Journal of Epidemiological Society of Nigeria Vol. 6, No. 2 Dec. 2023 1-10

Level of Preparedness for Screening of Chronic Obstructive Pulmonary Disease and Asthma at Primary Health Care Facilities in Jos North Local Government Area, Plateau State, Nigeria.

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Abstract

Background: The prevalence of chronic obstructive pulmonary disease and asthma are on the rise, yet both diseases have preventable risk factors. Primary Health Care facilities have a role to play in the prevention of these diseases. This study sought to assess the readiness of Primary Health Care facilities to screen for, diagnose and make referrals of chronic obstructive pulmonary disease and asthma in Jos North Local Government Area of Plateau State.

Methods: A cross-sectional assessment of 24 Primary Health Care facilities was made. Data were collected using a facility checklist adapted from a World Health Organization Rapid Assessment Tool. They were then processed and analysed with Epi-Info version 7.2 and presented as frequencies, percentages and means.

Results: In the facilities, the Community Health Extension Workers were the most available human resources (average of 4.1 ± 2.7 per facility). Only one person had received in-service training in chronic respiratory diseases. No guidelines were sighted for screening of chronic respiratory diseases and all the facilities lacked the instruments and drugs for screening and diagnosis of chronic obstructive pulmonary disease and asthma. All the facilities were able to refer when needed but lacked the necessary support in terms of transportation and communication gadgets.

Conclusion: Primary Health Care facilities in Jos North Local Government Area lack the preparedness to screen for and diagnose chronic obstructive pulmonary disease and asthma. There is a need for the equipping of Primary Health Care facilities for this purpose.

Key words: Screening preparedness, Primary Health Care facilities, diagnose, chronic obstructive pulmonary disease, asthma

Introduction

Global Burden of Disease (GBD) estimates have been able to establish that the global prevalence of both Chronic Obstructive Pulmonary Disease (COPD) and asthma had increased between 1990 and 2015.[1] It was determined that COPD had increased its lead as a cause of death while deaths from asthma reduced during the same period. Smoking was the risk factor found to be common to both of them.

Despite COPD being the third leading cause of death worldwide, affecting 329 million persons and an estimated global economic cost of USD 2.1 trillion, it appears to be relatively unknown.[2] It has been referred to as the "silent epidemic" of Africa. In Nigeria a study in Federal Medical Centre, Owo found COPD to be the third leading cause of respiratory disease hospitalization after tuberculosis (TB) and pneumonia. It was followed by asthma and lung cancer.[3]

Varying prevalence rates for asthma across African countries were stated in a review of studies by Gemart et al: Ethiopia 9.1%, Nigeria 13.0%, Mozambique 13.3%, Kenya 15.8% and South Africa 20.3%.[4] The wide variations were explained to be due to variations in poverty, climate, exposure to tobacco smoke, viral infections, air pollution, chemical irritants, helminth infections, diet and well-known allergens such as house dust mite, cockroach, dog and cat dander, and even washing soap which are all risk factors and triggers of asthma. A high prevalence of asthma was also noted in countries with very high prevalence of HIV/AIDS and TB of which Nigeria is one.[5] In order to combat these diseases as major contributors to morbidity and mortality, the health system needs to have a structure that gives people quick access to medical care which in Nigeria, appears to be concentrated in secondary and tertiary institutions.

The Primary Health Care (PHC) system in Nigeria is part of a three-tier health system, designed to be the service closest to the people. The minimum service components of PHC include education on and methods of preventing and controlling prevailing health problems.[6] The services at the primary level are provided by PHC workers of different cadres who are trained to provide broad-based health services. Typically, they include nurses, midwives, Community Health Officers (CHOs), Community Health Extension Workers (CHEWs), junior CHEWs and Environmental Health Officers (EHOs).[7,8] They have been shown to be effective in the implementation of programmes that target specific health needs such as tuberculosis and immunization programmes. In Nigeria, the PHC system was completely under the management of the local government, the level of government that is assumed to be closest to the people. Due to recent policy changes, its overall management is to be overseen by a single authority with management teams at State, local and facility levels.[9] This system was not in full implementation at the time of this study.

Screening is an important tool in the implementation of disease prevention strategies. The long latent period of most Non-Communicable Diseases (NCDs) provides a great opportunity for early detection. Primary Health Care centres are well positioned to provide community health education and screening services and thereby provide early detection. They can be an effective link for referral to diagnostic and treatment centres. Nigeria has a two-tier, two-way referral system within the public health service. The flow of patients is from primary to secondary and finally to tertiary health facilities. Linkages can be found with private facilities when there is a need for specialist care not available within the public health service.

The use of a questionnaire with manual/sensor-based peak flow meter or COPD-6 vitalograph and spirometry have been adjudged the most reliable method for the screening and subsequent diagnosis of COPD and asthma.[10,11,12] A questionnaire with a minimum of 4 questions to detect symptoms and risk factors and a peak flow meter have been shown to be highly sensitive in detecting those with COPD and/or asthma.[13] A Peak Expiratory Flow Rate (PEFR) of < 70% is usually indicative of airway obstruction. The WHO Package of Essential Non-communicable Diseases Interventions (WHO PEN) minimum package guidelines designed for primary care in low resource settings,[14] recognizes that asthma and COPD can present with similar symptoms and has therefore provided a set of guidelines for their screening, diagnosis,

management, and referral. It is the guide by which the facilities in this study were assessed for their level of preparedness to screen for these two diseases.

Methodology

Study setting

This was a cross-sectional study conducted in Jos North Local Government Area (LGA) of Plateau State which is home to a projected population of 572,700.[15] The LGA is made up of 20 smaller units called wards, 19 of which contain at least one of the 34 PHC centres of the LGA. These facilities had a total of 532 health workers as at the time of the survey. [16] A total of 24 PHC facilities were assessed in the study with at least one facility being selected from the wards that contained PHCs as described in a previously published paper by Miner et al.[17] Public PHC centres that were functional and offered clinical services at the time of the study were included. Excluded were PHC centres that were new (less than six months old) and not fully functional.

Survey Tool

A facility check list adapted from the WHO Rapid Assessment Tool for the prevention and control of NCDs in primary care centres in low-resource settings was used to obtain data.[18] It consisted of sections on: human resources, equipment, infrastructure/services, medicines, utilization of services, referral of patients and community links. It was pre-tested among six PHC facilities in a different LGA, thus enabling adjustments to be made before use for the survey.

Data collection and analysis

Six research assistants were trained for data collection. At each selected health facility, the officer in charge was approached, consent obtained and then interviewed to obtain information and identify items required from the facility checklist. Data were entered, cleaned and analysed using Epi-Info version 7.2. Facility preparedness was assessed according to the different domains and presented as percentages of the availability of items for each category.

Ethical consideration

Ethical approval was obtained from the Jos University Teaching Hospital (JUTH) Human and Research Ethics Committee (JUTH/DCS/ADM/127/XXVIII/990). Permission was sought and obtained from the Plateau State Ministry of Health, the Jos North Local Government council and PHC department to conduct the study. Consent was obtained from each facility head before obtaining data.

Results

A total of 24 PHC facilities were assessed for preparedness to screen for and diagnose COPD and asthma.

Human resources: The largest human resource available to the PHCs under study were the CHEWs with an average of 4.1 per facility. The lowest were the CHOs with less than one per facility as shown in Table 1. Only 1 facility had health workers trained in screening and diagnosis of Chronic Respiratory Diseases (CRDs) in general which include COPD and asthma. A quarter (25%) of the facilities regularly screen and diagnose for CRDs in general. There were no guidelines for the management of NCDs available in any of the facilities.

Equipment: Most of the equipment required for the screening and diagnosis of COPD and asthma were not available at the facilities under study (Table 2).

Infrastructure/Services: The electricity power source that was most reported for use was that obtained from the national grid (Table 3). Some of the facilities depended on more than one power source. The most common water source was the protected dug well. Only three of the facilities had communication equipment in the form of phones supported by the facility. Basic procedures required to screen for or diagnose COPD and asthma were not available at any of the facilities. Counselling and health education of patients and family members on risk factors was available in most of the facilities as seen in Table 4.

Community links: Table 4 also shows that only 1 facility had community activities that were associated with CRDs.

Medicines: None of the facilities had a constant availability of salbutamol tablets or inhalers which are required in carrying out the peak flow test that

enables differentiation between COPD and asthma when screening (Table 4).

Utilization of services: There were a total of 4073 outpatient visits to the facilities (Table 6). Only 12 of those visits were for asthma or chronic cough with one occurring a day prior to data collection.

Referral practices: All of the facilities are able to refer patients when required whether for diagnosis, to get a second opinion or for emergencies (Table 5). Majority, 14 (58%) of the facilities would normally use the form designed for the purpose of referrals and the forms were available in 19 (79%) of the facilities. Most of the facilities were within 20 – 30 minutes walking distance from a referral centre. Only one facility which was the one located in the State Secretariat had an ambulance available for which fuel was also available. Five of the facilities stated that they would be able to make arrangements for an ambulance transfer if required. The most frequent mode of transport for transferring patients is by commercial vehicles. In most cases, the patients are followed up at the referral centres.

Table 1: Human resources available for screening and diagnosis of COPD and asthma at health facilities

Staff cadre	No. working in facility	Average no. per facility N = 24	Range
Nurses/Midwives	43	.....	. . .
CHO	10	0.4 ± 0.7	0 – 2
CHEW	99	4.1 ± 2.7	1 – 12
JCHEW	54	2.3 ± 1.6	0 – 7
Laboratory scientist/technologist	11	0.5 ± 0.7	0 – 3
Laboratory Technician/assistant	25	1.1 ± 0.6	0 – 2

Table 2: Equipment available for screening and diagnosis of COPD and asthma

Equipment	No. of facilities where available N = 24	Number of devices available	Average no. per facility	Range
Weighing machines	24 (100.0)	53	2.2 ± 0.9	1 – 4
Measuring tape	23 (95.8)	52	2.2 ± 1.4	1 – 4
Stethoscope	22 (91.7)	45	1.9 ± 1.0	0 – 4
Peak flow meters	0 (0.0)	0	0	-
Portable spirometer	0 (0.0)	0	0	-
Questionnaire guide for COPD/asthma	0 (0.0)	0	0	-
Normogram for PEFR (if required)	0 (0.0)	0	0	-

Table 3: Distribution of amenities available at the health facilities

Amenity	Description	Frequency (%) N = 24
Electricity power source (multiple responses allowed)	National grid	15 (62.5)
	Generator	6 (25.0)
	Solar	10 (41.7)
Main source of water	Protected dug well	11 (45.8)
	Borehole	4 (16.7)
	Purchase water from vendors	4 (16.7)
	Public tap	4 (16.7)
	Unprotected dug well	1 (4.2)
Communication infrastructure	Facility owned or supported telephone	3 (12.5)
	Short wave radio	0 (0.0)
	Computer	0 (0.0)
	Access to email	0 (0.0)

Table 4: Services and drugs available for screening and diagnosis

Service/drug	Frequency (%)
Peak flow test	0 (0.0)
Spirometry	0 (0.0)
Patient counselling and education	22 (91.7)
Family members counselling and education	20 (83.3)
Community activities for CRDs	1 (4.2)
Salbutamol inhaler	
Always available	0 (0.0)
Sometimes available	2 (8.3)
Unavailable	22 (91.7)
Salbutamol tablets	
Always available	9 (37.5)
Sometimes available	5 (20.8)
Unavailable	10 (41.7)

Table 5: Referral practices in the Primary Health Care facilities

Practice	Description	Frequency (%) N = 24
Manner of referral	Use of designed form	14 (58.3)
	Written	10 (41.7)
Referral forms available	Yes	19 (79.2)
	No	5 (20.8)
Distance from nearest referral institution (measured in time)	5 mins	3 (12.5)
	10	4 (16.7)
	15	2 (8.3)
	20	7 (29.2)
	30	7 (29.2)
	60	1 (4.2)
Functional ambulance available	Yes	1 (4.2)
	No	23 (95.8)
Able to arrange for ambulance	Yes	5 (20.8)
	No	19 (79.2)
Most frequent mode of transport for emergency transfer	Commercial vehicle/ Public Transport	22 (91.7)
	Private Vehicle	1 (4.2)
	Ambulance	1 (4.2)
Able to refer for second opinion	Yes	24 (100.0)
	No	0 (0.0)
Follow up pattern	Follow up at upper level	18 (75.0)
	Referred back for follow up	6 (25.0)

Discussion

The minimum standards for PHC centres in Nigeria require that at the centres, it should be one medical officer if available, one CHO, four nurse/midwife, three CHEWs, six JCHEWs and one laboratory technician among other support staff.[19] They are expected to cover an estimated 10,000 – 20,000 population since they operate at the ward level. In this study these requirements were not met except in the case of the CHEWs. The data also revealed that there was a maldistribution of the staff, with some having complete absence of some cadres and others having excess. This dearth of human resources will impact negatively on the integration of non-communicable diseases in the primary health care system and in particular COPD and asthma. This points to a need for the government to employ more health workers for the primary level of care and ensure fair distribution that can adequately take care of the needs of the population. The support for health workers to be able to screen for and diagnose CRDs is not there as they have had no training, no guidelines are available and there is no sustained drive to screen for and diagnose CRDs. This finding is similar to that from a study conducted in the Federal Capital Territory of Nigeria which reported that 'there is no specific capacity building activity for NCDs'.[20] This is a gap that could allow many persons to go undetected, delay initiation of treatment and ultimately increase morbidity and mortality of these diseases. However, the standing order for community health workers covers what is to be done with patients presenting with symptoms of COPD and asthma.[21] This can be leveraged on during training periods to improve their skill and raise their index of suspicion.

The equipment required for the screening and diagnosis of NCDs were also not available in all the facilities. A lack of tools to work with limits the effectiveness of any worker. No facility had any health education materials related to CRDs or their risk factors so that at the minimum, information can be provided to communities. Developing and providing health education materials with locally

relevant content can encourage early presentation of illness. Disease-specific health education has been shown to be beneficial for COPD and asthma and in some places have become part of the management programme for those diagnosed with the disease.[22,23,24]

The procedures required for screening and diagnosis of COPD and asthma i.e. peak flow test and spirometry were not available in any of the facilities. The peak flow test is simple to conduct and requires less skill than spirometry.[25] This complete lack of screening tools limits the capacity of PHC workers to make evidence-based decisions for those who present at their facilities. Patients can be referred for spirometry but this may result in missed opportunities as it would mean increased cost and travel for the patient. Providing these simple but effective tools for the screening of COPD and asthma at PHC level would be a more cost effective approach in lessening the burden of these diseases.

In order to differentiate between COPD and asthma, there is need to administer a bronchodilator. The recommended drug to be used is salbutamol either as a tablet or as an inhaler. Yet this drug was mostly unavailable within the facilities. This once again showed that little priority is being given to detecting these two diseases. Other drugs that were assessed are used mainly to manage emergency situations before referral or follow up management of patients. Antibiotics and pain relief medication were fairly available. This provides a reasonable level of confidence that those who present with urgent respiratory conditions can be given some level of attention before definitive management is available. The only antitussive, codeine, was however not available possibly due to the recent ban on the importation, production, sale and distribution of the drug by the government due to its rampant abuse.[26]

The infrastructure required to support the facilities in providing services were weak. There was a near absence of communication infrastructure of which a phone or radio is the minimum standard required for PHC centres.[19] This makes it less efficient to provide referral services and feedback. It would also make it difficult to provide facility-driven linkages to care especially in emergencies Electricity supply was by multiple sources and water supply for most facilities was by the use of protected dug wells. The amenities are necessary for the smooth running of facilities. A study on the facility readiness of primary healthcare facilities in Nigeria demonstrated that the presence of amenities was related with the increased availability of certain drugs and services.[27] Even though the study was not specific to CRDs or any particular disease, it underscored the need for facilities to have a regular supply of light and water in order for them to provide the needed services.
There was a high turnout of patients at the facilities but very few of these were for asthma or chronic cough. The lack of patients presenting with chronic respiratory symptoms may be as a result of the lack of the drugs and services required to manage such cases rather than as a result of absence of these cases in the communities. It may also point to the low index of suspicion for these two diseases by PHC workers. The evidence from tertiary facilities paints a different picture as an increasing number of patients with COPD and asthma are presenting at that level of health care.[3,28,29] However, majority of the facilities offer in-patient care and most have beds on which patients can be kept for observation. This can be useful for patients who may come with an exacerbation of the COPD and would require the administration of intravenous medication.

Only one facility stated that there were community activities ongoing in respect to COPD and asthma. The activities were said to be at the instance of the ward health committees. However, specific activities could not be provided and the claim could not be ascertained. The lack of community activity with respect to CRDs points to the low level of awareness and low level of priority that these diseases occupy both in the health sector and among the populace. Several studies have shown the benefit of community services in the control of COPD and asthma.[30,31,32] These come in various forms including, door-to-door screening, home/school education interventions, social support and improved referral practices.

Primary health care facilities will require the use of referral services for standard diagnostic tests, assessments and for definitive management of COPD and asthma. The cases may also present as emergencies requiring immediate attention if it is

beyond their capacity or beyond what is available in the standing orders that are provided for them.

All the facilities are able to refer when required and most were within 5 – 30 minutes of a referral facility. Jos North is situated within the capital of the State and it is home to both secondary and tertiary institutions. Hence these institutions are readily accessible to these PHC centres and their patients. However, the conditions under which these referrals are done appears to make the process less efficient and effective. About 40% of the facilities would refer with a hand written letter, despite the fact that referral forms designed for the purpose were available in almost 80% of the facilities. Most were also able to assist the patient arrange to be taken to the referral centre though these arrangements were mostly by commercial vehicles as there was an absence of ambulance services in all but one of the facilities. This finding is similar to that of a study conducted in Nigeria which found that the most common form of transport for patients to the next referral centre was by public transport followed by private vehicles.[33] Ambulance services are not just about transporting patients to the next level of care but involves being able to provide life saving measures while in transit. The provision of ambulance services has continued to be a challenge in Nigeria at all levels of care with patchy attempts by different states and governments.[34] There are also almost no communication gadgets available at the centres hence they cannot call ahead to the referring institutions or contact specialists when required. These conditions may mean that patients do not end up where they were referred to. Also the primary facilities get feedback in only a few cases. This pattern is similar to that found in a study that identified similar issues with the referral system such as lack of ambulance services, lack of written referrals, patients arriving by public transportation and lack of communication networks.[33]

The referral services in PHC facilities need to be supported by the relevant government agencies such as the State Primary Health Care Development Agency (SPHCDA) with dedicated phone lines that are linked to referral centres in order to improve communication. Also transportation of patients can be supported with ambulance services or funds to transport patients to referral centres.

Conclusion

The facilities surveyed had deficiencies in human resources, equipment, services, infrastructure and drugs required for the screening and diagnosis of COPD and asthma. The study therefore concludes that there is a lack of preparedness by PHC facilities in the LGA for the screening and diagnosis of asthma and COPD. Intervention studies are required that would involve provision and training of health workers in the use of tools for detecting COPD and asthma and assessing if this will improve the detection of affected persons within communities. There is also an urgent need for the government to provide the necessary equipment, drugs, and services in PHC facilities for screening and diagnosis of CRDs. Health education programmes initiated by PHC workers are needed in communities to raise the awareness of COPD and asthma.

Acknowledgement

Research reported in this publication was supported by the Fogarty International Center (FIC); Office of the Director (OD/NIH); National Institute of Neurological Disorders and Stroke (NINDS/NIH); and the National Institute of Nursing Research (NINR/NIH) of the National Institutes of Health under Award Number D43 TW010130. The content is solely the responsibility of the authors and does not necessarily represent the views of the National Institutes of Health.

Conflict of Interest

The authors declare no conflict of interest.

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