Impact of problem-solving skills and attributional retraining on conduct disorder among students at public secondary schools in Nigeria

Sewanu Awhangansi[1], Michael Lewis[2,3], Khalid Karim[1,4], Jibril Abdulmalik[5], Philip John Archard[1,4,6], Adeniran Okewole[7,8] Michelle O'Reilly[1,4]

1. Leicestershire Partnership NHS Trust, Leicester, UK
2. University of Central Lancashire, Preston, UK
3. Ashworth Research Centre, Mersey Care NHS Trust, Liverpool, UK
4. University of Leicester, Leicester, UK
5. University College Hospital, University of Ibadan, Nigeria
6. Tavistock and Portman NHS Foundation Trust, London, UK
7. Neuropsychiatric Hospital Aro, Abeokuta, Nigeria
8. Pembroke College, University of Cambridge, Cambridge, UK

Abstract

Purpose: This paper reports a non-randomized control study undertaken (1) to investigate prevalence and correlates of conduct disorder among male secondary education students in South-West Nigeria; and (2) to assess the impact of a Problem-Solving Skills and Attributional Retraining (PSSAR) intervention with this population.

Design/methodology/approach: Seven hundred and eighty-seven male students from two schools were screened for conduct disorder. All participants who met criteria for the disorder were allocated to either treatment (n = 55) or control (n = 47) groups. Outcome measures comprised the Strengths and Difficulties Questionnaire (SDQ; teacher and student versions) and the Teacher Rating of Students' Aggressive Behaviors.

Findings: Thirteen percent of the sample were found to present with difficulties which met criteria for conduct disorder. The presence of these difficulties correlated with several demographic variables, including parental conflict and alcohol use. A statistically significant reduction in mean scores was observed for the treatment group in the student rating of the SDQ emotional subscale and total difficulties scores. Teacher ratings were less consistent in that conduct problems, prosocial behavior, and total difficulties increased following the intervention, whereas peer problems and aggressive behavior were reported by teachers to reduce. No statistically significant change was found in the outcome measures for the control group.

Practical implications: In resource-constrained settings, school-based interventions are an important means through which treatment gaps in child and adolescent mental health can be addressed.

Originality/value: This study's findings offer some preliminary support for the PSSAR intervention for conduct disorder in this context and suggest areas for further research.

Keywords: adolescence; conduct disorder; resource-constrained settings; school-based intervention; treatment gap; middle-income country

Introduction

Conduct problems are associated with a spectrum of antisocial, aggressive, dishonest, delinquent, defiant and disruptive behaviors, ranging from minor hostile or harmful acts to serious criminal activity (Rivenbark et al., 2018, Moffitt, 2003). For a diagnosis of conduct disorder, the child presents with a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms are violated (American Psychiatric Association [APA], 2013).

The occurrence of conduct disorder in childhood and adolescence is recognized as foreshadowing serious problems in adult life, including criminality, substance misuse, poor educational achievement, impaired social and occupational functioning, as well as serious mental disorder (Fairchild, 2018, Roberts et al., 2018). Alongside these personal costs, conduct disorder also poses a burden on society quantifiable in monetary and non-monetary terms, including costs of repairing properties damaged by vandalism, unsafe learning environments and neighborhoods, and the victimization of others (Rivenbark et al., 2018).

Nigeria has a predominantly youthful population with approximately 62.5% of the population falling into the 0–24 years age-range (National Population Commission, 2010). Relatively high prevalence rates of conduct disorder, ranging from 15.8% to 69.7% amongst children and adolescents (Diwe et al., 2016, Olashore et al., 2016), combined with a shortage of child and adolescent mental health professionals and reduced access to mental health care contribute to a treatment gap, thus increasing psychiatric morbidity in the country as a whole (Saraceno et al., 2007; Eaton et al., 2018).

Many types of interventions currently exist for children and adolescents with conduct and behavioral problems (Gatti et al, 2019, Abdulmalik et al., 2016, Adeusi et al., 2015). However, questions remain regarding effectiveness, particularly long-term outcomes (Gatti et al., 2019). Treatments for which empirical evidence supports effectiveness include problem-

solving skills training, parent management training, functional family therapy, multi-systemic therapy, contingency management training, and stimulant medication (Gatti et al., 2019, National Institute for Health and Care Excellence, 2013, Kazdin, 2007). These interventions have predominantly been utilized in high-income countries, and there is a paucity of interventions evaluated for conduct disorder in low- and middle-income countries, such as Nigeria, despite one local study indicating that these interventions may be adaptable (Abdulmalik et al., 2016). It is therefore important to investigate the effectiveness of such interventions while extending what is known about conduct disorder in a Nigerian context.

Problem-Solving Skills Training (PSST) is a cognitive-behavioral based intervention for children and adolescents with conduct and delinquency-related problems. Developed by Kazdin and colleagues (who built on the earlier work of Shure and Spivak on problem-solving techniques for children), PSST seeks to assist children and adolescents in acquiring interpersonal and cognitive problem-solving skills. Professionals guiding the intervention explore habitual ways children and adolescents approach everyday situations, helping them develop skills for problem identification, solution generation and selection, and appropriate behavior (Kazdin, 2007).

The PSST program is based on the premise that conduct and other disruptive behaviors arise due to an inability to constructively cope with certain thoughts and feelings. Consequently, children and adolescents with these difficulties need to be helped to 'slow down' their thinking and to consider multiple solutions to different issues they encounter. This, in turn, serves to reduce the occurrence of challenging behaviors, improving social relationships in the process. Specific techniques used include modeling, role-playing, teaching and reinforcement of alternative, appropriate behavior.

Owing to the cultural and logistical challenges involved in implementing the more established and sometimes costly intervention programs in resource-constrained settings, a

focus on school-based interventions is worthwhile as they can reach a greater number of adolescents by virtue of reduced treatment costs and accessibility. The mental health treatment gap (i.e., number of people experiencing mental ill-health who do not receive care) in Nigeria is estimated to be around 85% (Eaton et al., 2018), and is reportedly due to a widespread shortage of qualified mental health professionals, limited funding, and inadequate primary health care systems, as well as stigma and discrimination, misconceptions about mental health, and poor mental health literacy amongst the general population (Hook et al., 2021). This study therefore sought to evaluate the effectiveness of a minimal-cost PSST-based intervention (Problem-Solving Skills and Attributional Retraining) for adolescents with conduct disorder in Abeokuta, Ogun state, South-West Nigeria. The prevalence and psychosocial correlates of conduct disorder were also assessed. It is hoped that findings from this study may inform policy decisions for bridging the treatment gap and developing structured school-based services for children and adolescents with conduct problems in this context.

Research hypotheses

The following predictions were proposed:

1. Emotional and behavioral problems associated with conduct disorder will improve among the treatment group following exposure to the PSSAR intervention.

2. The treatment group will exhibit a greater change in emotional and behavioral problems of conduct disorder when compared to the control group following exposure to the respective interventions (i.e., treatment as usual for the control, and PSSAR for the treatment group).

Method

Study population

The study population was comprised of all the male students in junior years one to three of two randomly selected secondary schools whose parents gave consent for them to participate in the study. To increase the possibility of recruiting enough participants for the study, only male students were selected as there is sufficient evidence that they are considerably more likely than their female peers to be diagnosed with conduct disorder (Diwe et al., 2016, Saddock et al., 2015). Only students whose difficulties met criteria for conduct disorder were enrolled for the intervention phase of the study.

Sample

Sample size was calculated using the formula for estimating population proportion, $N=Z^2pq/d^2$ (Singh and Masuku, 2014), and the prevalence rate used was 56.5% based on a study of conduct disorder among Nigerian adolescents in a borstal institution utilizing a standard diagnostic instrument (Olashore et al., 2016). After oversampling by 20% to allow for attrition (non-response, incomplete or missing questionnaires) (Amico, 2009), the sample size was rounded up to 460 each, for the two schools randomly selected for the study.

< Insert Figure 1 here>

Nine hundred and twenty male students were assessed as eligible for participation, with 460 students approached from each school. School A was randomly assigned as the 'treatment group'. Of those eligible, only 405 students were interviewed for conduct disorder, as the rest either did not meet the inclusion criteria or declined to participate. Fifty-five of these students met the required conduct disorder criteria (age, M = 12.22, SD = 1.42). The same process was

used for school B, which formed the control group. Forty-seven students (age, M = 12.28, SD = 1.23) were assigned to this group after meeting the criteria for conduct disorder. Figure 1 outlines the recruitment process. Table 1 provides information regarding the prevalence of conduct disorder symptoms among the treatment and control groups.

< Insert Table 1 here >

Inclusion criteria

All male secondary school students in junior years one to three who:

1. Had parental permission to participate in the study.
2. Gave assent to participate in the study.
3. Understood and spoke English fluently.
4. Were less than 18 years at their last birthday.

Exclusion criteria

1. Students who were ill or recovering from illness at the time of the study.

Materials

The following measures were administered:

Socio-demographic questionnaire: A questionnaire designed for the study collected basic demographic variables which would potentially correlate with conduct disorder (Ojuope and Ekundayo, 2020). This included information on age, class, tribe, religion and religious

participation, academic performance, parental divorce/separation, whether a child was residing with their parents or not, family type (e.g., monogamous, or polygamous), sibling group size, parental employment status, substance use, and bullying behavior and victimization.

The Mini International Neuropsychiatric Interview-Kid Version (MINI-KID) conduct disorder module (Sheehan et al., 1998): The MINI-KID is a short, structured diagnostic interview for DSM-IV and ICD-10 disorders which was used to screen for conduct disorder. It has been used in several Nigerian studies without significant methodological concerns (Olashore et al., 2016, Adegunloye et al., 2010, Adewuya et al., 2007). Test-retest reliability in the most recent of these studies indicated a good to excellent kappa agreement for conduct disorder, k = 0.861 (Olashore et al., 2016).

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997): The SDQ is a brief screening tool for emotional and behavioral problems in children and adolescents containing 25 questions, comprising five questions each for five subscales relating to emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior. All items are rated on a three-point Likert scale ranging from 'not true' (0) to 'certainly true' (2). Psychiatric research in Nigeria (Adeosun et al., 2015, Okewole et al., 2015) has demonstrated that the measure has good internal consistency ($\alpha = .63$) and satisfactory inter-scale correlations on all except the pro-social subscale. Normative values are, however, unavailable for the child and youth population of Nigeria. Cut-off points for this study followed recommendations from the developer of the measure (Goodman, 1997). The total difficulties score can range from 0 to 40, with scores falling between 0 to 15 being considered 'normal', 16 to 19, 'borderline', and 20 to 40, 'abnormal'. Both student and teacher versions of the SDQ were deployed.

The Teacher Rating of Students' Aggressive Behaviors (TRAB): The TRAB questionnaire sought teachers' views on each student's involvement in overtly aggressive behavior in the previous month, such as taunting, threatening, or initiating fights with other

students in school. The TRAB is a 15-item questionnaire adapted from two previous studies (Ladd and Profilet, 1996, Dodge et al., 1995) and has been used as an outcome measure in a Nigerian study (Abdulmalik et al., 2016). In that study, it was shown to be an internally consistent tool for identifying male schoolchildren with higher-than-average levels of aggressive behavior ($\alpha = .95$). For items 1-9 on the scale, responses are rated on a three-point Likert scale, ranging from 'not true' (0) to 'often true' (2). A five-point Likert scale ranging from 'never true' (0) to 'almost always true' (4) is used for items 10-15. Total scores can range from 0 to 42, with higher scores indicative of increased aggressive behavior.

Intervention

Problem-Solving Skills and Attributional Retraining (PSSAR): The PSSAR intervention involved six sessions delivered in a group format on a weekly basis for all students who met criteria for conduct disorder in the treatment group. This was an adaptation of a local intervention study for aggressive primary school students (Abdulmalik et al., 2016) and informed by previous work on problem-solving skills (Kazdin, 2010). The intervention sought to improve pro-social behaviors and reduce core conduct disorder symptoms, particularly aggression. Sessions were held in a multi-purpose classroom made available by School A.

Procedure

The two secondary schools were selected via ballot method of simple random sampling from a list of public secondary schools in the Abeokuta metropolis. Each school was then allocated as either the treatment or control group. A systematic random sampling method with probability proportional to size of class levels was employed to obtain a representative sample of 460 students at each school. All junior male students comprised the sampling frame while the alphabetically ordered nominal registers of male students in each class level were merged

for a sub-sampling frame. The first participant in each class level was randomly chosen using a table of random digits. Thereafter, subsequent participants were selected using the class level-specific *k*-interval. Assenting students who returned appropriately signed parental consent forms and were randomly selected for the first phase of the study were sequentially assembled by class levels in manageable units. They were administered the sociodemographic questionnaire and interviewed with the conduct disorder module of MINI-KID. Of these students, those meeting criteria for the disorder were immediately shortlisted for the intervention by taking note of their name and class.

Shortlisted students in the treatment group (School A) completed the SDQ at baseline (T_0) before the commencement of the intervention, immediately post-intervention at week 6 (T_1), and then three months post intervention (T_2). Teachers who consented to participate in the study were required to complete the TRAB and teacher version of the SDQ for each student at each of the three time points.

Shortlisted students in the control group (School B) and their teachers also completed the SDQ and TRAB at T_0 and at T_1. Students in the control group received treatment-as-usual delivered by their teachers over the same six-week period. Treatment-as-usual comprised various behavioral management practices typically employed in the school. The study was conducted during the second and third terms of the academic session to enable teachers to gather knowledge of students' behavior.

Ethical approval

Ethical approval was granted by the Human Research Ethics Committee of the Neuropsychiatric Hospital, Aro, Abeokuta. Permission for the study was also obtained from the Ogun State Ministry of Education, as well as the authorities of the selected schools. Written

informed consent was obtained from parents/guardians of all participating students. Students also gave assent to participate.

Data analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) for Windows-Version 21.0. Tests of difference, notably t-tests, were used to determine any statistically significant changes in the outcome measures for the control and treatment groups across time points. Group differences were also examined. Chi-square tests of independence were performed to explore the relationship between demographic variables and the presence of conduct disorder. A p-value less than .05 was taken as statistically significant in all cases.

Results

Data were inspected and all necessary assumptions relevant to ensuing analyses were met. Table 2 presents descriptive statistics for the treatment and control groups at baseline (T_0) and week six (T_1). Descriptive statistics at three-months post intervention are also included for the treatment group (T_2).

< Insert Table 2 here >

Changes in mean score for each outcome measure from T_0 to T_1 were computed for the treatment (n = 49) and control group (n = 47) and are presented in Table 2. A series of independent samples t-tests indicated that there was no difference between the two groups on change in mean score for any of the subscales underpinning the student-rated SDQ (in all cases, $t > 0.14$, $p > .05$). However, when considering the teacher-rated SDQ, a statistically significant difference between treatment and control group was identified for emotional symptoms (t = -

2.14, df = 94, p< .05), conduct problems (t = 2.20, df = 94, p< .05), and prosocial behavior (t = 2.48, df = 94, p< .05). The treatment group exhibited the largest change between T_0 and T_1 for all three subscales. There was no significant difference between the treatment and control groups on teacher-rated hyperactivity, peer problems, and total difficulties score (in all cases, $t \geq -.69$, p> .05). For the TRAB, a significant difference was identified between the two groups (t = -7.62, df = 94, p< .01), with the treatment group evidencing a larger change in teacher-rated aggressive behavior between T_0 and T_1 compared to the control group.

Further, paired samples t-tests were performed to determine the impact of the PSSAR intervention. For the treatment group (n = 49), there was a statistically significant reduction in student-rated emotional symptoms (t = 2.13, df = 48, p< .05) on the SDQ between T_0 and T_1. This was also the case for total difficulties (t = 2.25, df = 48, p< .05) on the student-rated SDQ, with a decrease evidenced from T_0 to T_1. Analysis indicated an increase in teacher-rated conduct problems (t = -3.83, df = 48, p< .001) for the treatment group between T_0 and T_1. Prosocial behavior, as rated by teachers, also evidenced a significant increase between T_0 and T_1 (t = -2.66, df = 48, p< .05), and T_0 and T_2 (t = -3.01, df = 48, p< .01). A significant increase in teacher-rated total difficulties was observed across the timepoints T_0 to T_2 (t = -5.22, df = 48, p< .001) and T_1 to T_2 (t = -4.09, df = 48, p< .001). Positively, there was a reduction in teacher-rated peer problems between T_0 and T_2 (t = 2.54, df = 48, p< .05) and T_1 and T_2 (t = 2.80, df = 48, p< .01), as well as on the TRAB between T_0 and T_1 (t = 8.88, df = 48, p< .001) and T_1 and T_2 (t = -7.01, df = 48, p< .001). The variables and relevant time points not mentioned here did not reach statistical significance for the treatment group (in all cases, $t \geq .00$, p> .05).

The control group (n = 47) exhibited no statistically significant reduction or increase in student- and/or teacher-rated variables on the SDQ, or TRAB, across the two time points (in all cases, $t \geq .14$, p> .05).

< Insert Table 3 here >

Exploring correlates of conduct disorder for the entire sample (n = 787; CD absent, n = 685 (87.0%); CD present, n = 102 (13.0%)), a series chi-square tests for independence indicated a significant positive association between the presence of conduct disorder and school class (x^2(2, n =787) = 6.44, p< .05), religious participation (x^2(3, n =787) = 12.34, p< .05), self-rated academic performance (x^2(3, n =787) = 13.43, p< .001), parental conflict (x^2(2, n =787) = 6.99, p< .05), alcohol use (x^2(3, n =787) = 13.14, p< .001), tobacco use (x^2(3, n =787) = 13.72, p< .001), and bullying victimization (x^2(3, n =787) = 13.32, p< .001). Critical values for the chi-square tests are presented in Table 3. All remaining demographic variables, i.e., for age group, tribe, religion, parental divorce/separation, parental living situation, family type, sibling group size, parental employment status, cannabis use, and bullying behavior, demonstrated no significant association with the presence of conduct disorder (in all cases, $x^2 \geq .09$, p> .05).

Discussion

This study aimed to determine the prevalence and correlates of conduct disorder and to assess the impact of the PSSAR intervention on conduct disorder among junior male secondary school students in Abeokuta, Ogun state, South-West Nigeria.

Impact of the PSSAR intervention

The PSSAR intervention showed promise as an intervention for conduct disorder, with several significant findings. Notably, mean scores of the student-rated emotional difficulty subscale and the total difficulties scale of the SDQ were significantly reduced following the intervention. Additionally, teacher-rating of students' aggressive behavior was significantly reduced post-intervention. Use of a group format which fostered positive social interaction, an

emphasis on peer-tolerance, and attributional retraining sessions during the intervention also appeared to have improved pro-social skills of participants, with mean scores for the teacher-rated SDQ pro-social subscale increasing across time points.

Although mean total difficulties score of the student rated SDQ evidenced a significant reduction from baseline, there was a significant increase in mean total difficulties score rated by the teachers at baseline to three-month follow-up, and from baseline to week six. It is possible that the students were receptive to core principles of the PSSAR intervention and rated themselves accordingly, yet teachers continued to label them as 'problem children' and rated accordingly post-intervention. It is also possible that, for the core symptoms of conduct disorder, students may have rated themselves in a socially desirable manner, conveying an inaccurate reflection of their difficulties.

Despite the intervention, mean scores on the teacher rated SDQ conduct subscale increased from baseline to immediate post-intervention at week six and was still higher than the baseline value three months later. These increases were statistically significant and may be indicative of the impact of PSSAR as a means of addressing conduct problems but also be linked to the intervention's group-based format. Literature on iatrogenic effects of group interventions suggests that aggregating youth with conduct disorder can create environments where negative behaviors are reinforced (Macgowan et al., 2005), and the display of disruptive behavior increases antisocial behavior and potentially contributes to poorer treatment outcomes (Weiss et al., 2005). The relatively large number of students in the program studied may also be a contributory factor (Shay, 2021).

The study also evidenced a treatment effect for teacher-rated prosocial behavior and aggressive behavior. While the former increased following the intervention, the latter reduced. Despite these encouraging results, most of the other outcome measures did not reveal a significant treatment effect, and thus only partial support was identified for the two predictions

based on the findings discussed. It may be that the intervention is more suited to addressing externalizing behaviors, as opposed to conduct problems, albeit the nature of the group format should be carefully considered, and future research may examine the impact of the intervention on different externalizing behaviors.

Prevalence of conduct disorder

The 13.0% overall prevalence of conduct disorder in this study further evidences that conduct disorder is a serious issue among children and adolescents in Nigeria, where prevalence studies have previously been undertaken in different settings and yielded a wide prevalence, ranging from 15.8% to 69.7% (Diwe et al., 2016, Olashore et al., 2016, Omotunde and Philomena, 2014, Frank-Briggs et al., 2008). Methodological differences such as including senior students and using a conduct disorder symptom checklist compared to sampling junior students assessed and a diagnostic tool in the current study may partly explain this variance.

Aggression to people and animals, lying, starting fights, hurting others, and staying out later than permitted were the most prevalent indicators of conduct disorder, reflecting findings in earlier studies (Omotunde and Philomena, 2014). The long-term impact of conduct disorder as a developmental precursor of antisocial behavior and criminality is well established (Fairchild et al., 2018, Rivenbark et al., 2018, Diamantopoulou et al., 2010). These behaviors individually do not establish a diagnosis of conduct disorder, and APA diagnostic guidance stipulates that three of the fifteen criteria must have been present in the last twelve months, any one of which must have occurred in the last six months (APA, 2013).

Correlates of conduct disorder

This study did not find a statistically significant association between age group and conduct disorder, contrasting what has been reported by Nock et al. (2006). Possibly, age needs

to be viewed in relation to different psycho-social factors, such as family dynamics and substance misuse, for a significant correlation to be found, and age group sub-classification into adolescence limited and life-course persistent antisocial behaviors considered (Silberg et al., 2015, Moffitt, 2003). Maughan et al. (2004) found that, amongst children who met diagnostic criteria for conduct disorder, non-aggressive conduct problems increased with age. However, Dickson et al. (2008) found that half of those with childhood-onset conduct problems do not continue with antisocial behaviors beyond this period.

Higher rates of conduct disorder were noted in students who participated in religious activities less regularly. This is consistent with findings from extant literature that religiosity is associated with lower delinquency, conduct problems, antisocial behavior, truancy, and crime (Kelly et al., 2015, Salas-Wright et al., 2012,). It appears that religious commitment tends to constrain delinquent behavior in adolescents, especially when supported by the surrounding social environment (Salas-Wright et al., 2015). Indeed, it is possible that the predominantly religious nature of the study setting, with over 99% of the study participants practicing either Christianity or Islam, may have further contributed to the lesser likelihood of conduct disorder among participants.

Students who rated their academic performance as being average or below were significantly more likely to present with problems associated with conduct disorder. This finding conforms with earlier reports where students with behavioural disorders performed poorly academically (Kremer et al., 2016). Henricsson and Rydell (2004) reported that children with externalising problems had more conflicts with teachers, as well as more negative attitudes in teacher-student relationships and less positive self-perception than did children without these problems. Also, students with conduct problems are more likely to show high rates of school absenteeism which may ultimately affect academic performance (Mekonnen et al., 2020, Wood et al., 2012).

Most of the family characteristics assessed did not show any significant association with conduct disorder. The absence of significant associations between conduct disorder and these family characteristics is at odds with previous work (Sajadi et al., 2020). It is possible that the measured family characteristics may not play a primary role in adolescent conduct problems due to other mediating factors (Elizur et al., 2007, Sameroff et al., 2004). It is also conceivable that a larger sample may be needed to detect any statistical significance. Similar to results from earlier studies, parenting behaviors, such as frequency of parental conflict, in the current sample was significantly correlated with conduct disorder. Adolescents with conduct disorder appeared to be more affected by interactions with and between parents than the characteristics of their families.

Importantly, the significant association between both alcohol and tobacco use and conduct disorder found in this study echoes what has previously been reported (Wymbs et al., 2014, Liu et al., 2023). While some reports suggest conduct disorder is a major risk factor for substance use, other evidence indicates that substance use might predict the gradual development of conduct disorder symptoms (Masroor et al., 2019, Wymbs et al., 2014). There was no significant association between conduct disorder and cannabis use among the study participants, however, cannabis misuse during early- to mid-adolescence has been shown to increase the risk of developing different conduct problems by late adolescence (Hawes et al., 2020), as well as antisocial personality disorder in adulthood (LaSpada et al., 2020). It may be that since alcohol and tobacco use are both seemingly normative in adolescence, one may expect a stronger association between them and conduct disorder when less socially sanctioned substances such as cannabis are investigated.

Limitations

Several factors may have limited the PSSAR intervention's effectiveness. For example, difficulties supporting children displaying problem behaviors to use newly acquired social skills outside the therapeutic setting may have played a role. Some programs have also involved trusted adults, such as parents and teachers, to encourage the use of these skills (Frick, 2001), and it is possible the duration of the intervention (six sessions) was too short to observe a marked effect across all the outcome measures.

Some of the SDQ sub-scale displayed increased scores post-intervention for both treatment and control groups. Following similar observation in a related study, it has been suggested that the participants' heightened awareness of their conduct, hyperactivity, peer-problems and emotional problems, following exposure to the measures at baseline may be responsible (Abdulmalik et al., 2016). Future research can consider using independently observed changes in behaviors rather than self-report questionnaires alone. Moreso, the absence of validated local cut-off scores for the SDQ in Nigeria suggests that caution should be taken when interpreting the results using recommendations from Western settings.

The potential iatrogenic effect of a relatively large size intervention group may have contributed to the increase in the mean scores on the teacher rated SDQ conduct subscale over time. Future research may consider using small group sizes to mitigate this.

Conclusion

This study's findings highlight the potential of accessible interventions for youth with conduct problems in Nigeria and other resource-constrained settings where young people with mental health needs face multiple barriers to service use. Positive changes in several outcome measures for the treatment group comprise promising findings for the effectiveness of the PSST intervention, which can inform policy in developing structured school-based services for

helping children and adolescents with conduct problems in Nigeria. As with previous reports of modest effect sizes for comparable intervention studies for conduct disorder, more research is warranted to expand group and school-based interventions delivered in this context.

Implications for practice

- This study's findings can inform policy decisions regarding the development of structured school-based services for supporting children and adolescents with conduct problems across Nigeria and in other resource-constrained settings. As poor academic performance and school absenteeism have been shown to significantly correlate with conduct disorder, teachers and school authority could begin to use observations of conduct problems as an indicator of students who need more intensive academic support, rather than only a sign of truancy.
- While extensive research indicates that parent management training is the most effective evidenced-based intervention for reducing conduct problems (Gatti et al., 2019, National Institute for Health and Care Excellence, 2013), the current study findings reiterates the potential of the PSSAR intervention for conduct disorder (Abdulmalik et al., 2016). The combined treatment, however, has been found to be more effective than either treatment alone, with effects of treatment extending beyond multiple outcomes of the child (Kazdin, 2011).
- Interventions involving the child, the family, peer group and school should therefore be prioritized in this context in the future, considering the views of parents/carers and adolescents as stakeholders (Roberts et al., 2022, Talia et al., 2021).

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Figure 1: Consort flowchart summary of study participants.

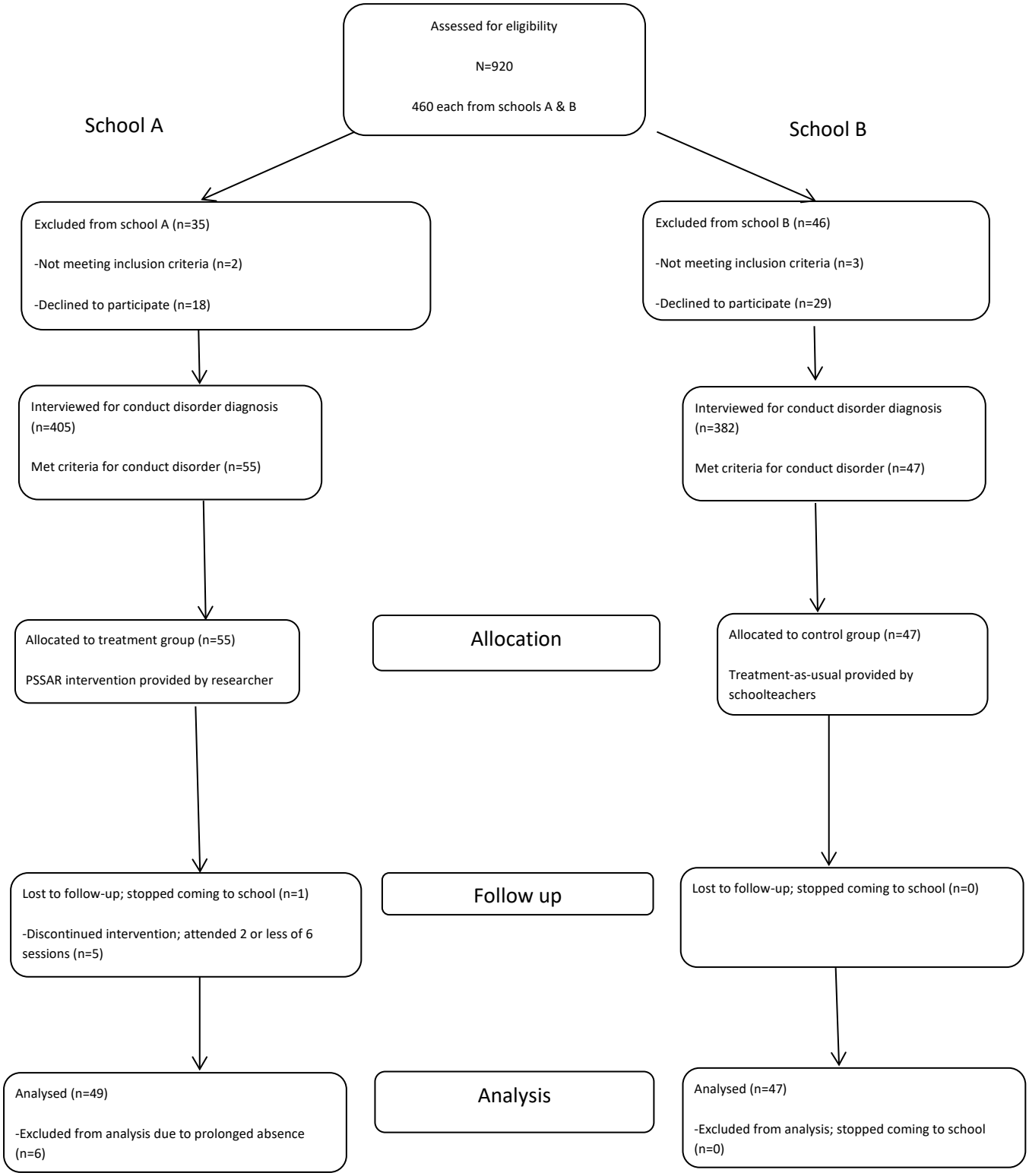

Table 1: Prevalence of conduct disorder symptoms among the treatment (n = 55) and control (n = 47) groups.

	School A (treatment group)		**School B (control group)**	
Conduct disorder symptom	**No; n (%)**	**Yes; n (%)**	**No; n (%)**	**Yes; n (%)**
Any complaint about behaviour	1 (1.8)	54 (98.2)	0 (0)	47 (100)
Started fights	32 (58.2)	23 (41.8)	28 (59.6)	19 (40.4)
Has used a weapon	51 (92.7)	4 (7.3)	42 (89.4)	5 (10.6)
Hurt someone on purpose	32 (58.2)	23 (41.8)	27 (57.4)	20 (42.6)
Hurt animals on purpose	9 (16.4)	46 (83.6)	7 (14.9)	40 (85.1)
Stolen things by force	55 (100)	0 (0)	43 (91.5)	4 (8.5)
Forcefully had sex with others	50 (90.9)	5 (9.1)	47 (100)	0 (0)
Started fire on purpose	49 (89.1)	6 (10.9)	43 (91.5)	4 (8.5)
Destroyed property	44 (80.0)	11 (20.0)	24 (51.1)	23 (48.9)
Broke into house or car	52 (94.5)	3 (5.5)	47 (100)	0 (0)
Lied to get things from others	12 (21.8)	43 (78.2)	15 (31.9)	32 (68.1)
Stolen things worth money	49 (89.1)	6 (10.9)	43 (91.5)	4 (8.5)
Stayed out later than allowed	37 (67.3)	18 (32.7)	28 (59.6)	19 (40.4)
Has run away two or more times	50 (90.9)	5 (9.1)	41 (87.2)	6 (12.8)
Has skipped school often	49 (89.1)	6 (10.9)	42 (89.4)	5 (10.6)

Table 2: Descriptive statistics for the outcome measures across time points for the treatment and control groups.

	School A (Treatment group; n = 49*)				School B (Control group; n = 47)		
Variable	**T_0, M (SD)**	**T_1, M (SD)**	**MD between T_0 and T_1 (SD)**	**T_2, M (SD)**	**T_0, M (SD)**	**T_1, M (SD)**	**MD between T_0 and T_1 (SD)**
Youth SDQ							
Emotional symptoms	4.06 (2.56)	3.27 (2.18)	-.80 (2.61)	3.18 (2.39)	4.26 (1.96)	3.85 (2.20)	-.40 (1.57)
Conduct problems	2.16 (2.05)	1.61 (1.57)	-.55 (2.20)	1.79 (1.99)	2.87 (1.81)	2.62 (1.98)	-.26 (2.21)
Hyperactivity	2.59 (2.06)	2.20 (2.01)	-.39 (2.00)	2.05 (1.99)	2.91 (2.14)	2.87 (1.74)	-.04 (2.11)
Peer problems	2.78 (1.71)	2.88 (1.89)	.10 (1.83)	3.16 (1.75)	3.04 (1.72)	3.17 (1.93)	.13 (1.95)
Prosocial behaviour	8.49 (1.70)	8.63 (1.52)	.14 (2.15)	8.47 (1.89)	8.15 (1.64)	8.28 (1.74)	.13 (1.60)
Total difficulties	11.59 (6.03)	9.96 (4.88)	-1.63 (5.09)	18.66 (5.29)	13.09 (4.84)	12.53 (4.59)	-.55 (4.60)
Teacher SDQ							
Emotional symptoms	5.73 (1.47)	5.24 (1.81)	-.49 (2.48)	5.14 (1.76)	2.28 (2.00)	2.74 (2.10)	.47 (1.83)
Conduct problems	4.71 (1.68)	5.73 (1.71)	1.02 (1.87)	5.65 (1.35)	1.83 (1.49)	2.09 (1.92)	.26 (1.53)
Hyperactivity	4.47 (1.50)	4.86 (1.43)	.39 (1.97)	4.82 (1.55)	3.28 (1.81)	3.77 (2.20)	.49 (1.98)
Peer problems	5.24 (1.96)	5.12 (1.44)	-12 (2.71)	4.27 (1.75)	2.70 (1.57)	2.91 (1.46)	.21 (2.02)
Prosocial behaviour	3.27 (1.54)	4.18 (1.89)	.92 (2.41)	4.18 (1.72)	6.64 (2.53)	6.47 (2.76)	-.17 (1.83)
Total difficulties	20.16 (3.44)	20.96 (2.14)	.80 (3.85)	24.06 (4.21)	10.09 (4.45)	11.51 (5.45)	1.43 (4.93)
TRAB	32.37 (5.03)	22.39 (6.39)	-9.98 (7.87)	31.61 (7.17)	33.04 (7.42)	34.72 (7.84)	1.68 (7.09)

Note: MD = Mean difference. *For the student-rated SDQ at T_2, n = 38.

Table 3: Correlates of conduct disorder in the entire sample (total sample, n = 787; CD present, n = 102; CD absent, n = 685).

Variable (n)	CD present n (%)	CD absent n (%)	x^2 (df)	p value	Effect size
Age group					
Early adolescence (9-12yrs; 439)	55 (12.5)	384 (87.5)	.09 (1)	.77	.01
Late adolescence (13-17yrs; 348)	47 (13.5)	301 (86.5)			
Class					
JSS1 (270)	24 (8.9)	246 (91.1)	6.44 (2)	*.04**	.09
JSS2 (281)	40 (14.2)	241 (85.8)			
JSS3 (236)	38 (16.1)	198 (83.9)			
Tribe					
Yoruba (725)	94 (13.0)	631 (87.0)	3.77 (3)	.29	.07
Hausa (6)	0 (0)	6 (100.0)			
Igbo (41)	4 (9.8)	37 (90.2)			
Other (15)	4 (26.7)	11 (73.3)			
Religion					
Islam (295)	35 (11.9)	260 (88.1)	1.17 (2)	.56	.04
Christianity (488)	67 (13.7)	421 (86.3)			
Traditional & other (4)	0 (0.0)	4 (100.0)			
Religious participation					
Regularly (706)	82 (11.6)	624 (88.4)	12.34 (3)	*.01**	.13
Sometimes (73)	19 (26.0)	54 (74.0)			
Less (1)	0 (0.0)	1 (100.0)			
Rarely/never (7)	1 (14.3)	6 (85.7)			
Academic performance (self-reported)					
Poor (13)	4 (30.8)	9 (69.2)	13.43 (3)	*.00**	.13
Average (84)	19 (22.6)	65 (77.4)			
Good (261)	35 (13.4)	226 (86.6)			
Excellent (429)	44 (10.3)	385 (89.7)			
Parents divorced/separated					
Yes (104)	18 (17.3)	86 (82.7)	1.59 (1)	.21	.05
No (683)	84 (12.3)	599 (87.7)			
Which parent living with?					
Both parents (630)	78 (12.4)	552 (87.6)	1.04 (2)	.56	.04
Single parent (115)	17 (14.8)	98 (85.2)			
Others (42)	7 (16.7)	35 (83.3)			

Family type					
Monogamous (577)	71 (12.3)	506 (87.7)	.24 (1)	.63	.02
Polygamous (208)	29 (13.9)	179 (86.1)			
Sibling size					
None (56)	9 (16.1)	47 (83.9)	.66 (2)	.72	.03
1 to 4 (615)	77 (12.5)	538 (87.5)			
5 or more (116)	16 (13.8)	100 (86.2)			
Father employed					
Yes (773)	102 (13.2)	671 (86.8)	1.11 (1)	.29	.05
No (14)	0 (0.0)	14 (100.0)			
Mother employed					
Yes (777)	99 (12.7)	678 (87.3)	1.30 (1)	.25	-.06
No (10)	3 (30.0)	7 (70.0)			
Parental conflict					
Regularly (27)	6 (22.2)	21 (77.8)	6.99 (2)	*.03**	.09
Sometimes (116)	22 (19.0)	94 (81.0)			
Rarely/never (644)	74 (11.5)	570 (88.5)			
Alcohol use					
Regularly (5)	2 (40.0)	3 (60.0)	13.14 (2)	*.00**	.13
Some days (37)	11 (29.7)	26 (70.3)			
Rarely/never (745)	89 (11.9)	656 (88.1)			
Tobacco use					
Regularly (4)	3 (75.0)	1 (25.0)	13.72 (2)	*.00**	.13
Some days (8)	1 (12.5)	7 (87.5)			
Rarely/never (775)	98 (12.6)	677 (87.4)			
Cannabis use					
Regularly (3)	1 (33.3)	2 (66.7)	1.86 (2)	.39	.05
Some days (17)	1 (5.9)	16 (94.1)			
Rarely/never (767)	100 (13.0)	667 (87.0)			
Bullying victimisation					
Regularly (30)	9 (30.0)	21 (70.0)	13.32 (2)	*.00**	.13
Some days (215)	36 (16.7)	179 (83.3)			
Rarely/never (542)	57 (10.5)	485 (89.5)			
Bullying behaviour					
Regularly (14)	4 (28.6)	10 (71.4)	5.23 (2)	.07	.08
Some days (105)	18 (17.1)	87 (82.9)			
Rarely/never (668)	80 (12.0)	588 (88.0)			

Note. CD = Conduct disorder; * = statistical significance