



Research Article

Psychoeducation and dialectical behavioural therapy: Managing problematic internet use among peer rejected in-school adolescents in Nigeria

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This study examined the effectiveness of Psychoeducation and Dialectical Behaviour therapy [DBT] in managing problematic internet [PIU] use symptoms among peer rejected adolescents in Nigeria. Pretest-posttest control group quasi-experimental design was adopted. Ninety adolescents with age range of 10-18 years who met the inclusion criteria were purposively drawn from three Senior Secondary School one located in Ibadan North Local Government Area. Three instruments namely; Problematic Internet Use Questionnaire, Peer Rejection Scale and Socio-Economic Status Scale were used for data collection. The three groups were randomly assigned into treatment conditions. The experimental groups were exposed to ten sessions of intervention using either Psychoeducation or DBT while the control group was not treated. The intervention which was conducted for ten weeks (one session of 2 hours per weeks). Statistical tool was analysis of covariance and hypotheses were tested at .05 level of significance. The results showed that the interventions were potentially effective in treating adolescents' PIU (excessive and dysregulated use of interactive media and electronic devices behaviours compared to those in the control group and the improvements were maintained at follow-up. The female participants displayed lower PIU than their male counterparts. Participants from low SES background gained more in therapy. The study provided preliminary evidence to suggest the effectiveness of psychoeducation and DBT in modifying the domains of PIU (obsession, neglect, and control disorder), however, DBT was more potent than psychoeducation. It was recommended that screening should be done to identify students who have PIU in schools and counselling psychologists should utilise these two interventions to modify problematic internet use behaviour.

Keywords: Adolescents in Nigeria, dialectical behaviour therapy, problematic internet use, psychoeducation

1. Introduction

The frequency and number of internet users have increased exponentially because internet use has become the most popular tool for worldwide information, communication, technology, and source of infotainment (Mbachu et al., 2024). It was reported that as at 2022, over 40% of Nigerians have access to the internet with a significant proportion being young people aged 15 to 24. Increased use of the internet by young people has been accompanied by emerging concerns regarding misuse. Internet use can pose a threat on various areas of individuals' lives due to its potentially addictive features (e.g. accessibility, anonymity, convenience, etc.) and/or the online activities themselves (e.g. gaming, gambling, social media use, etc.). With COVID-19 and its associated limited social interaction there is evidence that internet use behaviour among adolescents changed (Jahan et al., 2021; Ofole et al., 2015). Al-Mamun et al. (2022) reported that of the 601 Bangladesh students who participated in their study, 29.1% had problematic internet use. Similarly a study by Onukwuli et al. (2023) show that of the 851 students randomly selected from secondary schools in southeastern, Nigeria, majority (88.1%) had problematic internet use. Of the 88.1%, 24.9% had mild, 59.6% had moderate PIU, and 3.6% had severe PIU. Problematic internet use or pathological internet use is a problematic compulsive use of the internet that impairs an individual's function over a prolonged period of time (Mbachu, et al. 2024). The occurrence of PIU could occur at any stage of life,

however, adolescents are at the highest risk for its occurrence (Mbachu, et al. 2024). Adolescents are particularly vulnerable to PIU because of the rapid mental, emotional, and social developments occurring during this phase of life (Bada et al. 2023). Several studies and numerous anecdotal media reports, suggest possible links between overuse of the internet by adolescents and negative health consequences such as depression, mental health issues, Attention Deficit Hyperactivity Disorder, poor academic performance, high levels of anxiety, and an increase in drug abuse (Thomas et al., 2022; Joe et al., 2022; Ofole & Babatunde, 2015; Paulus et al. 2022).

Different social, psychological and physical problems can contribute to problematic internet use behaviour. One social factor that could cause PIU is being peer rejected. Peer rejection is a global term that encompasses the behaviour used by adolescents to exclude and hurt one another, including overt forms of control and exclusion and more subtle tactics, such as gossiping and spreading rumors. These methods, whether overt or covert, account for variance in adolescents' maladjustment and social acceptance above and beyond the effects of behaviours (Martín-Antón et al., 2024). Research suggests that adolescents who experience peer rejection are often lonely, have low self-esteem and more likely to have increased internet usage, often using the online as a way to compensate for their lack of social connection in the real world. This potentially leads to problematic internet use patterns that are often explained by the "compensatory internet use theory" where individuals seek social fulfillment online when they feel socially isolated offline (Martín-Antón et al., 2024).

Previous studies on PIU in Nigeria focused on the negative effect of PIU (Afolabi et al., 2022; Lakkunarajah et al., 2022) association between problematic usage and academic performance (Akanni & Adayonfo, 2015) as well as prevalence, predictors and consequences of adolescents' problematic internet use (Bada et al., 2023; Odinka et al., 2023). These previous researches were cross-sectional studies. Though survey studies are important because they provide a valuable method to gather large amounts of data about people's opinions, behaviours, and characteristics from a diverse population, allowing for identification of trends, understanding of attitudes, and making informed decisions based on collected insights. However, cross-sectional design major limitation is its inability to establish causality. Causality studies provide significant advantages by allowing for identification of cause-and-effect relationships between variables which facilitates understanding of how changes in one factor directly impact another. Without causality study it becomes difficult to make crucial informed decisions about PIU as well as development of effective interventions in the field of addictions. In order to optimise processes and facilitate actionable insights there is need to conduct a causality study on PIU among peer rejected adolescents. The outcome would enhance their overall safety, productivity and psychological well-being. Given the scarcity of causality studies in this domain and the escalating prevalence of problematic internet usage among adolescents cohort in Nigeria, This study therefore was designed to examine the effects of Psychoeducation and Dialectical Behavioural Therapy in managing problematic internet use among peer rejected adolescents in Nigeria.

2. Literature Review

2.1. Psychoeducation

Literature suggests that Psychoeducation is an evidence-based therapeutic intervention that provides information and support for individuals to better understand themselves and also to cope with life challenges such as addiction (Di Lorenzo, 2024). Psychoeducation [PE] is an intervention with systematic, structured, and didactic knowledge transfer for problematic issues treatment, integrating emotional and motivational aspects to enable clients to cope with the problems and to improve efficacy. Psychoeducation is grounded in Self-Determination Theory. Self-determination theory [SDT] (Ryan et al., 2000) is a psychological framework that suggests that humans are most motivated when their basic needs for autonomy (feeling in control), competence (feeling capable), and relatedness (feeling connected to others) are met, and psychoeducation, in this context, refers to the practice of providing individuals with information and education

specifically designed to support the fulfillment of these needs, thereby promoting intrinsic motivation and positive behavior change. When using SDT in psychoeducation, it is aimed to create an environment that fosters autonomy by offering choices, providing clear explanations, and respecting individuals' perspectives; supports competence by offering appropriate challenges and positive feedback; and cultivates relatedness by creating a sense of belonging and empathy. Thus psychoeducation was used to empower participants with knowledge and skills to reduce symptoms of PIU (obsession, lack of control, etc.) effectively. It involves educating the participants about the dangers of PIU, developing coping strategies, preventing relapse, involving families, improving self-esteem, enhancing self-awareness and planning for long-term management (Cathlin et al., 2024) this comprehensive approach helps clients understand their conditions, improve their coping skills, and foster a supportive environment, ultimately contributing to better treatment outcomes and overall well-being. Evidence from several controlled studies support the benefits of psychoeducational interventions for managing depression, obsessive-compulsive disorder, substance abuse, and borderline personality disorder (Di Lorenzo et al., 2024; Jibunoh et al., 2022). This suggests that psychoeducation treatment would benefit peer rejected adolescents with PIU.

2.2. Dialectical Behaviour Therapy

There is preliminary evidence that interventions with Dialectical behaviour therapy [DBT] can modify problematic internet use by identifying and managing cognitive distortions related to online behaviour, developing coping mechanisms, and promoting alternative activities to reduce excessive internet time by adolescents (Pluhar et al., 2020). DBT is an evidence-based form of psychotherapy used to treat a wide array of severe mental health disorders and alcohol addiction (Rizvi et al., 2024). "Dialectal" in dialectical behavioural therapy is a term that is focused on the belief that opposite thought and ideas can both create a balance. Individuals learn to validate their thoughts and emotions and also learn healthy coping skills to regulate emotions and develop appropriate behaviours. DBT was initially used to treat high-risk mental health disorders such as suicidal thoughts, self-harm behaviours, and borderline personality disorder, but its use has expanded to treat many types of mental health and substance use disorders [SUDs] (Mossini et al., 2024). Dialectical behaviour therapy is rooted in the belief that people with addiction do not have the skills to overcome stressful situations and, therefore, choose to engage in self-destructive behaviours such as drug and alcohol use (Gillespie et al., 2022). DBT focuses on validation and acceptance of the negative thoughts and feelings underlying the addiction. DBT believes that accepting ones thoughts and feelings, no matter how painful, can help people manage and work through difficult thoughts, emotions, and behaviours.

2.3. Theoretical Framework

This study is premised on Brand et al. (2016) interaction of Person-Affect-Cognition-Execution [I-PACE] theoretical framework. I-PACE explains the interplay between individual predispositions, emotional states, cognitive processes, and behavioural execution contributing to the development and maintenance of addictive internet behaviors including problematic internet use. Unlike other theories of internet use, this model provided an integrative theoretical framework concerning internet-related disorders (Brand et al., 2016) and posits that an individual's core characteristics, including personality, biopsychological constitution (e.g., early childhood experiences), social cognition, psychopathology and cognitive reactions in response to a situation (e.g., stress reactivity), constitute etiological factors involved in the development, maintenance, and relapse of different types of internet use disorders (e.g., excessive use of internet). In the I-PACE model, the predisposition factor refers to the core characteristics of the person and includes childhood experiences. In addition, the mediating factor refers to the reactions to situations, and it includes stress. Finally, the executive factor refers to a specific internet use disorder that may result, which includes PIU. The I-PACE model was updated to reflect recent studies and theoretical considerations (Brand et al., 2019), and the recent I-PACE model has undergone further revisions.

First, the addiction process was precisely defined by using recent empirical studies (Dempsey et al., 2019; Dong et al., 2019; Ioannidis et al., 2019; Ryu et al., 2018; Schneider, et al. 2018). Second, the mediating and moderating variables according to the addiction stage (early and later) were described. In particular, the addiction stage gradually increases, the relationship between affective and cognitive responses and addictive behavior becomes stronger, and the affective and cognitive responses evolve into cue reactivity and craving as a consequence of the conditioning process (Brand et al., 2019). Based on the I-PACE model, the study aims to provide intervention that would target problematic internet use from multiple aspects. Moreover, this study will also provide a theoretical basis for the prevention and intervention of smartphone addiction among college students.

2.4. The Aim and Hypotheses

The broad purpose of this study was to evaluate the effectiveness of Psychoeducation and Dialectical behavioural interventions in managing problematic internet use among peer rejected adolescents. Specifically, the study aimed to 1) examine the main effect of Psychoeducation and dialectical behavioural therapy in managing problematic internet use among peer rejected adolescents, 2) investigate the main effect of sex on problematic internet use among peer rejected adolescents, and 3) examine the main effect of parent's socio-economic status on problematic internet use among peer rejected adolescents.

The three null hypotheses postulated to guide the study was tested at .05 level of significance.

H1. There is no significant main effect of Psychoeducation and dialectical behavioural therapy in managing problematic internet use among peer rejected adolescents.

H2. There is no significant main effect of sex of gender on problematic internet use among peer rejected adolescents.

H3. There is no significant main effect of socio economic status on problematic internet use among peer rejected adolescents.

3. Method

3.1. Research Design

This study adopted pretest-posttest, control group quasi experimental design with a 3x2x2 factorial matrix (see Table 1). The columns consist of the treatments (Psychoeducation and dialectical behavioural therapy) and control group. On the other hand, the row was webbed with two moderating variables, namely; sex at two levels (male and female) and parents' socio-economic status.

Table 1

Schematic representation of treatment conditions

0 ₁	XA ₁	0 ₂
0 ₂	XA ₂	0 ₄
0 ₅	0 ₆	

Note. 0₁, 0₃ and 0₅ are pre-tests for the three groups; 0₂, 0₄, and 0₆ are post-tests for the three groups; XA₁ = Treatment with psychoeducation; XA₂ = Treatment with dialectical behavioural therapy; Control group (No treatment)

3.2. Participants

Out of the 90 participants in the study, the majority (66), representing 73.3%, were male, while 24 (26.7%) were female. In terms of age distribution, most participants (46; 51.1%) were between 10 and 13 years old, followed by 23 participants (26.6%) aged 14 to 17 years, and 21 participants (23.3%) who were 18 years or older. Regarding academic discipline, 37 participants (41.1%) were enrolled in commercial classes, 29 (32.2%) in arts classes, and 24 (26.7%) in science classes. In terms of socioeconomic status (SES), 42 participants (46.7%) were from middle SES backgrounds, 26 (28.9%) from high SES, and 22 (24.4%) from low SES households. Concerning religious affiliation, 45 participants (50%) identified as Christians, 40 (44.4%) as Muslims, while 50 participants (55.6%)

indicated adherence to other religions not specified in the questionnaire. These sociodemographic profiles of the participants are presented in Table 2.

Table 2
Sociodemographic Characteristics of Participants

<i>Variables</i>	<i>Frequency</i>	<i>Percentage</i>
Sex		
Male	66	73.3
Female	24	26.7
Age		
10-13	46	51.1
14-17	23	25.6
18 and above	21	23.3
Class		
Arts	29	32.2
Commercial	37	41.1
Science	24	26.7
Parents SES		
High	22	24.4
Middle	42	46.7
Low	26	28.9
Religion		
Christianity	45	50
Islam	40	44.4
Others	50	55.6

3.3. Study Area

The participants of the study were drawn from Ibadan North West Local Government Area, Oyo State, Nigeria. The Headquarters of the Ibadan North LGA is located at Agodi. In the North and East, the LGA is bounded by Akinyele and Lagelu LGAs respectively while in the West it is bounded by Ido, Ibadan South-West and Ibadan South-East LGAs. The choice of the study area was as a result of which consistently show that students in urban areas have significantly higher rates of internet usage compared to their rural counterparts, highlighting a significant "digital divide" where access to the internet is much more readily available in cities, leading to greater usage among urban student primarily due to better infrastructure and wider availability of internet services in urban environments (Hamza et al. 2019). This argument is in line with Odii et al. (2020) assertion that the social context of adolescence predicts their behaviours. In addition, a recent report by Afolabi et al. (2022) revealed a high prevalence of internet addiction among in-school adolescents in Ibadan. The students in public secondary schools in the LGA participated in the study. In the context of this study, a public school refers to secondary schools funded and operated by the government at the state or federal level, often charging minimal or no school fees. This is unlike private school that is administered and funded by private individuals, church, or other groups such as Non-Governmental Organisations [NGOs]. The choice of public schools was to ensure that the participants share similar characteristics – e.g., life experiences, socio-economic status amongst others.

3.4. Data Collection

With the letter of introduction from the Department of Counselling and Human Development Studies, Faculty of Education, University of Ibadan, the researcher approached the school principals who also gave their approval. Assent was obtained from parents of adolescents who were below 11 years, while adolescents from 18 years and above signed the consent form themselves. Similarly, only parents who gave responded to the peer rejection /peer acceptance

questionnaire were recruited for the study. Both the parents and the adolescents were assured that the information obtained from them would be confidential. All the students volunteered to participate in the study. They were informed about their right to withdraw (opt -out) from the study at any time they feel that their privacy or rights have been tampered with. Further, all the data collected were entered as codes to avoid linking any participants with their response. Multistage procedure was used to draw out the participants for the study. In the first stage, three public mixed secondary schools were randomly selected out of the twenty secondary schools located in Ibadan North Local Government Area. In the second stage, Kim and Kim (2017) Problematic Internet Use Questionnaire [PIUQ] was used to screen out 128 students who did not meet the first inclusion criteria (problematic internet use). Volunteers who scored between 25-50 in the Kim and Kim (2017) were purposely shortlisted and screened for peer rejection (criteria 11). Of the 177 who met criteria one, sixty -seven were excluded for not meeting criteria 2 were excluded remaining only 110 adolescents who met inclusion criteria I & 2 (problematic internet usage and peer rejection). In the final stage 110 adolescents who met inclusion criteria 1 & 2 were assigned to three intact classes. Thereafter, the three intact classes were randomly assigned into three treatment conditions: Psychoeducation (37), Dialectical Behavioural (36) and control groups (37). Of the 110, only data of ninety participants were analysed because 20 participants withdrew from the study for various reasons ranging from illness to loss of interest amongst other reasons.

3.5. Measures

Four standardized questionnaires were used for data collection. The questionnaire was divided into four sub sections. Section A was used to obtain information about the participants' socio-demographic characteristics (age, sex, school, and parent's socio-economic status).

3.5.1. Section B: Problematic internet use questionnaire

Section B consists of Nyikos et al. (2001) problematic internet use questionnaire. This questionnaire was adapted to screen the participants for the first inclusion criteria (problematic Internet use). The questionnaire was a 30 item which partly consisted of items from Young's (1998) Internet Addiction Test [IAT] scale. For every question, participants had to estimate how much the given statement was true for them on a scale between 1 (never) and 5 (always). Twenty Items which bothers on partners and household work were not relevant in the study it was therefore, expunged from the questionnaire. Only ten items were used for the study. Typical items include: How often do you feel tense, irritated, or stressed if you cannot use the Internet for as long as you want to; How often do you spend time online when you'd rather sleep? The participants' responses were categorised into four groups were created. Those with a score that was one standard deviation (9.85) below the mean score belonged to the no-problem [NP] group; those whose score was one standard deviation, at most, above the mean score belonged to the average-problem [AP] group; participants with a score that was more than one standard deviation above the mean score belonged either to the problem group [PG] (with a score less than two standard deviations above the mean) or to the significant-problem [SP] group (with a score more than two standard deviations above the mean). The participants with a score that was more than one standard deviation above the mean score and significant-problem group (with a score more than two standard deviations above the mean) were recruited for the study because they met the first criteria (problematic internet use). The instrument has satisfactory content and construct validity. The reliability index was $\alpha = .087$.

3.5.2. Section C: Internet Addiction Test [IAT]

Section C contained items of Kim and Kim (2017) Internet Addiction Test scale. It was used to assess the criterion variable (problematic internet use). The test consists of 20 items formulated in the form of questions about the impacts of the Internet use on everyday life, social life, productivity, sleep patterns and feelings. Typical items includes: "How often do you find that you stay online longer than you intended?: How often do your grades or schoolwork suffer because of the amount of

time you spend online?. After reading each statement carefully, based upon a 5-point Likert scale. The items were negatively worded so scoring was done in reverse form. The higher the score the higher the likelihood of problematic internet usage. The score range was classified as (6): 0–30: (lack of dependence on the Internet); 31–49: (a slight degree of dependence on the Internet), 50–79 (moderate degree of dependence on the Internet), and 80–100 (high degree of dependence on the Internet). The instrument has satisfactory content and construct validity. The reliability index was $\alpha = .82$.

3.5.3. Section D: Peer Rejection Scale

Parents of volunteered participants' completed Peer Rejection Scale by Aaron (2015). It is a 30 item self-report questionnaire which measures etiological factors that may be contributing to peer rejection. Such factors include physical attractiveness), externalizing behaviors, genetic makeup, language patterns/usage, academic performance, social awareness, and the presence of psychopathology. Parents rated the extent to which statements concerning their children's appearance, speech, problem behaviours, academics, and social skills were accepted or rejected using Likert format as follows: not true at all (1), somewhat true (2), true an average amount (3), true most of the time (4) and true all of the time (5). Typical items in the scale includes: Generally liked by other children, Rather solitary, prefers to play alone (a) The popular group consisted of all of those children who received a social preference score of greater than 1.0, a like most standardized score of greater than 0, and a like least standardized score of less than 0. (b) The rejected group consisted of all of those children who received a social preference score of less than -1.0. The instrument has satisfactory content and construct validity. The reliability index was $\alpha = .79$.

3.5.4. Section D: Socio-Economic Status Scale [SES]

The parents socio-economic status Scale developed by Salami (2000) was used to measure the participants' parents socio-economic. The SES scale has sections on educational qualification (14 points) and occupational status (10 points). The two sections were summarised to indicate the participants' parents' socioeconomic status. The highest obtainable score was 24 while the least obtainable score was four. On the basis of the scores, the respondents were classified into lower socio-economic status (1-8), middle socio-economic status (9-16), and higher socio-economic status (17-24). However, for purpose of analysis only two categories (HSE and LSE) were use. The instrument has satisfactory content and construct validity. The reliability index was $\alpha = .88$.

3.6. Interventions

Participants in group one was exposed to psychoeducation therapy while their counterpart in group 2 was exposed to Dialectical Behavioural therapy. Participants in the control group were not exposed to any intervention but the group served as a comparison group. Baseline and post intervention data were collected from the 3 groups. Each treatment lasted for ten weeks (one session of 2 hours per weeks). Psychoeducation intervention was adapted from Salah Elsayed Ghazy et al. (2022). Psychoeducation was designed to improve the participants' understanding of problematic internet use and to help them understand the negative consequences of being problematic internet user. The researcher who is also a counsellor taught how PIU can prevent them from actualisation of their life goals. They were also equipped with skills of value clarification, interpersonal communication, boundary setting, decision-making, conflict resolution, and emotional awareness (Salah Elsayed Ghazy et al., 2022). The aim was to address relationship skill deficits and a preventive function by supporting the participants' acquisition of the skills required for living a meaningful life.

Dialectical behaviour therapy was used on experimental group 2 to help them manage their emotions and improve their relationships. Dialectical Behaviour Therapy session enabled therapist to teach the participants how to practice and apply skills related to mindfulness, emotion regulation, distress tolerance, and interpersonal effectiveness, by using a "diary card" to track their

experiences and progress, with the goal of managing difficult emotions and behaviours while improving their quality of life. The DBT session was combined with group skills training sessions to make it more comprehensive. The researcher gave the clients specific take home assignments to practice the learned skills in daily life. The sessions were concluded by encouraging the participants' to manage their emotions in stressful situations without responding with harmful behaviours. The participants in the 3 groups were appreciated. Thereafter therapy was terminated.

3.7. Data Analysis

Data were collected, coded, tabulated and subjected to statistical analysis. Statistical analysis was performed by Statistical Package for Social Sciences (SPSS version 20.0). Descriptive statistics were applied in the form of mean and standard deviation. Analysis of Covariance (Ancova) was used to compare the means of multiple groups (psychoeducation, DBT and control) on a dependent variable (problematic internet use) while statistically controlling for the influence of continuous variables (covariates) that may vary between groups, essentially allowing for a more accurate comparison by adjusting for these confounding factors. Bonferroni test was used as a post-hoc procedure to correct the family-wise error rate following analysis of variance (ancova). Bonferroni test was used to determine the directions of differences of significance identified. Statistical significance was considered at p -value $p \leq .05$.

3.8. Control of Extraneous Variables

The researcher vigorously controlled for extraneous variables which have the potential of contaminating the outcome of study. One of the ways utilized to control the extraneous variable was through randomization of groups into treatment conditions. Moreover, in order to decrease the impact of confounding variables on the study the researcher made use of counterbalancing (rearranging of items in the questionnaire at the post intervention phase) This was to guard against instrument habituation (decline in responding to a repeated stimulus). Finally, the statistical analysis (ANCOVA) utilised for this study adjusted the outcome (dependent variable) for the impact of other variables that might affect it, allowing for a clearer view of the relationship between the main variables of interest and not the extraneous variables.

4. Results

Normality was assessed using the Kolmogorov-Smirnov test to determine whether the dataset was normally distributed for conducting the statistical analysis (ANCOVA). This step was necessary to avoid inaccurate results and unreliable conclusions. The results showed that the p -values for the Psychoeducation group ($p = .263$), Dialectical Behaviour Therapy group ($p = .115$), and Control group ($p = .214$) were all greater than the significance level of .05. Therefore, it was assumed that the data were appropriately normally distributed.

4.1. Effect of Psychoeducation and Dialectical Behavioural Interventions in Managing Problematic Internet Use

Hypothesis one predicted no significant main effect of Psychoeducation and Dialectical behavioural interventions in managing problematic internet use among in-school adolescents in Ibadan North West Local Government. To test this hypothesis, Analysis of Covariance (ANCOVA) was adopted to analyse the post-test scores of the participants on their problematic internet use behaviour using the pre-test scores as covariate to ascertain if the post experimental differences were statistically significant. The summary of the analysis is presented in Table 3.

Table 3

Summary of Analysis of Covariance (ANCOVA) showing the main effect of effect of treatments, sex and socio-economic status in managing problematic internet use among Peer rejected

	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Corrected Model	15344.341	3	5114.780	252.949	<.001	.917
Intercept	45.284	1	45.284	2.239	.139	.031
Pretest problematic internet use	329.374	1	329.374	16.289	<.001	.191
Treatment	14531.245	2	7265.622	359.318	<.001	.912
Socio Economic status	945.548	1	945.548	4.191	.044	.056
Sex	1328.183	1	1328.183	6.113	.016	.080
Treatment * Socio-economic status	426.650	2	213.325	16.740	<.001	.337
Treatment * Sex	294.727	2	147.363	9.619	<.001	.226
Socio-economic status * Sex	40.220	2	20.11	1.669	.311	.020
Treatment * Socio-economic status * Sex	4.142	1	17.071	1.418	.231	.000
Error	1395.220	69	20.221			
Total	140933.000	73				
Corrected Total	16739.562	72				
R Squared = .917 (Adjusted R Squared = .913)						

Note. Dependent Variable: Posttest source.

Table 3 reveals that there was a significant main effect of treatment $F_{(2,69)} = 359.318, p < .01$, partial $\eta^2 = .912$. Table 3 revealed the effect size of 91.2. This implies that 91.2% of the total observed (Adjusted R Squared = .913) in post problematic internet use among peer rejected in the ANCOVA model was due to the significant main effect of the interventions. Therefore, hypothesis one was rejected. In order to identify the magnitude of the significant main effect across the groups, Bonferroni's test was used to provide a pairwise comparison of the means as presented in Table 4.

Table 4

Bonferonni Pair-wise comparison showing the significant differences among various treatment groups and control group

Treatment (1)	Treatment (2)	Mean Difference (I-J)	SE	p
Psychoeducation (mean = 31.151)	Dialectical behaviour therapy (DBT)	-5.142 ^{a,b}	4.271	.777
	Control group	7.222 ^{a,b}	4.001	.310
Dialectical behaviour therapy (mean = 27.859)	Psychoeducation	5.142 ^{a,b}	4.271	.777
	Control group	10.281 ^{a,b}	4.332	.055
Control group (mean = 58.131)	Psychoeducation	-7.222 ^{a,b}	4.001	.310
	Dialectical behaviour therapy (DBT)	-10.281 ^{a,b}	4.332	.055

Table 4 reveals that after controlling for the effect of pre-problematic internet use, experimental group II (Mean = 27.859) displayed lowest problematic internet use, followed by experimental group I (Psychoeducation) (Mean = 31.151) and control group (Mean = 58.131). This order is represented thus: DBT > PS > CG. This implies that DBT was more potent in managing problematic internet use among peer rejected adolescents' in that group than psychoeducation. The coefficient of determination overall indicates the differences that exist in the group in the variation of problematic internet use behaviour among peer rejected adolescents.

4.2. Significant Main Effect of Sex in Managing Problematic Internet Use

Hypothesis two predicted no significant main effect of sex in problematic internet use among peer rejected adolescents. To test this hypothesis, Analysis of Covariance (ANCOVA) was adopted to analyse the problematic internet use post-test scores of the participants using the pre-test scores as covariate to ascertain the level of problematic internet use accounted for by sex. The summary of the analysis was presented in Table 2. It revealed a significant main effect of sex on problematic internet use of peer rejected adolescents $F_{(2,69)}=9.619, p < .01$, partial $\eta^2 = .226$. Table 2 revealed effect size of .226. The implication is that sex accounted for 22.6% of the total observed (Adjusted R Squared = .913) in post problematic internet use among peer rejected students in the ANCOVA model. The null hypothesis was therefore, rejected. In order to identify the magnitude of the significant main effect across the groups, Bonferroni's test was used to provide a pairwise comparison of the means as presented in Table 5.

Table 5

Bonferonni Pair-wise comparison showing the significant difference based on sex

Sex	Sex	Mean Difference	Std.Error	Sig.
Female (mean = 39.17)	Male	7.570	2.013	.044
Male (mean = 46.74)	Female	-3.812	1.310	.056

Table 5 revealed that after controlling for the effect of pretest problematic internet use behaviour, female participants displayed lower (*Mean* = 39.17) problematic internet use than their male counterpart (*Mean* = 46.74). This implies that the treatment was more effective for the when compared with their male counterpart.

4.3. Significant Main Effect of Parents' Socio-economic Status on Problematic Internet Use

The third hypothesis which predicted no significant main effect of parents' socio-economic status on problematic internet use among peer rejected adolescents. To test this hypothesis, Analysis of Covariance (ANCOVA) was adopted on the post-test scores of the participants using the pre-test scores as covariate to ascertain the level of problematic internet use accounted for by levels of parents' socio-economic status. The summary of the analysis was presented in Table 3. It shows that there was a significant main effect of parents socio-economic status on problematic internet use of peer rejected adolescents $F_{(1,69)} = 4.191, p < .05$, partial $\eta^2 = 0.056$. Table 3 revealed the effect size of 0.056. This implies that 5.6 % of the total observed (Adjusted R Squared = .913) in post problematic internet use among peer rejected in the ANCOVA model was due to the significant main effect of the interventions. Therefore, hypothesis three was rejected. In order to identify the magnitude of the significant main effect across the groups, Bonferroni's test was used to provide a pairwise comparison of the means as presented in Table 6.

Table 6

Bonferonni Pair-wise Comparison showing the significant difference among socio-economic status

Socio-economic status (SES)	SES	Mean Difference	Std.Error	Sig.
Low socio-economic status (mean = 39.661)	High socio-economic status	3.893	1.311	.056
High socio-economic status (mean = 43.554)	Low socio-economic status	-2.642	1.220	.069

Table 6 revealed that after controlling for the effect of pretest problematic internet use participants who were from low SES (*Mean* = 39.661) gained more in therapy as evidenced in lower mean score than their counterpart from high SES (*Mean* = 43.554). This implies that the treatments were more effective for the participants from low social economic status when compared with their counterpart from high socioeconomic status.

5. Discussion

The first finding from this study revealed that there was a significant main effect of treatments (Psychoeducation and Dialectical Behaviour therapy) on problematic internet use among peer rejected adolescents in Ibadan North Nigeria. The implication of this finding is that the two interventions modified problematic internet use among the participants. This outcome corroborate with the finding of Jibunoh et al. (2022) who found that psycho-education was effective in reducing anxiety symptoms among Nigerian adolescents. However, unlike the current study, Jibunoh et al. (2022) used children diagnosis of anxiety whose age ranged between 13–16 years. Similarly, Salah Elsayed Ghazy et al. (2022) reported that Psychoeducation had a positive effect on reducing the psycho-social problems of internet addicted nursing students. Though similar result was obtained, however, Salah Elsayed Ghazy et al. (2022) used nursing students that were older than adolescents used in the current study. There are also cultural differences between Nigeria and Egypt even though both countries are in Africa continent.

The outcome obtained from this study is plausible because psychoeducation intervention combines the elements of cognitive-behaviour therapy, group therapy, and education. The focus of PE was on strengthening the health, collaboration, coping capacity, and empowerment of students with PIU Psychoeducation would have assisted the participants to identify their triggers and develop healthy coping strategies (breathing exercises, mindfulness techniques or engaging in a creative) to manage them as they arise. Psychoeducation also acted as a powerful tool in dispelling misconceptions about PIU and carved out a realistic, actionable path towards healthy lifestyle. Psychoeducation can also help reduce feelings of stigma and shame by showing participant's that addiction struggles are common and do not determine their value or worth in society. Psychoeducation therapy also assisted the participants in reducing feelings of guilt and shame.

Further, Dialectical Behavioural therapy was also more effective in modifying problematic internet use of peer rejected adolescents exposed to treatment. This outcome supports previous findings of Pluhar et al. (2020) who applied DBT to a 15-year-old male individual with a history of dysregulated use of the Internet in the categories of gaming, pornography, information-bingeing, and social media. The result showed that DBT intervention improved targeted self-regulation behaviours of reducing nighttime screen use and decreasing frequency of pornography use and improved academic improvement, as he was able to complete homework more effectively without being distracted by devices. They concluded that the application of this adapted DBT was potentially helpful in treating adolescents' excessive and dysregulated use of interactive media and electronic devices. Similarly, Gillespie et al. (2022) reported that DBT contributed positively to the quality of life of outpatients from community mental health in the Republic of Ireland. The possible reason for this outcome could be because DBT focuses on teaching people skills to manage intense emotions, cope with challenging situations, and improve their relationships. The mindfulness aspect of DBT teaches people to pay careful attention to the nature, quality, and volume of their thoughts. Moreover, participants in DBT group obviously learnt how to swap their distorted thoughts with more productive ones which made them to be more willing to adopt a healthy life style without resorting to using internet (Kothgassner et al., 2021).

Finding from the second hypothesis show that there was significant main effect of sex on problematic internet use among peer rejected adolescents was rejected. This implies that there was a significant difference in problematic internet use behaviour of adolescents based on their sex. Female participants gained more in the treatment than their male counterpart. This outcome corroborates that of Pitschel-Walz et al. (2007) who reported that females benefitted significantly better from psychoeducation than the male participants in their study. There is evidence that that biological and sociocultural differences between males and females can significantly affect the diagnosis of diseases, clinicians' decisions about treatment, scope of treatment, and the incidence and manifestations of disease (Mauvais-Jarvis et al., 2020; Regitz-Zagrosek et al., 2023).

The third finding from this study is a significant relationship between parents SES and problematic internet use. It further showed that participants who were from low SES gained more

in therapy than their counterpart from high SES. By implication, coming from low socio-economic status would reduce the likelihood of having problematic internet use behaviour among. This finding corroborates the report of Petruzella et al. (2020) which revealed that parents significant relationship between SES and risky internet use, gambling and substance use among high school adolescents drawn from high school in a Czech from a Structurally Disadvantaged Region in Central Europe. Scholars have not yet reached an agreement in the relationship between family socioeconomic status and problematic internet use. One study showed a significant positive correlation between family socioeconomic status and digital addiction, as evidenced by the correlation between higher family socioeconomic status and a higher propensity to become addicted to the Internet (Mollborn et al., 2022). Another study also showed that students from high family socioeconomic status scored significantly higher on the tendency to digital addiction than students from low family socioeconomic status (Chen et al., 2025). However, some studies pointed to the opposite conclusion that family socioeconomic status has a significant negative correlation with digital addiction (Li et al., 2024). This result may be because an individual is in a high socioeconomic status household, which will reduce their reliance on online social activities. In contrast, households with low socioeconomic status can increase their dependencies on online social activities (Li et al., 2024). It can be concluded that the socioeconomic status of the family is a prominent influence on digital addiction.

6. Limitations of the Study

The findings of this study should be seen in light of some limitations. The first is reliance on self-reported data about problematic internet usage which can be inaccurate due to participants' tendency to underreport or over report due to social desirability factors. Moreover, the questionnaires used may also not have fully captured the complex factors contributing to problematic internet use such as underlying psychological issues or social context. The sample size used to obtain the prevalence level of problematic internet use adolescents in Nigeria is too small. The sample may not be representatives of Nigerian adolescents with problematic internet use. However, while these shortcomings exist, it did not invalidate the outcome of this study because adequate measures were used to control for all confounding variable as such generalization of the outcome can be made bearing in mind the limitations.

7. Recommendations

Based on the outcomes of this study, several recommendations are suggested to address problematic internet use (PIU) among adolescents. Counselling psychologists are encouraged to incorporate both Psychoeducation and Dialectical Behavioural Therapy (DBT) into treatment plans for managing addictive behaviours, particularly PIU. In designing these interventions, psychologists and other stakeholders should take into account participants' sex and parental socioeconomic status to optimize treatment effectiveness. School counsellors should also organize seminars and workshops for students to promote awareness of the productive use of the internet and the risks associated with excessive use. Similarly, workshops can be arranged for parents to help them establish clear boundaries and expectations around screen time, support their children in developing healthy digital habits, maintain open communication, and utilize parental control tools to monitor and limit access to inappropriate content. Counselling psychologists should further encourage students to engage in alternative, enriching activities such as sports, clubs, hobbies like art or music, community service, reading, outdoor recreation, skill-building, and spending quality time with family and friends. Additionally, students should be encouraged to seek professional help when they feel that their internet use is becoming unmanageable. Lastly, this study highlights the need to incorporate these two interventions—Psychoeducation and DBT—into the training curriculum of counselling professionals to equip them with evidence-based tools for managing addictive behaviours effectively.

8. Conclusion

Despite the potential benefits the Internet has, it is prone to excessive and uncontrolled use resulting to problematic internet use. This study investigated the effectiveness of Psychoeducation and Dialectical Behavioural Therapy in managing problematic internet use among peer rejected adolescents in Nigeria. The outcome provided empirical evidence to suggest that the two interventions were potent in modifying the domains of PIU (obsession, neglect, and control disorder), however, DBT was more potent than psychoeducation. Similarly, there was a differential treatment outcome due to the participants' sex and their parents' socio-economic status. The results suggest that the female participants gained more in the therapy than their male counterpart. Similarly, participants from lower socio-economic status background gained more than those from high SES. These results could serve as the first step for policymakers towards implementing early awareness campaigns to look at the problem of PIU more in-depth and come up with efficient actions to avoid it among in-school adolescents.

9. Suggestions for Future Research

It is suggested that future study should utilize large sample size that will include representative sample of Nigeria adolescents irrespective of location, religion, parents' socioeconomic status, and gender. Such sample size will produce objective prevalence which would be more suitable for generalizing prevalence of problematic internet use in Nigeria. Moreover, future studies should use other interventions to find out if those ones have superior outcomes than the ones used in this study. The participants were drawn primarily from Oyo State, future studies should compare results from other states to provide more insight on therapeutic intervention. Future research can also include comprehensive psychological assessments to explore potential underlying factors contributing to problematic internet use.

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Data availability: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declaration of interest: No conflict of interest is declared by author.

Ethics statement: The researcher obtained the consent of the school principals, the students and their parents before undertaken this study. The researcher brought a letter of introduction from the Department of Counselling and Human Development Studies, Faculty of Education, University of Ibadan Nigeria where she currently works. The researcher adhered to all ethical principles (respect for autonomy (informed consent), beneficence (doing good), non-maleficence (avoiding harm), and justice (fairness), guiding the research of this nature.

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