR influencing OR contributing OR associated))) AND ((use OR utilization OR uptake))) AND access, (((((((Evidenced[All Fields] AND -Based[All Fields]) OR (successful[All Fields] OR best[All Fields] OR Proven[All Fields])) OR (Practices[All Fields] OR Strategies[All Fields] OR Interventions[All Fields])) OR (Increase[All Fields] OR Accelerate[All Fields] OR Enhance[All Fields])) OR (Uptake[All Fields] OR ("utilization"[Subheading] OR "utilization"[All Fields]) OR ("utilization"[Subheading] OR "utilization"[All Fields] OR "use"[All Fields])) OR "primary health care"[MeSH Terms]) OR Chronic non communicable diseases[Title]) OR LMICs[All Field], ((primary health care[Title/Abstract]) OR cardiovascular disease[Title/Abstract]) AND Nepal.</p> | | | | | | |
| <p>Other search engine's literature search strategy:</p> <p>Literatures were also searched by using “advanced search” options from each of these locations by using above words: VU library, Google Scholar, Google (manual search specially for gray literatures).</p> | | | | | | |
| <p>Grey Literatures Search Strategy</p> | | | | | | |

Sources:

World Health Organization

United Nations

Food and Agricultural Organization

Ministry of Health and Population, Nepal

National Planning Commission, Nepal

World Bank

Department of Health Services

Some policy documents were obtained from personal contact with:

Focal person for NCD from Ministry of Health and Population and

National Planning Commission, Nepal

Table no. 7: Evidence based best practices in LMICs /HICs/summary table:

Table no. 7: Evidence based best practices summary table

| Problem Areas/The mes | Type of Practi ces | Auth or | Locat ion | Focus | Study Design | Interve ntion | Outcom e | Limitat ions |
|---|--------------------------------------|--------------------|---------------------------|--------------|--------------------------------------|--|---|---|
| RESOURCES | | | | | | | | |
| <i>Essential medicines and basic technologies & tools</i> | Community directed Incentives (CDIs) | (WHO 2008) | Cameroon, Uganda, Nigeria | General | Multi-country community intervention | Participatory community meeting, decision making, supply of drugs, accountability, monitoring, report, oversee, feedback | Increased coverage and treatment | Done on countries with well-developed health system, may not be feasible to all LMICs |
| | Supervision visits for drugs | (Nunan et al 2011) | Zimbabwe | | RCT | Supervision visit on use of guideline and stock management | Stock management supervision improved significantly | No change in drug availability but stock book management was improved |
| Human Resource | | | | | | | | |
| <i>Production & Training</i> | Training | (Kenegne A 2009) | Cameroon | NCDs | Qualitative and quantitative | 46 nurses/ 6 training courses/ Nurses led projects | Improved access to care (increased by 68.5%) | Treatment outcome was not measured |

| | | | | | | | | |
|--|------------------------------------|--|-----------------|-----|---|---|--|---|
| Retention & maldistribution | Task-shifting | (Mendis S et al 2010) / Ogedegbe G et al. 2014 | China & Nigeria | HTN | Clustered Randomized Trial/ Systematic Review of RCTs | Simple CVD risk management package assessment | Decrease in systolic BP (p<0.0001) | Some biases present in intervention and control side. |
| | Use of technology in task shifting | Tian M 2014) | India | CVD | Clustered RCT | Low cost CVD management trial | Increased treatment with diuretics and aspirin | No drop in BP |

Examples from High-Income countries

Monetary Incentives, PHC/Australia, (Stocks 2012)
 Phone reminder, PHC/UK, (Fairhurst K 2008)
 After hour service/GP/PHC/Australia (Comino EJ 2007)
 Multiple Screening/PHC/Canada (Grunfeld 2013)

ORGANIZATION

| | | | | | | | | |
|---|-------------|-----------------------|--------------------------------------|-----|----------------------------|---|--|---|
| Management/ Documentation/ Oversee | Monitoring/ | (Khaider et al. 2014) | Palestine refugees in UN PHC /Jordan | HTN | Retrospective Cohort Study | Measured number, characteristics, program outcome & disease control | Many refugees were registered /treated /performance of staffs was also evaluated/case load detected / complications controlled | BP was not much controlled / attendance was just satisfactory |
|---|-------------|-----------------------|--------------------------------------|-----|----------------------------|---|--|---|

| | | | | | | | | |
|--------------------------------|-----------------------------------|--|--|-----|--|--|---|--|
| | | | | | | | | |
| | Maintaining data registries | (Kalra et al. 2015) | India | CVD | PINNAACLE Registry Under PIQIP | Collection of OPD data from Patient's OPD card | Measured prevalence of CVD risk factors and CVD cases | Linking data was difficult due to lack of unique identification in subsequent visits |
| Enablers | | | | | | | | |
| Access/Awareness themes | Health promotion and on-site care | (Krisnan et al. 2011) With support of WHO | Ballaigarh / New-Delhi /India and Depok/We st Java/Indonesia | CVD | Intervention Study (Formative and outcome evaluation) / Large sample size | Advocacy/ Training / Community Campaigns/ Risk assessment /Camps/ Reorientation of health services | Reach of health program 25-32% (Increased Access, increased diagnosis, better management | Used IEC and Health camps but limited use of mass media - compromised the message reach /thinking it as a resource intensive and not |

| | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| | | | | | | | | feasible before national campai gn |
|--|--|--|--|--|--|--|--|--|