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Evaluating the impact of rational emotive behavior therapy on post-traumatic stress in farmers with experiences of natural disaster

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Abstract

Background/objective: This study was necessary due to the increasing number of cases of natural disasters such as flood, air pollution, erosion, etc in Nigeria, particularly in the Abia state, as well as the accompanying psychological and health issues affecting individuals within families and society as a whole. The study aimed to examine the impact of rational emotive behavior therapy on farmers' post-traumatic stress (PTS) in Abia State, Nigeria.

Method: A randomized control trial was conducted in Abia state, with a sample size of 118 farmers with experiences of natural disasters. Two assessments were conducted before the treatment, immediately after the treatment, and 2 months later to evaluate PTS and irrational beliefs among the farmers. The treatment involved a self-developed PTS-focused rational emotive behavior therapy manual, consisting of 12 sessions lasting 60 minutes each, delivered by counseling psychologists trained in rational emotive behavior and family therapies. Data from the pretest, posttest, and follow-up test were analyzed using chi-square, percentage, partial eta squared, and analysis of covariance statistical tools.

Results: The results showed no significant gender differences in the socioeconomic status, employment, and debt status of the participants. The rational emotive behavior therapy was effective in reducing PTS caused by the flood among farmers. Gender did not have a significant moderating effect on farmers' experiences with PTS.

Conclusion: The study suggested that family health specialists and rational-emotive therapists collaborate with local authorities to provide career counseling services to farmers and establish community-based rational emotive institutes in each state of Nigeria.

Abbreviations: ANCOVA = analysis of covariance, PTS = post-traumatic stress, PTSD = post-traumatic stress disorder, PTSDS = post-traumatic stress diagnostic scale, REBT = Rational emotive behavior therapy.

Keywords: farmers, natural disasters, Nigeria, post-traumatic stress, REBT

1. Introduction

Natural disasters have caused enormous economic losses for nations all around the world.^[1] According to statistics from the Center for Research on the Epidemiology of Disasters, global economic damages from natural disasters reached 210.1 billion US dollars in 2017, 49% more than the historical average.^[2] Specifically, current agricultural production systems globally are seriously threatened by the increasing frequency

of major climate disasters brought on by global warming.^[1,3] Yams, maize, cassava, and other high-value crops, as well as people's lives and property, including homes, have all been harmed by the flood that occurred in south east Nigeria, which is widely acknowledged.^[4] South Eastern Nigeria is well known for being agriculture. Due to this, most farmers have reportedly suffered from flooding and soil erosion on one or more occasions. According to an empirical study done in the state of Anambra, 48% of homes experienced flooding. Igbaram and

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The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Ossomala communities in Anambra state were more susceptible to flood-related cases out of 48% in 8 communities than in other areas.^[4]

As roughly 73% of households in the Igbariam neighborhood were kept hungry in 2020, the number of impacted families continued to climb.^[5] Oguta Community, another area affected by flooding on an ongoing basis, has 22% of its families with poor family health due to food poverty.^[5] Farmers in the Anambra state have seen a number of heavy downpours that have left them with chronic agony. In Anambra, flooding began almost 2 months ago (from August to September). As a result, more homes are being submerged daily, and more victims are being relocated to IDP camps.^[6]

People, including farmers, have described terrible life experiences as a result of natural disasters. Nigerian farmers have detailed negative flood disaster experiences and how they have affected their lives.^[7] Farmers are more susceptible to a variety of psychiatric disorders due to the painful disruption of their daily routine. Farmers have emotional instability every time there is a flood.^[8] These incidents keep happening again and again. Crops and livestock are likely to suffer damage from the flood that follows a heavy downpour. Farmers consequently experience extreme anxiety and tension due to concerns about property damage, farmland destruction, and the high cost of farm products.^[8] And being restless and nervous, the farmers are at risk of psychological problems considering the financial implications of the value of what they may lose. Evidence demonstrated that some of the farmers lost loved ones. This scale-up the emotional state of the farmers who are victims. A study has demonstrated that as the rainy period approaches each year, the farmers who are flood victims feel uneasy and unsafe.^[9] Flood victims is associated with post-traumatic stress disorder (PTSD) and feel unsafe each time there is heavy rain.^[8]

One of the psychological symptoms is PTSD which has been conceptualized and defined by different experts in the field of psychology and psychiatry. PTSD is a disorder that occurs after threatening incidents and is characterized by symptoms of re-experiencing aspects of the trauma.^[10] In the context of this study, the researchers operationalized PTSD as one of the mental health issues that is caused by natural disasters such as floods which farmers are exposed to, and is characterized by symptoms of remembering the trauma.

A farmer that is symptomatic to PTSD is considered to have some behavioral characteristics. PTSD is characterized by intrusive memories, hallucinations, avoidance, and hyperarousal (e.g., sleeplessness) as in DSM-IV.^[11] These symptoms could be observed after 1 month of traumatic events.^[12] In individuals exposed to 1 or more exceptionally threatening or horrifying events.^[13] Internationally, PTSD is the most common mental health problem happening as a result of traumatic exposure.^[14]

Globally, the prevalence of PTSD has also been reported in previous literatures. For instance, Olff, Koeter, Van Haften, Kersten, and Gersons^[15] showed that there is a high prevalence of PTSD among Dutch farmers. In the United States, evidence also recorded a prevalence of 6.8% of PTSD.^[16] In India, a report indicated that about 75% of Indian farmers are experiencing PTSD due to natural disasters, showing that there is a high presence of PTSD among the Indian farmers population.^[17] A cross-sectional study conducted in China revealed that females, older people, farmers, and those with family member loss were significantly more likely to develop PTSD. Other studies report that 9.4% of Israelis experience PTSD. Also, citation formatting should follow consistent academic standards.^[18]

Like many countries, Nigeria also experiences widespread post-traumatic stress (PTS). A study conducted in Nigeria showed that a good number of individuals and families are highly traumatized due to re-experiences of painful and threatening events.^[19] PTS reactions are severely affecting Nigerian farmers as a result of horrifying situations orchestrated by activities of man and natural disasters.^[20] It has negatively affected farming as an occupation.^[20]

Given this prevailing worrisome and disturbing case of PTS in the farmers' population who provide food for the nation, the assistance of mental health professionals is imperative. Over the years, people have continued to call for professionals to help improve the psychological well-being of farmers.^[15] Recently, a clarion call was raised for urgent psychological interventions for farmers with experiences of PTS experiences in Nigeria.^[20] This is due to the high rate of painful experiences found among farmers and the associated psychological problems such as PTS. One such intervention is rational emotive family health therapy. This is a family model of rational emotive behavior therapy (REBT) used by Ede^[21] to dispute the cognitive bias, behavioral misinterpretation of eventual situations, and negative emotional reactions causing desolation in family well-being. The approach was later changed to the family health-model of REBT in 2021.^[22] The basic assumption of rational emotive family health therapy (REFHT) is that once parents have unrealistic views about family situations, they will likely be unproductive in sorting out the problem. The proponent suggested that it is the belief system of the family members that determines the quality of family life. Ede^[21] stated that the presence of a problem is not responsible for psychological disturbances the household is experiencing but rather cognitive, behavioral, and emotional interpretations of the event. In this study, the events interpreted by the farmers are the natural disasters and the damages they caused. The belief system could include thoughts such as "I am worthless and should end my life," "I feel overwhelmed and consider suicide," or "I suspect my neighbors are to blame for my suffering." The founders of the family health model of REBT suggested that parents who hold such negative beliefs may be more susceptible to psychological distress, leading to increased stress and a lower quality of family life. Consequently, farmers may experience a range of clinical and nonclinical issues that require therapeutic intervention. If farmers and their family members are viewed in a negative light, it can have a detrimental impact on their overall health, well-being, and quality of life.^[23] They contend that incorrect interpretations take place when there is a discrepancy between the cognitive representation of the event and its actual occurrence, which is consistent with the REBT philosophy. People in such a mindset will interpret reality incorrectly, which could result in unfavorable beliefs. Wrong interpretation of events occurs when farmers refuse to accept situations they cannot cope with. Some of the farmers could be anxious, aggressive, and moody possibly because of the psychological impacts of flood, and begin to isolate socially; thus, the family experiences depression, anxiety, frustration, and self-downing among others.^[21,24]

Given that earlier cross-sectional and other quantitative studies have linked flooding episodes to PTSDs in Anambra state's farmers.^[4,5,25] and the need for psychological intervention,^[20] it has become pertinent to investigate the effect of rational emotive behavior therapy on PTS among farmers with experiences of natural disasters in Abia State Nigeria.

The flooding that occurred in Abia State Nigeria is well-known for having harmed lives, high-value products like yams, maize, and cassava, as well as buildings like homes and others. South-eastern Nigeria is prone to natural disasters such as erosion and flood which threaten farm activities. An empirical investigation carried out revealed that roughly 48% of households experienced flooding. Igbariam and Ossomala villages, out of the 48% in 8 communities, were more susceptible to flood-related cases than other areas in the state. The proportion of afflicted families became more and more. In the community of Igbariam in the year 2020, about 73% of households were kept hungry. Oguta Community is another community that has suffered from the long-lasting effects of flooding. Due to food insecurity, 22% of its households experienced poor family health. Farmers in Nigeria have seen some heavy downpours that have left many who were impacted with chronic agony. Empirical reports showed that the impact of floods on family well-being has been broadly studied in South-eastern Nigeria.

. Unfortunately, the flood has destroyed their farms which leads them to depression, fear, and anxiety each time they remember their farmland. They always say that they don't have any reason to be alive which leads them to PTS and anxiety disorders [Ugwuoke et al, 2023], and there is a need to help these set of people in their psychological conditions otherwise our country will suffer from food insecurity. Since the southeast is one of the flood-prone with negative consequences of floods on family health, family income, and family nutritional quality among farmers in the southeast in general there is still a paucity of literature on the possible psychological intervention for those victims. There is currently a dearth of literature on the subject, hence we urge empirically based literature to fill the void. These problems motivate the present researcher to investigate the effect of rational emotive family health therapy on flood-induce PTS and anxiety stress disorders among farmers in Abia State, Nigeria.

1.1. Research hypotheses

The following null research hypotheses were formulated and tested at 0.05 level significance:

- Ho₁: There is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at the pretest.
- Ho₂: There is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at posttest.
- Ho₃: Gender does not have a significant moderating effect on PTS levels among natural disaster victims.
- Ho₄: There is no significant interaction effect between treatment groups and gender on PTS levels among natural disaster victims.

2. Methods and materials

2.1. Participants and procedure

This study adopted a group-randomized control design utilizing 120 registered farmers in Abia State Nigeria. Regarding the demographic details of the participants, 37 (61.7%) males, and 23 (38.3%) females farmers were in the treatment group while 29 (50.0%) males, and 29 (50.0%) females farmers were in the waitlist control group and there is no significant difference in terms of gender ($\chi^2 = 1.629$, sig = 0.202). In the treatment group, 24 (40.0%) farmers had low socioeconomic status, 27 (45.0%) farmers had moderate socioeconomic status, and 9 (15.0%) farmers had high socioeconomic status. Whereas in the control group, 19 (32.8%) farmers had low socioeconomic status, 30 (51.7%) farmers had moderate socioeconomic status, and 9 (15.5%) farmers had high socioeconomic status and there is no significant difference in terms of socioeconomic status ($\chi^2 = 0.706$, $P = .703$). In the treatment group, 17 (28.3%) farmers were civil servants and 43 (71.7%) farmers were not civil servants. Whereas in the control group, 16 (27.6%) farmers were civil servants and 42 (72.4%) farmers were not civil servants and there is no significant difference in terms of work status ($\chi^2 = 0.008$, $P = .928$). In the treatment group, 41 (68.3%) farmers are on loan and 19 (31.7%) farmers are not on loan status. Whereas in the control group, 38 (65.5%) farmers are on loan status and 20 (34.5%) and there is no significant difference in terms of loan status ($\chi^2 = 0.106$, $P = .745$).

The participants were recruited from 4 farmers' cooperatives randomly from the Agriculture zones. Later, those farmers from the 2 local government areas were asked to pick cutout cards with the words YES and NO designed by the researchers. Each farmer was invited to choose one card from the bowl of cutout cards that the researchers had placed there. Indicating that the local government area from which a respondent chose a card

with YES was chosen for the study automatically. Due to equal opportunity for all regions that have comparable qualities, the 2 local government areas were chosen. Participants who picked YES were assigned to the treatment group whereas those who picked NO were assigned to the comparison group. The Gpower sample estimation method was statistically applied to the estimated value (125). Based on the power calculation (0.88), this sample size was adequate. Please refer to the process section for more information or specifics on the method used to randomly assign individuals to the treatment group and control condition (comparison group).

Following this, inclusion and exclusion criteria were applied to screen the eligibility of the farmers.

1. Must be assessed using the outcome/dependent measures post-traumatic stress diagnostic scale (PTSDS) and irrational belief scale. The 2 measures were used to screen the participants to determine baseline data/information, that is, whether the flood victims had high levels of PTS and irrational beliefs.
2. Must dwell in sampled regions.
3. Must be older than 18 years.
4. Must be willing to participate and must verbally consent.
5. Must have experience of natural disasters.

Exclusion criteria include

1. Presence of psychosis.
2. Receiving treatment from psychotherapists.
3. Severe illness due to experience of natural disaster.
4. <18 years.

Farmers who did not meet the aforementioned inclusion requirements were deemed ineligible. The recruitment exercise lasted for 2 weeks. The researchers and research assistant team divided the eligible participants into 2 groups: the waiting group and the rational emotive behavior therapy group. The waitlisted control group was used against placebo because it was not ethical to fake any counseling-oriented research process.

The pretest aided in the researchers' identification and eligibility screening of the potential participants. This was carried out shortly after the sampling procedure described in the section on samples and sampling methodologies. Two research assistants helped to support the pretreatment phase. One hundred eighteen persons were eligible to participate in this study after the 125 possible participants were vetted using the inclusion and exclusion criteria and screening methods. Later only 2 farmers did not participate due to exclusions as one was receiving medical care elsewhere and the second voluntarily declined. Figure 1 illustrates how the notion of sequence allocation approach helped to facilitate this process.

The REBT is a 12-session treatment manual designed to lessen farmers who have experienced flood damage in the previous 2 months' PTS and unreasonable beliefs. The participants were scheduled for the first session. The REBT model package created by the current researchers served as the foundation for the therapy procedure. The REBT is designed to help farmers reduce their PTS and irrational beliefs. Oguta village is another area that has been plagued by water damage for years. As a result of food insecurity, 22% of its households had poor family health. The several heavy downpours that hit farmers in the Abia state have left them in chronic agony. This gives 12 sessions.

The first session was devoted to introducing the participants, external evaluators, and counselors (therapists). They used their introductions to get to know one another's names, occupations, states of origin, etc. The therapists emphasized the rules and guidelines for organizing the events. Following the introduction, the research assistants informed the participants about the goal and significance of group interaction in treating psychosocial issues. The therapists gave the participants advice on how to respect each participant's privacy and confidentiality.

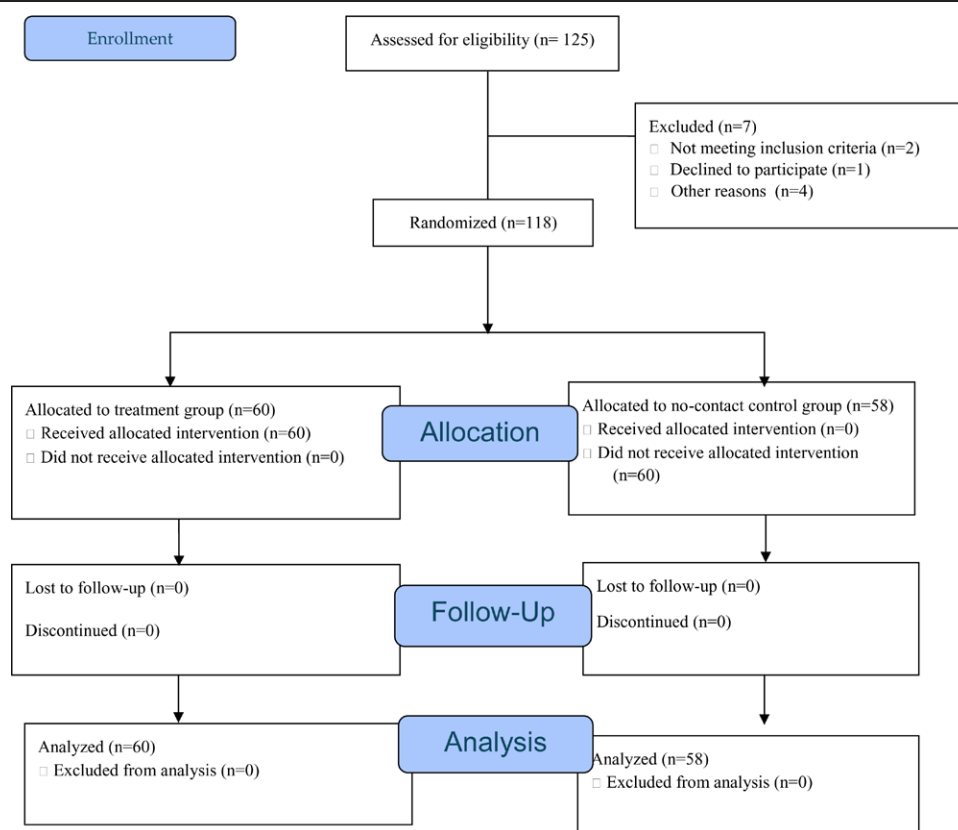


Figure 1. Consort diagram of participants' allocation of farmers with experiences of natural disaster.

Following the first session, the second and third sessions (weeks 2 and 3) focused on the definition of post-traumatic and illogical beliefs as well as their sources, effects, and potential for negative development (irrational belief). The participants received home exercises at the conclusion of each session. The fourth session focused on the participants' flood experiences and how they feel whenever it rains heavily. The focus of session 5 was on assessing feelings and identifying illogical beliefs connected to flood-induced PTSD and irrational beliefs. The therapists assisted the patients in examining how the unfavorable thoughts that occur from PTSD emerge. There was use of examples to demonstrate the true situation to the participants.

The 6th session focused on acting event (A) and beliefs system (B) principles of REBT. According to Ellis, the therapist discussed what "A" and "B" meant to participants. The therapist went into greater detail about the "A" principle, which stands for "activation event," and the "B" belief system. The therapist was able to discover additional illogical beliefs at this stage that contribute to PTSD. The discussion of the farmers' ideas and illogical views regarding the flood resumed in the seventh session. That was related to the REBT "C" principle by the therapists. The "C" stands for the results of the ideas or beliefs. The participants learned how some erroneous life ideologies can lead to unfavorable outcomes. Teaching children to accept circumstances they cannot change took up to 8 sessions. Invoking past flood experiences, it is suggested that flood damage be accepted in good faith. The "D" idea was explained to the attendees. The "D" stands for disputation, which is the process of turning illogical views into rational ones. During the aforementioned session, disputation techniques were practiced. The 9th session of therapy concentrated on evaluating occurrences and learning to identify true/rational ideas. The individuals were able to use relapse prevention strategies because to this. The 10th session focuses on practical application. The last session then started in order to wrap up the sessions. This occurred on the last day of

the session, which was also the due date. At this moment, the researchers praised and thanked the volunteers for their commitment and collaboration. Remind the group that confidentiality is protected even after the group experience is over.

There was a posttest right after the termination. The waitlist control group participants were invited to the same treatment location for the posttest before the instruments were finished and filled out. A posttest using the 2 instruments was given to those in the treatment and waitlist control groups as soon as everyone had arrived. The third assessment was given to the participants after 2 months. This exercise was conducted by the researchers.

2.1.1. Ethical compliance and approval. As required by the American Psychological Association and Helsinki Declaration, the researchers received formal consent from the Head, Department of Agricultural Science Education, Faculty of Vocational and Technical Education University of Nigeria Nsukka to conduct this study. The potential participants' oral consent was obtained by the principal researcher. The potential volunteers received guarantees that their privacy would be respected, that confidentiality would be upheld, and that there would be no unfavorable risks associated with the treatment.

2.2. Measures

The PTSDS was developed by Foa et al.^[26] and was adapted for the present study. The aim is to measure PTSD. The instrument has a total of 24 items and it has 3 dimensions such as talking to other people about the trauma (20 items), distress and interference (2 items), and symptom onset and duration (2 items). The 20 items were 20 DSM-5 PTSD symptoms but the additional 4 items access information about distress and interference caused by PTSD symptoms as well as onset and duration of symptoms. Symptom items are rated on a 5-point scale of

frequency and severity ranging from 0 (Not at all) to 4 (6 or more times a week/severe). That is to say, Not at all = 0, A little = 1, Somewhat = 2, Very much = 3, and Severe = 4, indicating the higher score shows a higher experience of PTSDs. Cronbach Alpha was used to measure the internal consistency on PTSD. The value of internal consistency was 0.72 for the PTS measurement scale.

Attitude and beliefs scale was developed by DiGiuseppe et al.^[27] and was adapted for the present study. The aim is to measure attitudes and beliefs. The instrument has a total of 24 items. The scales have five-point response options which include: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, and Strongly Disagree = 1. The rational-worded items were reversed and scored. Items that were positively skewed were reversely scored. Thus, higher scores reflect greater irrationality and lower rationality. Cronbach Alpha was used to measure the internal consistency on the Attitude and Beliefs Scale. In the present, the value of internal consistency was 0.78.

2.3. Treatment manual

2.3.1. Rational emotive behavior therapy manual on PTS. The intervention is based on the rational emotive behavior therapy manual for PTSDs and irrational beliefs. During the creation of this document, the tenets of the rational emotive behavior therapy manual were modified to address PTS. The handbook is a psychoeducational therapy that aims to examine REBT methodologies by utilizing them to change illogical beliefs connected to PTS, which lowers stress levels among flood victims. The treatment recommendations were organized according to the following criteria: duration, subject matter, weeks/sessions, goals, tasks, and methods/strategies. Each category in this list contains a subcategory of activities. The handbook was a 12-session comprising 8 weeks long intervention program. Each session lasted 60 minutes and had clear objectives and material at the outset. The contents of the manual were (PTSDs and irrational beliefs) comprising treatment guidelines. Examples of rational-emotive skills include Cognitive Alliance and Biofeedback. The cognitive alliance was applied to stimulate and build rapport with the participants.^[21] Biofeedback was necessary to make the participants see the psychological reactions that increase the traumatic feelings.^[21] Others included relaxation strategy exercise practice, a technique for problem-solving, and cognitive disputation Technique for assessing mood exercise routines, mood tracking, and relapse prevention both emotional and cognitive disputation.

2.4. Therapists

Two therapists provided the treatment and were university workers who had completed the necessary training, including counseling. The therapists' job is to carry out the REBT manual's

instructions. They are both licensed counselors who have been in the field for >6 years.

2.5. Research assistants and treatment integrity

The research assistants were 2 assessors who were postgraduate students of the University of Nigeria, Nsukka. They were recruited as research assistants to observe how treatment sessions were carried out, consulting the treatment manual ensuring that the therapists followed the procedures. They accessed how the therapists implemented the treatment manual reliably, ensuring that the steps were being implemented. Also, they assisted during the recruitment and participants' randomization to the treatment group and waitlist control group.

2.6. Data analysis

Analysis of covariance (ANCOVA) is a statistical method for assessing the equality of the means of a dependent variable across levels of a categorical independent variable, also known as a treatment, while accounting for the effects of other continuous variables, or covariates, that are not of primary interest. Given this, ANCOVA was used to analyze the data collected. Doing this, the following assumptions were checked, met, and satisfied and these included:

- Both the covariate and dependent variables are measured at the interval or ratio level on a continuous scale.
- Two or more categorical, independent groupings make up the independent variable.
- There are no significant outliers.
- Within each subpopulation, the dependent variable has an approaching normal distribution.
- Pretest and group interaction for homogeneity of regression line slope, and
- Levene test for homogeneity of variances.

The pretest total mean scores were employed as covariates, while the posttest and follow-up sum of mean scores served as the dependent variables. The significance level of .05 was used to base the conclusions of the hypotheses. All of these studies were carried out using SPSS version 28 (IBM Corp., Armonk, NY).

3. Results

3.1. Hypothesis 1

H_{01} : There is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at the pretest.

The ANCOVA results in Table 1 show the effect of rational emotive behavior therapy on PTS among farmers with experiences of natural disasters at the pretest. The result shows that an f -ratio of ($F(1, 117) = .463, P = .497, \eta_p^2 = 0.04$) was

Table 1

Analysis of covariance (ANCOVA) of the effect of rational emotive behavior therapy on post-traumatic stress at pretest.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	3.277*	1	3.277	.463	.497	.004
Intercept	1,239,902.308	1	1,239,902.308	175,321.577	.000	.999
Group	3.277	1	3.277	.463	.497	.004
Error	820.371	116	7.072			
Total	1,241,013.898	118				
Corrected total	823.648	117				

Note: S = significant, NS = not significant, and η_p^2 = partial eta squared.

*R squared = .004 (adjusted R squared = -.005).

obtained. Since the associated probability value of 0.497 is more than 0.05 set as the level of significance, the null hypothesis was accepted. Hence, there is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at the pretest.

3.2. Hypothesis 2

H_{02} : There is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at posttest.

The ANCOVA results in Table 2 show the effect of rational emotive behavior therapy on PTS among farmers with experiences of natural disasters. The result shows that an f -ratio of ($F(1, 117) = 381.049, P < .01, \eta^2_p = 0.77$) was obtained. Since the associated probability value of 0.01 is $< .05$ set as the level of significance, the null hypothesis was rejected. Hence, the therapy was significantly effective in reducing PTS among farmers with experience of natural disasters. The result further showed the effect size of ($\eta^2_p = 0.77$), which indicates that 77 percent (77%) variance of the reduction in PTS among farmers with experience of natural disasters was attributed to the REBT.

3.3. Hypothesis 3

H_{03} : There will be no significant moderating effect of gender on flood-induced PTS among natural disaster victims.

The result in Table 3 shows the ANCOVA of the moderating effect of gender on PTS among farmers with experiences of natural disasters. The result shows that an f -ratio of ($F(1, 117) = 01.550, P > .216, \eta^2_p = 0.13$) was found. As stated in the hypothesis if the associated probability value is $> .05$, the null hypothesis is accepted. Thus, the inference drawn is that there was no significant moderating effect of gender on PTS among farmers with experiences of natural disasters. The result further showed the effect size of ($\eta^2_p = 0.13$), which indicates that only a 13 percent (13%) variance of the reduction in PTS among farmers was not due to the moderating effect of gender.

What is the interaction effect of the REBT and gender on flood-induced PTS among farmers?

3.4. Hypothesis 4

H_{03} : There will be no significant interaction effect of the groups and gender on flood-induced PTS in flood victims (farmers)

The result in Table 4 shows the ANCOVA of the interaction effect of gender and REBT treatment on PTS among farmers. The result shows that an f -ratio, $F(1, 117) = 0.607, P > .437, \eta^2_p = 0.005$ was obtained. Since the associated probability value of .55 is $> .05$ and is set as the level of significance, the null hypothesis was accepted. Thus, the inference drawn is that

there was no significant interaction effect of gender and REBT treatment on PTS among farmers.

4. Discussion

At the baseline test, there is no significant difference in PTS scores between participants in the rational emotive behavior therapy group and those in the control group at the pretest. This shows that the farmers in both groups did not differ in their experiences of PTS. The outcome showed that REBT was successful in lowering PTS among farmers with experiences of natural disasters. It was also found that there was no significant interaction effect of gender and REBT treatment on PTS among farmers. According to the research, rational emotive behavior therapy considerably reduced the PTS that farmers in Anambra state experienced as a result of the flood. The current results concur with those of Omeje^[28] who demonstrated that REBT approaches successfully reduced the occupational stress of lecturers in agricultural education. The findings of both studies are astounding because rational-emotive methods are advantageous for the 2 studies' 2 different populations that were sampled. Despite the participants in Omeje and the farmers' earlier study having different attitudes, the intervention showed progress in lowering psychological stress. Grove, et al^[29] demonstrated statistically significant reductions in PTSD with medium, moderate-to-medium, and small effect sizes, as shown by the current study. This is astounding considering that the reviewed study was conducted abroad and demonstrated that REBT therapies are effective treatment options for PTSD regardless of setting or patient population. Onuigbo et al^[30] found that the REBT group saw a significant mean drop in stress levels and their beliefs moved to reasonable. The significant experiences of farmers in the current study are consistent with this finding. The fact that both studies concur that the goal of REBT is to convert irrational belief into rational belief is fantastic. Eseadi^[31] in accordance with the current study, demonstrated that REBT significantly reduced trauma-specific irrational beliefs in comparison to students in the treatment group compared to those in the waitlist control group. It is fantastic that both studies—despite the 2 research' differing populations—show that REBT therapies are a potent strategy for treating PTS.

The findings indicated that farmers' experiences with flood-related PTS are not moderated by their gender. Farmers who experienced PTSD due to flooding did not significantly differ based on their gender. It is amazing as the reviewed study was a foreign study showing that there is a moderating effect size among participants experiencing symptoms of psychological disorders. The corresponding result of the hypothesis revealed that there was a significant moderating effect of gender on flood-induced PTSD among farmers. The present study is in line with Omeje^[28] who found that the stress level of male lecturers reduced during the treatment period more than their female counterparts. A similar result was found in a parallel study that gender significantly moderated farmers' anxiety disorder that was due to flood.^[32] It is astonishing as the reviewed study and present are showing that there moderating effect of rational

Table 2
Analysis of covariance (ANCOVA) of the effect of rational emotive behavior therapy on post-traumatic stress at posttest.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	15,719.382*	3	5239.794	134.503	.000	.780
Intercept	931,060.587	1	931,060.587	23,899.828	.000	.995
Group	14,844.431	1	14,844.431	381.049	.000	.770
Error	4441.074	114	38.957			
Total	970,784.981	118				
Corrected total	20,160.456	117				

*R squared = .780 (adjusted R squared = .774).

Table 3**Analysis of covariance (ANCOVA) of the moderating effect of gender on post-traumatic stress among farmers with experiences of natural disaster.**

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	15,719.382*	3	5239.794	134.503	.000	.780
Intercept	931,060.587	1	931,060.587	23,899.828	.000	.995
Gender	60.401	1	60.401	1.550	.216	.013
Group * gender	23.651	1	23.651	.607	.437	.005
Error	4441.074	114	38.957			
Total	970,784.981	118				
Corrected total	20,160.456	117				

Note: S = significant, NS = not significant, and η_p^2 = partial eta squared.

*R squared = .780 (adjusted R squared = .774).

Table 4**Analysis of covariance (ANCOVA) of the interaction effect of the groups and gender on flood-induced post-traumatic stress among farmers.**

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Corrected model	15,719.382	3	5239.794	134.503	.000	.780
Intercept	931,060.587	1	931,060.587	23,899.828	.000	.995
Group gender	23.651	1	23.651	.607	.437	.005
Error	4441.074	114	38.957			
Total	970,784.981	118				
Corrected total	20,160.456	117				

Note: S = significant, NS = not significant, and η_p^2 = partial eta squared.

emotive techniques among participants experiencing psychological disorders. The present study is in agreement with Lawal et al^[20] who show that literacy level influences post-traumatic reactions of victims of cattle rustling as manifested in their occupational status while no mediation effect of gender was found. It is wonderful that the reviewed study and the present study have the same intervention effect of gender irrespective of the population sample participant.

Male farmers experienced less PTS than their female counterparts, which was alleviated by REBT. The treatment for PTSD among farmers was not significantly impacted by the interaction of gender and REBT. The current found no evidence that there was a gender difference in PTSD prevalence or relationships between symptoms, supporting Birkeland^[33] findings. This is an indication that experience of PTSD cut across male and female populations from various countries. The present study is in line with Omeje^[29] who found a significant interaction effect of gender and treatments on occupational stress of agricultural education lecturers. It is beautiful that the present study and the reviewed study have the same interaction effect of gender irrespective of a population sample of participants.

4.1. Implications

REBT was effective in reducing flood-induced PTSD. Rational emotive behavior therapy was significantly effective in reducing PTS among farmers in Abia state. The implication is that rational emotive behavior therapy is a wonderful intervention. When used on farmers who have PTS it will reduce the irrational beliefs to rational beliefs. Therefore there is a need for researchers to put their hands together to use REBT to carry out research in different states of Nigeria that are flood victims. It implies that the family will face a psychological problem, like when a father is affected psychologically the whole family is affected too, in terms of health, food balance, education, and society order.

Farmers' PTS caused by natural disasters like floods is not moderated by gender. Farmers who experienced PTS due to

flooding did not significantly differ based on their gender. It implies that researchers could concentrate on both male and female victims of flood. It also implies that flood-induced PTS has no preference for male or female farmers. It is important, therefore, as they are the head of the family and the giant of the nation that provides for their respective families. The implication has shown that flood-induced PTS does not discriminate among farmers in terms of experiences, symptoms, and health-related adverse impacts. It implies that if male and female farmers are not consistently receiving psychological treatment the heads of families and giant of nation, families, and nation may go down in food insecurity, insecurity, threatening the economy and psychological health.

The result indicated that there was no interaction effect of gender and REBT treatment in reducing the PTS of farmers. There was no significant interaction effect of gender and REBT treatment on PTS among farmers. It has shown that intervention is more effective in reducing PTS of male farmers than their female counterparts. It implies that if there is no intervention among male farmers who have post-traumatic there may be a crisis of food and, unhealthy life for the family down to the society and country at large.

4.2. Conclusion

Psychological outcomes of floods in Nigeria have been palatable among farmers. Cases abound that some experience PTS. The increased rates necessitated this study. The study found that mental health issues due to PTS among farmers were considerably reduced through rational emotive behavior therapy. Farmers who experienced natural disasters-induced PTS did not significantly differ based on their gender. The treatment for PTS among farmers was not significantly impacted by the interaction of gender and REBT. Therefore, counselors with experiences in rational emotive behavior therapy and family health experts should create additional awareness to other parts of the country that could not benefit from this study.

4.3. Recommendations

According to the study's conclusions, family health specialists and rational-emotive therapists should communicate with local authorities in order to offer career counseling services to farmers. They will learn more about the potential effects of rational emotive family health therapy thanks to the service. The goal is to provide them with a preventive intervention that could reduce the high incidence of post-traumatic disorders brought on by floods. To maintain the psychological treatment results, it is advised that farmers raise their level of acceptance of rational emotive behavior therapy. This is due to the fact that the farmers would develop internal resilience and persistent ability to treat flood-related physical and psychological issues provided they had sufficient psychological dispositions for rational emotive behavior therapy. Once the farmers could prevent relapse or avoid reversing back to their irrational beliefs, they would have sorted out there to 50%, especially when a professional is unavoidable. The state government is advised to make sure that trained psychologists, counselors, and other relevant specialists are sent to the schools and institutions where the farmers would be reached. Every local government council should have an educational policy that supports the use of rational emotive behavior therapy.

4.4. Limitations

As in other quantitative studies, the present study has methodological flaws, therefore, caution should be taken in generalizing the findings. The sample size might not be sufficient to represent the overall farmer population in Nigeria in general. In addition, this study does not analyze the data in accordance with the dimensions of the measurement tools (instruments). If such had been done, a thorough explanation of the issues and the degree to which the REBT intervention's improvements were made would have been provided. Another major limitation of this study is that the instruments did not have mechanisms of change. It seemed like PTS does not have a dimension that assesses coping mechanisms/strategies. Given these methodological weaknesses, the researcher, therefore, suggests that subsequent researchers should incorporate these things that are missing here in future studies.

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