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AWARENESS AND BARRIERS IN IMPLEMENTING COST-EFFECTIVE WHO PACKAGE OF ESSENTIAL NON-COMMUNICABLE DISEASES IN PAKISTAN

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ABSTRACT

Objective: To determine awareness regarding WHO Package of Essential Non-communicable (PEN) disease interventions among House Officers working in the outpatient department of multiple tertiary healthcare centers of Sindh and Punjab and identify the barriers they perceive to implementing WHO PEN. **Methods*:*** A descriptive cross-sectional study was done over a period of 1 year from September 2022 to August 2023. A total of 320 House Officers participated in the study for assessment of awareness regarding WHO PEN disease interventions, using Google Forms in English. **Results:** Data was collected from private and public tertiary care hospital house officers. The survey showed that most of the doctors (66%) had not heard the term WHO Package of Essential Non-Communicable Disease Interventions for primary health care, and the level of knowledge among doctors of the public sector was higher than in the private sector. Besides knowledge, the most important reported barriers to the management of non-communicable diseases included insufficient medicines (91%), non-availability of equipment (87%), and non-availability of laboratory services (78%). Other notable barriers included lack of manpower/ trained staff (57%), long working hours (69%), and time constraints due to increased patient numbers (79%). **Conclusion*:*** Effective management of non-communicable diseases requires healthcare professionals to be familiar with cost-effective WHO PEN guidelines, receive tailored training programs, and have comprehensive policy reforms to address barriers and adjust national healthcare priorities in a low-resource country like Pakistan.

KEYWORDS: WHO, Non-communicable diseases, Package of Essential Non-Communicable Diseases, House Officers, Barriers.

1. INTRODUCTION

The WHO Package of Essential Non-Communicable Disease Interventions (WHO PEN) was introduced to address the prevention, timely detection, management, and control of Non-Communicable Diseases (NCDs) and stands as a fundamental pillar in the field of primary health care.[1] Despite well-recognized protocols, their implementation is limited to a moderate extent. The World Health Organization identified four main classifications of NCDs, resulting in 41 million deaths yearly, constituting 71% of global mortality. In lower and middle-income states, 74% of NCD-related deaths and 82% of premature deaths occur due to their existing harsh socio-economic conditions.[2] Many countries have adopted the WHO Package of Essential Non-Communicable Diseases (PEN), evaluating its effectiveness. In Pakistan, a national action plan framework 2021-2030 for NCD guided by the WHO global NCD Action Plan was adopted to enhance disease prevention and control.[3] According to our literature search, the first National Action Plan for Non-Communicable Diseases was released in 2004[4], and a revised version was introduced in 2021, which emphasized the implementation of WHO PEN to ensure timely treatment and referrals.[5] One major gap in is the lack of high-quality research that advises the government in policy development for NCD prevention programs.[6]

In countries like Pakistan, the overwhelmed healthcare system limits doctors' ability to offer personalized guidance on the control of risk factors for NCDs. In 2019, NCDs caused 55.3% of Pakistan's 1.49 million deaths.[3] Managing significant NCDs requires cost-effective, evidence-based interventions emphasizing behavioural and lifestyle changes. Early detection and intervention can mitigate their impact, improving both viability and standard of life.[6] Research in the African continent revealed obstacles in implementing the PEN

package, including staff shortages, limited medical resources, inadequate healthcare facilities and infrastructure, and a shortage of diagnostic tools.[7]

A Nigerian study revealed poor control of NCDs due to the knowledge gap among healthcare workers.[8] In Bhutan, the implementation of WHO PEN interventions had shown successful outcome with improved proportion of patients follow up and regular intake of medication.[9] An Indian survey assessed the healthcare facilities to address the monitoring of NCDs and documented significant gaps in terms of the availability of essential medicines, technologies, training of human resources, and counselling services.[10] A cross sectional study in Myanmar demonstrated a higher NCD burden especially among those with a lower education status.[11] In Pakistan, a study of family physicians found that most general practitioners rarely adhere to international guidelines for managing diabetic patients.[12]

This study aims to improve NCD management in Pakistan in order to achieve the Sustainable Development Goals, of which Pakistan is a signatory. It intends to assess the capacity of healthcare workers to implement the WHO PEN package of interventions in tertiary care settings.

2. MATERIALS AND METHODS

A multicentre descriptive cross-sectional study was planned to measure the knowledge of house officers regarding the PEN package. It is carried out over a period of one year from September 2022 to August 2023. The synopsis and the questionnaire were crafted from September 2022 to May 2023, followed by ERC approval, data collection, analysis and manuscript writing. Data was collected online from House Officers (HOs) working in public and private tertiary care centers across Pakistan's two most populous provinces, Sindh and Punjab. The data was collected from June 2023 onwards and subsequent analysis was done in August 2023. HOs were selected for study because they are recent graduates with up-to-date theoretical knowledge about NCDs. They are also assigned to tertiary care centers, Basic Health Units and Rural Health Centers, making them the frontline healthcare workers responsible for managing NCD patients, necessitating sufficient knowledge of NCD treatment.

A total of 320 HOs were recruited through social media platforms. The self-administered questionnaire was developed in English using Google Forms. Approval for this study protocol was granted by BMY Health's ethical committee (number BMY-ERC1-09-2023).

The sample size was calculated using an online WHO sample size calculator for proportion. Prevalence of good knowledge of participants as 64.3%, as reported by *Sanabel Afana*[13], with a confidence level of 90% and relative precision of 7%, the sample size came out to be 311. All HOs working in tertiary care hospitals in Sindh and Punjab were included in the study through non-probability convenience sampling with exclusion of those who had not attended medicine rotation.

After written informed consent the participants filled in the survey form. The survey was structured into three primary sections: demographic information and work experience, knowledge regarding the PEN package and its guidelines, and barriers that hindered the implementation of the package. This questionnaire was designed in line with WHO PEN guidelines for low-resource healthcare setups. There were 20 questions regarding awareness; correct answers were scored as one and incorrect as zero. Total score for each individual was calculated and score of $\geq$ 75% was set for the cut off for satisfactory knowledge.

Data was entered and analysed using SPSS version 25.0, and results were presented as frequencies and percentages. Means and standard deviation were calculated for quantitative variables like age and score. Awareness about WHO PEN was cross-tabulated with certain socio-demographic variables using chi-square with alpha pre-set at 5%.

3. RESULTS

3.1 Demographic Details of Doctors Surveyed

There were 320 doctors surveyed from both public and private sector hospitals, which were further stratified based on their current department and status of house job. Among whom, 292 were from public hospitals and 28 from private. A total of 139 were surveyed during their housejob and 181 were surveyed within two weeks of completing their housejob. Regarding departments, 262 were from Medicine & Allied, 34 from Surgery & Allied, 11 from Gynaecology, and 13 from Paediatrics. All of them had done their rotation in internal medicine.

3.2 Awareness of Doctors regarding WHO PEN

Our study found that 66% of the doctors had not heard of the term WHO PEN for primary health care, but most of them (79.1%) had knowledge about the components of NCD management.

The knowledge about the most practical test used for diagnosis of diabetes in low-resource settings was found only 46.9% correct. Additionally, many doctors (58.4%) did not know what levels of HbA1c should be achieved through treatment. Furthermore, while almost all healthcare officers (96.9%) were aware of hypertension risk factors, only 68.8% knew that at least two separate visits are required to diagnose hypertension, according to WHO PEN recommendations. Finally, the knowledge about the age at which mammography is recommended, was incorrectly mentioned by 59.1% of participants. In total only 56.3% of respondents possessed a satisfactory understanding of WHO PEN guidelines (Table 1).

Table 1: Awareness of doctors about WHO PEN disease interventions.

Question	Correct No. (%)	Incorrect No. (%)
1) Heard of WHO PEN Disease Interventions for primary health care	107 (33.4)	213 (66.6)
2) Components for NCD management?	253 (79.1)	67 (20.9)
3) WHO PEN covers which items?	201 (62.8)	119 (37.2)
4) Symptoms for assessment of asthma?	207 (64.7)	113 (35.3)
5) Symptoms for assessment of COPD?	312 (97.5)	8 (2.5)
6) Measure peak expiratory flow rate in suspected patients of asthma or COPD?	280 (87.5)	40 (12.5)
7) Medicine for measuring peak expiratory flow rate?	268 (83.8)	52 (16.3)
8) Drug contraindicated in asthmatic patients.	303 (94.7)	17 (5.3)
9) Washing hands or changing gloves or using sterilized equipment for each patient is necessary	317 (99.1)	3 (0.9)
10) Most practical test for diagnosing diabetes in a low-resource setting	150 (46.9)	170 (53.1)
11) Level of HbA1c to be achieved through treatment in diabetic patients?	133 (41.6)	187 (58.4)
12) Risk factors for hypertension?	310 (96.9)	10 (3.1)
13) Minimum number of visits required to diagnose hypertension?	220 (68.8)	100 (31.3)
14) For diabetics with high risk for CVD what are the recommended lowest levels of blood pressure?	243 (75.9)	77 (24.1)
15) Risk factors for breast cancer?	293 (91.6)	27 (8.4)
16) At what age mammography is indicated for screening breast cancer?	131 (40.9)	189 (59.1)
17) A 45-year-old, female patient has lump in the breast, recent nipple retraction and bloody discharge. She has calcifications present on mammography. Will you refer this patient to an oncologist?	315 (98.4)	5 (1.6)
18) A 50-year-old female patient comes to you in OPD with a report suspicious for malignancy, you will refer to oncology department	175 (54.7)	145 (45.3)
19) Minimum minutes per day recommended for physical activity (brisk walk)	203 (63.4)	117 (36.6)
20) Maximum amount of salt recommended per day orally?	171 (53.4)	149 (46.6)
Satisfactory Score	**180 (56.3)**	**140 (43.8)**

[WHO = World Health Organization, PEN = Package of Essential Non-Communicable Diseases, NCD = Non-Communicable Diseases, COPD = Chronic Obstructive Pulmonary Disease, CVD = Cardiovascular Disease, OPD = Out-patient Department]

3.3 Association of PEN Package with socio-demographic characteristics

Doctors' knowledge of WHO PEN in the public sector was higher than that of the private sector. In the public sector 55% had a satisfactory score compared to only 1.3% in the private sector with a $p \leq 0.001$ on Chi-square test. The results for score based on different departments were inconclusive on Chi-square with a $p = 0.85$. Of those who had recently completed housejob, 38.1% had a satisfactory score as compared those who were currently attending who only had 18.1%, with a p-value of ≤ 0.001 on Chi-square analysis.

3.4 Practice of Doctors regarding WHO PEN

The doctors were asked about the practice of counselling patients for various NCDs, 95% responded that they provide counselling on self-care for blood pressure monitoring, 92% on blood glucose monitoring in diabetes, 79% on asthma and COPD monitoring, and only 23% encouraged rehabilitation exercise.

While treating patients, 77.5% always assessed the patient's risk factors for NCDs. Specifically for smoking, 83.4% always asked about their smoking status, and 12.5% often did. In the patients who had a history of smoking 87.8% always counselled patients for smoking cessation, and 10.3% often did.

When study participants were asked whether they had been adequately trained in diagnosing and treating NCDs during their housejob, 36% agreed, while 47% stayed neutral on the matter, and 17% disagreed.

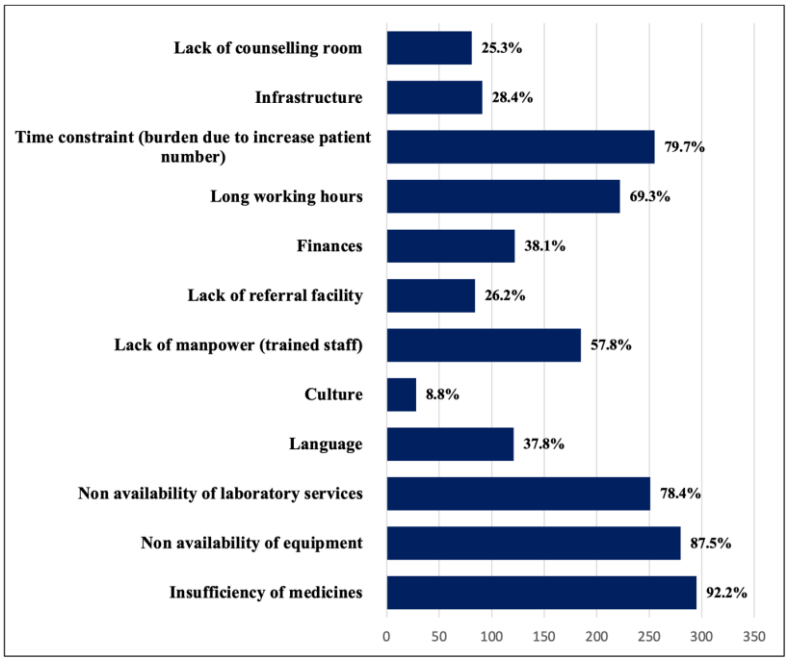

Figure 1: Barriers faced for implementation of non-communicable diseases.

3.5 Barriers Faced by Doctors in Managing NCDs

The study also examined the perceived barriers to implementing the WHO PEN. Participants were presented with a list of barriers, and they were asked to indicate whether each barrier was a hindrance to effective implementation. The most reported barriers included insufficiency of medicines (91%), non-availability of equipment (87%), and non-availability of laboratory services (78%). Other notable barriers included lack of manpower (trained staff) (57%), long working hours (69%), and time constraints due to increased patient numbers (79%) (Fig 1).

Participants were also inquired about the availability of WHO PEN recommended medications & equipment. It was confirmed that many of the basic medications and lab services were available most of the time. As for equipment for use in the outpatient department, there was a lack of spacers for inhalers (16%), measuring tapes (40%), and troponin test strips (19%) (Fig 2).

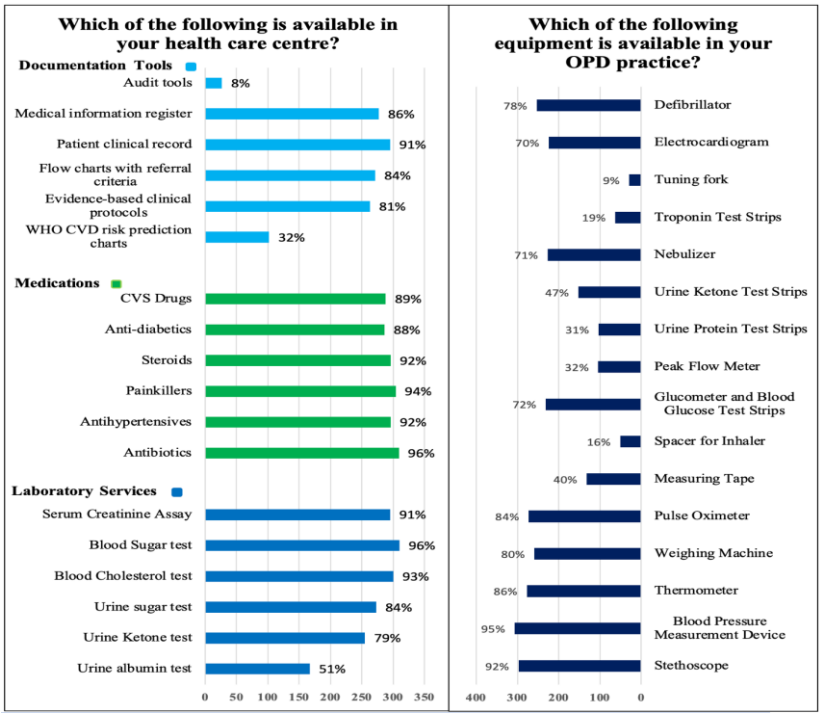

Figure 2: Availability of documentation tools, medications, laboratory services, and equipment in healthcare facilities *[WHO = World Health Organization, CVD = Cardiovascular Disease, CVS = Cardiovascular OPD = Out-patient Department]*

3.6 DISCUSSION

This research investigates HOs level of awareness regarding WHO PEN guidelines and the factors that hinder the implementation of the WHO PEN package of interventions. This study adds to the broader conversation on effective management of NCDs.

The discovery that only 56.3% of respondents possessed a satisfactory understanding of WHO PEN guidelines underscores the necessity for targeted educational initiatives and ongoing professional development during house job. When compared to other studies, like the one conducted by Sanabel A.,[13] our findings reveal variations in doctor awareness levels. Sanabel A. reported a higher percentage of participants, 64.3% of whom had good knowledge of WHO PEN guidelines. These disparities emphasize the need for tailored educational interventions to enhance awareness levels in our specific context.

Although a notable proportion of participants demonstrated a broad understanding of NCD management, certain areas of deficiency became evident. The data showcases a strong proficiency in managing lung diseases like asthma and COPD. However, knowledge gaps were noticeable in other domains, such as the optimal target HbA1c levels for therapy (41.6%). Furthermore, it became evident that while HOs were aware of the risk factors linked to conditions such as hypertension and breast cancer, a substantial portion lacked knowledge of precise diagnostic criteria. This underscores the significance of not only grasping disease causes but also having a solid understanding of practical diagnostic criteria.

A notable observation is the relatively low prevalence of HOs advising patients to engage in rehabilitation exercises, with only 23% reporting such practice. This discovery emphasizes the need to place a stronger emphasis on lifestyle modifications in our education and training. This is particularly important considering the crucial role of rehabilitation exercises in NCD management. In comparison, a study in Sri Lanka found that 41.3% of medical officers advised NCD patients to modify their lifestyles.[14] Similarly, in China, only 28.3% of physicians provided lifestyle modification advice to hypertensive patients.[15] These international findings highlight that promoting lifestyle changes, especially through rehabilitation exercises, remains a global challenge in NCD management.

The study's identification of barriers reveals the complex challenges hindering the effective implementation of WHO PEN guidelines. Notably, 83.8% of participants identified a lack of training in palliative patient care as a significant barrier. This highlights a significant deficiency in healthcare professionals' capacity to deliver comprehensive care for individuals with chronic and life-threatening conditions.

3.7 Recommendations and Limitations

Tailored training programs focused on WHO PEN guidelines should be implemented for healthcare workers, ensuring that HOs are updated with the latest developments, and efforts should be made to prioritize NCDs in the list of priority diseases by national health authorities so that resources can be allocated more effectively. Further studies must be carried out with probability sampling to strengthen the evidence. Doctors should be encouraged to engage in research projects that explore the effectiveness of implementing WHO PEN guidelines in diverse contexts. Research outcomes can inform evidence-based practices and contribute to the refinement of NCD management strategies.

4. CONCLUSION

Our study found out that most of the doctors in Pakistan are not familiar with the term WHO PEN and it is highlighted as a crucial factor in effectively managing NCDs. Bridging the knowledge gap among healthcare professionals is essential, and tailored training programs that offer practical insights into disease assessment and management are significantly needed. Implementation of comprehensive policy reforms are necessary to address the barriers identified, and empowering professionals with the necessary skills and adjusting national healthcare priorities can lead to a holistic approach to disease management. These implications extend to healthcare institutions, policymakers, and educators, emphasizing the need for collaboration and action to enhance healthcare delivery and contribute to broader public health objectives.

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