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Original Article

Pulmonary rehabilitation implementation in Northwest Nigeria: A qualitative study of the views of respiratory health-care professionals

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ABSTRACT

Objectives: Pulmonary rehabilitation (PR) service is a comprehensive program comprising both pharmacological and non-pharmacological (exercise training, counseling, nutritional, etc.) treatment options that have been proven to improve physical and psychological conditions of patients with chronic respiratory diseases (CRDs). Nevertheless, PR is non-existent in most parts of Africa. The objective of this study is to report on the views of respiratory health professionals (pulmonologists and allied health) regarding the implementation of PR in Northwest Nigeria.

Materials and Methods: Using a qualitative descriptive design, a group of 11 purposively sampled respiratory health professionals working in tertiary hospitals in Northwest Nigeria was contacted to participate in the study. Semi-structured in-depth interviews were conducted with the participants. Information power was used to stop data collection. The data obtained were analyzed using thematic synthesis.

Results: Six themes emerged from the interviews as follows: (i) Description of PR as a comprehensive life-saving intervention that involves exercises, education, self-care, and nutrition; (ii) absence of PR units; (iii) possession of knowledge of their roles; (iv) possession of basic knowledge of roles of other team members; (v) lack of specialized workforce; and (vi) lack of facilities and equipment. In general, the results of the study indicated that some respondents were more conversant with PR as an intervention in CRDs than others. Furthermore, the respondents had basic knowledge of the roles of other professionals in the delivery of PR. Finally, the major barriers to the utilization of PR services were poor awareness, lack of equipment, and workforce.

Conclusion: There was a general lack of comprehensive PR services in the study area with respiratory health-care professionals demonstrating variable, but mostly good knowledge of PR.

Keywords: Pulmonary rehabilitation, Qualitative, Respiratory health professionals, Implementation

INTRODUCTION

Chronic respiratory diseases (CRDs) such as asthma, chronic obstructive pulmonary disease, respiratory allergies, interstitial lung disease, lung cancer, occupational lung diseases, and pulmonary hypertension affect hundreds of millions of people of all ages in different countries.[1] These diseases are known to significantly contribute to health-care utilization/costs, morbidity, and substantial mortality rates worldwide.[2] They also represent a public health challenge in both industrialized and developing countries because of their high occurring frequency and substantial economic impact.

Patients with CRDs in the developing countries also face poor access to optimal health-care services due to limited resources.[3] There are a number of unmet needs for respiratory medical care in many developing countries, since most of the patients mainly receive pharmacotherapy intervention due to lack of expertise for the use of non-pharmacological aspects of CRD management.[4] One area of non-pharmacological treatment for patients with CRDs that are lacking in most parts of the developing countries is pulmonary rehabilitation (PR). PR has been proven to be of benefit for improving symptoms, exercise capacity, physical and psychological condition, and reducing the burden experienced by people with CRDs.[5-7]

Unfortunately, the uptake of PR services is poor in low-income countries, especially in rural areas.[8] Some of the major barriers for effective PR programs have been identified to include lack of trained allied respiratory professionals to conduct PR, limited confidence in the effectiveness of PR by patients, and financial load on the patient and health-care system effective programs.[9,10] The five top barriers to PR institution in Nigeria include unavailable/insufficient rehabilitation specialists, lack of rehabilitation equipment, non-availability of institutionalized documented PR protocols, inadequate training on PR, and cost of care to patients. Furthermore, they found that about majority of the physicians they interviewed felt that they lacked sufficient skill and competence to integrate PR program in their institutions, despite having good knowledge of PR.[10]

A comprehensive program of PR intervention involves using physical exercises to address deconditioning and reduce breathlessness and fatigue. It also offers patient education with provision of self-management plans, psychological therapies to manage anxiety, and breathlessness, potentially including optimization of treatment in some health-care settings.[6,11,12] There are ongoing efforts aimed at instituting and increasing access to PR services across many countries of the world. Therefore, it is important to further identify areas of need and perception of relevant stakeholders currently involved in the management of patients with CRD of different setting/environment. This study reported the views of pulmonologists and allied respiratory professionals, namely, respiratory physiotherapists, nurses, nutritionists, psychologists, dieticians, and occupational therapists working in the northwest region of Nigeria on implementation of PR by means of in-depth interviews.

MATERIALS AND METHODS

Study design

The study employed a qualitative descriptive design.[13] Qualitative descriptive design is a generic approach to qualitative inquiry, which employs consistent methods to explore a phenomenon of interest by staying as close as possible to the informants' expressions, thus providing a rich surface description of the phenomenon.[13] We employed this design for its robustness and congruence with our research question and objective of the study. Findings were reported according to the consolidated criteria for reporting qualitative studies (COREQ).[14]

Theoretical/philosophical underpinnings

This study employed the philosophical assumptions of interpretivism.[15] The philosophy postulates that knowledge or reality is subjective and socially constructed based on the lived experiences of social actors.[15] In this study, pulmonologists and allied respiratory professionals were the social actors concerned with PR. We had the assumption that these professionals could provide relevant information needed for the implementation of PR based on their experiences. Hence, the professionals were engaged to understand their views and opinions on the implementation of PR in Northwest Nigeria.

Ethics/ethical considerations

Ethical clearance was sought and obtained from Human Research Ethics Committee of College of Health Sciences, Bayero University, Kano, Kano State, Nigeria. Consent of study participants was sought before the interviews.

Participants

The participants of this study were respiratory health-care professionals that provided or indicated to provide one service or the other within the context of PR based on the Global Obstructive Lung Disease recommendations. These include chest physicians, respiratory physiotherapists, respiratory nurses, psychologists, nutritionists, and occupational therapists.

Recruitment

Using a purposive sampling technique with maximum variation,[16] we selected 11 health-care professionals that specialized in providing PR as mentioned above. All participants indicated their interest and agree to participate in the study.

Data collection

Data were collected using a semi-structured in-depth interview. The interview guide consists of six semi-structured questions, which were developed based on the extant literature and a series of discussions among the authors. We structured the interview guide around five fundamental concepts, these include (a) general knowledge of PR,

(b) availability of equipped PR unit, (c) knowledge of roles of various professionals in PR, (d) factors hindering the delivery of PR services, and (e) strategies that promote the delivery PR [Table 1]. The interviews were conducted by HUB, who was mentored and trained by JM and SKS. Both JM and SKS have previous experience in conducting and publishing qualitative studies. HUB conducted 11 interviews with the participants. Each interview lasted for a minimum of 45 min. The interviews were recorded using an android-based smartphone (Samsung Galaxy S8®). During the interviews, demographic information of the participants was collected using the biographic information sheet.

Data analysis

HUB transcribed the recorded interviews verbatim. JM and SKS conducted the data analysis using thematic synthesis.[17] Thematic synthesis is congruent with our research design and is appropriate for the analysis of qualitative interviews. We conducted the thematic synthesis using six iterative steps. These include data familiarization, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and production of the final report. The familiarization phase involves reading and rereading the transcribed interviews to gain familiarity with the information. This was followed by the generation of initial codes using *in vivo* codes. Following the generation of initial codes, abstraction was performed to search for themes, define, and name the emerging categories. Subsequently, the emerging categories are supplemented with illustrative quotes from the participants' expressions. Finally, the analysis was concluded with the production of the final report using the COREQ guidelines. JM and SKS completed the steps jointly to minimize bias and uphold rigor.

Table 1: Demographic characteristics of the interviewees (*n*=11).

S/N	Professional	Gender	Age (years)	Location
1.	Chest physician	M	56	AKTH
2.	Chest physician	M	33	ABUTH
3.	Physiotherapist	M	41	AKTH
4.	Physiotherapist	M	33	AKTH
5.	Occupational therapist	M	28	FMC, Gusau
6.	Occupational therapist	M	35	UDUTH
7.	Respiratory nurse	F	46	AKTH
8.	Respiratory nurse	F	46	AKTH
9.	Psychologist	M	54	AKTH
10.	Dietician	M	53	AKTH
11.	Dietician	M	40	ABUTH

AKTH: Aminu Kano Teaching Hospital, ABUTH: Ahmadu Bello University Teaching Hospital, FMC: Federal Medical Centre, UDUTH: Usmanu Danfodio University Teaching Hospital

Strategies for establishing rigor

We employed strategies recommended by proponents of qualitative description. These include authenticity, credibility, criticality, and integrity.[18] We observed these strategies by staying very close to our data throughout the analysis, paying attention to participants' details during data collection, and reflecting on all the decisions we made during the study.

RESULTS

Information obtained was organized into the characteristics of the informants and emerging themes as in the subsections that follow.

Demographic characteristics of the informants

Eleven respiratory health-care professionals were the informants. Two chest physicians, two physiotherapists, two occupational therapists, two nurses, two dieticians, and one psychologist working at the hospitals indicated [Table 1] were interviewed. They were mostly males, with long-term experience (average of 10 years) as clinicians or health care workers managing patients with CRDs The occupational therapists reported a relatively shorter working experience (<5 years).

Emerging themes

The informants expressed their views about the implementation of PR in tertiary hospitals in Northwest Nigeria. These views were organized into the following categories: Perception of the meaning of PR, availability of equipped PR unit, knowledge of roles of various professionals in PR, factors hindering the delivery of PR services, and strategies for promoting the delivery of PR.

Emerging themes

The six themes that emerged from the study are as follows:

1. PR is a comprehensive life-saving intervention that involves exercises, education, self-care, and nutrition
2. Absence of PR unit
3. Possession of knowledge of their roles
4. Possession of basic knowledge of roles of other team members
5. Lack of specialized workforce
6. Lack of facilities and equipment.

Perception of the meaning of PR

The study informants described PR as a comprehensive life-saving intervention that involves exercises, education, self-care, and nutrition. They also describe PR to be a multidisciplinary practice involving a number of professionals.

Some excerpts of findings from the in-depth interviews are presented below:

> "*Pulmonary rehabilitation is a multidisciplinary practice which involves the pulmonologist, infectious disease specialist, physiotherapist, and any other related field that may be required to manage the complications of the patients*" (*Physician 1*)
>
> "*When we talk about pulmonary rehabilitation, we are talking about how to educate a patient with pulmonary problems most especially COPD with specific attention to discharge. There is a need to educate the patient on how to carry out some active exercises. Empowering the patient by teaching pulmonary exercises will reduce the rate of the readmission*" (*Nurse 2*)
>
> "*Pulmonary rehabilitation is all about trying to improve the lung function of somebody that has pulmonary problem such as asthma, bronchitis, coughing, or respiratory difficult*" (*Dietitian 2*)
>
> "*It has to do with breathing exercise or breathing. I don't know how you actually call it; rehabilitation may be for people with incapacity to breathe that is how you help them to have good breathing*" (*Psychologist 1*)

The physiotherapists and occupational therapists tended to have more accurate description of PR as illustrated by the excerpts that follow:

> "*Pulmonary rehabilitation is a structured exercise plan that is used to improve the pulmonary function of the patient. It involves medications, chest physiotherapy, close monitoring, and adequate nutrition all in a bid to make the pulmonary function of the patient adequate enough*." (*Physiotherapist 1*)
>
> "*Multidisciplinary practice aimed at optimizing the respiratory function of the patients so that the quality of life is improved and the patient can adapt to certain changes that are irreversible especially in the respiratory system*." (*Occupational Therapist 1*)

Availability of equipped PR unit

The informants reported a lack of functional PR units in their hospitals. The major areas of need comprise mainly workforce and infrastructure. It was also observed that they tended to refer their patients to the necessary health professionals based on need. Some excerpts from the in-depth interviews are presented below:

> *"I cannot really say why we don't have, may be due to workforce shortage, personnel too, there are a lot of physiotherapists but everyone has his own area of specialty, so in this aspect, I don't think that they have enough that will go round*" (*Nurse 1*)
>
> "*We don't have a particular unit but we have all the functional units required to give the pulmonary rehabilitation we give through referrals*" (*Physiotherapist 1*)
>
> "*Yes, we don't have a particular unit but we have all the functional units required to give the pulmonary rehabilitation we give through referrals*" (*Physician 1*)
>
> "*We usually have referral of patients who have been admitted to the hospital and they undergo what we call the in-patient rehabilitation program*" (*Physiotherapist 2*)

Knowledge of the roles of various professionals in PR

The study informants seem to have variable, but mostly good knowledge of their roles and those of other health professionals in delivering PR. The physiotherapists viewed their roles to include thorough assessment of the pulmonary status of the patients, assessment of exercise tolerance, and breathing pattern. The physicians viewed their roles to include detection, diagnosing, and assessment of disease complications. The occupational therapists also reported rendering breathing exercises in addition to self-care and behavioral training. Some excerpts of findings from the in-depth interviews are presented below:

> "*A lot of advice, a healthy lifestyle, healthy eating. Avoid things that would trigger their condition*" (*Dietitian 1*)
>
> "*We have to do thorough assessment of their cardiopulmonary status, assessing their exercise tolerance, assessing their breathing pattern (dyspnea or orthopnea), assessing generally their BMI, weigh their level of education*" (*Physiotherapist 2*)
>
> "*Well as a pulmonologist, I am the primary physician who usually detect or diagnose pulmonary diseases, assess complications, outline the kind of treatment and human resource needed for his/her management, and make prescription as well as other supportive services that are needed by the patients*" (*Physician 1*)
>
> "*We help them with their difficulties. We help them realize what they are feeling can be treated. We offer drugs sometimes depending on the severity of the disease because of depression, not actually pulmonary drugs, we help them with ant depressants*" (*Psychologist 1*)
>
> "*We play many roles like breathing exercises, diaphragmatic training (4-7-8 breathing technique), we emphasize on self-care training and behavioral technique and stress management*" (*Occupational therapist 1*)"

Factors hindering the delivery of PR services

The study informants identified the major factors affecting the delivery of optimal PR services to include little experience, lack of knowledge/awareness, and inadequate training of the health professionals that are to be involved in PR. Some excerpts of findings from the in-depth interviews are presented below:

> "*Even how to carry out the procedure we have not been trained, its only from the little experience we are having*

from working with other medical personnel like the doctors that admit the patients, or the primary team doctors when they come on review, apart from that one there is no standard way of training staff on how to rehab a patient with this pulmonary problem" (*Nurse 2*)

"*Lack of awareness of the importance of pulmonary rehabilitation, even among other health professionals*" (*Physiotherapist 2*)

"*It has to do with workforce and inadequate knowledge. Not a lot of people are trained or skilled in pulmonary rehabilitation*" (*Physician 2*)

"*There is lack of equipment or facilities in the teaching hospitals*." (*Dietician 2*)

Strategies for promoting the delivery of PR

The informants gave their views on how to promote optimal PR delivery. Specifically, the need for a specific department or unit for PR was suggested. Furthermore, there was a need to institute team work and retraining of team members. Some excerpts of findings from the in-depth interviews are presented below:

"*What we need to do…. had it been we could talk to one or two of the policymakers probably if we can have a specific department for pulmonary rehabilitation*." (*Physiotherapist 1*)

"*We need team work also because without team work, we can't address such kind of conditions, so we need to bring them together*" (*Occupational therapist 1*)

"*So, we need the human resource first then get the diagnostic and therapeutic equipment like spirometry and other supportive diagnostic facilities*" (*Physician 1*)

"*I think that there is a need for training and retraining of staff*" (*Physician 2*)

DISCUSSION

The main results of the study indicated that PR services are largely unavailable in the study area. The majority of the respondents seemed to have good knowledge of the goals, components, indications, and health professionals involved in PR. These results were corroborated by the findings from the index study. The study respondents also identified lack of awareness, workforce, teamwork, and equipment to be the major barriers to the institution of optimal PR in the study area. This was the first study assessing knowledge, level of utilization and implementation, and barriers associated with PR among a wide spectrum of health professionals in the study area, the existing studies being those among physicians only.[10]

Similar results have been reported in the previous studies where variable knowledge levels were found.[19-21] It is important for respiratory health professionals to have good knowledge of PR because it has been demonstrated to be effective in enhancing exercise performance, dyspnea, and quality of life as well as being cost effective with psychosocial benefits. It is also associated with reduced health-care utilization and improved survival among patients with CRDs.[20]

The respondents of this study observed some factors as barriers to the implementation of comprehensive PR, which is in tandem with the findings of Akinremi and Ogwu (2015).[10] This is not surprising because health-care provision in this environment is fraught with several challenges including poor funding, lack of standard equipment and training of staff, and lack of specialized workforce.[22,23]

The pattern of referral also showed that patients with CRD were most likely to be referred to the physicians followed by dieticians and physiotherapists. The physician's roles are usually central (diagnosing and prescribing medication) in the management of these patients, hence, the high referral rate.[24,25] These patients are also known to have a high prevalence of nutritional abnormalities and physical impairments explaining why a high proportion may get referred to physiotherapists and dieticians.[26-28]

The physiotherapists included in the study seemed to have good knowledge of PR. This finding is backed by a recent study among expert physiotherapists in which it was demonstrated that they (physiotherapists) had good knowledge of physical activity and exercise interventions in rehabilitation.[21] The views of the informants in the present study on how to promote PR delivery included the need for policy for the establishment of optimal PR units, training and retraining of specialized workforce, and provision of equipment which corroborated findings from the survey. Furthermore, they expressed the need to work together as a team and for the members to undergo training and retraining.

This study has a few limitations. First, besides physicians, most of the other health professionals did not receive postgraduate training or specialization in the management of respiratory disorders. They were also involved in the management of non-respiratory disorders. Therefore, the results expressed in this study should be viewed within this context. However, the inclusion of professionals with some experience in the management of patients with CRDs only might have reduced any obscurity. Second, only 11 respondents from four out of seven tertiary health facilities in Northwest Nigeria were included in the study. Nevertheless, we are confident that the information power, which indicates that the more information the sample holds, relevant for the actual study, the lower number of participants is needed, applies to our study. Moreover, information power depends on the aim of the study, sample specificity, use of established theory, quality of dialogue, and analysis strategy.[29]

CONCLUSION

There is a lack of PR services in the study area. Nevertheless, pulmonary health-care professionals that participated in the study demonstrated variable, but mostly good knowledge regarding most aspects of PR. A number of barriers, ranging from poor awareness, lack of equipment, and workforce substantially inhibited the provision of standard, coordinated, and PR services.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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