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Assertiveness and Mental Well-Being Among Adolescents Living in Institutional Care in Puducherry, India: A Cross-Sectional Study

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Abstract

Background: Assertiveness has been proposed as a resource supporting adolescent mental well-being, but this relationship remains unexamined among institutionalized adolescents in India. This study assessed the association between assertiveness and mental well-being among adolescents in institutional care in Puducherry, India, and examined correlates of each construct.

Methods:A cross-sectional study was conducted among 150 adolescents (n = 150) aged 13–16 years residing in institutional homes in Puducherry. Assertiveness and mental well-being were assessed using the Rathus Assertiveness Scale and the modified Warwick-Edinburgh Mental Well-Being Scale. Associations were examined using Pearson and Spearman correlations and linear regression, adjusted for age, gender, admission type, length of stay, reason for institutionalization, educational status, and school performance.

Results: The mean assertiveness score was 92.80 (SD 15.00); 85.3% were moderately assertive. The mean mental well-being score was 32.03 (SD 9.54), with 59.3% classified as having inadequate well-being according to the study-defined descriptive cutoffs. Assertiveness was not significantly correlated with mental well-being ($r = -0.110$, $p = 0.180$), and the adjusted association remained non-significant ($\beta = -0.074$, 95% CI: -0.198 to 0.051; $p = 0.245$). No characteristic independently predicted assertiveness. The model for mental well-being was significant ($R2 = 0.148$, $p = 0.0016$): being an orphan, parental separation/divorce, and parental conflict as reasons for institutionalization were associated with lower well-being than poverty-related admission. Gender was significantly associated with well-being at the bivariate level.

Conclusion: Institutionalized adolescents showed a substantial burden of inadequate mental well-being that was unrelated to assertiveness but strongly patterned by the circumstances of institutionalization, underscoring the need for interventions addressing relational and circumstantial adversity alongside individual skills-based approaches.

Introduction

Adolescence is a crucial time of physical, cognitive, and psychosocial development, with a fast-paced neurobiological maturation that aligns with the development of autonomy, self-identity, and interpersonal skills[1]. During this time, adolescents learn how to regulate their emotions, make decisions, and communicate effectively, as well as how to express their needs, opinions, and boundaries in a growing network of social interactions[1]. Psychosocial adjustment during adolescence may have implications for later functioning, highlighting the importance of factors that support healthy adolescent development[2].

Mental health is an integral part of adolescent health, not just the absence of psychiatric disorders, but also the presence of positive psychological functioning, emotional balance, self-esteem, and ability to cope with life's stresses[3]. One of the most widely used scales in this field is the Warwick-Edinburgh Mental Well-Being Scale which operationalizes mental well-being as positive affect, satisfying

interpersonal relationships and positive functioning, both hedonic and eudaimonic[4]. Children from a family with conflicts and poverty, and poor care may have heightened emotional and psychosocial problems[5]. This vulnerability is the reason for looking at mental well-being in particular with adolescents who have found themselves in such situations that they have had to be cared for outside the family.

Institutional care is defined as a residential placement for children and adolescents that cannot live in a stable family setting, usually due to death, parental separation or divorce, family conflict, poverty, or poor care giving[6]. Adolescents in institutional care often face challenges with family relationships, separation from parents/caregivers, less individualized attention, and changes in schedules, as well as social stigma and uncertainty about the future[6]. Studies from institutionalized care in India suggest that children and adolescents might have emotional and behavioral issues, and that early adversity and disruption of attachment can impact psychosocial functioning[7]. Children in residential care institutions have been found to have emotional and behavioural sequelae associated with early trauma and attachment disruption as well as low self-esteem in social, academic and general domains[8].In institutional settings, the adolescent is in regular contact with peers, caregivers, teachers, and institutional staff and needs to communicate needs, express views, and respond appropriately to interpersonal situations. Hence, interpersonal skills are especially relevant to the psychosocial adjustment of adolescents living away from their families, especially in institutional settings where the level of individual attention and care is reduced[9,10].

Assertiveness is defined as expressing ideas, feelings, needs and preferences directly and honestly while respecting the rights and feelings of others[11]. Assertive behavior is believed to help in effective communication, setting boundaries, decision making, and constructive interaction with interpersonal conflict[12]. There is a possible theoretical relationship between assertiveness and mental health. Assertiveness training for early adolescents (aged 10–13) has shown reductions in total difficulties on standardized behavioural screening tools and increases in assertiveness scores, indicating that the ability to express oneself appropriately is linked to overall psychosocial functioning in this age group[13]. Overall, these findings indicate that good self-expression can improve an adolescent's feelings of control and interpersonal competence, which could lead to less frustration and more adaptive coping; however, most of the evidence is intervention-based, and the relationship is not well supported and is not strong or causal.

This relationship will not be simple with institutionalized adolescents, as it can be influenced by contextual factors such as age, gender, cause of institutionalization, length of time spent in the institution, educational context and previous family adverse situations. Adolescent mental health is a significant and under-recognized public health issue in India, and family adversity, poverty, school-related stressors, and caregiver-related stressors are responsible for psychosocial problems. Adolescents in institutional care, however, are still relatively under-researched, especially as regards positive psychological outcomes, including mental health and interpersonal skills.However, few studies that specifically examine the link between assertiveness and mental health among adolescents in

institutional care, and evidence from India is still limited, especially among adolescents in institutional care. In addition, the psychosocial dimensions of mental well-being among institutionalized adolescents might vary by individual and/or by institutionalization circumstances, and therefore such adolescents should not be considered a homogeneous group for research or planning for interventions. Insight into the assertiveness and mental health of adolescents in institutional care and the connection between these two concepts could be useful in the identification of psychosocial needs of this population. The aim of this study was to evaluate the relationship between assertiveness and mental health of adolescents in institutional care in Puducherry, India. A secondary aim was to investigate the relationships between sociodemographic, institutional, and educational factors and assertiveness and mental health of these adolescents.

Methods

Study design and setting

A quantitative, cross-sectional study design was conducted to assess assertiveness and mental well-being among adolescents living in institutional care in Puducherry, India. The study was conducted in one selected school in Puducherry, India, which was attended by adolescents residing in institutional care. As the study was conducted in a single school, clustering across multiple schools was not applicable. The study population comprised adolescents residing in institutional care facilities in Puducherry. The study was designed to assess the levels of assertiveness and mental well-being and to examine the relationship between the two constructs, as well as their associations with selected sociodemographic and institutional characteristics. Data were collected during **May to July 2026** from eligible adolescents residing in the selected institutional homes.

Sample size and sampling

The sample size was estimated using the standard formula for estimating a population proportion, $n = Z^2pq/d^2$. Based on a previous Indian study using the same Rathus Assertiveness Scale, which reported that 75% of adolescents were moderately assertive[14], this proportion ($p = 0.75$) was taken as the anticipated prevalence. With a 95% confidence level ($Z = 1.96$) and an absolute precision of 7%, the minimum required sample size was calculated as 147 participants. A sample of 150 adolescents was therefore recruited, providing adequate precision for estimating the prevalence of assertiveness categories in the present institutionalized population.The participants were determined according to the study protocol and feasibility of recruitment from the selected institutional homes in Puducherry. Because the study used convenience sampling, the achieved sample represents the accessible study population rather than a probability sample of all adolescents living in institutional care in Puducherry.

Study population and participants

The target population comprised adolescents residing in institutional care in Puducherry. The accessible population consisted of adolescents residing in the selected institutional homes during the study period. Adolescents were eligible for participation if they were aged 13–16 years, were residing in an institutional care setting at the time of data collection, and were able to understand and respond to the study questionnaire. Adolescents who were unable to complete the questionnaire because of a documented cognitive or communication difficulty, or who were unavailable during the data-collection period, were excluded The final analytical sample comprised 150 adolescents. Participant recruitment was performed using a convenience sampling technique, whereby eligible adolescents available in the selected institutional homes during the study period were invited to participate.

Study variables

The primary study variables were assertiveness and mental well-being. Assertiveness was specified as the primary explanatory variable and mental well-being as the primary outcome for the principal analysis. Both were analysed as continuous total scores to retain the information contained in the original measurement scales. The following participant characteristics were included as covariates in the analyses: age, gender, admission type, length of stay in the institutional home, reason for institutionalization, educational status, and school performance. These variables were specified a priori based on their potential relevance to adolescent psychosocial well-being. Age was recorded in completed years and analysed as a continuous variable, whereas the remaining characteristics were analysed as categorical variables.

Data collection instrument

Data were collected using a structured questionnaire consisting of three sections.

Section A: Sociodemographic and institutional characteristics: Section A collected information on age, gender, admission type, length of stay in the institutional home, reason for staying in the institutional home, educational status, and school performance. These variables were selected a priori because they represented demographic, educational, family-related, and institutional characteristics potentially relevant to adolescent psychosocial well-being.

Section B: Rathus Assertiveness Scale [15] : Assertiveness was assessed using the Rathus Assertiveness Scale, comprising 30 items. Each item was scored on a five-point response scale from 1 to 5. The scoring system used in the study assigned the following values to positively worded items: Always = 5, Mostly = 4, Sometimes = 3, Rarely = 2, and Never = 1. Negatively worded items were reverse scored. Items 1–15 were identified as positive items and items 16–30 as negative items in the study instrument. The final assertiveness score was calculated as the sum of all 30 item scores, giving a possible range of 30–150, with higher scores representing greater assertiveness. The total scores were classified as follows: 30–70 indicates less assertiveness, 71–110 denotes moderate assertiveness, and 111–150 signifies

high assertiveness. The internal consistency of the assertiveness scale in the present sample was assessed using Cronbach's alpha. The observed alpha coefficient was 0.872, indicating good internal consistency.

Section C: Modified Warwick–Edinburgh Mental Well-being Scale [16] : Mental well-being was assessed using the Modified Warwick–Edinburgh Mental Well-being Scale, comprising 14 items. Each item was scored on a five-point frequency scale: None of the time = 1, Rarely = 2, Some of the time = 3, Often = 4, and All of the time = 5. The total mental well-being score was calculated by summing the 14 item responses, producing a possible score range of 14–70, with higher scores representing better mental well-being. For descriptive reporting, the total scores were categorized a priori into three levels: 14–30 as inadequate mental well-being, 31–50 as moderately adequate mental well-being, and 51–70 as adequate mental well-being. These cutoffs were defined a priori for descriptive purposes in the present study and have not been validated against clinical outcomes. The continuous total score was used for the primary inferential analyses. The continuous total score was used for the primary inferential analyses. Internal consistency was assessed using Cronbach's alpha, which was 0.926 in the present sample, indicating excellent internal consistency.

Scale reliability

The internal consistency of the study instruments was assessed using Cronbach’s alpha. In the present sample, the Modified Warwick–Edinburgh Mental Well-being Scale demonstrated excellent internal consistency (Cronbach’s α = 0.926), while the Rathus Assertiveness Scale demonstrated good internal consistency (Cronbach’s α = 0.872).

Data collection procedure

Eligible adolescents were identified in the participating institutional homes, with permission from the relevant institutional authorities. Eligible participants were informed about the purpose of the study, the procedures, the voluntary nature of participation, and the confidentiality of the study in terms that were understandable to them, given their age and level of understanding. Ethical procedures appropriate for research with minors were followed, since the participants were adolescents. Authorized authorities of the participating institutional homes granted permission to approach and recruit adolescents. Each eligible adolescent was told in language appropriate to his/her age and level of understanding the purpose of the study, what it involved, that participation was voluntary, that it was confidential, and that he or she could refuse to participate or withdraw at any time without any consequence. Prior to the questionnaire administration, written informed assent was taken from each adolescent. As per institutional and ethical norms, consent was also obtained from the legally authorized representative responsible for the adolescent, where required. The study only included adolescents who had consent and assent procedures performed as required.

The questionnaire was conducted in an environment where there was some degree of privacy and there was not a lot of other residents or staff around during the completion of the questionnaire. Participants were asked to answer the questions on their own and told that participation was voluntary and they could refuse to answer or stop at any time without consequences. Completed questionnaires were examined for completeness, coded with unique study identification numbers and entered into the statistical dataset.

Quality control and data management

Data were checked for completeness, consistency, and valid ranges before statistical analysis. Item-level responses were examined to identify invalid values and missing observations. Total scores were independently checked against the corresponding item responses to ensure accurate scoring.

Potential sources of bias

Several measures were incorporated to minimize potential sources of bias. A standardized structured questionnaire was used for all participants to maintain consistency in measurement. The same scoring procedures were applied to all participants, and the continuous scale scores were verified against item-level responses. Selection bias could not be completely excluded because convenience sampling was used. Consequently, adolescents who were available and willing to participate may differ from those who were unavailable or declined participation. Information bias was minimized by using standardized instruments and administering the questionnaire under conditions intended to support privacy. Because assertiveness and mental well-being were measured using self-reported responses, social desirability and response bias remain possible. Potential confounding was addressed during analysis by prespecifying age, gender, admission type, length of stay, reason for institutionalization, educational status, and school performance as covariates in the multivariable models.

Statistical analysis

Statistical analyses were performed using Stata version 19.5 (StataCorp LLC, College Station, TX, USA). All statistical tests were two-sided, and $P < 0.05$ was considered statistically significant. Categorical variables were summarized using frequencies and percentages, while continuous variables were summarized using means and standard deviations and, where appropriate, medians, interquartile ranges, and observed ranges. Internal consistency of the assertiveness and mental well-being scales was assessed using Cronbach's alpha. The associations between continuous assertiveness and mental well-being scores were examined using Pearson's correlation coefficient, with Spearman's rank correlation coefficient used as a non-parametric sensitivity analysis. Simple linear regression was used to estimate the unadjusted association between assertiveness and mental well-being, followed by multivariable linear regression with mental well-being score as the dependent variable and assertiveness score, age, gender, admission type, length of stay, reason for institutionalization, educational status, and school performance as covariates. Age was entered as a continuous variable, while categorical variables were

entered using indicator variables with male, care admission, ≤ 5 years of institutional stay, poverty, middle school, and poor school performance as the respective reference categories. Multivariable linear regression was also used to examine factors associated with assertiveness, with assertiveness score as the dependent variable and the same covariates. Bivariate comparisons of continuous outcome scores across participant characteristics were performed using independent-samples *t* tests for two-group comparisons and one-way analysis of variance for comparisons involving more than two groups when parametric assumptions were satisfied; Mann–Whitney U and Kruskal–Wallis tests were used as non-parametric alternatives when appropriate. The assumptions of linear regression were assessed by examining linearity, residual distributions, influential observations, multicollinearity, and homoscedasticity. Multicollinearity was assessed using variance inflation factors, and heteroscedasticity was assessed using a formal test. Because evidence of heteroscedasticity was identified, heteroscedasticity-robust standard errors were used in the final multivariable regression models. Regression results are presented as regression coefficients with corresponding 95% confidence intervals and *P* values.

Missing data

The completeness of each study variable was examined before analysis. All 150 participants completed all items on both scales with no missing responses, and therefore no imputation was required.

Ethical considerations

Participants were informed about the purpose and procedures of the study, their right to decline participation or withdraw, and the measures taken to maintain confidentiality. No personal identifying information was included in the analytical dataset. Data were used solely for research purposes and were handled in accordance with the requirements of the approving ethics committee.

Results

Sociodemographiccharacteristics of participants

Table 1 presents the sociodemographic and institutional characteristics of the 150 participants included in the study. The participants were adolescents aged 13–16 years. The largest proportion were 15 years old (33.3%, n = 50), followed by those aged 13 years (30.7%, n = 46) and 14 years (26.0%, n = 39), while participants aged 16 years constituted the smallest group (10.0%, n = 15). More than half of the participants were male (56.7%, n = 85), whereas 43.3% (n = 65) were female. Regarding admission type, education-related admission was the most common (42.7%, n = 64), followed by care (24.7%, n = 37), safety (21.3%, n = 32), and parent conflict (11.3%, n = 17). Regarding length of stay, 44.0% (n = 66) had been institutionalized for ≤ 5 years, 38.7% (n = 58) for 6–10 years, and 17.3% (n = 26) for > 10 years. Thus, most participants had experienced institutional care for 10 years or less. The most frequently reported reason for institutionalization was poverty (36.7%, n = 55), followed by being a semi-orphan (34.7%, n =

52). Parents' separation or divorce accounted for 14.7% (n = 22), while 14.0% (n = 21) were orphans. In terms of educational status, 35.3% (n = 53) were attending higher secondary school, 34.7% (n = 52) were in middle school, and 30.0% (n = 45) were in high school. Regarding school performance, nearly half of the participants were categorized as having average performance (48.7%, n = 73), followed by good performance (30.0%, n = 45) and poor performance (16.7%, n = 25); only 4.7% (n = 7) were classified as having excellent academic performance. Overall, the sample was predominantly male and comprised mainly adolescents aged 13–15 years. Educational needs and care were the most common admission types, while poverty and parental loss were prominent reasons for institutionalization. Most participants had been in institutional care for ≤ 10 years, and average academic performance was the most frequently observed category.

Table 1
Sociodemographic and institutional characteristics of participants

Characteristic	Category	n	%
Age	13 years	46	30.7
	14 years	39	26
	15 years	50	33.3
	16 years	15	10
Gender	Female	65	43.3
	Male	85	56.7
Admission type	Care	37	24.7
	Education	64	42.7
	Parent conflict	17	11.3
	Safety	32	21.3
Length of stay	6–10 years	58	38.7
	<=5 years	66	44
	> 10 years	26	17.3
Reason for institutionalization	Orphan	21	14
	Parents Separation/Divorce	22	14.7
	Poverty	55	36.7
	Semi Orphan	52	34.7
Educational status	High school	45	30
	Higher Secondary School	53	35.3
	Middle School	52	34.7
School performance	Average	73	48.7
	Excellent	7	4.7
	Good	45	30
	Poor	25	16.7

Assertiveness and mental well-being scores

Assertiveness: less assertive 11 (7.3%), moderately assertive 128 (85.3%), highly assertive 11 (7.3%). Mental well-being: inadequate 89 (59.3%), moderately adequate 50 (33.3%), adequate 11 (7.3%).

Table 2
Distribution of assertiveness and mental well-being scores

Outcome	Mean	SD	Median	IQR	Range
Assertiveness	92.80	15.00	95	89–101	38–121
Mental well-being	32.03	9.54	28	26–36	19–61

Association between assertiveness and mental well-being among participants

Table 3 examines the association between assertiveness and mental well-being among the participants using correlation and regression analyses. Both correlation analyses indicated a weak negative association between assertiveness and mental well-being. The Pearson correlation coefficient was r = −0.110 (p = 0.180), while the Spearman correlation coefficient was ρ = −0.135 (p = 0.099). However, neither association reached statistical significance at the conventional 5% significance level. In the unadjusted linear regression analysis, assertiveness was not significantly associated with mental well-being (β = −0.070, 95% CI: −0.173 to 0.033; p = 0.180). The negative regression coefficient suggests that higher assertiveness scores were associated with a small decrease in mental well-being scores in this sample; however, the confidence interval included zero, indicating that the observed association could be compatible with no association. Similarly, after adjustment for age, gender, admission type, length of stay, reason for institutionalization, educational status, and school performance, the association remained statistically non-significant (adjusted β = −0.074, 95% CI: −0.198 to 0.051; p = 0.245). The adjusted estimate was very similar to the unadjusted estimate, suggesting that controlling for the measured sociodemographic and institutional characteristics did not materially alter the observed relationship. Overall, the findings do not provide evidence of a statistically significant association between assertiveness and mental well-being in this study population. Although the direction of the association was consistently negative across Pearson, Spearman, unadjusted, and adjusted analyses, the effect was weak and imprecisely estimated. Therefore, the results should not be interpreted as demonstrating that greater assertiveness leads to poorer mental well-being; rather, no statistically significant relationship was detected in this study.

Table 3
Association between assertiveness and mental well-being using correlation and linear regression analyses

Analysis	Estimate	95% CI	P value
Pearson correlation	r = − 0.110	—	0.180
Spearman correlation	ρ = −0.135	—	0.099
Unadjusted linear regression	β = −0.070	−0.173 to 0.033	0.180
Adjusted robust linear regression	β = −0.074	−0.198 to 0.051	0.245

Adjusted for age, gender, admission type, length of stay, reason for institutionalization, educational status, and school performance.

Factors associated with assertiveness

Table 4 presents the adjusted robust linear regression analysis of factors associated with assertiveness. The overall model was not statistically significant (R^2 = 0.116; $F(15,134)$ = 1.13; p = 0.339), indicating that the included sociodemographic, institutional, and educational factors collectively explained 11.6% of the variation in assertiveness. None of the individual predictors were statistically significantly associated with assertiveness ($p > 0.05$). High-school education showed a borderline positive association compared with middle school (adjusted β = 5.162, 95% CI: −0.524 to 10.847; p = 0.075), while good and excellent school performance showed non-significant negative associations. Overall, the findings suggest that none of the examined characteristics independently predicted assertiveness in this study population.

Table 4
Factors associated with assertiveness: adjusted robust linear regression

Predictor	Adjusted β	95% CI	P value
Age, per year	−1.553	−4.333 to 1.226	0.271
Female vs male	−3.230	−8.829 to 2.369	0.256
Admission—Education vs Care	0.829	−4.985 to 6.643	0.778
Admission—Safety vs Care	−2.535	−10.165 to 5.094	0.512
Admission—Parent conflict vs Care	−2.456	−10.171 to 5.259	0.530
Length of stay—6–10 vs ≤ 5 years	−1.585	−7.633 to 4.463	0.605
Length of stay—>10 vs ≤ 5 years	−2.215	−9.650 to 5.220	0.557
Reason—Semi-orphan vs poverty	−4.753	−10.575 to 1.069	0.109
Reason—Orphan vs poverty	−3.037	−10.890 to 4.815	0.446
Reason—Separation/divorce vs poverty	3.502	−4.517 to 11.521	0.389
Education—High school vs middle school	5.162	−0.524 to 10.847	0.075
Education—Higher secondary vs middle school	2.239	−4.790 to 9.267	0.530
Performance—Average vs poor	−0.743	−6.325 to 4.839	0.793
Performance—Good vs poor	−6.241	−13.721 to 1.238	0.101
Performance—Excellent vs poor	−12.376	−27.086 to 2.334	0.098

Overall model: R^2 = 0.116; $F(15,134)$ = 1.13; P = 0.339.

Factors associated with mental well-being

Table 5 presents the adjusted robust linear regression analysis of factors associated with mental well-being. The overall model was statistically significant (R^2 = 0.148; F(16,133) = 2.59; p = 0.0016), explaining 14.8% of the variation in mental well-being scores. Assertiveness was not significantly associated with mental well-being (adjusted β = −0.074, 95% CI: −0.198 to 0.051; **p** = 0.245). However, parental conflict as the reason for institutionalization was associated with lower mental well-being scores compared with poverty (adjusted β = −4.995, 95% CI: −9.671 to − 0.319; p = 0.036). Participants who were orphans (adjusted β = −5.224, 95% CI: −9.595 to − 0.853; p = 0.020) and those institutionalized due to parental separation/divorce (adjusted β = −6.910, 95% CI: −11.961 to − 1.859; p = 0.008) also had significantly lower mental well-being scores than those institutionalized because of poverty. No other predictors showed statistically significant associations.

Table 5
Factors associated with mental well-being: adjusted robust linear regression

Predictor	Adjusted β	95% CI	P value
Assertiveness, per point	−0.074	−0.198 to 0.051	0.245
Age, per year	−0.169	−1.404 to 1.066	0.787
Female vs male	−2.102	−5.718 to 1.515	0.252
Admission—Education vs Care	−1.042	−5.162 to 3.077	0.618
Admission—Safety vs Care	2.153	−3.184 to 7.489	0.426
Admission—Parent conflict vs Care	−4.995	−9.671 to − 0.319	0.036
Length of stay—6–10 vs ≤ 5 years	−1.904	−5.597 to 1.790	0.310
Length of stay—>10 vs ≤ 5 years	0.370	−4.969 to 5.710	0.891
Reason—Semi-orphan vs poverty	−0.546	−4.594 to 3.503	0.790
Reason—Orphan vs poverty	−5.224	−9.595 to − 0.853	0.020
Reason—Separation/divorce vs poverty	−6.910	−11.961 to − 1.859	0.008
Education—High school vs middle school	3.482	−0.602 to 7.566	0.094
Education—Higher secondary vs middle school	1.260	−3.110 to 5.630	0.569
Performance—Average vs poor	1.118	−2.821 to 5.058	0.575
Performance—Good vs poor	1.429	−2.784 to 5.641	0.504
Performance—Excellent vs poor	−3.420	−9.760 to 2.920	0.288

Overall model: R^2 = 0.148; F(16,133) = 2.59; P = 0.0016.

Bivariate associations of assertiveness and mental well-being with participant characteristics

Table 6 presents the bivariate associations between participant characteristics and the two study outcomes. Assertiveness was not significantly associated with any of the examined participant characteristics in either parametric or non-parametric analyses ($p > 0.05$). For mental well-being, significant differences were observed by gender in the non-parametric analysis ($p = 0.0003$) and by reason for institutionalization in both parametric ($p = 0.018$) and non-parametric analyses ($p = 0.001$). No significant associations were observed between mental well-being and age, admission type, length of stay, educational status, or school performance. These findings indicate that gender and reason for institutionalization were the main participant characteristics associated with differences in mental well-being at the bivariate level.

Table 6
Bivariate comparisons of outcome scores by participant characteristics

Outcome and characteristic	Parametric P	Non-parametric P
Assertiveness—age	0.730	0.598
Assertiveness—gender	0.174	0.536
Assertiveness—admission type	0.711	0.761
Assertiveness—length of stay	0.461	0.328
Assertiveness—reason	0.438	0.066
Assertiveness—education	0.247	0.604
Assertiveness—school performance	0.091	0.139
Mental well-being—age	0.690	0.444
Mental well-being—gender	0.130	0.0003
Mental well-being—admission type	0.283	0.436
Mental well-being—length of stay	0.476	0.525
Mental well-being—reason	0.018	0.001
Mental well-being—education	0.956	0.929
Mental well-being—school performance	0.811	0.861

Parametric tests: independent-samples t-test for gender and one-way ANOVA for variables with > 2 groups. Non-parametric alternatives: Mann–Whitney U and Kruskal–Wallis tests.

Discussion

This cross-sectional study examined assertiveness and mental well-being among 150 adolescents aged 13–16 years living in institutional care in Puducherry, India. Assertiveness scores fell predominantly in the moderate range (85.3%), with a mean of 92.80 (SD 15.00) on the Rathus scale, whereas mental well-

being was considerably more constrained, with 59.3% of participants classified as having inadequate well-being and a mean score of 32.03 (SD 9.54) on the modified Warwick–Edinburgh scale. Assertiveness was not significantly associated with mental well-being in either unadjusted or adjusted analyses (adjusted β = −0.074, 95% CI: −0.198 to 0.051; p = 0.245), and no socio demographic or institutional characteristic independently predicted assertiveness. In contrast, the multivariable model for mental well-being was statistically significant overall, driven chiefly by reason for institutionalization: adolescents who were orphans, who had experienced parental separation or divorce, or who had been admitted following parental conflict reported significantly lower well-being than those institutionalized because of poverty. Gender was also associated with well-being at the bivariate level.

The absence of a significant assertiveness–well-being association diverges from a body of Indian and international work reporting positive correlations, including a study of Indian adolescents using the same Rathus instrument that found assertiveness positively correlated with self-esteem[14], a psychosocial predictors study from Karnataka linking self-esteem, interpersonal communication, and quality of life to assertive behaviour[17], and a Slovak adolescent cohort in which both distress and performance dimensions of assertiveness were associated with psychological well-being and self-esteem[18]. Trial-based evidence has similarly shown that structured assertiveness training raises psychological well-being and lowers stress in adolescents[19] and improves mental health alongside self-esteem in a randomized trial among Iranian female students[20]. However, our null finding is not without precedent: an earlier Indian study using the identical Rathus scale alongside a general mental health inventory likewise reported an insignificant correlation between assertiveness and mental health in college-going adolescents[21], and a recent Armenian sample found assertiveness unrelated to well-being across gender and education subgroups despite an overall positive correlation[22]. A plausible explanation for this divergence is population and context specificity: most of the concordant literature was drawn from community or school-going adolescents whose everyday assertiveness operates within intact family and peer support systems, whereas assertive self-expression in an institutional setting may carry different social costs and meanings, potentially being tempered by hierarchical care giving structures, routinized daily life, or the need to conform to institutional expectations. It is also possible that a mediated rather than direct pathway better describes this relationship, as suggested by pathway analysis showing that assertiveness's association with adolescent mental health operates indirectly through self-efficacy and problem-solving[23]; such mediators were not modelled here and may explain why a direct linear association was not detected in this sample.

The prevalence of poor mental well-being was significantly high in this group and this is in line with the literature on institutional care. A large systematic review and meta-analysis found that institutionalization is related to substantial, albeit relatively small, differences in socio emotional development and mental health outcomes compared to children raised in families[24] and qualitative research from a post-Soviet context indicated that institutionalisation can exacerbate children's feelings of abandonment due to separation, rigid routines, and reduced autonomy[25]. The finding of reason for institutionalization as the strongest correlate of well-being is very similar to an Indian study of

institutional homes in Visakhapatnam, which found that reason for institutionalization (along with age, sex and duration of institutionalization) was significantly associated with behavioural and emotional problems[26] and a study of adolescent orphans in Kerala which found that type of orphanhood (along with duration of institutionalization) significantly differentiated emotional and behavioural outcomes, with double and maternal orphans faring worse than paternal orphans[27]. These findings together further support the notion that the conditions that lead to institutionalization, especially those that involve relational deprivation (that is, the loss or separation from parents), may also be a significant psychological burden in addition to material deprivation.

The gender difference observed at the bivariate level parallels a study of orphaned and separated children in New Delhi reporting poorer self-concept and attachment scores among females[28], but contrasts with findings from Indonesian and Ethiopian institutional samples reporting no gender difference or even a female advantage in psychological resources[29]. This inconsistency suggests that gendered vulnerability within institutional care may be shaped by socio cultural context, and the loss of significance for gender after adjustment in the present study indicates that its apparent bivariate association may be partly explained by its relationship with reason for institutionalization or other covariates. These findings suggest that interventions for institutionalized adolescents may need to address the relational and circumstantial adversity underlying admission alongside individual interpersonal skills.

Limitations

This study is limited by its cross-sectional design, which precludes causal inference and cannot capture bidirectional or lagged relationships between assertiveness and well-being. Convenience sampling from selected homes in a single union territory limits generalizability to institutionalized adolescents elsewhere in India. Self-reported measures are subject to social desirability bias, particularly in a setting where responses may be shaped by institutional supervision. Sample sizes within some subgroups of reason for institutionalization were modest, potentially limiting statistical power to detect small associations and unmeasured factors such as pre-institutional trauma history, institutional quality, and caregiver-to-child ratio were not assessed despite their potential relevance to psychosocial outcomes.

Conclusion

The mental well-being scores of institutionalized adolescents in this sample in Puducherry were low, and a significant number of adolescents were found to be in the low well-being category based on the study-defined cut-offs. There were no significant relationships between mental well-being and assertiveness; however, there was a strong patterning of mental well-being by the circumstances of institutionalization, including parental loss, parental separation, and parental conflict. Longitudinal, multi-site, and mixed methods studies are needed to elucidate the mediating pathways and to develop interventions more specifically designed for the adversities experienced by institutionalized adolescents, in addition to, if not in place of, individual skills-based interventions.

Declarations

Ethical considerations

Ethical approval was obtained from the Doctoral Committee of Bharath Institute of Higher Education and Research, Director- Department of Women and Child Development, Puducherry and the Internal Scientific Committee, Institute Ethics Committee (IEC), BIEC-109-24 dated 21.06.2024, before commencement of the study. The Study was conducted according to the Helsinki declaration. Permission to conduct the study was obtained from the Administrators of participating institutions. Written informed consent was obtained from Institutional Care in-charges and assent from all participants before data collection. Participation was voluntary, and confidentiality and anonymity of participant information were maintained throughout the study.

Consent for publication:

Not applicable.

Consent to Participate:

Written and Informed consent was obtained from caretakers/legal guardians of the participants under 18 years and no financial compensation was provided.

Conflicts of interest/Competing interests:

Authors declare that there are no conflicts of interest.

Declaration of generative AI and AI-assisted technologies in the writing process

The authors used QuillBot as a language-editing tool for spelling and grammar correction during manuscript preparation. The authors reviewed and edited the output and take full responsibility for the final content of the manuscript.

Contributions

Varun Babu Elango– Conceptualization, Methodology, Software, Validation, Formal analysis, Resources, Writing - Original Draft, Writing - Review & Editing, Data Curation. Dr.M.Abirami - Conceptualization, Methodology, Validation, Writing - Review & editing, Supervision.

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Author Contribution

Varun Babu Elango– Conceptualization, Methodology, Software, Validation, Formal analysis, Resources, Writing - Original Draft, Writing - Review & Editing, Data Curation. Dr.M.Abirami- Conceptualization, Methodology, Validation, Writing - Review & editing, Supervision.

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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.

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