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A survey of facilities and human resource for paediatric nephrology training and practice in Nigeria: Resident doctors' perspective

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Abstract: *Background:* Kidney diseases are emerging as important contributors to non-communicable diseases in children worldwide and they impact negatively on the socioeconomic wellbeing of families and nations. Unlike rich economies of the world there is dearth of facilities and manpower needed for the practice and training in Paediatric Nephrology in resource challenged nations like Nigeria. There are however no data to support this assertion.

Objectives: The study sought to provide information on facilities and manpower available for paediatrics nephrology practice and education in the country.

Methods: We deployed an indirect, unobtrusive and introspective method to gather needed data using semi structured self-administered questionnaire on resident doctors who fitted well as key informants. Subjects were attendees at the annual Update Course in Paediatrics organised by the National Postgraduate Medical College of Nigeria in 2019.

Results: Of the 154 attendees 93 (31 males and 62 females) participated in the study. Fifty four, 34 and 5 respectively were from Federal Teaching Hospitals, Federal Medical Centres and State Teaching Hospitals. Seventeen (31.5%), 14(25.9%) and 12(22.2%) of the residents working in federal teaching hospitals were from the South-south, Northwest and Southeast zones respectively while majority of the residents employed in state facilities were from the Southwest. Northeast and North-central zones had few residents. Facilities for haemodialysis ($X^2 = 9.58$; $p = 0.008$), renal

biopsy ($X^2 = 27.98$; $p = 0.000$) and tissue handling ($X^2 = 9.97$; $p = 0.007$) were significantly more in state and Federal Teaching Hospitals compared to Federal Medical Centres. Haemodialysis is not done in a quarter of the hospitals and in places where it was carried out, facilities are not dedicated to children and are not regularly done. One in 4 and two in 5 respondents came from centres where peritoneal dialysis (PD) is carried out with improvised materials. Among a quarter and half of the respondents, PD is respectively not done or seldom carried out.

The views of 55.9% and 60.2% of the respondents on practice of Paediatric Nephrology was “fair” and “basic” respectively. Supplementary local and overseas training respectively could be accessed by only 23.7% and 12.9% of the respondents. Dedicated training in nephrology was available in centres hosting only 29% of the respondents. Where available the training was assessed as fair and good by 37.0% and 55.6% of the residents respectively. In the opinion of about half the respondents factors militating against training and practice were manpower/infrastructural deficits, and lack of commitment of stakeholders.

Conclusion and Recommendations: Practice and training in Paediatrics Nephrology in Nigeria is at best basic and limited in scope and depth. They are hamstrung by multiplicity of factors. Advancing their cause in the country would require commitment of all stakeholders through improved funding and programs re-orientation.

Key words: Paediatrics, nephrology, facilities, training, practice, Nigeria

Introduction

Non-communicable diseases (NCDs) are leading causes of morbidity and mortality in adults as well as children worldwide.¹ Over 1.2 million children and youths died of NCDs in 2002.² Their impact in low and middle-income countries are remarkable as the poorest and most vulnerable population are those at risk and less likely to have access to care.¹ The Global Action Plan for the Prevention and Control of NCDs (2013-2020) emphasised four diseases to the exclusion of kidney disease.² Some authors have since then argued that kidney disease was unjustifiably excluded granted the rising incidence and the many social and structural factors that directly affect its risk and outcome.³ Important risk factors for kidney disease in children are diarrhoeal diseases, infection with HIV, malaria, low birth weight and premature birth.³ Others are overweight, cardiovascular diseases, exposure to air pollution, alcohol and poor dietary intake.⁴

Kidney diseases are accompanied by high economic and social burden.³ About 3.0% of the annual health budget of high-income countries is devoted to the management of end stage renal disease (ESRD) occurring in less than 0.03% of the population.⁵ In 2010, about 3 million persons received dialysis worldwide: a figure that is estimated to double by 2030.⁶ Most kidney disease events in adults have their roots in childhood.⁴ Effective control and management of kidney disease, therefore, entails a holistic package that should be deployed right from childhood. Some authors have averred that averting the legacy of kidney disease in later life means focusing on events in childhood.⁷ The extent to which developing nations are prepared in the global effort to reduce the burden of renal disease and NCDs is uncertain.

In resource-challenged countries including Nigeria, there is a popular assertion that there is paucity of facilities and manpower needed for the effective practice of paediatric nephrology.^{8,9} This reason is given by some authors^{10,11} for advocating preventive nephrology as the only viable option for renal care in such countries. Factual as such assertions may be they are essentially conjectural as there are no data to back them. A survey of available training, infrastructural facilities and practices in the country would readily have bridged the gap in knowledge but such planned survey would be hamstrung if it is obtrusive, requires the executioners to reveal identities of health facilities that may have poor records and if there are tendencies by operators to make up records for fear of negative budgetary consequences from the State that is the primary sponsor of health facilities in the country. The annual Update Course in Paediatrics organised by the National Postgraduate Medical College of Nigeria where virtually every tertiary hospital in the country is represented offered the opportunities to circumvent the perceived challenges and carry out a review of the practices, facilities and training in Paediatric Nephrology in Nigeria. Outcomes of the study, could be handy to practitioners and researchers in the relevant field as well as policy makers in planning/ resource allo-

cation in the country. The study, therefore aimed at examining the training capacities as well as conducting human and material resource audit in tertiary hospitals, albeit using an indirect approach.

Subjects and Methods

The study is a cross sectional and descriptive one. Subjects were resident doctors attending the annual Update Course in Paediatrics organised by the NPMCN in Benin City. In the annual event resident doctors specialising in Paediatrics are invited for a two-week intensive programme. Attendees were classified into three groups: those at the Primary level, those at the Part 1 level and those at the Post Part one level. Attendees are drawn from virtually all teaching and specialist centres and other training centres in the country. Even though some centres had more than one participant at the different levels attending the Course responses were individualised. Part of the curriculum covered during the course are aspects of Paediatric nephrology.

A pretested and semi-structured self-administered questionnaire was used to collect data on training, infrastructural facilities and practices related to Paediatric Nephrology in their respective centres. Following broad introduction on the subject, the questionnaires were administered on the subjects. Participation in the exercise was voluntary. Participants were given definite time to complete the forms after which they were then retrieved. This was meant to ensure that responses were spontaneous and intuitive, making room for reliable responses. Content of the instrument included the subjects' assessment of practices using a five grade point developed on a Likert scale, facilities available for training and practices, content and quality of training among others. Categorical variables of place of practice and availability of haemodialysis/peritoneal dialysis/appropriate handling of renal biopsy tissues were compared using the Chi square test with Yates correction for continuity.

Results

Socio-demographic characteristics of respondents

Ninety-three residents made up of 31 (33.3%) males, and 62 (66.7%) females participated in the study. Majority of the respondents were in the age brackets of 30 – 34 years, 43 (46.2%) and 35 – 39 years (25 or 26.9%). Fifty six (60.2%) were pre-part I while 35 (37.6%) were post part I (Table 1) Of the 93 respondents 54(58.1%) were from federal teaching hospitals whereas 34 (36.6%) were from federal medical centres. The remaining five (5.4%) were from teaching hospitals owned by States.

Distribution of paediatric nephrologists

Approximately 10.0% of the respondents came from

centres without paediatric nephrologists, just as about half of the respondents were drawn from centres with just a specialist. The remainder (40.0%) came from centres with two or more experts.

Gender	N	%
Male	31	33.3
Female	62	66.7
<i>Level of Training</i>		
Post part 1	35	37.3
Pre-part 1	56	60.7
Primary	2	2.2
<i>Place of Practice</i>		
Federal Teaching Hospital	54	58.1
Federal Medical Centres	34	36.6
State Teaching Hospital	5	5.4
<i>Age (Years)</i>		
29	5	0.5
30-34	43	46.2
35-39	25	26.9
>39	20	21.5

Residents' disposition by place of practice and geo-political location

Of the 93 residents, 24 (25.8%) were from the South east (SE) geopolitical zone. Northeast (NE) had few residents 2(2.2%). Seventeen (31.5%) of the 54 residents working in federal teaching hospitals were in Southeast (SE) while only one (1.9%) was from the NE. Residents in FMCs were fairly distributed. Eleven (32.4%) of the 54 were from the Southeast (SE) while 7(20.6%) each were drawn from South-south (SS) and Northwest (NW). Four (80.0%) of the five residents from state teaching hospitals were from Southwest (SW). (Table 2)

Table 2: Disposition of resident doctors according to place of practice and geopolitical location

	Federal Teaching Hospital n (%)	Federal Medical Centre n (%)	State Teaching Hospital n (%)
<i>Geopolitical Zone</i>			
South-south (n=24)	17 (31.5)	7 (20.6)	0 (0.0)
South-east (n=24)	12 (22.2)	11 (32.4)	1 (20.0)
South-west (n=12)	4 (7.4)	4 (11.8)	4 (80.0)
North-east (n=2)	1 (1.9)	1 (2.8)	0 (0.0)
North-central (n=10)	6 (11.1)	4 (11.8)	0 (0.0)
North-west (n=21)	14 (25.9)	7 (20.6)	0 (0.0)

Facilities

Peritoneal Dialysis

According to 24 (25.8%) of the 93 residents, adequate facilities for peritoneal dialysis (PD) were available in their centres. Another 39 (41.9%) respondents admitted having improvised PD facilities in their centres, whereas 30 (32.3%) did not have any form of facility for PD in their centres. Though not statistically significant standard peritoneal dialysis facilities were commoner in state facilities and teaching hospitals. (Table 3)

Haemodialysis and transplantation

Only 11 (11.8%) of the 93 respondents volunteered to the effect that dedicated haemodialysis facilities for paediatric patients were available in their centres. This was against the backdrop of the fact that 61 (65.6%) and 16 (17.2%) respondents respectively came from centres with 1-3 dialysis machines and 4-6 units available for the adult patients from which older children could benefit. Facilities for haemodialysis were significantly more in state facilities and teaching hospitals in comparison to FMCs. ($X^2 = 9.58$; $p=0.008$) (Table 3)

Eight (8.6%) of the 93 residents drawn from only five federal teaching hospitals admitted that their centres had machines dedicated to children. Paediatric renal transplantation takes place in only one public facility across the country.

Renal Biopsy

Only 41 (44.1%) of the 93 residents were drawn from centres with facilities and skills for carrying out renal biopsy. However, only 24 (25.8%) of the 93 residents came from centres with adequate facilities for handling tissues so obtained. In effect, only 24 (25.8%) of the 93 respondents were drawn from centres that could comprehensively handle renal biopsy specimens without recourse to assistance from other hospitals. Facilities for renal biopsy ($X^2 = 27.98$; $p=0.000$) and tissue handling ($X^2 = 9.97$; $p=0.007$) were disproportionately and significantly in favour of state and teaching hospitals in contradistinction to federal medical centres. (Table 3)

Table 3: Relationships between respondents' place of practice and facilities for practice/opportunities for training

	Teaching Hospital n(%)	FMC n(%)	State Hospital n(%)	X_y^2	p value
<i>Facilities for PD</i>					
Standard (n=24)	13(24.1)	9(26.5)	2(40.0)	2.63	0.62
Improvised (n=39)	22(40.7)	14(41.2)	3(50.0)		
None (n=30)	19(35.2)	11(32.3)	0(0.0)		
<i>Facilities for Renal Biopsy</i>					
Yes (n=41)	35(64.8)	3(8.8)	3(60.0)	27.9	0.000*
No (n=52)	19(35.2)	31(91.2)	2(40.0)	8	
<i>Facility for HD</i>					
Yes (n=11)	9(16.7)	0(0.0)	2(40.0)	9.58	0.008*
No (n=82)	45(83.3)	34(100.0)	3(60.0)		
<i>Facilities for Renal Histology</i>					
Yes (n=24)	15(27.8)	5(14.7)	4(80.0)	9.97	0.007*
N (n=69)	39(72.2)	29(85.3)	1(20.0)		
<i>Opportunities for Local Training</i>					
Yes (n=22)	10 (18.5)	12(35.3)	0(0.0)	4.89	0.09
No (n=71)	44 (81.5)	22(64.7)	5(100.0)		
<i>Opportunities for Overseas Training</i>					
Yes (n=12)	7(13.0)	5(14.7)	0(0.0)	0.84	0.66
No (n=81)	47(87.0)	29(85.3)	5(100.0)		

Practice

Haemodialysis is not performed at all in centres from which 25 (26.9%) residents were drawn. In hospitals from which 38 (40.9%) and 24 (25.8%) residents were

drawn respectively, haemodialysis is “seldom” and “often” carried out. Corresponding values for the practice of peritoneal dialysis were 24 (25.8%), 47 (50.5%) and 16 (17.2%). In centres hosting 48 (51.6%) of the 93 respondents, renal biopsy was not done at all. According to another 33(35.5%) respondents, the procedure is seldom carried out in their facilities. Only 8 (8.6%) residents came from centres where the procedure is carried out often.

Table 4: Rating of practice and content of training of Paediatric Nephrology

	Practice n%		Training n%		Programme Content n%	
Poor	6	(6.5)	0.0	(0.0)	0	(0.0)
Fair	52	(55.9)	10	(10.8)	11	(11.8)
Good	26	(28.0)	16	(17.2)	15	(16.1)
V. Good	8	(8.6)	1	(1.1)	1	(1.1)
Excellent	1	(1.1)	0	(0.0)	0	(0.0)
Not Applicable	0	(0.0)	66	(71.0)	66	(71.0)

Assessment of Practice of Paediatric Nephrology

The general practice of Paediatric Nephrology was considered poor and fair by 6 (6.5%) and 52 (55.9%) residents in their respective centres. Only 26 (28.0%) considered such practice “good” in their facilities. According to 56 (60.2%) the practice was just basic while only 4 (4.3%) assessed the practice of paediatric nephrology as advanced in their facilities.

Training

Only 22 or 23.7% of the 93 residents came from centres where they were offered opportunities for supplementary training in paediatric nephrology in other centres within the country. Training opportunities overseas were available in centres hosting only 12 (12.9%) residents. Local or international training opportunities were independent of where the resident practiced.

Assessment of Training

Twenty-seven (29.0%) of the 93 respondents asserted that they had dedicated training in nephrology in their centres. Of the 27 respondents, it was the view of 10/27 or 37.0% that the training was fair. Sixteen (59.3%) of the 27 rated the programmes as good while one (1.1%) rated it as very good. None rated the programmes as either poor or excellent. According to 11 (40.7%) of the 27 respondents, the content of the dedicated Paediatric Nephrology programme was fair. Fifteen (55.6%) and one (3.7%) resident only adjudged the programme to be good and very good respectively. (Table 4) Only a fifth of the residents considered the period allocated to training in paediatric nephrology in the curriculum as adequate. For 56 (60.2%) and 19 (20.4%) respondents, the time allocated to training was “fair” and “poor” respectively.

Table 5: Perceived constraints relating to training and practice of paediatric nephrology among residents

	Training n(%)	Practice n(%)
Paucity of manpower (n=93)	50(53.8)	47(50.5)
Paucity of facilities (n=93)	83(89.2)	82(88.2)
Lack of related infrastructure (n=93)	73(78.5)	68(73.1)
Absence of structured programme (n=93)	56(60.2)	48(51.6)
Lack of commitment from critical stakeholders (n=93)	56(60.2)	46(49.5)

Constraints to Advancement of Nephrology Training and Practice in Nigeria

Constraints to advancement of Paediatric Nephrology training and practices as perceived by the respondents are as shown in Table 5. Main challenges to advancement of frontiers of training in paediatric nephrology in Nigeria are paucity of facilities and deficiencies in related infrastructure as volunteered respectively by 83 (89.2%) and 82(88.2%) respondents. On the other hand, practices were constrained by paucity of facilities and deficiencies in related infrastructure. These were the views of 56 (60.2%) and 46(49.5%) respondents respectively. According to 50 (53.8%) and 56 (60.2%) respondents respectively other impediments to training were lack of manpower and absence of commitment from critical stakeholders. According to 47 (50.5%) and 46 (49.5%) residents the same respective factors served as impediments to practice.

According to the residents, reasons for the deficits in the infrastructure needed for paediatric nephrology training and practices in Nigeria were mainly poor commitments from stakeholders, 73/93 or 78.5% and inadequate budgeting provisions by proprietors of the various health facilities. (Table 6).

Table 6: Causes of deficits in physical infrastructural facilities in relation to paediatric nephrology training/practice as volunteered by residents

Paucity of funds (n =93)	58(62.4)
Inadequate budgetary allocation (n=93)	69(74.2)
Lack of commitment of critical stakeholders (n=93)	73(78.5)
Poor state of Practice (n=93)	51(54.8)

Discussion

Over 90% of the respondents were drawn from federal tertiary health facilities in confirmation of the widely held view that the Federal Government unlike the federating States, was the driver of postgraduate medical education as well as paediatric tertiary healthcare delivery in Nigeria.¹²

Over half of the respondents came from hospitals with just one or no paediatric nephrologist. The dearth of medical personnel in relation to the population is widely acknowledged but the shortfall may in fact be more marked with specialists and sub specialists. Federal tertiary health institutions are equitably distributed in the country. The fact that there are still centres devoid of

such critical manpower underscores either the maldistribution or deficiency of paediatric nephrologists in the country. Manpower is crucial to driving practice, teaching and learning. Where such critical input is lacking, desired practice and learning would necessarily be deficient.

About a quarter of the residents each came from Southeast, South-south and Northwest geo-political zones. The under representation of Southwest among attendees from federal teaching hospitals and medical centres may have been by choice as it does not reflect the usual manpower disposition in the country otherwise shown in the distribution of state health facilities. Under representation of the Northeast and North-central zones across the three forms of facility may be ascribed to the lingering insurgency and banditry in the zones. The social challenges can make the zones unattractive to prospective residents and other qualified healthcare personnel.

Peritoneal dialysis is invaluable in the management of the child with acute kidney injury.¹³ To an extent, its practice is indicative of the commitment of a centre to appropriate management of the paediatric renal patient in a given facility. Only a quarter of the respondents volunteered that the facility was available in their centres. That another 40% came from centres where facilities for peritoneal dialysis were improvised is a testimony of the dearth of facilities in the country including those needed to provide specialized services.^{8,9} The dearth of facilities is more pronounced with state hospitals as all hospitals with peritoneal dialysis facilities were federal facilities. The non availability of critical equipment was even more marked with haemodialysis. About 90% of respondents were drawn from centres without haemodialysis facilities for children. Though a considerable number of hospitals (states and teaching hospitals) had haemodialysis facilities they were meant essentially for adults. Children were only marginally accommodated in the arrangement. The ideal of having facilities dedicated to children was only available in five centres in the country underpinning the serious facility gap inherent in our hospitals. More of the facilities in Federal/State hospitals compared to FMCs could be explained by the fact that federal hospitals are older and better equipped while some state teaching hospitals particularly from the South west are noted for their facility endowment.

Only about a quarter of the respondents came from facilities fully equipped to handle kidney tissues obtained through biopsy. Though the importance of tissue histology has assumed less importance in recent times, it nonetheless threw some light on the sophistication of a centre in the handling of the renal patient. The widespread non availability of the facility further buttresses the dearth of critical facilities and competencies in our tertiary health facilities.^{8,9} That the teaching hospitals (State and Federal) rather than FMCs are also favoured in this regard may also be explained by the fact that Federal Teaching Hospitals attract more budgetary allocation while a few State Teaching Hospitals are acknowledged to be well equipped.

The paucity of basic but critical facilities needed for the child with renal diseases paralleled practices of peritoneal and haemodialysis in the various centres. In health-care delivery, effectiveness and performance can be hamstrung by non-availability of resources almost to the same extent as lack of needed manpower. Stakeholders in the health sector in Nigeria have repeatedly bemoaned the non-availability of relevant equipment, and it is seen in some quarters as the bane of health care delivery in Nigeria.^{8,9}

Perception of key informants or operators of a system is important for assessing the performances of the sector. Residents are key players in healthcare system operations. The perceptions of residents regarding practices and training in the country were abysmal. Based on the impromptu, non-obtrusive and introspective approach adopted in data gathering, the views as expressed by the respondents could be seen as a true reflection of what is obtainable in the economy. The poor verdict as passed by the residents was not restricted to training but involved as well content of training and period dedicated to training in paediatric nephrology in the various facilities. Damning as it may seem it may in fact signal a wakeup call on planners and executioners of healthcare policies, on the need to act decisively and address the shortcomings.

In identifying reasons for the shortcomings in training and facilities, respondents readily identified shortfall in needed facilities/infrastructure which they traced to inadequate funding and lack of commitment from critical stakeholders including proprietors of the health facilities. Tertiary healthcare in Nigeria is essentially public sector driven. The last three decades witnessed rapid expansion in the number of tertiary health facilities without concomitant increase in sectoral allocation. The net effect is steady dwindling in the resources available to the public hospitals. The inadequate funding reflects in training quality and availability of needed facilities.

Conclusion

In conclusion, training and practice of Paediatric Nephrology in Nigeria as assessed by insider source are sub-optimal as occasioned by poor funding and lack of commitment from relevant stakeholders. If the identified gaps in training and practice of Paediatric Nephrology must be bridged, it may require innovative solutions thought out of the box and the immediate purview of the State.

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