**ENABLERS AND BARRIERS IN IMPLEMENTATION OF PEN SERVICE IN MYANMAR**

# **ABSTRACT**

**Background Information:** Package of Essential Non-Communicable Disease Intervention **(**PEN) was started in 2016 in Myanmar to combat the preventable non-communicable diseases (NCDs). This study was done to assess the enablers and barriers for PEN implementation service among community and health service providers.

**Methods:** Study was conducted in Nyaung-Oo, Lewe and Taung-Ngoo Townships of Myanmar in 2019 by using mixed methods among 330 community household members of age 40 year and above for quantitative study and 29 health care providers and 6 community leaders for qualitative portion.

**Findings:** Of 330 participants, nearly half of the participants (44%) had known NCDs. More than half of participants who knew PEN services in their areas (61.5%) had not consulted in PEN clinic. The reason of not consulting in PEN clinic they mentioned were because of not presence of NCDs among them (56.4%) and some participants (13.5%) didn’t know about the PEN services and (12.7%) had already taken the NCDs treatments from physician or private clinic, (11.1%) mentioned that they had no extra time to come to PEN clinic and (1.6%) stated that because of deformity or stroke. From the qualitative study, enablers of PEN service they mentioned were supply of drugs with free of charge, getting of trust towards BHS from community, supporting of guideline for treatment, increasing confident of BHS on NCDs treatment, easily accessible for treatment of NCDs for community, regular clinic day, early diagnosis and treatment of NCDs, increasing awareness of community on NCDs, presence of supporting organizations to PEN service and supporting from the ministry of health and sports. Barriers were insufficiency of drugs, some problem in equipment, not getting response in time repairing equipment from central level, some weakness in training, lower health education level and awareness on NCDs among community and shortage of manpower. Most of them suggested to supporting refresher trainings to basic health staff, to continuous supply of drugs and equipment and to combine the all reporting forms with standard reporting format.

**Conclusion:** On conclusion, nearly half of the participants had known NCDs but nearly two-third of the respondent had not utilized the PEN service. The main reasons of not using were lack of awareness on PEN service. Enablers were more than barriers on implementation of PEN service; therefore, PEN service should be continued to cover the whole country.

**Key Words: Enabler, Barrier, Non-communicable diseases, PEN**

**TABLE OF CONTENTS**

[**ABSTRACT** ii](#_Toc36320618)

[**TABLE OF CONTENTS** iii](#_Toc36320619)

[**ABREVATION** vi](#_Toc36320620)

[**ACKONOGMENT** vii](#_Toc36320621)

[**1.** **INTRODUCTION** 1](#_Toc36320622)

[**2.** **OBJECTIVE OF THE EVALUATION** 2](#_Toc36320623)

[**3.** **STUDY METHODOLOGY** 3](#_Toc36320624)

[**3.1 Study Design and setting** 3](#_Toc36320625)

[**3.3. Study Participants** 3](#_Toc36320626)

[**3.4. Data Collection Method** 3](#_Toc36320627)

[**3.4. Data management and analysis** 4](#_Toc36320628)

[**3.5. Ethical consideration** 4](#_Toc36320629)

[**4. RESULTS** 5](#_Toc36320630)

[**4.1. Quantitative findings** 5](#_Toc36320631)

[**4.1.1. Socio-demographic background of the study participants** 5](#_Toc36320632)

[**4.1.2 Awareness about NCDs among study participants(n=330)** 6](#_Toc36320633)

[**4.1.3. Source of information** 7](#_Toc36320634)

[**4.1.5. Utilization of PEN service** 9](#_Toc36320635)

[**4.2. QUALITATIVE FINDING** 10](#_Toc36320636)

[**4.2.2. The major findings of the qualitative study** 11](#_Toc36320637)

[**4.2.1.1. Thematic Area One: Enablers of PEN services** 11](#_Toc36320638)

[**4.2.1.2. Thematic Area Two: Barrier for PEN services** 15](#_Toc36320639)

[**4.2.1.3. Suggestions to improve the PEN services** 17](#_Toc36320640)

[**DISCUSSION** 19](#_Toc36320641)

[**RECOMMENDATIONS** 24](#_Toc36320642)

[**REFERENCES** 25](#_Toc36320643)

**LIST OF TABLES**

[**Table 4.1. Socio-demographic Characteristics of study participants(n=330)** 4](#_Toc37158649)

[**Table4. 2. Awareness about NCDs among community members** 5](#_Toc37158650)

[**Table 4.3. Awareness about availability of PEN service and its utilization among community members** 7](#_Toc37158651)

[**Table 4.4. summary of the characteristics of BHS and administrators(n=29)** 9](#_Toc37158652)

[**Table 4.5. Summary of the characteristics of Community Leaders(n=6)** 10](#_Toc37158653)

[**Table 4.6. Perceptions of community members and health care providers on enablers and barriers of PEN services (n=35)** 10](#_Toc37158654)

**LIST OF FIGURES**

[Figure 4.1. awareness about NCDs among study participants(n=330) 5](#_Toc37158661)

[Figure 4.2. The main reasons for visiting NCD Clinics(n= 79) 8](#_Toc37158662)

[Figure 3. The major reasons for not utilizing PEN services(n=126) 9](#_Toc37158663)

# **ABREVATION**

Admin- Administration Staff

BHS- Basic Health Staffs

Cl- Community Leader

CVD- Cardiovascular Disease

IRB- Institutional review Board

NCDs- Non-Communicable Diseases

PEN- Package of Essential Non-communicable Disease Interventions

QDA- Qualitative Data Analysis Software

STATA- Software for Statics and Data Science

WHO- World Health Organization

# **ACKONOGMENT**

1. **INTRODUCTION**

Nowadays, the growth of non-communicable diseases (NCDs) especially cardiovascular diseases threatens to most of the developing and developed countries and is creating major public health problems worldwide. In 2012, among 56 million global deaths, (68%) were attributed by NCDs and (74%) of these deaths occurring in low and middle income countries (Aryal et al., 2015). In Myanmar, there are 4 major NCDs (CVD including hypertension, diabetes, cancer and chronic respiratory diseases) that are involving in most of premature NCDs deaths. Major modifiable risk factors such as tobacco (smoke and smokeless) use, harmful use of alcohol, unhealthy diet and physical inactivity are attributed in the highest leading causes of NCDs death globally. The 2010 WHO Global Status Report on NCDs described that main causes of NCD deaths in 2008 are cardiovascular diseases (48%), cancers (21%), chronic respiratory diseases (12%), and diabetes (3%) respectively. Nearly (80%) of these deaths occurred in low and middle-income countries (WHO, 2010). In 2012, 25% of deaths among total deaths by NCDs, were still caused by cardiovascular diseases. In 2014, according to the National Survey of Diabetes Mellitus and risk factors for NCDs in Myanmar, 26.4% were hypertension and 10.5% were diabetes respectively. Globally, among (38) million deaths yearly due to NCDs,46%were caused by hypertension and cardiovascular diseases (WHO, 2014).

In Myanmar, Package of Essential Non-communicable Disease Interventions (PEN) has been engaged actively to combat against the preventable non-communicable diseases in different States and Regions since early 2016. Currently PEN implementation service training completed in all over 330 townships and the service was started in 177 townships (both screening and treatment at primary health care level). The service helped the community to get basic health service with low cost to the nearest of their residence while it also helped the MoHS to increase access the of the service. BHS are not only the main responsible person in health system but also in PEN implementation service and they contributed in the process of promotion of healthy lifestyle for communities in all over the country. This study will be done in three townships (Nyaung-Oo, Lewe and Taung-Ngoo) which were selected depending on the three monthly data reporting rate to central NCD unit.

1. **OBJECTIVE OF THE EVALUATION**

To improve the PEN services all over the country, we need to know the enablers and barriers of giving service among basic health staff and also among the health staff in administrative level. As knowledge about PEN implementation service among community member is also needed to know and will be described in this study. From the results of this study, we can use them and correct the needed things in future planning and expansion of PEN service implementation. This study was done to assess knowledge about PEN implementation service among community and to explore the enablers and barriers for PEN implementation service among community leaders and health care providers in Nyaung-Oo, Lewe and Taung-Ngoo townships.

1. **STUDY METHODOLOGY**

**3.1 Study Design and setting**

Mixed methods research (both quantitative complimented by phenomenological qualitative study) was used. The study setting was selected randomly among the highest reporting rate townships (Nyaung-Oo Township, Mandalay Region) and from the lowest townships (Lewe Township, Nay Pyi Taw Region) using the list from central NCD unit during the period of August to December 2019.

**3.3. Study Participants**

For quantitative study, 330 community household members who were age of 40 year and above was selected from three selected townships. For qualitative study, total 35 participants was selected in which (23) participants of basic health staff including TMO, HA, MW and PHS-II who had experience or involved in PEN at least 6 months duration and (6) administrators including focal person from regional NCD department, responsible person from regional public health department and central NCD unit. For community perspectives, (6) community leaders from respective townships were also interviewed for qualitative study.

## **3.4. Data Collection Method**

For study area, three townships were selected according to the reporting rate to central NCD unit, Nay Pyi Taw in 2018. Firstly, townships were ranked in order from lowest to highest reporting rate. Three townships were randomly selected from the list of low, middle and high reporting rates in 2018. Before data collection, researchers gave hand on training to data collectors for two days to prevent the inter-observer bias. Data collection was done by using Kobo collect data collection software. Pretest was also done before data collection with (20) participants among community in Thanlyin Township and questionnaires was modified according to the pretest results to test the reliability of questionnaires.

For quantitative data, (110) participants from each selected township were selected by using systematic random sampling method from the lists of households in the respective areas. The selected participants were interviewed for the knowledge about PEN service. For qualitative data, total (35) participants in which (23) BHS including TMO, THA, HA, midwife, PHS-II and (6) administrative person from respective townships and from central region and also (6) community leaders from respective townships were interviewed with in-depth interview guideline to explore the enablers and barriers for PEN implementation service among community and health service providers. Interview with each participant was lasting for about 30 to 60 minutes and was made in place where privacy had. To standardize the interviewing process, the members of the research team received pre-study training in qualitative interview and analysis was done by the researchers. Interviews were conducted in Myanmar language.

## **3.4. Data management and analysis**

For quantitative data, collected data from the Kobo collect was downloaded and analyzed with STATA 14.2 version software. Summary statistics was described with tables and figures. For categorical data, was presented frequency and percent. For continuous data, mean and standard deviation was presented. The recorded qualitative interviews were audio-recorded and documented in writing simultaneously. After data checking and cleaning, raw data were transferred, coded, and categorized. The transcripts were analyzed using thematic analysis with the assistance of a qualitative software package QDA miner lite.

**3.5. Ethical consideration**

This study was conducted through the permission of Institutional Review Board-1 (IRB-1), Nay Pyi Taw. Written informed consent was also obtained from each participant. The name of the study subject was not written on the questionnaires form and not mentioned on the results to ensure confidentiality. Those who did not give the consent was not selected. All interviews were done with prior permission to record the interview. They were informed that those recorded files will be deleted after the study. And the results of this study will be used only for research purposes. Data ownership was only be corresponded to two principal investigators in this study and findings of research will not be influenced by the organization of financial support and there was no conflict of interest.

# **RESULTS**

the results of this study was presented under two major categories, where the findings of quantitative findings followed by the results of quantitative study.

**4.1. Quantitative findings**

The quantitative findings were summarized under socio- demographic characteristics the study participants, Awareness about NCDs, Source of information, Community awareness on the utilization of PEN services and Utilization of PEN service.

## **4.1.1. Socio-demographic background of the study participants**

In the current study most of the participants were female 241 (73.0%) and 115 (34.9%) were between the age group of 40 to 50 years. Nearly half of participants 146 (44.2%) had primary school level of education. Most 241 (73.0%) were married and dependent were 102 (30.9%). The current study found that, most participants, 307 (93.0%) had less than 100,000 kyats of per capita income, mean was 53310.52 kyats and standard deviation was 37922.

**Table 4.1. Socio-demographic Characteristics of study participants(n=330)**

|  |  |
| --- | --- |
| **Characteristic of participants** | **Frequency (%)** |
| **Age ( completed years)** |  |
| 40-50 | 115 (34.9) |
| 51-60 | 99 (30.0) |
| 61-70 | 68 (20.6) |
| 71-80 | 37 (11.2) |
| 81-90 | 11 (3.3) |
| **Sex** |  |
| Male | 89 (27.0) |
| Female | 241 (73.0) |
| **Marital Status** |  |
| Single | 26 (7.9) |
| Married | 241 (73.0) |
| Separated | 2 (0.6) |
| Divorced | 3 (0.9) |
| Widowed | 58 (17.6) |
| **Education** |  |
| Illiterate | 20 (6.1) |
| Read and Write | 28 (8.5) |
| Primary school level | 146 (44.2) |
| Middle school level | 79 (24.0) |
| High school level | 45 (14.0) |
| University student | 2 (0.6) |
| Graduated | 10 (3.0) |
| **Occupation** |  |
| Dependent | 102 (30.9) |
| Governmental staff | 11 (3.3) |
| Own Business | 94 (28.5) |
| Manual worker | 54 (16.4) |
| Farmer | 15 (5.0) |
| **Per capital income per month (MMK)** |  |
| <100,000 | 307 (93.0) |
| 100 000-200,000 | 21 (6.4) |
| >200,000 | 2 (0.6) |
| Mean =53310.52, SD=37922 |  |

**4.1.2 Awareness about NCDs among study participants(n=330)**

According to the findings, nearly half of the participants 144 (44%) had known NCDs and Most of participants themselves had known NCDs which were hypertension, 112 (77.8%), diabetes, 42 (29.2%), asthma or COPD 8 (6.0%) and 4 (2.8%) respectively**.**

Figure 4.1. awareness about NCDs among study participants(n=330)

**Table4. 2. Awareness about NCDs among community members**

|  |  |
| --- | --- |
| **Knowledge concerning NCDs** | **Frequency (%)** |
| **Have you heard about 4 major NCDs in Myanmar? (n=330)** |  |
| Yes | 311 (94.2) |
| No | 19 (5.8) |
| **The major types of NCDs mentioned (n=311)** |  |
| CVD (including HT) | 301 (96.8) |
| DM | 277 (89.1) |
| Chronic respiratory diseases | 26 (8.4) |
| Cancer | 93 (29.9) |
| **Do you know the 4 major risk factors of NCDs? (n=330)** |  |
| Yes | 291 (88.2) |
| No | 39 (11.8) |
| **Major risk factors they mentioned (n=291) (multiple responses)** |  |
| Tobacco use | 74 (25.43) |
| Harmful use of alcohol | 64 (22.0) |
| Physical inactivity | 10 (3.4) |
| Unhealthy diet | 274 (94.2) |
| **Source of information about NCDs (n=330) (Multiple responses)** |  |
| Health care providers not from PEN clinic | 198 (60.0) |
| Health care providers at PEN clinic | 39 (11.8) |
| Social Media (eg. Facebook) | 16 (4.9) |
| TV/Radio | 103 (31.2) |
| Pamphlet/ Billboard | 19 (5.8) |
| Family member/relatives | 88 (26.7) |
| Peer group | 116 (35.2) |
| **Preventive ways for risk factors of NCDs (Multiple responses) (n=330)** |  |
| Healthy Diet (more vegetable and fruit) | 309 (93.6) |
| Regular Physical exercise | 38 (11.5) |
| Avoidance of smoking | 69 (20.9) |
| Avoidance of smokeless tobacco | 62 (18.8) |
| Harmful use of alcohol | 67 (20.3) |
| Maintenance of suitable body weight | 5 (1.5) |
| Sufficient amount of water drinking | 6 (1.82) |
| Reduce the stressful condition and keep positive thinking | 13 (3.94) |
| **Things need to follow if known hypertension and diabetes among participants and their family members (n=330)** |  |
| Regular treatment taking from health care providers | 306 (92.7) |
| Regular blood pressure monitoring | 67 (20.3) |
| Regular blood glucose testing | 15 (4.6) |
| Avoid Unhealthy food/taking healthy food | 22 (6.7) |
| Physical Exercise | 5 (1.5) |
| Taking traditional medicine | 3 (0.9) |
| Don’t know | 6 (1.8) |

Most of the participants have heard about four major NCDs and cardiovascular disease including hypertension were described by the vast majority ,96.8%) of participants, followed by diabetes,89.1%, cancer,29.9% and chronic respiratory disease ,8.4%. More than three-fourth 88.2% of participants had mentioned four major NCDs risk factors. Among the major NCDs factors, unhealthy diet was mentioned by the vast majority, ,94.2%, followed by tobacco use 25.4% and harmful use of alcohol 22.0% respectively. On the other hand, only,3.4% mentioned physical inactivity as risk factor for NCDs.

## **4.1.3.** **Source of information**

Majority of the study participants, (60%) were mentioned health care providers as their main source of information, followed by PEN clinic (11.8%) and Social Medias(4.9%)..

With regarding the prevention mechanisms for risk factors, healthy diet intake was mentioned by the most majority( 93.6%), followed by regular treatment should be taken from health care providers for hypertension and diabetes, where only few participants( 1%) mentioned traditional medicine as prevention mechanism. On the other hand, nearly 2% of the study participants responded no idea with regarding to the prevention mechanisms for NCDs risk factors.

Regarding the information on the availability of PEN services, among the participants 216 (65.5%) who have heard about PEN service, most of them 205 (95%) knew the PEN service was already implemented in their local areas (See Table 3).

**Table 4.3. Awareness about availability of PEN service and its utilization among community members**

|  |  |
| --- | --- |
| Knowledge about PEN service | Frequency (%) |
| Recommended age for screening (n=205) |  |
| Yes | 159 (77.6) |
| No | 46 (22.4) |
| If ”yes”, mention it (n=159) |  |
| <40 year | 15 (9.4) |
| ≥40 year | 144 (90.6) |
| Services available in PEN clinic (n=205)  (Multiple responses) |  |
| Screening | 162 (79.0) |
| Treatment | 173 (84.4) |
| Health Education | 60 (29.3) |
| Don’t know | 26 (12.7) |
| Diseases screened at PEN clinic (n=205)  (Multiple responses) |  |
| HT | 167 (81.5) |
| DM | 162 (79.0) |
| Asthma/COPD | 1 (0.5) |
| Cancer | 2 (1.0) |
| Don’t know | 32 (15.6) |
| Diseases can be treated at PEN clinic (n=205)  (Multiple responses) |  |
| HT | 176 (85.9) |
| DM | 169 (82.4) |
| Asthma/COPD | 6 (3.0) |
| Cancer | 1 (0.5) |
| Don’t know | 22 (10.7) |
| Health Education topics in PEN clinic (n=205)  (Multiple responses) |  |
| HT | 84 (41.0) |
| DM | 81 (40.0) |
| Asthma/COPD | 2 (1.0) |
| Cancer | 3 (1.5) |
| Obesity | 1 (0.5) |
| Smoking/smokeless tobacco | 11 (5.4) |
| Alcohol | 9 (4.4) |
| Healthy diet and physical exercise | 8 (2.4) |
| Don’t know | 109 (53.2) |

4.1.4. Community awareness on the utilization of PEN services

Amongst the study participants who had information about availability of NCDs services in their area, 205(95%), most of them (90.6%) mentioned that people at age of forty (40) and above should visit PEN Clinic for screening, while only less than ten percent ( 9.4%) mentioned people less than age of forty(40) also should visit PEN clinic for screening of hypertension, DM and asthma or COPD.

## **4.1.5.** **Utilization of PEN service**

According to the finding of the current study, among 79 (39%) of participants have used the PEN services and nearly half of them (47%) were visited PEN clinic to access treatment for NCD, followed by screening for NCDs ( 46%) and for consultation for other diseases(7%). .

Figure 4.2. The main reasons for visiting NCD Clinics (n= 79)

Among those who have information on the availability of NCDs services, more than half of them (61.5%) were not consulted the clinics since they didn’t acquired NCDs( 56.4%), followed by those who don’t know availability of the services (13.7%), those who received the service from physician or private clinic(12.7%)( See below graph).

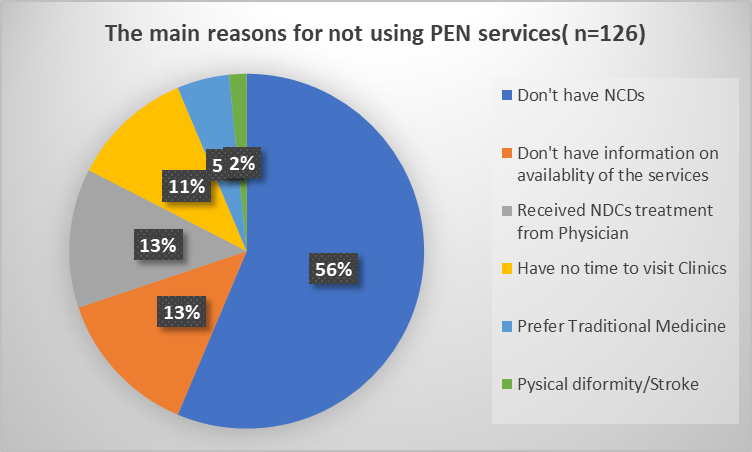
****

Figure 3. The major reasons for not utilizing PEN services(n=126)

# **4.2. QUALITATIVE FINDING**

4.2.1. Summary of the study participants

Qualitative study was done among 29 health staff (including both basic health staff and administrators) and six community leaders from Nyaung-Oo, Lewe and Taung-Ngoo townships. Most of the health staff were equal or less than 40-year-old and female and had total service of more than 10 years. Among the community leaders, all of them were male and lowest age was 40 year and highest age was 62-year-old.

**Table 4.4. summary of the characteristics of BHS and administrators(n=29)**

|  |  |
| --- | --- |
| **Characteristics of participant** | **Frequency (%)** |
| **Age (completed years)** |  |
| ≤40 | 19 (65.5) |
| >40 | 10 (34.5) |
| Mean=37.8 , SD=9.8 |  |
| **Sex** |  |
| Male | 11 (37.9) |
| Female | 18 (62.1) |
| **Rank of participants** |  |
| Administrator | 6 (20.7) |
| Basic health staff | 23 (79.3) |
| **Total service (Years)** |  |
| ≤10 | 11 (37.9) |
| >10 | 18 (62.1) |
| Mean=12.9, SD=8.3 |  |

**Table 4.5. Summary of the characteristics of Community Leaders(n=6)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Age**  **(year)** | **Sex** | **Education** | **Occupation** |
| 1 | 49 | Male | High School Level | Farmer |
| 2 | 40 | Male | Graduate | Government staff |
| 3 | 62 | Male | High School Level | Own business |
| 4 | 40 | Male | High School Level | Farmer |
| 5 | 45 | Male | Middle school level | Government staff |
| 6 | 41 | Male | Primary school level | Own business |

**4.2.2. The major findings of the qualitative study**

The results of qualitative study were summarized in three major thematic areas. These three main themes include, Enabler of PEN service, Barriers of PEN service and Suggestion to improve PEN service were extracted from the coding of the transcript and the following sub- categories under main themes were come out. The description of the participants were coded with numbers and “BHS” represent “Basic health staff”, “CL” represent “Community leader” and “Admin” represent “Administrative person” in presentation of their quotation.

**Table 4.6. Perceptions of community members and health care providers on enablers and barriers of PEN services (n=35)**

|  |  |
| --- | --- |
| **Themes** | **Subcategories** |
| Enablers of PEN services | Supply of drugs with free of charge |
| Getting of trust towards BHS from community |
| Supporting of guideline for treatment |
| Increasing confident of BHS on NCDs treatment |
| Easily accessible for treatment of NCDs for community |
| Regular clinic day |
| Early Diagnosis and treatment of NCDs |
| Increasing awareness of community on NCDs |
| Presence of supporting organizations to PEN services |
| Supporting from the ministry of health and sport |
| Barrier for of PEN services | Insufficiency of drugs and some problem of not working of equipment |
| Not getting in time repairing from central level |
| Some weakness in training |
| Lower health education level and awareness on NCDs among community |
| Shortage of manpower |
| Suggestions to improve the PEN services | Need refresher training |
| Regular and continuous supply of drugs and medical equipments |
| Combination of all reporting forms with standard format |
| Planning the printing process for vinyl/posters and pamphlets in respective regions |
| Establishment of newly reporting format |

**4.2.1.1. Thematic Area One: Enablers of PEN services**

Most of the basic health staff said that supporting of essential drugs for NCDs was the main enabler of PEN services.

“tusKd;&Sdygw,f/ bmaMumihfvJqdkawmh PEN zGifhxm;awmh aq;awGqdkvnf; tcrJh&w,fayghaemf/ tJhvdkawGaMumifhrdkYvdkY vlemawG ydktqifajywmawG &Sdwmayg”

“As the drugs for NCDs can be given with free of charge in PEN clinic, it is more convenience for the patients.” (BHS009)

The study participants were also discussed the importance of PEN training with regarding increasing the confidence of BHS on NCDs treatment. Most of the basic health staff also mentioned that implementation of PEN services made getting of trust towards BHS from community and supporting of guidelines in training can make BHS more confidence in treatment of NCDs.

“Training &NyD;oGm;awmh treatment awGrSm aq;ay;&wm udk,fhudkudk,fydkNyD;awmh ,HkMunfpdwfcsrI ydkwdk;vmw,f/ bmvdkYqdk weight csdef&w,f/ aoG;aygifcsdef&w,f/ ESvHk;qdkvdkY&Sd&ifvJ card av;awGay; xm;awmh csufcsif;jyefNyD;awmh ajymEkdifwmaygh/”

“After getting the training of PEN service, we got much more confident in the treatment of NCDs because we can give services like monitoring weight, blood pressure and calculating the 10 years CVD risk of patients and can give their results back immediately to them.” (BHS005)

Another study participant was also discussed on the importance of PEN guidelines in the following manner.

“PEN &JU tm;omcsufu Guideline ay;xm;w,f nDrwdkUrSm udk,frodwmudk jyefNyD;awmh tao;pdwf&Sif;jywm&Sdw,f/ udk,fuawmh jyefzwf&wmaygh/”

“Supporting of guideline for detail facts in PEN service is an advantage for us because we can make self-learning from this guideline and we can check the things that we don’t know clearly in field.” (BHS001)

Community leaders said that the patients in their village did not need to cost for transportation to get treatment for NCDs like hypertension and diabetes as before because of presence of PEN clinic in their area.

“udk,fhaus;&GmrSm r&Sdqif;&Jom;awG jzpfwJhtcgusawmh aq;½Hkaq;cef; roGm;Edkifbl;av/ aq;awmif 0,frpm;Edkifbl;/ tJh'Dhtcgusawmh olwdkYu wpfywfpmaq; ay;w,fqdkawmh olwdkYtaeeJYaumif;wmaygh”

“As most of the people in this village were poor, they can’t go to hospitals and clinics and even they can’t buy medicine to take. In PEN clinic, drugs are supported with free of charge for them, therefore this PEN service is benefit to these kinds of people.” (CL001)

Basic health staff also mention that opening of PEN clinic on regular day was one of the enablers. Some of them stated that opening of PEN clinic on regular day can cause increasing awareness among community on NCDs and they can get early diagnosis and treatment.

“PEN Service &Sdawmh vlwdkif;u 'D NCDs udk odvmMuw,fayghaemf/ 'D NCDS clinic udk Ak'¨[l;aeYwdkif; zGifhay;w,f/ zGifhay;awmh vlwdkif;uodw,f/ odwJhtwGuf olwdkYu 40 ausmf&if 'DaoG;wdk;a&m\*g&Sdovm;/ oGm;prf;oyf&r,fqdkwmudk olwdkYu odvmMuw,f/”

“The community became getting awareness on NCDs as PEN clinic was

opened every Wednesday and they even know that the people who are more than 40 years should go to PEN clinic and should screen for NCD like hypertension.” (BHS020)

Some basic health staff also discussed easily accessibility of the services to the community as one of the major enabling factors for the implementation of NCDs services in the area.

“wcsdKUqkd&if wjcm;aq;cef;awGukd olwkdYwul;wu oGm;p&mrvkdawmhbl;/ wcsdKU½Gmol½Gmom; awGu um;iSm;NyD;oGm;&w,f/ okH;bD;iSm;NyD; oGm;&w,f/ ykdufqHukefw,fav/ tckukd,fh½GmrSm&Sdawmh oufomwmaygh/ wjcm;ae&m oGm;&r,fqkd&if olwkdYrSm wpfvrSwpfacgufyJ oGm;&rSmayghaemf/ ukd,fhqDrSm zGifhvkdufvkdY&Sd&if wpfygwfukdwpfcg wpfvukd (4)cgavmuf tNrJwrf; vmppfjzpfw,f/”

“Some people in this village have to go to the other clinics for treatment of NCDs by hiring cars and they have to cost a lot for transportation and now they do not need to do like this as the PEN clinic is opened here. They can also do screening and take treatment regularly about 4 times per month in this clinic.” (BHS012)

“½Gmem; aq;cef;&Sdwmqkdawmh a0;a0;vHvHroGm;&awmhbl;aygh/ eD;eD;em;em;qkdawmh ta&;eJUtaMumif;eJYqkd&if bmyJjzpfjzpf 'Daq;cef;ukdyJ vm&w,f/”

“Now the villagers don’t need to go far for taking treatment of NCDs as PEN clinic is near the village and they can easily go to this clinic even in case of emergency” (CL006)

Some of the study particpants were also mentioned the trust of community on BHS as enabling factors for the implementation of PEN services in the study area.

“wevFm? Ak'¨[l;? aomMumwdkif; OPD Munfhay;w,fqdkwm qdkif;bkwf wyfxm;w,f/ tJhawmh Public &JU tm;udk;rIudk ydk&w,f/ ydk&w,fqdkwmu 'D OPD zGifhwJhxJrSmrS tpfrwdkY'D PEN clinic zGifhwmvnf; ydkNyD;awmh jynfolvlxktwGuf tusdK;½dSwmayhg/ aoG;ppfaq; w,f/ pressure wdkif;ay;w,f/ a&m\*g screening vkyfay;w,fqdkvdkY½Sd&if jynfolvlxk tm;udk;rI ydk&w,f/”

“We got the public trust as we let the people know the clinic days are Monday, Wednesday and Friday. As every patient who came to this clinic was monitored with blood pressure and blood tests, we got more trust from the community” (BHS021)

Some administrators said that presence of supporting organizations and encouragement from the minister of ministry of health was one of the enablers for PEN services. The following examples illustrated their outlooks.

*“tm;omqHk;uawmh jynfaxmifpk0efBuD;udk,fwkdifuvnf; 'gudk Preventive Category taeeJYaqmif&GufzdkY q&mwdkYud k Drive vkyfwmayhgaemf/ q&mwdkY&JU Higher Level Commitment wpfck &dSaer,fqdk q&mwdkY vJ atmifatmifjrifjrifeJY acsmhacsmharGUarGYeJY aqmif&GufEkdifwmaygh/ 'guawmh tm;omqHk; tcsufaygh/”*

*“Strongest enabling factor was getting encouragement from Minister and*

*Ministry of Health and Sports and now the PEN services is conducting as the*

*preventive category and as a high-level commitment. Therefore, I think the process*

*of service is smooth and succeed” (Admin 006)*

*some admin participants were also discussed the presence of supporting partners for this programme as enabling factor for the implementation of NCDs services in the area.*

*“tm;omcsufu 'D Training Package BuD;udk pwifaqmif&GufwJhtcgrSm q&mwdkY partner &dSwmayghaemf/ q&mwdkYudk axmufyHhay;r,fh tzJGYtpnf;&dSvdkY q&mwdkY pwifaqmif&GufEkdifjcif;jzpfwmayhg/”*

*“One of the enabling factors of PEN service was presence of partner or organization for supporting of needed things.” (Admin006)*

**4.2.1.2. Thematic Area Two: Barrier for PEN services**

Most of basic health staff mentioned that insufficiency of drugs and un-functionality of some of medical equipment’s as a barrier for implementation of PEN services.

“wcgwav tcuftcJ½Sdwmu? qD;csdKaq;vm,lwmudk aq;jywf ae&ifawmh tqifrajy bl;aygh? t"duu aq;rjywfzdkU&,f”

“One of the difficulties of PEN was shortage of drugs sometimes and it will not be OK for patients especially for diabetes patients.” (BHS008)

“PEN udk jrifjrifcsif;awmh (40)ausmf&if screening vkyfr,faygh? tJhvdkem;vnfcJhwmaygh/ tckaemufydkif;usawmh tJhvdkvkyfaer,fqdk b,fvdkrSypönf;u ravmufEdkifbl;av/ tJhawm risk ½dSwmawGyJ azmufr,fqdkNyD;awmhvkyf&wmaygh/”

“According to not enough of test strips, we can only do screening to the people who have risk factors of NCDs, although we knew that screening should be done to all people who are 40 years and above.” (BHS008)

“PEN &JU tm;enf;csufuawmh BP cuff aygh Digital awGay;xm;w,fav Digital awGuawmh taumif;pm;rS rSefw,fvdkY ajymw,f/ 'gayr,fh nDrwdkYudk ay;xm;wJh [mawGu cPav; eJY ysufw,f/ NyD;&ifnDrwdkY wdkif;vdkufvdkYY½Sd&iftm;vHk;u Hypertension yJ? yHkrSef (120) vlu csdefvdkuf (150) tJhvdkrsdK;jzpfaewmqdkawmhav? tck ay;NyD;om; Digital awGeJYqdk&if nDrwdkYuawmh tqifrajybl;vdkYxifw,f”

“I think, one of the weaknesses of PEN service was supporting digital BP cuff because they are occasionally not working and getting error results when measuring to the patients. So it was not OK for us.” (BHS015)

The study participants were also raised the issue of repairing medical equipment as one of the barriers. They explained that since the medical equipment’s are repaired at central level which takes time to get the needed equipment’s on time, they had to buy the needed equipment sometime with fund from the patients.

The other issue mentioned by BHS as barriers for the implementation of PEN service was about inadequate of training. Some of basic health staff said that they have some trouble in filling of data forms because they still don’t understand well about data registration in training.

“wqifhjyefoifay;wmawmh&zl;w,f/ 'gayr,fh ckcsdefxd vcsKyfcsKyf&wm tqifrajyao;bl;/ uRefrwdkYu oifwef;u rwufzl;bl;/ oifwJh oluvJ uRefrwdkY 'DvcsKyfvdkufwm wrsdK; rSm;jyefNyD jyefcsKyfqdkwmrsdK; qdkwmav udk,fudkwdkifvJ oifwef;rwuf&ao;wJh twGuf vcsKyf csKyfwmawmh tcuftcJawmhjzpfw,f/”

“Although my senior teaches me back about the PEN service and it was still not OK in filling of data in data form. I think it may be due to the reason that I haven’t got the training directly”. (BHS002)

“Traning u aumif;ygw,f/ wck½Sdwmu from awGjznfhwmeJYywfoufNyD; wdwdusus av; xGufvmay;&ifawmh ydktqifajyr,fvdkYxifw,f/ wcsdKUus form (1) u register awGudk form (3) rSmxnfh&rvm;? rxnfh&bl;vm;? tJhvdkrsdK; wdwdusus oifay;&ifawmh ydkNyD;awmh aumif;r,fvdkY xifw,f/”

“Training is good, nevertheless, there is still difficult in filling of data form for us. We are confusing sometimes in data recording portion and it will be better if we have taught exactly how to do it again.” (BHS008)

The other area raised as barriers for the implementation of PEN service was the Lower health education level and awareness on NCDs among community. Both BHS and community leaders mentioned that community had low level of health education and awareness on NCDs and they only got attention only if getting complication of NCDs in them.

“aq;awGu tvum;&aeawmh odyfav;av;eufeuf rxm;Mubl;/ raMumufbl;jzpfaewm? aoG;wdk;qD;csdKjzpfaewmudk raMumufMubl;/ wckckxyfjzpfcgrSaMumufwm? tem jzpfwmwdkY tJhvdk[mawGyJ aMumufwm ½Sd&if;pGJa&m\*gudk raMumufJMubl;/ aoG;usaq;? qD;csdKusaq;vnf; aomufcsifrS aomufMuwm jywfoGm;&if oGm;xkwfcsifrS xkwfMuwm/ wcsdKYvlemawG raomufMubl;aygh/”

“Actually, community is not afraid to NCDs like hypertension or diabetes and they got awareness only if the complication of NCDs like diabetes ulcer become. They don’t also know how importance of NCDs, and it may be due to drug supply by free of charge in clinic and sometimes the drugs were not taken by patients although we have supplied.” (BHS022)

Shortage of human power was also discussed as one of the major barriers for the implementation of PEN services. Some of the administrators pointed out the shortage of human power as a barrier for the implementation of PEN services..

“yxrOD;qkH;ajym&r,fqdk&if uRefawmfuawmh uRefawmhrl&if; tvkyfuawmh PEN r[kwfbl;aygh/ uRefawmfudk olwdkYtwif; assign ay;cHxm;&wmaygh/ tJhawmh uRefawmfae&mrSmvJ vlvdkw,f vdkYajym&rSmaygh/ NyD;awmh zGJUpnf;ykH t&vnf; uRefawmfhatmufrSm vl(7)a,muf&dSw,f/ jrifwJhtwdkif;yJ ajrjyifrSmawmh wpfa,mufrSr&dSbl;/”

“I am assigned in PEN service because of shortage of manpower and actually it was not my main duty. According to the real organization set up of this department, there must have total 7 staff under my post but as you see there was no one in current situation.” (Admin001)

### **4.2.1.3. Suggestions to improve the PEN services**

With regards to the way forward, the study participants were discussed the importance of refresher trainings and supply of drugs and medical equipment. Most of them were mentioned the importance of regular fresher trainings to update themselves.

“Training taeeJYusawmh q&mrawGu 0ifvkdufxGufvdkufeJYqdkawmh

wcsdKUtopfawu odyfem;rvnfbl; jyefNyD;awmh training ay;&ifawmh taumif;qHk;aygh Training &xm;wJh olusawmh pmcsKyf&wmtqifajyw,f topfawGusawmh udk,fawGuajymvJ ceyJ/”

“We need the training again because of the changing of posting among the basic health staff and some new staff are not well understand about the format of data registration although we have taught them as much as we can.” (BHS005)

The study participants were also raised the issue of regular andcontinuous supply of drugs and medical equipment. Most of them were mentioned the importance of regular and continuous supply of drugs and medical equipment for the improvement of PEN services.

“tBuHay;csifwmawmh aq;vHkvHkavmufavmufeJY ay;Ekdifr,fqdk lawGuvJ,HkMunfNyD; tjrJvmrSm t&rf;BuD;jywfwmr[kwfayr,fh wpfcgwavjywfwmayghaemf/”

“I think PEN service can have more trust from community if we can give continuous drug supply to the patients who came to the clinic because sometimes, we have to face the shortage of drug supply.” (BHS002)

The other issues discussed by study participants was about reporting formats. Most of them were mentioned the importance of combining all reporting formats with the standard format.

“uRefawmfwdkY XmerSmvnf; Ak'¨[l;aeYqdk vkyfxm;wJh qD;csKdaoG;csKd clinic qdkwm &dSw,fav tJhawmh/ tJh'Du&vmwJh report &dSw,faygh wvwpfcgykHrSef report &dSw,f/ tJh[mav;eJY enf;enf; report format pkvkyfNyD; wapmifwnf; udk,fvdkcsifwJh tcsufyJ,lr,fqdk ydkaumif;r,f xifw,f/ report jznfh&w,fhvlvnf;oufomwmaygh/ tJhvdkrsKd;aomff¤if;? 'grSr[kwf report eJYywfowfNyD; tcsif;csif;ñSdEdIif;&ifawmhydkyD; tqifajyygw,f/ vkyf&w,fh vlawGtwGufav/”

“It will be better if two types of report from both diabetes clinic and PEN clinic are in the same format and have to fill the needed data. If it is so, I think, the burden of BHS will be reduced in some extent.” (Admin001).Furthermore, the study participants were also discussed on the importance of compressive new reporting format to avoid parallel data collection system.

“t"duu Reporting awGjyif&r,f/ bmjzpfvdkUvJqdkawmh HMIS data source wpfckoufouf&SdNyD;om; tpfrwdkU 'D[mvnf; parallel Data system jzpfaewmayhg/ jznfh&wJh[mawGut&rf; rsm;w,f Reporting rSm b,fvdkjzpf&rvJqdkawmh HMIS rSm&EdkifwJh Data udkz,fNyD;awmhtpfrwdkU vdkcsifwJh Data enf;enf; yg;yg;udkyJ aumufEdkifr,fqdk&ifawmh BHS twGuf Burden avsmhoGm;r,f Reporting tydkif;udkjyif&r,f/”

“Mainly we have to correct the current reporting format because there is also a reporting format HMIS data source which was already established and now it becomes dual parallel data system. It will be better if we can edit the form format to include the needed data which was not included in the HMIS data format. If it is so, the burden of BHS for filling of so many forms will reduce to some extent.” (Admin005)

The other point raised by study participants was about cost-efficiency of the current printing system. According to the study participants, the printing of vinyl/posters and pamphlets should be done in the corresponded state and regions because the cost of transportation of vinyl and pamphlets is greater than the total printing cost currently.

“Reporting Form awmfawmfrsm;rsm;u Central uyJ ay;wm e\*dku tJhrSmvnf; ydkufqHrsm;&dSvdkYuawmhayghaemf jynfe,feJYwdkif;awGudkyJ ay;vdkdufcsifw,f/ rdrdtpDtpOfeJY rdrdaqmif&GufzdkYaygh/ &dkufwJh Cost xufudk Transport Cost u ydkdkrsm;aew,f/”

“Although the reporting forms are distributing from the central level to all states and regions currently, it will be better if these can be printed in corresponded states and regions. Because now the cost of logistic fees for transportation of vinyl and pamphlet is greater than the total printing cost.” (Admin006)

# **DISCUSSION**

As non-communicable Diseases (NCDs) are one of the major health and development challenges of the 21st century which can affect the human suffering and can damage to the socio-economic fabric of countries. Package of Essential Non-communicable Diseases (WHO PEN) interventions for primary care in low-resource settings is an innovative and action-oriented and cost-effective intervention and which can be delivered to an acceptable quality of care, even in resource-poor settings (WHO, 2010). In Myanmar, implementation of PEN service was also started on May 2017 at few townships in different regions and now expanding the service to all 330 townships in Myanmar but fully coverage was not obtained yet especially in hard to reach areas in Myanmar. Key PEN intervention activities are assessment of Township Health Department (Township Health Facilities and NCDs Health Situation), development of PEN intervention action plans in townships, conducting advocacy meetings or seminars that discuss NCDs issues including “Myanmar National PEN Scaling up Project Plan” and highlight the WHO NCDs action plan, training of Medical Officers and Basic Health staff, implementation of PEN protocol in townships and regular supervision, monitoring and evaluation of PEN scale up activities by central and regional level supervisors and township level staff (Township Medical Officers, Township Public Health Officers, Medical Officers) (Manual of TOT manual for PEN, 2017). There was no survey to assess the condition of PEN service after implementation of PEN service in Myanmar and there was needed to know the community and health care providers to make the future planning strategies. Therefore, the current study was conducted to explore the enablers and barriers of PEN service from both community and health care provider perspectives by using both quantitative and qualitative study design in 2019.

According to the quantitative results, most of the participants were between the age group of 40 to 50 years, female, married and dependent. Nearly half of participants (44.2%) had primary school level of education. Vast majority of participants (93.0%) had less than 100,000 kyats of monthly per capita income. Nearly half of the participants (43.6%) had known NCDs and which were hypertension (77.8%), diabetes (29.2%), asthma or COPD (6.0%) and cancer (2.8%) respectively. In the study at Bhutan in 2014, (6.6%) of study population had NCDs, (47.4%) were aged between 40 to 59 years, (60%) were female, illiterates were (66.6%) and farmers were (52.7%) respectively. And also (61.7%) had income below US$ 50 that is 750,000 Myanmar Kyats per month. Regarding to NCDs that they had, (22.6%) were hypertensive patients, (26.1%) were diabetes (Wangchuk et al. 2014).

Regarding the knowledge of non-communicable diseases, majority of participants (94.2%) had heard about four major NCDs and the most common was cardiovascular diseases including hypertension (96.8%) and diabetes (89.1%) however, cancer and chronic respiratory diseases were (29.9%) and (8.4%) were mentioned least by the participants respectively. And (88.2%) of participants had known four major risk factors for NCDs correctly. Although almost all (94.2%) answered that unhealthy diet, tobacco use (25.4%) and harmful use of alcohol (22.0%) were risk factors of NCDs. Only (3.4%) knew that the other risk factor was physical inactivity. So, we need to emphasize on health education concerning physical exercise and their advantages to the community. According to the results, only (11.8%) of participants have got information about NCDs from the health staff of PEN clinic. Regarding to the preventive ways for risk factors for NCDs, almost all (93.6%) answered to take healthy diet.

More than half (65.5%) had heard about PEN service and almost all of them, (94.9%) knew about the presence of PEN service in their areas. Vast majority of the participants (90.6%) knew that people who were equal or more than 40 year should go to PEN clinic for screening. However, (12.7%) of participants didn’t know about the services which were available in the PEN clinic. Although majority of participants (61.5%) knew PEN service in their areas but they had not consulted in PEN clinic. The reason of not consulting in PEN clinic they mentioned most was because of not presence of NCDs among them (56.4%). Few participants (13.5%) didn’t know about the PEN services, (12.7%) of participants had already taken the NCDs treatments from physician or private clinic and (11.1%) of participants mentioned that they had no extra time to come to PEN clinic and (1.6%) can’t came to clinic because of their deformity or stroke. In the study at Bhutan in 2014, the reasons for missing the follow-up were inability to walk for long distances by old people, disability following stroke, and not wanting to travel by bus due to motion sickness. A few patients shifted to indigenous medical practitioners, and loss to follow up rate was higher among patients in the hospitals, as many took treatment from other sources such as the army and other employers (Wangchuk et al. 2014).

The main enabler of PEN service most of the participants mentioned was supply of essential drugs for NCDs with free of charge. By implementation of PEN service, basic health staff become more keep in touch with community and can give service on NCDs more than previously and they got more trust from community. The basic health staff stated that they become more confident on giving treatment on NCDs as treatment guideline was supported as training manual books and this was also a good point for implementation of PEN service. Another point was community also had advantages because they can get early diagnosis and treatment of NCDs to prevent the complications and also it can reduce the admission rate of NCDs at hospitals. Opening of regular clinic day make increasing awareness of community on non-communicable diseases. Besides, presence of supporting organizations (HelpAge International and World Bank) and encouragement from the Minister of Ministry of Health and Sports was also the main enablers for PEN service.

Although essential drugs and equipment can supply for free of charge, some basic health staff complaint for shortage of drug supply and not working of equipment in some areas. They claimed for not getting in time response for repairing of equipment which was asking to repair to central level was one of the barriers and they had to buy the needed equipment sometimes with fund from the patients. According to the interview results, there were some problems, because health staff from administrative level said that they had enough essential drugs and equipment in central level and they can distribute immediately if the lower level requested. And they stated that the staff from lower level did not ask for the needed things like drugs and equipment to central level. So, there was a gap between the primary health care level and central level in distributing the drug and equipment supply. There was also gap in a study done in Nepal, they also stated that there was a gap in capacity of health institution and system in terms of training, supply, equipment, and diagnostics. They recommend that training of health workers, supply of essential medicines and improvising the service delivery would supplement the effective implementation of PEN in Nepal (Aryal et al. 2018).

There were difficulties in filling of data forms for some BHS who were the person might not getting the training well. As the training program of PEN was multiplier training, there may be weakness in training. Firstly, central team level got training and these central team was teach back to the TMO,THO and HA from corresponded townships from different regions and theses township level staff including TMO, THO, HA1 who have got training also teach back again to their BHS at local areas as multiplier training.

Another aspect of administrators who pointed out as a barrier was shortage of manpower. In a similar study which was done in Ghana, they also mentioned that there was the gap between the human resource capacity and service delivery at the primary care levels. Adequately equipping the primary health care level with trained health workers, basic equipment, medications and diagnostics can optimize the performance of WHO-PEN intervention when implemented (Nyark et al. 2016).

As an enabler, community leaders in this study mentioned that the patients in their village did not need to cost for transportation to get treatment for NCDs like hypertension and diabetes like before because of presence of PEN clinic in their area. Nevertheless, not all people of 40 year and above in the study population was not utilized the PEN service because most of them mentioned that they didn’t know about that PEN service and they perceived that they don’t need to go to clinic because they were healthy and absence of diseases like NCDs. It was pointed out that community had low awareness and health education level on PEN service in their areas. So, we need to emphasize on advocacy among the community level about PEN service in local areas. In a qualitative study of Palestinian territory, results showed that patients perceived positive changes in the quality of NCD services since the introduction of the PEN (Barghouthi et al. 2017). Also, in this study, most of the participants had positive perspective on PEN services implementation.

Most of basic health staff in this study suggested arranging the refresher training for basic health staff. Administrators also aware of giving refresher training to BHS but financial problem was said to be a barrier. Other things basic health staff wanted to suggest were to support the regular and continuous supply of drugs and medical equipment and to combine all of reports forms with standard format. Administrator level also suggested arranging printing of vinyl/posters and pamphlets in their states and regions because the cost of logistic fees for transportation of them was higher than the total printing cost. Some of participants suggested that to establish new reporting format to avoid parallel data system and to reduce the burden of basic health staff.

On conclusion, nearly half of the participants had known NCDs and most common were hypertension and diabetes as it was an alarming feature of the country. But more than half of the respondent had not utilized the PEN service. The main reasons of not using were they did not know about the service and lack of awareness on PEN service. There were more enablers than barriers on implementation of PEN services, therefore, PEN service should be continued and expanded more to cover the whole country.

Strength of this study was conducting the research by using both quantitative and qualitative study design and all level of health care providers (started from health staff in central level up to basic health staff in primary health care level) and community leaders from each village in selected townships were also interviewed and could explore their perception on PEN service. Limitation may be the description of the proportion of the known NCDs status among the participants, because these results had to rely only on their verbal responses and not from the measurement of blood pressure and blood sugar and other investigations among the participants at the data collection time.

# **RECOMMENDATIONS**

1. Refresher training for basic health staff need to be given because most of them mentioned that they needed the training again.
2. Continuous supply of drugs and equipment to the primary health care level is required
3. Recruitment and training of additional human power is needed
4. More advocacy meeting should be conducted at the community level concerning PEN service
5. Reporting format of PEN service should be adjusted with other reporting system like HMIS to avoid the duplication of data reporting.
6. Printing process for vinyl/posters and pamphlets should be planned in the corresponded states and regions to reduce the transportation cost of them.

# **REFERENCES**

Aryal, B.K et al. 2018. Assesssment of Health Facilities for Implementation of Non-

communicable Disease Package. Journal of Nepal Health Research Council 16, 149–155.

Barghouthi, N et al. 2017. Implementation of WHO package of essential non-

communicable disease interventions in the occupied Palestinian territory:

assessment of patient perceptions to changes in quality of care with

participatory ranking methods. The Lancet 390, S27. doi:10.1016/s0140-

6736(17)32028-7

Manual of training of trainer manual for package of essential non-communicable

disease intervention (PEN), 2017

Nyarko, K.M et al. 2016. Capacity assessment of selected health care facilities for the

pilot implementation of Package for Essential Non-communicable Diseases (PEN) intervention in Ghana. The Pan African medical journal 25, 16.

doi: 10.11604/pamj.supp.2016.25.1.6252

Wangchuk, D et al. 2014. Package of essential non communicable disease (PEN)

interventions in primary health-care settings of Bhutan: a performance assessment study. WHO South-East Asia Journal of Public Health 3, 154. doi:10.4103/2224-3151.206731

World Health Organization, 2010. Package of Essential Noncommunicable (PEN)

Disease Interventions for Primary Health Care in Low-Resource Settings.

WHO, 2015. *World Health Report*. Non-Communicable Diseases