The impact of an educational intervention on knowledge of attention-deficit hyperactivity disorder among primary school teachers in Lagos, Nigeria

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Abstract
Objective Primary school teachers have been identified as important partners in the prompt recognition, referral and management of children with ADHD. However, their capacity to function in these roles is hinged on their extent of knowledge about ADHD. Furthermore, teachers' knowledge about ADHD may influence the education and clinical outcomes of children with ADHD. This study assessed the impact of an educational intervention program on knowledge about ADHD among primary school teachers in Lagos, Nigeria.

Method An experimental study of the impact of a brief educational intervention on ADHD literacy among primary school teachers (n=144) in Lagos, Nigeria. At baseline, knowledge about symptoms and treatment of ADHD was elicited with a vignette-based questionnaire. The intervention consisted of the administration of an educational leaflet about ADHD, designed by the American Academy of Child and Adolescent Psychiatry. One week post-intervention, the baseline assessments were repeated.

Results At baseline, 92.4% of the teachers could not recognize features of ADHD. The majority were also unaware of the role of teachers, medications, and psychological interventions in the management of children with ADHD. Post-intervention, significantly greater number of respondents compared with baseline (88.0% vs. 7.6%) correctly identified symptoms of ADHD (p<0.005), and agreed that ADHD could be successfully managed with medications (63.2% vs. 9.0%; p<0.005) and psychological treatment (79.2% vs. 16.7%; p<0.005).

Conclusion A simple low-cost educational intervention is effective in improving knowledge about ADHD among primary school teachers in the short-term. Further research is required to evaluate the impact of this intervention in the long term.

Keywords ADHD, Teachers, Educational Intervention, Knowledge, Mental Health Literacy.

Introduction
Attention-deficit/ hyperactivity disorder (ADHD) is a neuro-psychiatric disorder of childhood onset characterised by developmentally inappropriate symptoms of hyperactivity, impulsivity and/ or inattention. It is the most commonly diagnosed psychiatric disorder in children, with an estimated prevalence of about 5%, according to a western systematic review and meta-analysis. Since the features of ADHD, even when previously occult, become more apparent in the school setting, teachers have important roles in the prompt identification and referral of children with ADHD to mental health services.

In western countries, a high proportion of children with ADHD are referred for clinical evaluation by teachers, a role contingent on knowledge about ADHD. Previous research has shown varying degrees of knowledge deficit regarding the features of ADHD and its treatment modalities among primary school teachers. About 20% and 47% of primary school teachers in Thailand and Iran respectively were reported to have knowledge about features of ADHD, while in the United Kingdom, case vignettes of ADHD were correctly identified by 43% to 56% of teachers. North American and Australian teachers demonstrated higher rates of ADHD literacy with average correct responses to questionnaire items eliciting knowledge...
about ADHD ranging from 48% to 82% and 76% to 82% respectively. Overall, teachers were more informed about the features of ADHD than about its treatment modalities, and majority were reluctant to recommend medications.

A recent Nigerian study on this subject revealed a remarkably lower level of ADHD literacy among primary school teachers. Less than a tenth of teachers recognised the features of ADHD or agreed that ADHD could be managed with medications.

Recognition of the need to improve teachers’ ADHD literacy in order to facilitate access of school children with ADHD to services and improve their educational outcomes has informed the design of a number of interventions in this regard. The earliest evidence of the impact of educational intervention on knowledge of teachers about ADHD was demonstrated by Barbaresi and Olsen among 44 primary school teachers in North America.

The intervention, which consisted of a 2 hour exposure to an ADHD educational curriculum, significantly improved ADHD literacy among the participants. In Pakistan, Syed and Hussein demonstrated the positive impact of an educational intervention on knowledge of ADHD among 49 school teachers.

The intervention consisted of a workshop covering various aspects of ADHD and its management lasting two hours each for 5 days, accompanied with video-clips and pamphlets. The efficacy of educational interventions in improving teachers' knowledge about ADHD was subsequently substantiated among 67 primary school teachers in India. Similarly, Aquiar et al. reported the positive impact of psycho-educational intervention on teachers' knowledge among 37 elementary school teachers in Brazil.

The intervention which consisted of an ADHD awareness program significantly increased the knowledge of teachers about ADHD. In addition to improving knowledge about ADHD, brief educational interventions have been shown to facilitate the capacity of teachers to pick up features of ADHD in comparison to standard diagnostic algorithm, thereby improving the accuracy of identification of students at risk for ADHD.

Evidence suggests that simpler low cost educational interventions which do not require attendance of workshops or structured face to face teaching may be equally effective in improving ADHD literacy among teachers. Sarraf et al. demonstrated that non-attendance educational intervention involving exposure to ADHD booklet was as effective as workshop attendance in improving teachers' knowledge about ADHD. Such simple low-cost interventions may be more feasible to implement and achieve wider coverage in a resource-constrained setting like Nigeria.

To the best of our knowledge, no previous study has investigated the impact of an intervention targeted towards improving knowledge about ADHD among teachers in Africa. This informed the need for the current study which assessed the impact of a brief educational intervention program (exposure to an ADHD educational leaflet) on the knowledge about ADHD among primary school teachers in Lagos, Nigeria.

Methods

Study Design and Setting: The study was an experimental study conducted among teachers recruited from four primary schools in Lagos, south-West Nigeria.

Ethical Consideration: Approval was obtained from the Lagos Educational Authority District Office and the school authorities of the participating schools. The participants were duly informed about the purpose and nature of the study before obtaining their consent. A high level of confidentiality was maintained during and after the data collection.

Sampling technique: The schools were selected by convenience sampling and all the consenting teachers in the schools constituted the sample.

Instrument and Procedure: At baseline, knowledge about ADHD was elicited with a vignette based self-report questionnaire, after obtaining informed consent from the participants. The case vignette depicts a student with features of ADHD (combined subtype) based on the DSM-IV criteria as highlighted below, and has been previously used by other authors. Daniel is nine years old and in Year 5, and is not making the academic progress his teacher would expect even though he is of average cognitive ability. Daniel seems to daydream during lessons and sometimes does not listen when directly spoken to. Anything that happens in the classroom takes his mind off his work, which he then finds hard to return to. He frequently fails to follow verbal or written instructions for tasks; however, with one-to-one help, Daniel is able to understand instructions and is willing to follow them. He has difficulty getting ready for activities or doing things in an organised way; he tends to shift from one thing to another. Daniel makes careless mistakes and his schoolwork is messy and incomplete mainly because he fails to pay attention to detail. He frequently misplaces things and is forgetful. Daniel tries to avoid doing things that require mental effort, especially if he is not interested in the subject. Daniel is fidgety and frequently leaves his seat and wanders about the classroom. He gets into trouble with his friends because he does not take turns when playing and is constantly running about and intruding on other people's games. He is chatty, interrupts other people and answers questions before the teacher has finished asking. Daniel comes across as being different from the rest of the class, who are more focused and able to stay on task and sit quietly. His previous teachers had a similar experience teaching him. Daniel's parents say that he has always been like this, and he is forgetful and restless at home as well. Daniel's teacher and parents believe that Daniel's difficulties significantly impair his academic functioning, his leisure activities and his home life.

The vignette was followed by an open ended question eliciting knowledge of ADHD: “What do you think is wrong with Daniel?” Subsequent items elicited...
knowledge about treatment of ADHD, recognition of the role of teachers in management of ADHD and recommendation toward Daniel's improvement. The items included 'Daniel should be evaluated if medication would be useful for him', and 'Daniel would benefit from psychotherapy/psychological treatment' in True/False response format. The age, gender and years of teaching experience of the respondents were also documented.

**Intervention:** The intervention consisted of administration of educational leaflets containing information about ADHD to the participants immediately after the baseline interview. The information leaflet was designed by the American Academy of Child and Adolescent Psychiatry to educate lay people on the symptoms of ADHD and the various treatment approaches. Subsequently, the vignette-based questionnaires were re-administered to the participants one week after the completion of the initial assessment. About 85.4% (125) of the initial participants completed the second wave of the assessment.

**Statistical Analysis:** Data was analysed with the IBM-SPSS version 20 software. Frequencies, mean and standard deviation were calculated for relevant variables. The primary outcome measures of knowledge of symptoms and treatment of ADHD were dichotomised into correct or incorrect responses or true and false as appropriate for each item assessed on the vignette based questionnaire.

The McNemar test was conducted to compare frequency of correct responses post-intervention versus baseline in order to assess the impact of the intervention. The level of statistical significance was set at p<0.05.

**Results**

The mean age of the teachers was 41.7 (±9.3) years and 37.5% were males. On the average, the participants had taught for more than one decade (12.6 ±7.8 years). At baseline, only 11 (7.6%) of the teachers correctly identified the ADHD case vignette (Table 1). The other respondents believed that Daniel was either 'too playful'/silly' (49.3%), stubborn/naughty (30.6%), or 'over-indulged'/spoilt child' (12.5%).

Only 9.0% of the respondents correctly believed that medications could be useful in the management of ADHD, while 16.7% agreed that psychological treatment could be beneficial. The participants predominantly (83.3%) erroneously recommended corporal punishment/'serious discipline' for ADHD.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N=144 Baseline n(%)</th>
<th>N=125 Post-intervention n (%)</th>
<th>McNemar p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of case vignette</td>
<td>11 (7.64)</td>
<td>110 (88.00)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Recognition of need for medications</td>
<td>13 (9.03)</td>
<td>79 (63.20)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Recognition of need for psychotherapy</td>
<td>24 (16.67)</td>
<td>99 (79.20)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Recognition of role of teachers</td>
<td>9 (6.25)</td>
<td>69 (55.20)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Recommendation of punishment</td>
<td>120(83.33)</td>
<td>47 (37.6)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

After the intervention, 85.4% (n=125) of the sample was available for re-assessment (Table 1 and Figure 1). Post-intervention, knowledge about the symptoms of ADHD improved significantly among the participants (Figure 1). More respondents correctly identified the symptoms of ADHD (88.0% vs. 7.6%; p<0.001). Similarly, significantly greater number of respondents correctly agreed that ADHD could be successfully managed with medications (63.2% vs. 9.0%; p<0.001) and psychological treatment (79.2% vs. 16.7%; p<0.001) while fewer respondents endorsed corporal punishment/disciplinary approach in managing a student with ADHD (37.6 %vs. 83.3%; p<0.001). The participants were also more informed about the role of teachers in the management of ADHD post-intervention (p<0.001).
Figure 1: Teachers’ Knowledge about ADHD at Baseline versus post-intervention

Discussion

Globally, the impact of educational intervention on ADHD literacy of teachers is grossly under-researched. To the best of our knowledge, this is the first study to assess the impact of an intervention on ADHD literacy among teachers in sub-Saharan Africa. Recognition of features of ADHD depicted in the case vignette increased significantly from 7.6% at baseline assessment to 88.0% post-intervention (p<0.001). Our findings are consistent with that of Saraff et al. who demonstrated the effectiveness of exposure to an ADHD educational booklet in improving teachers' knowledge about ADHD in Iran. Other researchers have also substantiated the impact of brief educational interventions in ADHD literacy among teachers in Iran, U.S.A, Brazil and the United Kingdom.

However, methodological variances including instruments used to assess ADHD knowledge, content of educational intervention, and mode of intervention precludes direct comparability across studies. Our findings highlight potential opportunities for interventions to bridge the current gap of unmet need for ADHD literacy among school teachers in Nigeria.

Of particular interest is the fact that the intervention used in the current study is simple, brief and low-cost; which makes it feasible in a low-resource developing setting like Nigeria. There is evidence that such brief low-cost intervention initiatives may be as effective as intensive educational interventions such as workshop attendance in increasing knowledge about ADHD among teachers.

The frequency of teachers who believed ADHD could be successfully managed with medications increased significantly from 9.0% to 63.2% post-intervention (p<0.001), while recognition of the benefit of psychological treatment significantly increased from 16.7% to 79.2% (p<0.001). Concomitantly, there was a corresponding reduction in the endorsement of disciplinary measures (p<0.001). These findings are convergent with previous research. Barbaresi and Olsen demonstrated a reduction in hesitance to recommend medications for ADHD by teachers in the U.S.A from 64% to 34% following a brief educational intervention lasting only two and half hours.

Subsequent research conducted in North America, Europe, South America and Asia have confirmed the positive impact of educational interventions on knowledge of treatment modalities for ADHD among teachers. Improvement in perception of need for treatment following educational interventions has significant implications on the access of students with ADHD to mental health services. A recent review identified poor literacy about ADHD among teachers as a major barrier to early identification and referral of children with ADHD to services.

In congruence with extant evidence, the current study also demonstrated a significant improvement in the awareness of the role of teachers after the intervention. The potential role of teachers as partners in the management of ADHD is not limited to early detection and referral but also extends to the implementation of classroom modifications including modification of teaching strategy, adaptation of curriculum, monitoring effectiveness of treatment using standardised rating scales and providing important feedbacks to the clinicians and parents.

Performance of these tasks by a teacher demands literacy about ADHD, as well as motivation to commit more time, effort and attention to children with ADHD and this may be challenging for the teachers to cope with. The role of teachers as potential partners in the early referral and management of ADHD may even be
more important in a country like Nigeria where mental health is considerably under-resourced and a huge treatment gap exists. Early detection will facilitate prompt intervention thereby improving treatment outcomes and the quality of life of the child with ADHD.

Teachers' knowledge and attitudes about ADHD have a significant influence on the educational and clinical outcomes of children with ADHD. Without engagement in multimodal interventions including behavioural modifications within the classroom setting, children with ADHD will perform below their intellectual capacity and their academic progress will be disrupted. Therefore, teachers with low levels of literacy about ADHD cannot meet the educational needs of children with ADHD. Furthermore, teachers' knowledge about ADHD will affect their interaction with the children. Teachers with knowledge about ADHD are more likely to perceive educational support as beneficial and therefore more likely to engage children with ADHD.

On the other hand, teachers who are ignorant and have misconceptions about ADHD may subject students with ADHD to abuse under the guise of 'discipline', which may eventually culminate in these children dropping out of school.

Our study has a number of limitations. Firstly the participants were not recruited by probability sampling and teachers were selected from only four schools in Lagos which may limit the generalisation of our findings. Secondly, the case vignette may not accurately reflect the portrayal of symptoms as manifested in real life.

Consequently, participants' reaction in real-life situations may not be consistent with their responses to the vignette based questionnaire. However, most research on this subject has employed the use of vignettes, and the adoption of a similar methodology facilitates comparability across studies.

In addition, the use of vignette has been shown to facilitate communication of the adolescent's opinion with minimal interference from the researcher. Thirdly, the knowledge assessed post-intervention could have been 'contaminated' by information from other sources. However, the likelihood of contamination may be minimal due to the short interval between the two waves of assessment.

Finally, the extent to which the post-intervention assessment reflects actual improvement in the understanding of ADHD exclusive of the influence of socially desirable responses and rote learning is difficult to ascertain. However, completion of the questionnaires anonymously may reduce the likelihood of social desirability bias.

Overall, this study has contributed to filling an important gap in knowledge by demonstrating the impact of a simple, low-cost intervention in improving ADHD literacy in a sample of primary school teachers in South-West Nigeria.

The impact of this intervention needs to be re-assessed in the longer term and in a larger, more representative sample. It is also desirable for future interventions to build the capacity of teachers to implement simple behavioural and educational modifications in managing children with ADHD.

Conclusion

In consonance with previous research, the current study substantiated the effectiveness of a brief educational intervention program (exposure to educational leaflet) in improving knowledge about ADHD among primary school teachers in Lagos, Nigeria.

Further studies are required to determine the impact of the intervention in the long-term and extend the current findings.

Declaration of interest
No conflict of interest identified.

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References


