Using rational-emotive language education to improve communication and social skills of adolescents with autism spectrum disorders in Nigeria

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Abstract
Background/Objective: Studies show the need for improved communication and social skills of adolescents with autism spectrum disorders (ASDs). Therefore, the present study aimed to analyze the effect of using rational-emotive language education (RELE) to pursue this need for adolescents in Nigeria.

Methods: The design of the study was a group randomized trial, with pretest, post-test, and follow-up. Sixty-eight adolescents with ASDs participated in the study. Autism Communication and Social Skills Scale for Adolescent (ACSSSA) was used for data collection. The method of data analysis in the study was repeated measures ANOVA procedure, with Partial eta squared ($\eta^2$), adjusted $R^2$, mean, standard deviation, and upper/lower limit.

Results: The RELE program significantly improved communication and social skills of adolescents with ASDs exposed to the treatment intervention when compared with waitlist control group.

Conclusion: Exposure to RELE significantly improved communication and social skills of adolescents with ASDs in this study. Therefore, we recommend that language educators, speech pathologists, language therapists, special educators and counsellors, and other professionals involved in the treatment and caring for ASDs patients be trained on the application of the RELE technique so as to enable them to employ the program in their professional practices.

Keywords: adolescents, autism syndromes disorders, rational-emotive language education

1. Introduction
In recent times, adolescents are reportedly suffering from autism spectrum disorders (ASDs). The ASDs include autism, Asperger syndrome, and atypical autism or pervasive developmental disorder, not otherwise specified.[1] These disorders are defined as neurodevelopmental disorders, which are displayed with persistent deficiencies in communication, social interaction, and repetitive patterns of behaviors, interests, or activities.[2,3] Recent studies have found that individuals with ASDs have significant deficits in sensory perception, sleep habits, and autonomic regulation, as well as substantial health loss across their lifespans.[4-8] Studies have shown evidence that ASDs are also associated with high levels of functional limitations, poor health status in children, [9] increased parenting stress and family burden.[10] Findings from other studies have emphasized that symptoms of ADSs among adolescents include deficiency in social interaction, communication, and a repetitive repertoire of behavior.[11] The challenges faced by adolescents with ASDs can be summed up as poor communication and social skills.[12] It is possible that adolescents with ASDs might have trouble taking turns in conversations. They might talk a lot about a favorite topic but find it problematic to talk about a variety of topics. They might be confused by language and take things literally and might speak in an unusual tone of voice. Nonverbally, adolescents with ASDs might have trouble reading nonverbal cues like body language or tone of voice to deduce how someone else might be feeling. They might use eye contact in an unusual way; express few emotions on...
his face; or not be able to read other people’s facial expressions. In
terms of relationships, it is also possible that adolescents with
ASDs might prefer to spend time on their own rather than with
friends. They might require other adolescents to play by their
rules; have trouble understanding the social rules of friendship;
have few or no real friends; have trouble relating to children
of their own age; prefer to play with younger children or adults; and
have difficulty adjusting their behavior in different social
situations.[13]

Studies have found that ASDs accounted for 53 disability-
adjusted life-years (per 100,000 populations of children. Baxter
et al[8] reported that there were an estimated 52 million cases of
ASDs globally in 2010. Other studies show increasing diagnostic
data of ASDs among children or pupils.[10,14] According to
Centre for Disease Control and Prevention,[15] studies in the
United State of America have reported the prevalence of ASDs,
ranging from 50 to 90 in 10,000 children. Despite the high
prevalence of ASDs, little attention has been given to its treatment
at the global public.[16]

In African societies, there is evidence of a high prevalence of
ASDs. For instance, 33.6% and 11.5% of the population was
found in in Egypt and Tunisia, respectively.[17] In Nigeria, a
study found 11.4% children with ASDs according to diagnostic
criteria for childhood autism.[18,19] However, studies within
African countries reported a lack of expressive language as the
common symptom of ASDs. Belhadj et al[20] recounted that
51.2% of children demonstrated a lack of expressive language
in cases of ASDs in this age group. In another study, Mankoski
et al[17] reported 71% lack of expressive language cases of
ASDs in their study. Seltzer et al[21] reported that 40.5
dividuals between the ages of 10 and 53 manifested symptoms
of ASDs.

The known cases of ADSs appear to be increasing in Nigeria.
Recent studies recounted that patients in Africa, Nigeria in
particular, often fail to develop expressive language ability, with
little or no speech at all.[22] In South-East Nigeria, a case of a
boy with an ASD was reported[22,23] as showing that the boy tended
to be mute with little or no speech and was being seen for the first
time at the age of 15 years in a psychiatric clinic of a university
teaching hospital.[22] Still in the South-East Nigeria, a case of a
boy with comorbid ASD and oculocutaneous albinism, charac-
terized by a lack of expressive language, with little or no speech,
was reported, and the boy was being seen in an orthodox clinical
practice for the first time at the age of 13 years.[15] This shows
that there is lack of early diagnosis and treatment for ASDs in the
Nigerian communities. Meanwhile, rational emotive language
education (RELE) would enhance early recognition and
intervention, which has been observed to improve prognosis in
individuals with ASDs.[19]

Evidence indicated that individuals with ASDs have significant
cognitive, communicative, emotional, and behavioral
impairments that affect them and their families.[24] It could be
possible that the adolescents with ASDs experience harmful
thoughts and beliefs that bar them from taking part in social
interactions and communication. In comparison to adolescents
who experience typical development, adolescents with ASDs
experience significant problems related to psychological, social,
and emotional health.[25] Anderson et al[26] and Colgan et al[27]
observed that individuals with ASDs face challenges with social
engagement and age-appropriate play. Bauminger and Shul-
man[28] emphasized that such individuals have difficulty
processing their own and the emotions of others.[29] These
challenges, in combination with communication deficits and
nonconforming behavior, often lead to poor communication and
social adjustment.[25]

The consequence of such communication deficits is poor
verbal interaction and language development.[30] The authors
further stressed that individuals with ASDs require a high level
of adapted parental communication, which focuses specifically
on the subtle details of interaction in the context of their specific
imperfections. The potential causes of ASDs are reportedly said
to be cognitive deficit, language impairment, and poor
perception.[31] Therefore, intervention programs that address
cognitive, communicative, emotional, social, and behavioral
aspects of language development might have a significant,
positive effect on adolescents with ASDs. The increasing
prevalence of ASDs in the studies cited earlier in the paper
demonstrates that so far successful methods of treatment for
ASDs have not been found and there is a need for more research
to test new interventions. It was at this premise that the current
study focused on investigating the effectiveness of RELE on
improving communication and social skills among adolescents
with ASDs.

RELE can be very effective from the perspective of many
groups of adolescents with ASDs. Many programs are dedicated
to improving students’ social and emotional skills.[32–34] Special
schools, rehabilitation centres, and hospitals try to support the
development of adolescents with ASDs as responsible citizens.
Adolescents with ASDs are expected to have learned to cope with
their disorders; to develop a modicum of social skills; and to have
the ability to manage emotions in an age- and context-
appropriate manner. However, due to the harmful thoughts
and beliefs they struggle with, many are afraid to socialize freely
with other people.[35] Even schools, rehabilitation centers, and
hospitals with the highest behavioral standards for their staff in
terms of mindfulness, gender competence, intercultural compe-
tence, friendliness, awareness, rational language, a willingness
to discuss, among others, have not been able to successfully teach
communication and social skills to adolescents with ASDs.[16]

Studies have shown that the rational, explicit, and direct teaching
of content is important for the development of stable knowledge
and skills.[12] From this frame of reference, we chose the RELE,
which is based on the applied principles of Rational Emotive
Behavior Therapy (REBT).

REBT is committed to the establishment and maintenance of
mental health. REBT holds the individual at the center of
attention.[12] The basic idea underlying REBT is that emotional
disturbances emerge from defective thinking about events
rather than the events themselves.[34] A distinct feature of
REBT has been the notion that the individual is not independent of the social context but is also responsible and
has degrees of freedom.[12] Studies show that REBT-based
intervention can be used to strengthen the components of
communication and social skills within a scientifically oriented
frame of reference.[12,37–39] Different REBT-based interventions
exist in the literature, but there are limitations. Therefore, as
part of our research we developed RELE as a REBT-based
intervention to improve communication and social skills among
adolescents with ASDs. We developed RELE by transferring
the knowledge of REBT to the language education discipline and
through deep collaboration with REBT experts. In our
research, we tested the following hypothesis: using RELE will
significantly improve communication and social skills of
adolescents with ASDs.
2. Method

2.1. Ethical consideration

To comply with ethical issues in randomized trial, we observed the human research standards by Human Research and Ethics committee of the faculty of Education, University of Nigeria, Nsukka; the American Psychology Association; and the American Medical Association and Medical Association of Nigeria. Participants’ rights were also observed, and their informed consent was obtained prior to participation in the study.

2.2. Participants

The participants of the present study consisted of 68 adolescents with ASDs. The participants were selected from communities in South-East Nigeria. The study focused on using RELE to improve communication and social skills of adolescents with ASDs in communities where adolescents with ASDs were particularly disadvantaged. We were dealing with adolescents whose parents, for various reasons, did not educate their children on how to deal adequately with themselves or others. These adolescents’ access to the world was often very limited as they had very few real-life experiences.[12]

To qualify for the study, all potential participants had to meet specific criteria. They had to have received a diagnosis of an ASD from a medical, psychological, or educational professional, as reported by their parents. Other criteria included being able to participate in the intervention with 2 family members; being an adolescent with ASDs between the ages of X and Y; and having the ability to communicate in English. On the whole, the participants met DSM-IV-TR criteria for ASDs as recommended by Seltzer, Krauss (21), Lord, Risi (40), and had lower communication and social skills of adolescents with ASDs. The participants were selected from communities in different areas of Nigeria, and were to serve as the adolescent sample of participants required for the study. Their families were invited to participate in the study. The participants were randomized into treatment (n = 33) and waitlist control (n = 35) groups.

The participants did not receive any therapeutic treatment within the period of RELE program or follow-up. After the completion of the study, a social life support program was organized for them. Data collected in the 3 measures were analyzed by a professional data analyst who did not have direct contact with the participants. The participants who chose closed envelopes inscribed with the word “Yes” formed the treatment group, while those who chose envelopes inscribed with the word “No” formed the waitlist control group.

The participants responded 3 times of measure: before the treatment (Time 1); after the treatment (Time 2); and after the follow-up (Time 3). The participants in the treatment group were exposed to a 12-week of RELE program with 2 sessions per week, with each 2 hours in length. There was also a follow-up event that was held 2 months after the initial RELE treatment intervention. The participants in the waitlist group did not receive any therapeutic treatment within the period of RELE program or follow-up. After the completion of the study, a social life support program was organized for them. The participants did not partake in the assessment and was not involved in the RELE implementation; this design was in line with previous study.[45]

3. Intervention

3.1. Rational emotive language education (RELE)

RELE was a 12-week intervention program, which aimed at improving communication and social skills of adolescents with ASDs. The RELE intervention consisted of 24 sessions, which lasted 2 hours each and occurred twice a week for the duration of the study. Each adolescent with ASDs was required to attend the RELE intervention program with 2 family members, preferably their mother and a close sibling. If their mother or sibling could not attend the program, they could bring a close family member or caregiver instead. The responsibility of the family members was to serve as the adolescent’s communication and social
partners and assistants with whom the adolescents with ASDs interacted during the intervention break sessions and at home. The reason for involving family members in RELE program was because evidence has shown that consequence of communication impairment in ASDs can result in the parent and child failing to establish a communicative “meshing” and verbal interaction of a kind that is known to facilitate language development.\(^{130}\) Therefore, we deduced that involving the family members in the RELE program would promote their interactions with the adolescents and thereby facilitate the adolescents’ communication and social skills.

The major focus of the RELE program was to help the participants to improve communication and social skills by disputing harmful thoughts and beliefs they were holding as reasons for their inability to communicate and socialize with others.\(^{42}\) The RELE identified pivotal areas such as motivation, self-initiation, and self-management, which have been proven to be critical in eliciting broader treatment gains.\(^{42}\) The RELE focuses on using a number of strategies to help increase participants’ motivation during intervention, such as using a variety of adolescent-chosen activities that are intrinsically motivating to each adolescent, and interspersing maintenance and acquisition tasks to strengthen adolescents’ exposure to well-established response-reinforcer contingency. To overcome the challenges of therapists’ initial relationship with the autistic adolescents and their family, the RELE employed some important strategies to engage the participants. The strategies include: careful explanation of the service context and our role; beginning strategies to engage the participants. The strategies include:

- Careful explanation of the service context and our role.
- Careful listening, including with what the adolescents sees as the problem.
- Maintenance of a respectful attitude; careful listening, including with what the adolescents sees as the problem.
- Beginning strategies to engage the participants.

The adolescents and their family, the RELE employed some important strategies for ASDs. The items were selected in line with DSM-IV-TR criteria for ASDs. The 22 items were weighed on a 4-point scale: strongly agreed (4 point); agreed (3 point); disagreed (2 point); and strongly disagreed (1 point). The scale measured communicative and social skills used in the diagnosis of autism. Mean scores of 60 to 88 represented high communication and social skills, while mean scores of 0 to 59 represented low communication and social skills in the current study. Experts in speech and language pathologists validated the ACSSSA. Also, the reliability of the instrument was determined to be 0.88 Alpha.

4. Measure

4.1. Autism communication and social skills scale for adolescent (ACSSSA)

We generated the ACSSSA items in line with autism literature and scales\(^{46}\) and the Autism Diagnostic Observation Schedule—Generic by Lord et al.\(^{47}\) The ACSSSA had 22 items that tested the communication and social skills of adolescents with ASDs. The items were selected in line with DSM-IV-TR criteria for ASDs. The 22 items were weighed on a 4-point scale: strongly agreed (4 point); agreed (3 point); disagreed (2 point); and strongly disagreed (1 point). The scale measured communicative and social skills used in the diagnosis of autism. Mean scores of 60 to 88 represented high communication and social skills, while mean scores of 0 to 59 represented low communication and social skills in the current study. Experts in speech and language pathologists validated the ACSSSA. Also, the reliability of the instrument was determined to be 0.88 Alpha.

4.2. Design/data analysis

The design of the study was a group randomized trial, with pretest-post-test and follow-up. The design involved separating the study participants into 2 groups and obtaining a pretest measure prior to administering RELE program, followed by a posttest and follow-up test on the same measure after RELE treatment. The data collected in the study was analyzed with repeated measures ANOVA in which with Partial eta squared ($\eta^2_p$), adjusted $R^2$, mean, standard deviation, and upper/lower limit were reported, and the decision regarding the significance value was taken at $P \leq .05$.

5. Results

Table 2 indicated pretreatment, posttreatment, and follow-up results of improved communication and social skills of adolescents with ASDs, using the ACSSSA. At the pretreatment measure, the adolescents in the treatment and waitlist control groups had low mean scores of 16.59 ± 1.23 and 17.28 ± 2.65, respectively (Fig. 1). However, there was no significant difference
between the treatment and waitlist control groups in communicative and social skills of adolescents with ASDs, $F(1,66) = 0.578$, $P = .450$, $\eta^2_p = 0.009$, $R^2 = 0.006$. At the posttreatment measure, the adolescents in the treatment group had a high mean score of $67.93 \pm 2.02$, while their counterparts in the waitlist control group had low mean scores of $15.14 \pm 3.09$. However, after the RELE program, the measure indicated a significant improvement in communication and social skills of adolescents with ASDs in the treatment group when compared with their counterparts in the waitlist control group: $F(1,66) = 1164.18$, $P = .000$, $\eta^2_p = 0.945$, $R^2 = 0.946$. At the follow-up measure, the participants in the treatment group maintained high mean score, $70.65 \pm 2.04$ while their counterpart in the waitlist control group maintained low mean score, $16.11 \pm 0.34$. However, the measure further indicated a significant improvement in communication and social skills of adolescents with ASDs in the treatment group when compared with their counterparts in the waitlist control group: $F(1,66) = 1094.22$, $P = .000$, $\eta^2_p = 0.945$, $R^2 = 0.946$. Based on the results, our hypothesis was correct: using RELE will significantly improve communication and social skills of adolescents with ASDs.

6. Discussion
The finding at the pretreatment measure indicated that there was no significant difference between the treatment and waitlist control groups in communication and social skills of adolescents with ASDs. The participants showed symptoms of low communication and social skills expressed in symptoms such as being troubled taking turns in conversations; talking a lot about a favorite topic but finding it problematic to talk about a variety of topics; being confused by language and taking things literally; speaking with an unusual tone of voice; having trouble reading nonverbal cues like body language or tone of voice; not being able to guess how someone else might be feeling; etc., in support of previous study. The findings further supported evidence of high rates of ASDs.

The findings of the current study further revealed that using RELE significantly improved communication and social skills of adolescents with ASDs. Participants experienced significant improvements in their communication and social skills after experiencing the RELE program compared with those participants who did not experience the RELE program. This finding supported previous findings that individuals with ASDs had significant cognitive, communicative, emotional, social, and behavioral impairment that affected both the individuals and their families. The RELE program addressed the cognitive, communicative, emotional, social, and behavioral dimension of ASDs that impaired the communication and social abilities of the adolescents with ASDs. The RELE program helped the adolescents to improve communication and social skills by...
disputing harmful thoughts and beliefs that affected their communication abilities before the program. The finding further supported evidence that adolescents with ASDs who experience significant problems related to social and emotional health can be helped using a REBT-based intervention.\(^{[235]}\) Our findings further strengthened the previous assertion that a REBT-based intervention can be used to strengthen the components of communication and social skills within a scientifically oriented frame of reference.\(^{[12,37-39]}\) We therefore encourage language education practitioners, speech pathologists, special education teachers, medical professionals, rehabilitation workers, counselors, and psychologists to incorporate the principles of RELE into their practices so as to help adolescents with ASDs improve upon their communication and social abilities.

**7. Limitations**

The study could not cover a very wide sample of the population of adolescents with ASDs due to the fact that many potential participants did not meet the inclusion criteria for the study. The smallness of the sample may have an impact on the total generalization of the findings. Therefore, it is advisable that future researchers will test the effect of using RELE to improve communication and social skills of adolescents with ASDs so as to confirm its generalizability to a wider audience. Using qualitative method to analyze the data collected in the study may have made a difference in the study findings, but we used only quantitative methods to analyze the data. We therefore recommend that future studies on RELE should endeavor to use both quantitative and qualitative methods of analysis.

We also were not able to include the demographic mediation analysis in the study. Even though that was primarily due to the unequal distribution of the demographic variables in the study, we encourage the future researchers to endeavor to provide demographic mediation analysis in a study with RELE program to further strengthen the effect of the program. Also, we recommend that the future researchers should attempt to use equal demographic distribution.

**7.1. Implications for research and practice**

Apart from contributing to the body of knowledge of this subject area, we drew some implications from the current findings. The findings have implication on research collaborations across disciplines. Though few researchers have suggested that the conventional knowledge practices of disciplines were the fundamental obstacle to mutual understanding between academic experts,\(^{[48]}\) our findings provided evidence that disciplines could collaborate effectively in a study. We therefore recommend more research collaborations between academic experts in language education, medical profession, psychology, special education, and counselling. This is because study with RELE requires knowledge sharing among different academic experts for effectiveness. The findings and the limitation of our study further implied that experts in language education, special education, medicine, rehabilitation counseling, and other related disciplines should conduct large-scale, randomized, and controlled trials aimed at improving communication and social skills of adolescents with ASDs. The effectiveness of such studies will further strengthen and support the claims of the current study.

It may be important for future studies to investigate how RELE can be applied for the treatment of other aspects of ASDs other than communication and social skills. It appears that RELE might be significant in treating other aspects of ASDs, but future researchers should test this notion. Our findings also implied that researchers all over the world should attempt to use RELE for different speech and language-related problems such as aphasia, stammering, and beyond. Also, language therapists, speech pathologist, counselors, and other experts working with ASDs patients should adopt the principles of RELE in treating the patients.

**8. Conclusion**

The present study showed that using RELE could improve communication and social skills in adolescents with ADs. RELE effectively increased communication and social skills of adolescents with ASDs. Therefore, we recommend that language educators, speech pathologists, language therapists, special educators, and counsellors and other professionals involved in the treatment and caring for ASDs patients be trained on the application of RELE technique so as to enable them to adopt the RELE program in their professional practices. A future paper will address the critical question of whether RELE is able to improve communication and social skills of children with ASDs. In the meantime, evidence from this study demonstrates that RELE is a reliable means of improving early signs thought to communication and social skills of adolescents with ASDs.

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**Table 2**

Repeated-measures ANOVA showing the effect of RELE to improve communication and social skills of adolescents with autism spectrum disorders.

| Time        | Measures     | Group  | Mean (SD) | F     | Sig. | \(\eta^2\) | \(R^2\) | 95% CI     |
|-------------|--------------|--------|-----------|-------|------|------------|--------|------------|
| Pretreatment| ACSSSA       | Treatment | 16.59 (1.23) | 0.578 | 0.450 | 0.009      | –0.006 | 14.59–18.59 |
|             |              | control  | 17.28 (2.65) |       |      |            |        | 15.07–20.75 |
| Posttreatment| ACSSSA      | Treatment | 67.03 (2.02) | 1164.18 | 0.000 | 0.945      | 0.946  | 65.77–70.82 |
|             |              | control  | 15.14 (3.09) |       |      |            |        | 13.19–17.09 |
| Follow-up   | ACSSSA       | Treatment | 70.65 (2.04) | 1094.22 | 0.000 | 0.947      | 0.947  | 68.24–73.63 |
|             |              | control  | 16.11 (0.34) |       |      |            |        | 14.04–18.18 |

Degree of freedom = 1, 66; number for treatment group = 32; number for control group = 35.

RELE = Rational Emotive Language Education, ACSSSA = Autism Communication and Social Skills Scale for Adolescent, M = mean, SD = standard deviation, \(\eta^2\) = effect size, \(R^2\) = adjusted R squared.
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