

Respiratory diseases morbidity and mortality in two tertiary health institutions in South West Nigeria: incidence, pattern and referral for physiotherapy care

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Abstract

Background: There are several respiratory diseases (RDs) in the Nigerian populace. However, reports on the incidence and physiotherapist's involvement in the care and management of RDs is scarce. This study investigated the incidence, pattern of RDs and referral for physiotherapy care in two Nigerian teaching hospitals.

Methodology: A 10-year retrospective audit of RDs was conducted at two Nigerian University teaching hospitals, Osun State, South-west, Nigeria. A total of 2,637 case files of patients with RDs from January, 2005 to December 2014 were reviewed. Types of RDs, socio-demographic information, duration of hospitalization, referral for physiotherapy care, and status at the point of discharge (dead or alive) were recorded. Data were summarised using descriptive statistics and graphical representations.

Results: The frequency of RDs was 12.4% in both hospitals. Pneumonia and respiratory tract infections (RTI) 1446(54.8%), tuberculosis 460(17.4%) and chronic obstructive pulmonary diseases (COPD), 296(11.2%) were the predominant forms of RDs. More males than females were affected especially children whose ages ranged between 0 – 9 years constituting 58.2%. Pneumonia/ RTI and COPD were the leading causes of death, 42.1% and 23.3% respectively. Majority of the patients, 77.9% were discharged within the first week of admission while only 4(0.2%) of all cases of RDs were referred for physiotherapy.

Conclusion: The frequency of respiratory diseases in two tertiary health institutions in South-west, Nigeria from a 10 year review was high. Pneumonia and COPD were the leading causes of hospitalisation while male children were more vulnerable with high mortality and referral for physiotherapy was extremely poor.

Key words: *Incidence, Pattern, Respiratory disease, Tertiary health institution, Physiotherapy*

Résumé

Contexte: Il existe plusieurs maladies respiratoires (MR) dans la population nigériane. Cependant, les rapports sur l'incidence et la participation du physiothérapeute dans les soins et la gestion des MR sont rares. Cette étude a étudié l'incidence, le schéma des MR et le renvoi pour les soins de physiothérapie dans deux hôpitaux d'enseignement nigérien.

Méthodologie: Une vérification rétrospective de 10 ans sur les MR a été menée dans deux hôpitaux d'enseignement de l'Université nigériane, Etat d'Osun, Sud-Ouest, Nigeria. Un total de 2637 dossiers de cas de patients atteints de MR de janvier 2005 à décembre 2014 a été examiné. Les types de MR, les données sociodémographiques, la durée de l'hospitalisation, le renvoi pour les soins de physiothérapie et le statut au point de décharge (mort ou vivant) ont été enregistrés. Les données ont été résumées à l'aide de statistiques descriptives et de représentations graphiques.

Résultats: L' fréquence des MR a été de 12,4% dans les deux hôpitaux. La pneumonie et les infections de la trachée respiratoire (ITR) 1446 (54,8%), la tuberculose 460 (17,4%) et les maladies pulmonaires obstructives chroniques (MPOC) 296 (11,2%) étaient les formes prédominantes de MR. Plus de mâles que de femmes ont été affectés, en particulier les enfants dont les âges variaient entre 0 et 9 ans, représentant 58,2%. La pneumonie/ITR et la MPOC ont été les principales causes de décès, respectivement 42,1% et 23,3%. La majorité des patients, 77,9% ont été libérés au cours de la première semaine d'admission alors que seulement 4 (0,2%) de tous les cas de MR étaient référés pour la physiothérapie.

Conclusion: l' fréquence des maladies respiratoires dans deux établissements de santé tertiaire dans le sud-ouest, du Nigeria à partir d'une évaluation de

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10 ans était élevée. La pneumonie et la MPOC ont été les principales causes d'hospitalisation, tandis que les enfants masculins étaient plus vulnérables avec une mortalité élevée et le renvoi pour la physiothérapie était extrêmement médiocre.

Mots clés: *Fréquence, Schéma, Maladie respiratoire, Institution de santé tertiaire, Physiothérapie*

Introduction

The prevalence of respiratory diseases is on the increase globally [1]. According to the British Thoracic Society [2], approximately 1 in 7 individuals are affected by some forms of chronic lung disease, most commonly chronic obstructive pulmonary disease (COPD), which includes asthma, chronic bronchitis and emphysema. Data from the Centres for Disease Control and Prevention indicated that 16.2 million adults and 6.7 million children had asthma leading to more than 10.6 million visits to office-based physicians and a minimum of 444,000 hospital stays [3, 4]. Similarly, acute respiratory infections in children under 5 years of age are the most frequent cause of death from lung disease causing more than 4 million deaths annually. Furthermore, pulmonary tuberculosis (TB) constitutes the most frequent cause of death from a single pathogen in persons aged 15 to 49 years accounting for a total of 2 – 3 million deaths annually [5].

According to Lozano *et al* [6] when the top ten leading causes of death worldwide are considered, four belong to respiratory diseases namely chronic obstructive pulmonary disease (COPD), lower respiratory tract infections, pulmonary TB and lung cancer. Lower respiratory tract infection (RTI) and pulmonary TB are ranked second and eighth respectively as major causes of mortality in Africa [6]. In Nigeria, lower RTI constituted the second leading cause of death in all age brackets in 2002 and pulmonary TB was the seventh leading cause of death accounting for 4% of all deaths [7]. It is now evident that rates of death from lower RTI is more than double for each decade of life, whereas rates of death from pulmonary TB remain relatively constant [8]. Respiratory diseases have thus remained major public health concern and may continue to put heavy burden on the health care system if urgent actions are not taken.

Although national immunisation programme for the prevention and control of childhood communicable diseases has led to substantial reduction in the prevalence of major killer diseases among children, respiratory diseases are still among important leading causes of morbidity and mortality

in sub-Sahara Africa (SSA) [9]. Several factors but not limited to poor nutritional status among children, persistent air pollution and increasing smoking habit among young adults as well as increasing aged population have been identified as risk factors for the increasing incidence of respiratory diseases in SSA [9, 10]. Unfortunately, there are few studies investigating the incidence of respiratory diseases in the south-west of Nigeria and also Nigeria as a whole.

Management of respiratory diseases has always been domiciled in tertiary health institutions due to inadequacy of specialised healthcare practitioners and facilities at primary and secondary health care centres. In Osun State, south-western Nigeria, there are only two tertiary health institutions providing medical services to a huge population of patients in the cities. However, larger numbers of inhabitants in Osun State are living in the rural communities with limited access to medical services. Treatments of respiratory diseases using pharmacological approaches have been reported to be effective for controlling infections, airway clearance and efficient breathing. However, many patients remain burdened with respiratory disability due to easy fatigability and poor exercise tolerance.

There is evidence that exercise plays significant role in reducing the burden of respiratory diseases through improvement in exercise capacity and quality of life [11, 12]. However, there is dearth of empirical data on pattern and involvement of physiotherapists in the management of respiratory diseases in Nigeria despite the prevailing evidence of its importance in the literature. This study conducted a 10 - year retrospective audit on the frequency and pattern of respiratory diseases and referral for physiotherapy care in two tertiary health institutions in Osun State, South west, Nigeria.

Methodology

This retrospective study was conducted in Ladoké Akintola University of Technology Teaching Hospital (LAUTECH), Osogbo and Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) Ile-Ife Osun State, Nigeria. The LAUTECH is a state government owned institution established about 20 years ago. It is located in Osogbo, capital city of Osun State. The hospital has more than 350 bed spaces and receives referral from all the neighbouring cities and states close to Osun State. The hospital is well developed with modern facilities for respiratory care and a good number of experts in pulmonology and respiratory care.

The Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) Ile - Ife Osun State,

Nigeria was founded more than four decades ago and is being funded by the Federal government of Nigeria. It was founded on integrated comprehensive health care services based on a pyramidal structure designed to secure excellent and efficient services. The institution has more than 850 bed spaces and provides health-care services to more than 10 million Nigerians in South West Zone of Nigeria. The services cover neighbouring states including Ondo, Oyo, Ekiti, Edo and part of Kwara State [13].

Procedure

The ethical approval for this study was obtained from the Health and Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile – Ife, Nigeria. Permission to examine case files of patients with respiratory diseases within period of years under review (January, 2005 to December, 2014) was sought and obtained from both institutions. The procedures for data collection were in two stages. Stage 1 included obtaining records from the health information technology units of the medical record of LAUTECH and OAUTHC to assess the total number of patients diagnosed and admitted for various respiratory diseases during the period under review. Furthermore, the case file number and other relevant information needed to facilitate the retrieval of case file in the medical record library were obtained. Data that were obtained covered January, 2005 and December, 2014. Stage 2 involved selection of case files of patients with various respiratory diseases over the period under review and individual case notes were traced out and scrutinised to obtain data including gender, age, types of various respiratory diseases, number of patients referred for physiotherapy and status at discharge (dead or alive) and yearly distribution of various respiratory diseases. Other relevant information to this study was obtained from the case file. The data were organised and tabulated. Age group was classified into ten years interval and duration of hospitalisation. Information obtained were recorded and stored in a storage device.

Data analysis

Data were analysed using descriptive statistics of frequency, percentage and graphical representations. The Statistical Package of Social Sciences (SPSS version 19) was used to perform statistical analysis.

Results

Table 1 showed annual distribution of respiratory diseases at Ladoke Akintola University of Technology Teaching Hospitals (LAUTECH), Osogbo and Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Osun State,

South west, Nigeria over a period of ten years 2005 to 2014. The incidence rates of respiratory diseases in LAUTECH and OAUTHC were 33.0 and 67.0% respectively. Highest incidence of respiratory diseases was witnessed in year 2010 with a prevalence rate of 12.4% and a distribution rate of 40.5 and 59.5%. However, year 2011 recorded the lowest incidence of respiratory diseases with 6.6%. The incidence rate of pneumonia/ respiratory tract infection (RTI) during the years under review at both teaching hospitals was 54.8% followed by pulmonary tuberculosis, 17.4% and chronic obstructive pulmonary diseases (COPD) with 11.2 %. Pleural effusion and pulmonary oedema were the least respiratory diseases (Table 2).

Table 1: Annual distribution of respiratory diseases at both teaching hospitals

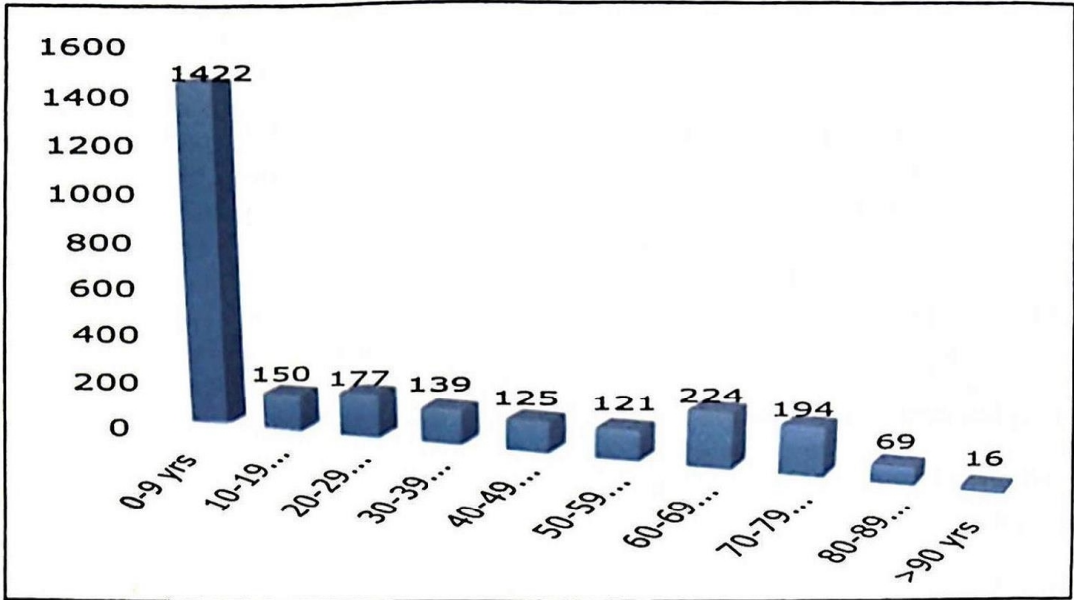
Year	LAUTECH n(%)	OAUTHC n(%)	All N(%)
2005	104(33.1)	210(66.9)	314(11.9)
2006	101(39.3)	156(60.7)	257(9.7)
2007	85(32.1)	180(67.9)	265(10.0)
2008	104(35.5)	189 (64.5)	293(11.1)
2009	104 (35.7)	187(64.3)	291(11.0)
2010	87(31.0)	194(69.0)	281(10.7)
2011	101(40.4)	149(59.6)	250(9.5)
2012	64(26.7)	176(73.3)	240(9.1)
2013	100(40.0)	150(60.0)	250(9.5)
2014	84(42.9)	112(57.1)	196(7.4)
Total	934(35.4)	1703(64.6)	2637(100.0)

*Key: LAUTECH – Ladoke Akintola University of Technology Teaching Hospital
OAUTHC – Obafemi Awolowo University Teaching Hospitals Complex*

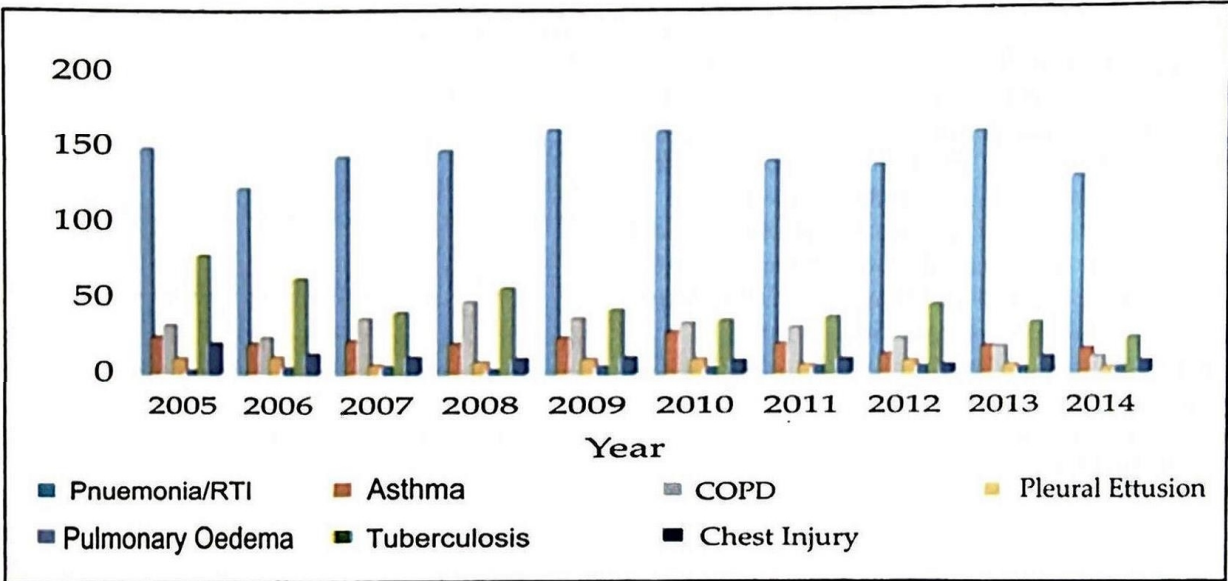
Table 2: Frequency and pattern of various respiratory diseases recorded at both teaching hospitals

Respiratory Diseases	No. of cases	Percentage
Pneumonia/RTI	1446	54.8
Pulmonary TB	460	17.4
COPD	296	11.2
Asthma	205	7.8
Chest Injury	109	4.1
Pleural Effusion	80	3.1
Pulmonary Oedema	41	1.6
Total	2637	100.0

Key: RTI – Respiratory tract infection, COPD – Chronic obstructive pulmonary diseases, TB - Tuberculosis



Key: Yrs: years
Fig. 1: Age distributions of respiratory diseases at both teaching hospitals



Key: RTI - Respiratory tract infection, COPD - Chronic obstructive pulmonary diseases
Fig. 2: Annual distribution of all respiratory diseases at both teaching hospitals

The age distribution of patients with various respiratory diseases showed that individuals within age group of 0 – 9 years were mostly affected with a total prevalence of 53.9%. However, individuals older than 90 years recorded least prevalence of 0.6% (Figure 1). Table 3 shows gender distribution of respiratory diseases by age at both teaching hospitals during the years under review. The total prevalence of respiratory diseases was 57.4%. Male children within the age group of 0–9 years constituting 53.9% recorded highest prevalence of respiratory diseases. Males also recorded higher prevalence except in the age group of 20–29 years with a prevalence rate, male to female of 46.6% and 55.4% respectively.

The annual distribution of respiratory diseases showed that pneumonia had the highest prevalence rate.. Highest prevalence rates of pneumonia/RTI were recorded in years 2009, 2010 and 2013 respectively (Figure 2). The mortality rate resulting from all respiratory diseases was 10.1%. The highest mortality rate -15.3% from respiratory diseases occurred in 2005 while the lowest- 3.3% occurred in year 2013. Findings from this study also showed that there was progressive but inconsistent decline in mortality between years 2005 to 2014 (Table 4). Table 5 shows the mortality rate resulting from various respiratory diseases during the years under review. Pneumonia/RTI remained consistently the

Table 3: Gender distribution of respiratory diseases by age at both teaching hospitals

Age (year)	Male n (%)	Female n (%)	All N (%)
0 - 9	828(58.2)	594(41.8)	1422(53.9)
10 - 19	79(52.7)	71(47.3)	150(5.7)
20 - 29	79(46.6)	98(55.4)	177(6.7)
30 - 39	70(50.4)	69(49.6)	139(5.3)
40 - 49	65(52.0)	60(48.0)	125(4.7)
50 - 59	68(56.2)	53(43.8)	121(4.6)
60 - 69	135(60.3)	89(39.7)	224(8.5)
70 - 79	130(67.0)	64(33.0)	194(7.4)
80 - 89	45(65.2)	24(34.8)	69(2.6)
>90	10(62.5)	6(37.5)	16(0.6)
Total	1509(57.2)	1128(42.8)	2637(100.0)

Table 4: Distribution of death and live cases recorded per annum at both teaching hospitals

Year	Death n (%)	Alive n (%)	All N (%)
2005	48(15.3)	266(84.7)	314(11.9)
2006	38(14.8)	219(85.2)	257(9.7)
2007	32(12.1)	233(87.9)	265(10.0)
2008	23(7.8)	270(92.2)	293(11.1)
2009	24(8.3)	267(91.7)	291(11.0)
2010	23(8.2)	258(91.8)	281(10.7)
2011	24(9.6)	226(90.4)	250(9.5)
2012	8(3.3)	232(96.7)	240(9.1)
2013	30(12.0)	220(88.0)	250(9.5)
2014	16(8.2)	180(91.8)	196(7.4)
Total	266(10.1)	2371(89.9)	2637(100.0)

Table 5: Mortality distribution from various respiratory diseases at both teaching hospitals

Respiratory condition	No. of case	No. of death	Percentage
Pneumonia/RTI	1446	112	42.1
COPD	296	62	23.3
Pulmonary TB	460	40	15.6
Chest Injury	109	17	6.4
Pleural Effusion	80	14	5.3
Pulmonary Oedema	41	12	4.5
Asthma	205	9	3.4
Total	2637	266(10.1)*	100.0

*Total Death Rate = 10.1%

Key: COPD - Chronic obstructive pulmonary diseases, RTI - Respiratory Tract Infection, TB - Tuberculosis

Table 6 shows the duration of hospitalization for various respiratory diseases and referral physiotherapy care at both teaching hospitals. Most patients were discharged from hospitals within the first week of admission with a prevalence rate of 77.9% while fewer patients were hospitalized more than nine weeks. However, the rate of referral showed that only 0.2% of all cases of respiratory diseases were referred for physiotherapy care throughout the years under review.

Table 6: Duration of hospitalisation and referral for physiotherapy care at both teaching hospitals

Duration (week)	No. of cases	Percentage
0 - 1	2054	77.9
1 - 2	389	14.8
2 - 3	132	5.0
3 - 4	47	1.8
4 - 5	1	0.0
5 - 6	3	0.1
6 - 7	3	0.1
7 - 8	5	0.2
> 9	3	0.1
Total	2637	100.0
Referral for physiotherapy care	n	%
Yes	4	0.2
No	2633	99.8
Total	2637	100.0

leading cause of mortality throughout the years. The prevalence of death rate from pneumonia/RTI alone was 42.1% followed by COPD (23.3%) and pulmonary TB (15.6%) while the least cause of death from respiratory diseases was asthma with 3.4%.

Discussion

This study investigated the prevalence, pattern and referral for physiotherapy care for respiratory diseases in two government owned tertiary health institutions during a ten year period - 2005 to 2014.

The result indicated a high incidence of respiratory diseases such that Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife had higher cases of respiratory diseases compared to Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Osun State. The plausible explanation for the difference between the two teaching hospitals could be that the OAUTHC receives larger number of patients, more medical facilities and had presence of a large number of experts in the field of respiratory medicine. Furthermore, the hospital is one of the leading centres for care of respiratory diseases being funded by the Federal government of Nigeria.

Findings from our study also show that a prevalence ratio of male to female was 1.3: 1, implying more males than females were affected by respiratory diseases. This finding is also similar to a study by Rogerson *et al.*, [14] who reported higher incidence of respiratory diseases in men. However, this is contrary to the findings of Desalu *et al.*, [15] who reported male to female ratio of 1:1.4. The gender bias in the incidence of respiratory diseases may be due to hormonal differences between male and female. It has been reported that oestrogen might confer a protective mechanism on women from respiratory diseases until after menopause [16]. Furthermore, male gender might possibly be at higher risk of respiratory diseases due to risky lifestyle including smoking and alcohol abuse. However, Ibeh and Ele, [17] were of the opinion that the rate of respiratory disease might be changing without gender difference perhaps due to an increasing prevalence of smoking habit among women in the recent time.

Highest incidence of respiratory diseases was found among children within the age group of 0–9 years. This is in agreement with the findings of Kumar *et al.*, [18] who reported that incidence of respiratory diseases decreases with increasing in age. The reason for high incidence in this age group could be adduced to low immune status in this age category. Furthermore, studies have reported that children with low socio-economic status are more prone to respiratory diseases [19, 20]. Poor nutritional status and poor neighbourhood environment including air pollution may lead to development of respiratory diseases among children and adults [10, 20]. Considering the pattern of respiratory diseases in the two health institutions, pneumonia/RTI, COPD were the leading causes of morbidity and mortality in this study. This is consistent with the findings of previous studies that pneumonia and COPD were the leading causes of death as a result of respiratory diseases [21, 22].

We found that death rate from respiratory disease was high. Similarly, reports from Ireland [23] also indicated that respiratory disease is the second leading cause of death accounting for 42% of all deaths, however, this figure has fallen by almost a quarter [23]. Our finding was also similar to that of Menezes *et al.*, [24] who reported that mortality from respiratory diseases was high but is gradually on the decline. Although, findings from our study show that there was progressive decline in the mortality rate from 2004 (18.1%) to 2007 (8.7%), nonetheless reduction in death rate appears not yet satisfactory. The reduction in mortality rate could be explained from the view point of improvement in health care services, national immunization programme against killer diseases such as whooping cough, tuberculosis and increasing awareness against the risk factors such as smoking and changes in lifestyles that predispose to respiratory diseases. Furthermore, availability of anti-retroviral drugs for the treatment of HIV could also contribute to the reduction in the incidence of TB and other chest conditions.

Treatment of respiratory disease involves multi-disciplinary approach. The use of pharmacological intervention such as antibiotics, corticosteroids and expectorants helps to control infections, relief of breathlessness, suppresses immune reactions, lessen acute exacerbation and lower mortality [25, 26]. Furthermore, patients with respiratory diseases usually experience dyspnea, fatigue and impair exercise tolerance. Exercise has been found to be capable of enhancing aerobic performance and improve exercise capacity. Exercise is one of the core physiotherapy practices for improving strength, dyspnea and functional capacity, strengthening of breathing muscles and thoracic cage compliance, exercise tolerance, and quality of life [12, 27]. Various physiotherapy procedures and techniques including postural drainage, relaxation methods and breathing control are important in improving respiratory care.

Findings from our study show that referral for physiotherapy care is poor. Previous studies have shown that patients with respiratory diseases improved significantly following physiotherapy intervention [25 – 27]. Similarly, physiotherapists also use different methods to help clear excessive secretion along airway and breathing techniques to lessen energy expenditure during labored breathing. In addition, increased physical activity and improved health-related quality of life has direct link with reduction in all-cause mortality [26, 27]. Systematic reviews and meta-analyses also showed that patients with COPD and acute hypercapnic respiratory

failure, physiotherapy care including non-invasive ventilation reduced mortality compared to usual care and reduced the need for intubation [28, 29]. Several factors not limited to lack of multidisciplinary team approach, communication barrier and lack of knowledge of physiotherapists' role in the management of respiratory diseases among experts in respiratory care might account for the poor referral for physiotherapy care.

The outcome of this study should be interpreted with caution due to some inherent limitations. This report was mainly hospital-based findings which might not be true reflection of what is obtainable at community level. This might limit the generalizability of our findings to other settings. Furthermore, the actual causes of death in patients with respiratory diseases were not ascertained as not all cases of death had post mortem reports.

Conclusion and recommendations

In conclusion, incidence of respiratory diseases is high among patients attending government owned tertiary health institutions in Osun State, south-west, Nigeria. Pneumonia and chronic obstructive pulmonary diseases, were the leading causes of morbidity and mortality and children below ten years old were more vulnerable especially males. Referral of patients with respiratory diseases for physiotherapy care was extremely poor. There is an urgent need to increase awareness about the importance of physiotherapy in respiratory care in Nigeria to enhance effective management and reduce morbidity and mortality associated with respiratory diseases. Government should formulate policies against tobacco smoking, air pollution by industries, good environmental hygienic practices, reduction in biomass materials for cooking and tarring of roads to reduce inhalation of dust that can easily predispose individuals to respiratory diseases. Children less than 10 years should be given greater attention in the care for respiratory diseases. Furthermore, referrals of respiratory diseases for physiotherapy care should be emphasized in our hospitals. In addition, community physiotherapy should be intensified to educate the populace about the havoc of indoor and outdoor biomass pollutants in the aetiology of respiratory diseases.

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