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Training doctors in basic EEG: analysis of a learning tool relevant to resource-limited settings

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ABSTRACT – *Aim.* Clinicians trained to interpret EEG in Africa are scarce. The region is challenged by inadequate access to healthcare professionals and a significant burden of disease, with the result that trained neurophysiologists and epileptologists may not be viewed as an immediate priority. However, approaches, specific to the African context, could be adopted to enable safe practice of basic EEG interpretation. Educational guidelines for the interpretation of paediatric studies, relevant to the region, are lacking. As a result, a handbook targeting this training need was developed and a pilot study undertaken to assess the efficacy of this tool to improve EEG-reporting skills for clinicians at a basic level.

Methods. Eleven health practitioners, who manage children with epilepsy, from various African countries, were recruited. The group analysed selected EEGs before and after reading a training manual (the handbook). A survey was conducted on how useful the participants found the handbook.

Results. There was a trend ($p<0.06$) supporting improvement in the ability to analyse EEGs following reading of the handbook. The doctors who had one-on-one tutoring, in addition to access to the handbook, did significantly better in most EEG-reporting variables ($p<0.01$).

Conclusions. The handbook was found to be a viable tool to promote EEG interpretation in the African setting, where foundation skills are needed. However, optimal outcomes were evident with additional individual tutoring, as well as on-going support to maintain skills. This curriculum will be adapted into a post-graduate qualification intended to generate clinicians with key basic EEG skills, but not fully trained electrophysiologists. Currently, in the African setting, for maximum impact on patient care, this approach is considered the most likely to have the furthest reach.

Key words: Africa, EEG, handbook, pediatric training, resource-limited settings

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Epilepsy is one of the most common serious disorders of the brain. An estimated 50 million individuals live with epilepsy worldwide, irrespective of their age, ethnicity, socio-economic class, or geographic location. Nearly 80% of these people live in resource-limited settings (RLS) (WHO, 2004a). In these countries, health care is often limited to a few public institutions, which cannot provide optimal services because of economic and administrative limitations. In these RLS, the prevalence and incidence of epilepsy is thought to be higher than that of developed countries (Carpio and Hauser, 2009). There is approximately one neurologist for 10 million people in many of the poorest countries in sub-Saharan Africa (Bower and Zenebe, 2005; Birbeck, 2010).

The diagnosis of epilepsy is fundamentally a clinical judgement, especially in RLS. The accuracy of the diagnosis depends on the knowledge of the physician and the quality and reliability of the information provided by the witness (Radhakrishnan, 2009). However, due to the shortage of neurologists in sub-Saharan Africa, most people with epilepsy are diagnosed and treated by physicians who have no specific training or expertise in epilepsy management (Wilmshurst *et al.*, 2011). Educational resources are needed, as well as standard guidelines, for the diagnosis of epilepsy, which should be produced and distributed to RLS (WHO, 2004a, 2004b; WHO, 2009). There are books and manuals which are used to teach neurophysiology, but those relevant to children in RLS are lacking (Radhakrishnan, 2009). This pilot study assessed the efficacy of a simple instructional guideline which was developed in the authors' training centre to assist doctors with an interest in acquiring basic paediatric EEG skills, who work in RLS.

The aim of this study was to assess the usefulness, acceptability and efficacy on the clinician's ability to interpret EEGs after exposure to a handbook on basic paediatric EEG interpretation.

Development of the handbook

The handbook was devised and adapted by the principal investigator (VK) who supported the training needs of the in-house trainees and African doctors attached to the neurophysiology department. It was evident that there was a need for basic understanding and interpretation of EEG amongst clinicians who care for children in Africa. The handbook was standardised to ensure that the key critical aspects were addressed to generate safe practice over the six chapters. Safe practice was defined as the ability to accurately perform an EEG, to be aware of how to limit artefact in the recordings, and how to interpret key common conditions (*e.g.* childhood absence epilepsy) or those with management-altering findings (*e.g.* sub-clinical status epilepticus and epileptic spasms). The topics covered are summarised in *table 1*. The handbook is currently only available in English.

Methods

Study population

A pilot study was undertaken on 13 doctors to validate the efficacy of the handbook based on the participants' ability to interpret EEGs, having read the text.

Table 1. Contents of the Handbook for basic interpretation of EEG studies in children (number of pages: 50; size of booklet: A4; will be available as a downloadable pdf for registered course applicants).

Chapter 1: Measurement of the 10/20 system- the international markings of EEG electrode placement.
Chapter 2: Derivations/montage- the common montages used in paediatrics. EEG instrumentation- how the EEG machine works with all filter settings. Polarities- how the electrical potentials in the brain work.
Chapter 3: Artefacts- the various artefacts (physiological/non-physiological)
Chapter 4: Waveforms- normal waveforms, from the neonatal period to adolescence, both during the awake and sleep states. Normal Variants- normal variants in children that are not potentially epileptogenic.
Chapter 5: Activation procedures- hyperventilation/intermittent photic stimulation and sleep. Epileptiform activity- recognition of spikes and sharp waves, as well as non-epileptiform activity.
Chapter 6: Reporting of EEGs- some guidelines on how to report an EEG. Examples of reporting- a table with some examples of sentences to make up a report. EEG glossary- terminology used in EEG. Epileptic disorders- various common disorders affecting children. EEG illustrations- typical examples Table on clinical presentation and recommendations- covering the above disorders, from the neonatal period to adolescence.

The participants consisted of seven doctors from South Africa and six from other African countries (*table 2*). Three of the total participants (one local and two international) had completed courses in the neurophysiology department prior to the study commencing, either over a long (a two-year Mphil course; *n*=2) or short period (six weeks of clinical observation; *n*=1), and as such, already had access to additional tutoring. Two new participants (both international) joined the department from February to March 2012 and had one-on-one tutoring during the study period. Thus, in total, five participants had one-on-one tutoring. The remaining eight participants only had access to the handbook and had had no previous EEG training (*table 2*). All participants were known to the unit and had some form of working relationship with the researchers via the African Child Neurology Association (ACNA), and had expressed an interest in building on their knowledge of epilepsy interpretation since they regularly cared for children with epilepsy in their day-to-day practice.

Study activities

"Structured" EEGs were selected based on representation of the key common epilepsy diagnoses which should not normally be overlooked (including childhood absence epilepsy, benign centrotemporal epilepsy, and epileptic spasms). To balance any differences based on the reality of day-to-day practice, "prospective" EEGs were collected from the first 20 patients referred to the neurophysiology unit from 1st December 2011, regardless of the diagnoses. Each EEG consisted of 10 consecutive pages (200 seconds of data), as the participants did not consistently have access to *Nihon Khoden* software to read digital EEGs. The EEGs were recorded in the bipolar montage using the 10/20 system (Niedermeyer and Lopes da Silva, 2005). The recordings were performed either in the awake (20 minutes), natural sleep, or sedated state (30 minutes). All participants reviewed 20 EEGs (10 "structured" and 10 "prospective") before reading the handbook, independently of each other. Participants were provided with the age and mental state of the patients. The EEGs were interpreted via a tick-sheet, noting whether the EEG was "normal", "abnormal" or "don't know". In addition, as part of the interpretation, each EEG was analysed for specific background rhythms. Points were awarded if: background activity was appropriately described (delta, theta, alpha, beta, sleep spindles, V waves, and normal variants), artefacts were identified (noting whether they were physiological or non-physiological), specific abnormalities were identified (epileptic activity or encephalopathic background), there was correct interpretation of hyperventilation and intermittent photic stimulation responses, and a clear final summary of the overall findings was provided. The report was then completed with a conclusion. The "conclusion" was considered important and different from the "interpretation" which noted only whether an EEG was "normal" or "abnormal". The conclusion provided outcomes as to whether the findings of the study would alter the management of the patient, for example, if the EEG pattern was consistent with a recognised syndrome, such as epileptic spasms or childhood absence epilepsy. The structured and prospective EEGs were reported by the PI and were independently reviewed (JW). Participants were asked not to access additional information via the internet or from text books during the study period. Participants who were in contact with each other were asked not to discuss the EEGs or the study itself.

Prior to reading the handbook, two sets of data were collated, one for EEG interpretation and the other for conclusions based on the EEG findings. The scoring of reports was based on up to five key items of information potentially identifiable on each EEG (*table 3*). Therefore, scores per EEG report ranged between a minimum of 0 and a maximum of 5, depending on the number of items to be identified on each EEG (*see figures 1 and 2*). The maximum score for the test before reading the handbook corresponded to a total of 37 for the structured EEGs and 39 for prospective EEGs. Once the participants had performed the test, the findings were compared and correlated with the original report made by the clinical technologist. The participant outcome scores completed for the test prior to reading the handbook were withheld until the second set of studies was completed after reading the handbook. As such, participants served as their own internal controls for the reporting of EEGs.

Participants were each given the handbook and were allotted one month to read the text. The participants were allowed to use the handbook during the test, after having read it. All participants reviewed a further 10 novel structured and 10 prospective EEGs (as explained above). EEG information and analyses were the same as for the tests before reading the handbook. The maximum score obtainable for the test after reading the handbook was 76, 39 of which corresponded to the structured EEG reports and 37 to the prospective EEG reports.

The participants were further divided for the analysis according to their ability to successfully interpret and conclude EEGs based on whether they had had access to tutoring, in addition to reading the handbook.

A qualitative survey on the role of the handbook was also completed by the participants. The Likert four-point rating scale, from 1 (strongly disagree) to 4 (strongly agree), was used to evaluate the handbook (Likert, 1932).

Table 2. Participant demographics and experience before and after the study.

Participants	Position	Location	Paediatricians (per 100,000)	Child neurologists (total per country)	Population (millions)	Years of child neurology experience	Post-handbook reading activity
1-Tutored	Paediatric Neurologist	South Africa	1.9	30	50	Newly qualified neurologist	Actively caring for children with epilepsy.
2-Tutored	Paediatric Neurologist	Kenya	0.6	5	40	2.5 years	Establishing services for children with epilepsy.
3-Tutored	Paediatrician	Nigeria	0.2	17[a]	158	15 years. No specific training- special interest only.	Establishing services for children with epilepsy.
4-Tutored	Paediatrician	Nigeria	0.2	17[a]	158	18 years. No specific training- special interest only.	Establishing services for children with epilepsy.
5-Tutored	Paediatrician	Nigeria	0.2	17[a]	158	Year 1: neurodevelopment trainee.	Establishing dedicated service for neurodevelopmental service for child in her region in Nigeria, also supporting epilepsy care in this group.
6- Not tutored	Paediatrician	Nigeria	0.2	17[a]	158	12 years. No specific training- special interest only.	Establishing services for children with epilepsy.
7- Not tutored	Paediatrician	South Africa	1.9	30	50	Year 2: newly-qualified consultant in neurodevelopment- large clinic load with epilepsy.	Now confident in selecting appropriate referrals and understanding EEG reports.
8- Not tutored	Paediatrician	South Africa	1.9	30	50	Year 2: neurodevelopmental trainee.	Now a consultant paediatrician at a tertiary teaching hospital with a significant clinic load of patients with epilepsy.
9- Not tutored	Training Paediatrician	South Africa	1.9	30	50	Year 2: general paediatric training.	Now qualified general paediatrician with an interest in epilepsy.

Table 2. (*Continued*).

Participants	Position	Location	Paediatricians (per 100,000)	Child neurologists (total per country)	Population (millions)	Years of child neurology experience	Post-handbook reading activity
10-Not tutored	Medical Officer	South Africa	1.9	30	50	30 years working in an epilepsy service but never reported EEGs before.	Now insight into appropriate EEG requests, procedural techniques and interpretation of reports.
11-Not tutored	Medical Officer	South Africa	1.9	30	50	15 years working in an epilepsy service but never reported EEGs before.	Now insight into appropriate EEG requests, procedural techniques and interpretation of reports.

Table 3. Comparison between the EEG reporting of the tutored versus the non-tutored group, *i.e.* one-on-one tutoring exposure in addition to reading the handbook.

Analyses	Group	*n*	Mean	SD	t value	*p* value
Pre-handbook access						
Total score (%)	Tutored	5	46.56	34.84	2.17	0.09
	Not tutored	6	12.27	5.99		
Structured (%)	Tutored	5	47.56	32.58	2.02	0.11
	Not tutored	6	17.1	9.61		
Prospective (%)	Tutored	5	45.64	37.76	2.23	0.09
	Not tutored	6	7.72	5.13		
EEG interpretation (%)	Tutored	5	11.4	7.47	0.46	0.67
	Not tutored	6	9.83	1.72		
Conclusion (%)	Tutored	5	8.2	6.87	1.65	0.17
	Not tutored	6	3	1.79		
Post-handbook access						
Total score (%)	Tutored	5	73.7	9.49	8.99	<0.05
	Not tutored	6	32.25	4.39		
Structured (%)	Tutored	5	76.42	9.48	7.71	<0.05
	Not tutored	6	35.47	7.83		
Prospective (%)	Tutored	5	70.84	9.99	8.73	<0.05
	Not tutored	6	28.8	4.41		
EEG interpretation (%)	Tutored	5	15.4	2.51	3.37	0.15
	Not tutored	6	13	2.53		
Conclusion (%)	Tutored	5	13.6	3.72	1.57	0.01
	Not tutored	6	5.83	3.92		

SD: standard deviation; equal variances not assumed for all data.

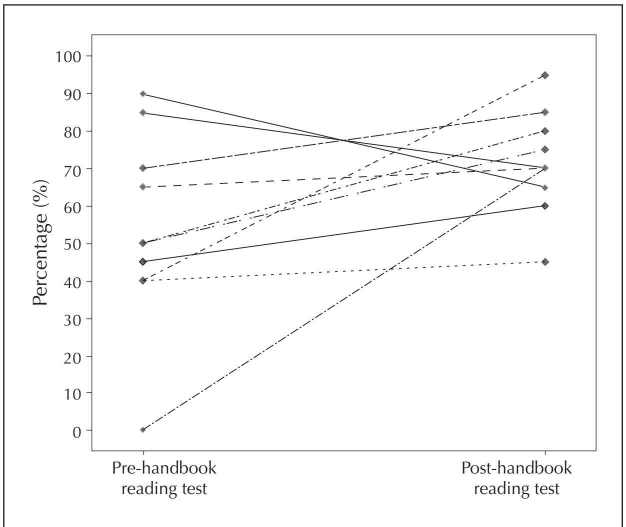

Figure 1. Line diagram depicting correct EEG interpretation before versus after reading the handbook. Ten lines are present due to overlapping lines of two participants who had identical results.

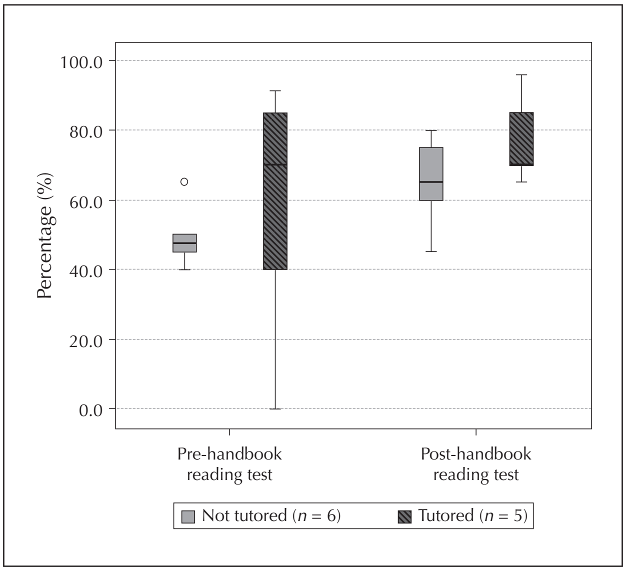

Figure 2. Box plot diagram depicting pre-exposure to the handbook versus post-exposure to the handbook regarding correct EEG interpretation for those who had tutoring and those who had the handbook in isolation.

Questions addressed how useful the participants found the content of the handbook to be, if the language was understandable, if the illustrative examples used were helpful, how effective they felt the handbook was in isolation in improving their EEG-reporting skills, and if they felt they had undergone an improvement in their practice.

Statistical analysis

A Wilcoxon sign ranked test was used for analysis of the EEG interpretation because the data was not normally distributed. An independent means test using Levine's test for equality of the variances was performed for analysis of the accuracy of reporting. The equality of variances is simply a statistical test to determine if there is a significant difference in the variance (standard deviation around the mean) between the two items being compared by the t-test. Survey question results were analysed using the Pearson's Chi-squared test. All statistical analyses were performed using SPSS 20. The decimal point was rounded up to attain the calculated percentages.

Results

From the original 13 participants who were recruited to participate in the study, two (one local and one international) withdrew as they were unable to complete the study activities due to time constraints. The results relate to the remaining 11 participants (*table 2*).

The statistical analysis of participants' efficacy in correct EEG interpretation before reading the handbook was compared to test results after reading the handbook, taking into account those who had had one-on-one training (tutored) and those who only had the handbook as a teaching aid. These results are summarised in *figure 1*. Following reading of the handbook, the median outcome for EEG interpretation improved from 50% (IQ: 40-70%) to 70% (IQ: 60-80%). There was one outlier in the pre-handbook-reading group who had no knowledge of EEG and scored 0. Although not statistically significant ($p<0.06$), the increase in the median scores supported a trend towards participant improvement in EEG analysis skills following reading of the handbook. All 11 participants confirmed that no additional reading was undertaken before or after reading the handbook. The line diagram (*figure 1*) shows that the outlier improved significantly after reading the handbook. For two international participants (one Kenyan [Mphil] and one Nigerian [short attachment]), who had previously undergone individual tutoring, the test results declined after reading the handbook by 25% and 15%, respectively. Two participants had the same results before and after reading the handbook.

Five (45.5%) of the participants had received additional tutoring. The effect of tutoring and non-tutoring with regards to the analysis of correct EEG interpretation is summarised in *figure 2*. Following reading of the handbook, the median score for EEG interpretation for the tutored group increased to 65% (IQ: 70-85%), compared to those who read the handbook in isolation, whose median score was 45% (IQ: 60-75%). However, there was a decline for two tutored participants after having read the handbook, as seen in *figure 1*.

As such, the tutored group showed a 27.1% total score improvement, whereas the non-tutored group showed a 20% increase after having read the handbook (*table 3*). EEG reporting improved after reading the handbook, which was statistically significant on all scores, with the exception of EEG interpretation for both the tutored and non-tutored groups. Overall, the data demonstrated no difference between the tutored and non-tutored pre-handbook-reading results, but after reading the handbook, the tutored group did significantly better in all areas, except EEG interpretation, where the outcomes were similar.

Descriptive statistics for analysis of correct conclusion on EEG reporting versus correct EEG interpretation of the 440 EEGs are presented in *table 4*. Based on t-test analysis, a statistically significant difference in correct EEG interpretation was identified relative to correct EEG report conclusion, such that, although the group improved in their ability to recognise whether an EEG was abnormal or not, the same degree of improvement was not found in their ability to conclude what this might mean for the patient's diagnosis or management.

Descriptive analysis using t-tests for comparison of statistical significance of the structured and prospective EEG interpretations for the 22 participant activities (11 pre-and 11 post-test) were performed. The structured EEGs were interpreted significantly more accurately than the prospective studies (p=0.004).

Results of the survey regarding participants' beliefs on the usefulness of the handbook, between tutored and non-tutored participants, were analysed using the Pearson Chi-Squared test. Overall, concerning the survey data for four of the six questions, all participants' responses ranged from agreeing to strongly agreeing. Participants agreed that access to one-on-one teaching or e-learning was more effective in conjunction with reading the handbook. Comments on the last question, relating to "improvement in practice", for those who had no prior knowledge, were very positive regarding the basic information they received. Some participants found the technical chapters confusing and hard to understand. The question of effectiveness had the most "disagree" responses, with the consensus being that a hands-on or practical approach in training would be useful in conjunction with the handbook.

Discussion

There is a paucity of expertise amongst doctors and specialists in Africa who are skilled in EEG interpretation (Wilmshurst *et al.*, 2011; Wilmshurst *et al.*, 2013). Medical schools in sub-Saharan Africa rarely teach even the basic principles of epilepsy in children to their students at an undergraduate or post-graduate level (Wilmshurst *et al.*, 2011; Wilmshurst *et al.*, 2013). As such, the majority of doctors managing children with epilepsy in Africa have had little or no training in this area. Many countries have only one or two child neurologists to support their national healthcare needs (for example: Malawi, Uganda, Zambia, and Tanzania) (Wilmshurst *et al.*, 2011; Wilmshurst *et al.*, 2013). The concept that doctors should be trained as epileptologists, who are solely responsible for neurophysiological screening, whilst effective and viable in resource-equipped settings, is not realistic in the African setting at this time. Hence, the establishment of an alternative training module. The training program that operates at the study site, a tertiary paediatric institute in South Africa, has aimed to fill the training gap for

Table 4. EEG interpretation versus correct conclusion before and after reading the handbook.

Analyses		***n***	**Mean**	**SD**	**t value**	***p* value**
Total EEGs interpreted (%)	Pre-handbook	11	21.18 (27.85)	21.82 (28.71)	**-2.1**	**0.05***
	Post-handbook	11	38.82 (51.09)	17.23 (22.68)		
Structured Totals (%)	Pre-handbook	11	11.45 (30.95)	9.95 (26.90)	**-2.39**	**0.03***
	Post-handbook	11	21.09 (54.08)	8.93 (22.89)		
Prospective Totals (%)	Pre-handbook	11	9.73 (24.95)	12.18 (31.24)	-1.79	0.09
	Post-handbook	11	17.73 (47.91)	8.52 (23.06)		
Correct EEG interpretation (%)	Pre-handbook	11	10.55 (26.36)	4.95 (12.37)	**-2.09**	**0.05***
	Post-handbook	11	14.09 (35.23)	2.70 (6.75)		
Correct EEG conclusions (%)	Pre-handbook	11	5.36 (13.40)	5.28 (13.19)	-1.75	0.09
	Post-handbook	11	9.36 (23.41)	5.45 (13.61)		

*significant ($p<0.05$) for the t-test. The variance is equal for all scores.

many doctors and paediatricians from Africa, and has identified considerable data concerning the deficiencies in EEG interpretation on the continent (Kander *et al.*, 2012). Great similarities exist, relating to the challenges listed above, to those found in other RLS, such as India (Radhakrishnan, 2009). In order to address some of these challenges, the handbook was devised, focusing on teaching basic principles in paediatric EEG interpretation.

There are many texts and resources available on EEG interpretation in the format of large volumes which are full of technical terminology and descriptions, which render them challenging for most practitioners who manage children with epilepsy in RLS. A number of training courses in epileptology, including online courses exist, however, many doctors from sub-Saharan Africa and other RLS cannot afford to attend these courses, do not have access to the internet (especially in rural areas), or are not at a level to be able to follow the academic requirements of the course (Dr Okunola Olusola Peter, personal communication 2013, May 14; www.aset.org [American Society of Electrodiagnostic Technologist]). The handbook, piloted and evaluated in this study, was produced to address this need for training, with the aim of accurate and safe EEG interpretation. The content of the handbook forms part of a curriculum which is under development at the University of Cape Town, as a one-year post-graduate diploma (available from 2015) on the subject of basic EEG interpretation and management of children with epilepsy. It is hoped that this course will assist in promoting and developing paediatric EEG interpretive skills across the African continent. This course could act to provide the foundation skills to enable clinicians to benefit from more technically specialised EEG courses.

The handbook with tutoring led to improvement in EEG interpretation. Although the same degree in improvement of EEG conclusion did not occur, again, positive trends were evident. As the EEG conclusions would allow for definitive management plans to be made, this area of the training would need to be developed further as the training program continues. The outcomes of this study are limited by the small sample size. When comparing the scores of the tutored versus the non-tutored doctors, those participants with one-on-one tutoring fared significantly better in their interpretation scores, conclusion, and overall reporting of EEG findings.

No negative marking was performed during the scoring. Based on these outcomes, the handbook facilitated the participants' ability to interpret paediatric EEGs, specifically the ability to identify whether they were normal or abnormal. It is hoped that improved accuracy and competency in interpretation of EEG, as a result of the use of the handbook, will, in turn, lead to the improved diagnosis and management of epilepsy and epilepsy syndromes by doctors caring for children with epilepsy. Further, through improving accuracy of the neurological diagnoses made in children, this should avoid or minimize inappropriate therapy. As such, the handbook aims to promote safe practice. However, there are no comparative reports in the literature to compare with this study.

Individual tutoring combined with the use of the handbook produced the optimal outcomes for more accurate interpretation of the EEG. However, support with one-on-one interaction should ideally be on-going in order to maintain and further develop interpretive skills. Internet links for group discussions, where possible, and weekly meetings and troubleshooting sessions are valuable resources to enable this. It is the recommendation of the investigators that this balance of one-on-one-focused tutoring with the handbook, as well as the on-going collaborations after training, are part of the training program, rather than the handbook in isolation.

The results may have been understated due to:
- Some of the participants' unsupervised use of the handbook;
- Time management issues;
- The small size of the group studied;
- The diverse representation of the study group.

Although the entire study was conducted based on the assumption that the handbook was used in the manner in which it was intended to be used, this could not be closely monitored. The participants were required to work through the instructional material within a one-month time frame. The study did not stipulate a specific amount of time to be spent on the handbook, allowing the participants the flexibility to proceed through the handbook at their own learning rate.

Four of the participants who came from two of the African countries (one from Kenya and three from Nigeria) had received individual EEG tutoring (*table 2*). The impact of training these practitioners who are involved in the care of children with epilepsy is already significant in terms of increasing the service capacity in this field in Africa (Wilmshurst *et al.*, 2011; Wilmshurst *et al.*, 2013). The ripple effect of sending these doctors with improved EEG skills into different parts of Africa has the potential to change approaches to epilepsy in each region. On-going contact and collaboration with these doctors confirms that they are promoting the recognition and delivery of care to children with epilepsy in their settings (*table 2*). A further five participants (one from Tanzania, one from Ghana and three from Nigeria) will take part in the program in 2014.

This will be the first published handbook on paediatric EEG in South Africa and the overall results of this study suggest that such a handbook is, and could be, useful as a learning tool in the interpretation of paediatric EEG for individuals with access to individual tutoring, as well as those without. It also complements clinical courses at the neurology unit in our centre and serves as a stepping stone for further EEG training, such as that offered by online courses. The compact presentation of the handbook and the low-cost implications relative to other training options, such as online courses, also make it an attractive and viable option in RLS. In this context, the handbook may assist in addressing the deficit in training of epileptology amongst doctors in sub-Saharan Africa, especially paediatricians.

Ethical Approval

The study protocol was passed by the Red Cross War Memorial Children's Hospital Research Committee and the University of Cape Town Ethics Committee REC/REF 494/2011.
This article is based on the research Veena Kander conducted for her Masters of Technology Degree in Neurophysiology.
In relation to the journal's position on issues involved in ethical publication: We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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TEST YOURSELF

(1) There are few specialists equipped to report EEGs in Africa. True or false?

(2) What were the optimal training methods identified in this study? One-on-one training as well as the handbook, or accessing the written material in isolation?

Note: Reading the manuscript provides an answer to all questions. Correct answers may be accessed on the website, www.epilepticdisorders.com, under the section "The EpiCentre".