

Parent Engagement in Early Childhood Education: A Multivariate Analysis in the Turkish Context*

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Received : 17 January 2026
Revised : 27 June 2026
Accepted : 20 July 2026
DOI : 10.26822/iejee.2026.465

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* This study, under the same title, was presented
as an oral paper at the 9th International Congress
on Preschool Education, hosted by the Faculty
of Education at Bursa Uludağ University, held on
October 27–30, 2025.

Abstract

This study examined parent engagement in early childhood education in Türkiye and its associations with demographic characteristics. A cross-sectional survey was conducted with 496 parents of children aged 66–72 months recruited through convenience sampling with snowball features. Participants completed the 25-item Turkish Parent Engagement in Early Childhood Education Scale, comprising Knowledge and Expectations, Trust and Communication, and Home-Based Engagement. Demographic differences were examined using Mann–Whitney U and Kruskal–Wallis tests with false discovery rate correction, followed by multiple linear regression analyses with HC3 standard errors. Overall engagement was high, although Home-Based Engagement was comparatively lower. Respondents with one child reported higher Home-Based Engagement than respondents with two, three, four or more children, whereas the multiple-child groups did not differ significantly from one another. Urban respondents also reported higher Home-Based Engagement than rural respondents. Educational-level contrasts were identified for Total Parent Engagement but not for Home-Based Engagement after adjustment. Home-Based Engagement demonstrated low internal consistency ($\alpha = .48$; $\omega = .52$). Therefore, findings involving this subdimension should be considered preliminary. The results indicate demographic associations rather than causal effects and require replication using psychometrically stronger measures and more representative samples.

Keywords:

Early Childhood Education; Demographic Variables; Parental Engagement; Parent Involvement; School-Family Relationship

Introduction

Early childhood education is widely recognized as a critical period for children's cognitive, social, and emotional development, during which learning experiences are shaped not only by educational institutions but also by family contexts. Within this period, parents play a central role in supporting children's learning trajectories by shaping everyday experiences, learning opportunities, and relationships across home and school settings. Accordingly, parent engagement has been consistently identified as a key mechanism through which early educational experiences are enriched and sustained (Fantuzzo et al., 2013; Weiss et al., 2010). Rather than being limited to



www.iejee.com
ISSN: 1307-9298

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school-based participation, parent engagement encompasses a broader set of beliefs, practices, and relational processes that influence children's development over time and across multiple contexts (Manzon et al., 2015).

Despite its recognized importance, parent engagement remains conceptually diverse and is sometimes used interchangeably with family engagement and parent involvement (Fantuzzo et al., 2013; Gross et al., 2020; Halgunseth et al., 2013). In the present study, parent engagement is understood as the beliefs, attitudes, relationships, and activities through which parents support children's learning across home and educational settings. This conceptualization emphasizes sustained, bidirectional, and trust-based relationships between families and educational programs rather than participation in isolated school-defined activities (Manzon et al., 2015; Weiss et al., 2010). It therefore provides a multidimensional framework encompassing parents' knowledge and expectations, communication with educational institutions, and learning-related practices at home.

Theoretical frameworks further contribute to understanding how parent engagement is established and sustained in early childhood contexts. Two influential approaches have been identified in the literature: Weiss and colleagues' framework (2010), which primarily addresses elementary and secondary education, and Halgunseth and colleagues' Social Exchange Model of Family Engagement (2009), which is specifically grounded in early childhood education settings (Forry et al., 2012). Given the focus of the present study, the Social Exchange Model of Family Engagement provides a particularly relevant lens. Drawing on social exchange and ecological theories, this model conceptualizes parent engagement as emerging from reciprocal, trust-based partnerships between families and early childhood programs, supported by both program-level and family-level resources (Halgunseth et al., 2009). According to the model, engagement is fostered through practices such as welcoming school environments, two-way communication, home visits, joint decision-making, parent education opportunities, and the provision of home-based learning resources, while families contribute by supporting learning at home, sharing information with educators, participating in program activities, and collaborating with schools (Halgunseth et al., 2009). Importantly, the model highlights the need to attend to cultural sensitivity and contextual diversity, suggesting that parent engagement may vary meaningfully across demographic and environmental conditions. Recent evidence from low-resource settings similarly suggests that parental engagement is patterned by socioeconomic conditions. For example, using an ecological framing and multivariate logistic regression, Gitonga et al. (2026) examined parents of Pre-Primary 2 children

in public ECE settings in rural Kenya and found that higher parental education and household income were associated with higher engagement, whereas economic constraints substantially limited parents' ability to contribute to their children's early education. Such findings underscore the relevance of examining demographic and structural correlates of engagement in a country-specific manner.

Empirical findings also suggest that family engagement may vary according to parental and household characteristics, although the direction of these associations is not always consistent across contexts or engagement dimensions. In Türkiye, Varol et al. (2023) found that mothers reported greater participation than fathers and that maternal education was associated with school-based involvement, with primary-school-educated mothers reporting greater participation than mothers with bachelor's degrees. Other Turkish studies have identified employment demands, limited time, communication difficulties, and competing family responsibilities as barriers to sustained participation (Çakmak, 2010; Orçan Kaçan et al., 2019; Akyol et al., 2021). Recent qualitative evidence from rural Türkiye has additionally highlighted spatial inequalities in access, adequacy, and educational opportunities experienced by families (Dikmen & Gökalp, 2026). Taken together, these findings suggest that educational background, family responsibilities, and residential context may shape both families' opportunities for engagement and the forms that engagement takes. However, these relationships remain insufficiently examined through multidimensional measures of parent engagement in Turkish early childhood education.

Consistent with these theoretical perspectives, empirical research has conceptualized parent engagement as a multidimensional construct encompassing various forms of interaction across home, school, and community contexts. For instance, Gross et al. (2022) synthesized the literature and identified core dimensions of parent engagement, including home-based engagement, school-based engagement, and communication among parents, teachers, and schools. Home-based engagement refers to parents' efforts to support learning within the home environment, whereas school-based engagement involves participation in activities organized by educational institutions (Gross et al., 2022; Wondim, 2024). Similarly, the OECD (2011), building on earlier work by Epstein (1995) and Oakes and Lipton (2007), distinguished between child-focused practices such as parenting, communicating, and fostering learning at home, and center-oriented practices such as volunteering, decision-making, and collaboration with the community. Other studies have emphasized specific manifestations of engagement, including volunteering, parent-teacher meetings, classroom activities, and home-based learning support (Cutshaw

et al., 2022; Wondim, 2024). Taken together, these perspectives underscore that parent engagement is not a singular behavior but a constellation of practices that may differ by context, educational level, and stakeholder perspective (OECD, 2011).

Parent engagement should also be distinguished from parent involvement. Although the terms are sometimes used interchangeably, involvement generally refers to parents' participation in school-defined activities, whereas engagement emphasizes shared responsibility, parental agency, and sustained collaboration around children's learning (Ferlazzo, 2011; Goodall & Montgomery, 2014). Parent engagement therefore extends beyond attendance or compliance and foregrounds reciprocal relationships between families and educational professionals (Gross et al., 2022). Consistent with this distinction, the present study focuses on parent engagement.

In Türkiye, parent participation in education has gradually developed through policy, institutional, and community-based initiatives. School–family associations, parent meetings, home visits, parent education programs, and the work of organizations such as the Mother–Child Education Foundation have contributed to this development (Kağıtçıbaşı et al., 2009; Tekin, 2011). Successive early childhood education programs have also moved from treating parent involvement as a general principle toward providing more structured guidance for family and community participation (MoNE, 2002; 2013; 2024a; 2024b). Nevertheless, parent involvement remains the dominant term in Turkish policy and research, and multidimensional parent engagement has received comparatively limited empirical attention (Kaya, 2023; Kaya, 2024; Serdaroğlu & Bekir, 2024).

Against this backdrop, there is a notable gap in the empirical literature concerning parent engagement in early childhood education in Türkiye. To the best of the authors' knowledge, few studies have systematically examined parent engagement as a multidimensional construct across demographic characteristics using a validated measurement framework in the Turkish early childhood education context. Existing studies have often focused on parent involvement, relied on limited indicators, or lacked comprehensive demographic analyses. Consequently, little is known about how different dimensions of parent engagement, particularly home-based engagement, vary across family characteristics such as parental education, family size, and residential context. Addressing this gap is essential for advancing the international literature on parent engagement and for informing contextually responsive policies and practices in early childhood education in Türkiye.

The present study aims to address this need by examining parental engagement in early childhood education within the Turkish context using a

multidimensional, validated scale. By investigating overall levels of parent engagement and exploring demographic differences across dimensions, the study contributes to the literature by providing a detailed demographic profile of multidimensional parent engagement in early childhood education in Türkiye. In addition to its theoretical contribution, the study offers practical implications for early childhood programs and policymakers by identifying demographic patterns associated with home-based engagement, thereby highlighting groups that may benefit from targeted support and intervention. Guided by this rationale, the study addresses the following research questions: (1) Do Total Parent Engagement and subdimension scores differ across demographic characteristics in the Turkish context? (2) Which demographic variables are associated with Home-Based Engagement? (3) Which demographic characteristics show adjusted associations with parent engagement outcomes when considered simultaneously?

Method

Research Design

This study employed a quantitative cross-sectional correlational survey design to describe parent engagement and examine its associations with selected demographic characteristics. Data were collected at a single point in time without manipulating the study variables. Accordingly, the findings represent descriptive and relational patterns and do not support causal inference (Creswell & Creswell, 2018; Cohen et al., 2018). Parent engagement was examined as a multidimensional construct encompassing Knowledge and Expectations, Trust and Communication, and Home-Based Engagement. Demographic group differences were evaluated using nonparametric procedures, and adjusted associations were examined using multivariable regression models.

Participants

The participants of the study consisted of 496 parents of children aged 66 to 72 months residing in different regions of Türkiye. Participants were recruited using a convenience sampling strategy. Because the survey link was shared among participants' personal and social networks, the recruitment process also exhibited characteristics of snowball sampling. This approach increased accessibility and facilitated data collection across a wide geographic area; however, it also imposed limitations on the representativeness of the sample and, consequently, on the generalizability of the findings. Data collection was conducted online in April 2025. Participation was entirely voluntary, and no incentives were provided. All participants were informed about the purpose of the study and completed the questionnaire after providing informed consent. Detailed demographic characteristics of

the participants are presented in Table 1. These characteristics include parent gender, monthly household income, parent age, number of children in the household, parent employment status, parent educational level, child gender, prior preschool education experience, type of preschool institution, and place of residence, categorized as urban or rural.

Table 1.
Participants' Demographic Characteristics (N = 496)

Variable	Category	n	%
Parent Gender	Male	45	9.1
	Female	451	90.9
Monthly Household Income	Low	249	50.2
	Middle	188	37.9
	High	59	11.9
Parent Age (years)	22–25	29	5.8
	26–30	126	25.4
	31–35	200	40.3
	36–40	103	20.8
	41–45	35	7.1
	46 and above	3	0.6
Number of Children in the Household	1	139	28.0
	2	247	49.8
	3	85	17.1
	4 or more	25	5.0
Parent Employment Status	Public sector employee / Worker	90	18.1
	Not employed / Home-maker	307	61.9
	Private sector employee	99	20.0
Parent Educational Level	Doctorate	5	1.0
	High school	148	29.8
	Middle school	77	15.5
	Master's degree	17	3.4
	Bachelor's degree	205	41.3
	Primary school	44	8.9
Child Gender	Male	271	54.6
	Female	225	45.4
Prior Preschool Education Experience	Yes	220	44.4
	No	276	55.6
Type of Preschool Institution	Public	367	74.0
	Private	129	26.0
Place of Residence	Rural (town/village)	75	15.1
	Urban (city center)	421	84.9

An examination of Table 1 indicates that the majority of participants were mothers, nearly half of the households were in the lower income category, and the most common age group among parents was 31 to 35 years. More specifically, mothers constituted 90.9% of the sample. The term “parents” is retained because both mothers and fathers participated; however, the findings primarily reflect maternal reports. To examine whether the principal regression patterns were

driven by the small group of fathers, the multivariable analyses were repeated in the mother-only subsample as a sensitivity analysis. Approximately half of the families had two children, and most participants resided in urban areas. While this demographic distribution reflects several typical characteristics of parents of preschool-aged children in Türkiye, the use of convenience sampling with snowball features requires that the findings be interpreted with caution, particularly with regard to their generalizability to the broader population. Because the master's and doctoral groups were small, these categories were combined with the bachelor's group as “bachelor's degree and above” for inferential analyses. For the regression analyses, the six descriptive parent-age categories presented in Table 1 were consolidated into three broader groups: 22–30 years (n = 155), 31–35 years (n = 200), and 36 years and above (n = 141). This consolidation avoided the unstable estimation that would result from retaining the very small oldest age category.

Data Collection Tool

The data collection tool used in this study was the Early Childhood Education Parent Engagement Scale, referred to in Turkish as the Erken Çocukluk Eğitime Aile Bağlılığı Ölçeği. This scale is the Turkish adaptation of the Parent Engagement in Early Childhood Education Scale originally developed by Gross and colleagues (Gross et al., 2020; Gross et al., 2022). The Turkish adaptation, validity, and reliability study of the scale was conducted by Kaya, Demircan, and Altun (2024). As a result of the adaptation process, the Turkish version of the scale retained the original three-dimensional structure and was culturally adapted and validated for use in the Turkish context.

The Early Childhood Education Parent Engagement Scale is designed to assess parents' levels of engagement in early childhood education, with a particular focus on their involvement in their children's learning processes, school-family collaboration, and home-based educational activities. The scale consists of a total of twenty-five items, and responses are obtained using a four-point Likert-type format ranging from one, strongly disagree, to four, strongly agree. Higher scores indicate higher levels of parental engagement in early childhood education.

The scale comprises three subdimensions. The Knowledge and Expectations subdimension consists of nine items and measures parents' awareness and knowledge regarding their child's learning process, educational goals, and expectations from the school. The Trust and Communication subdimension consists of eleven items and assesses the level of trust-based communication parents establish with teachers and school administrators. The Home-Based Engagement subdimension consists of five items and captures

parents' behaviors related to supporting their child's learning at home, engaging in interactions with their child, and creating a learning-supportive home environment.

Evidence for the validity and reliability of the Turkish version of the scale was provided in the adaptation study conducted by Kaya et al. (2024), in which confirmatory factor analysis supported the three-factor structure of the instrument, with acceptable model fit indices reported as a chi-square to degrees of freedom ratio equal to 2.84, a comparative fit index equal to .93, and a root mean square error of approximation equal to .057. In the same study, internal consistency coefficients were reported as .82 for the total scale and ranged between .70 and .80 for the subdimensions.

The psychometric characteristics of the scores were re-examined in the present sample. Internal consistency was assessed using raw Cronbach's alpha and McDonald's omega. In addition, corrected item-total correlations, mean inter-item correlations, and alpha-if-item-deleted coefficients were examined. Because Home-Based Engagement demonstrated low internal consistency, item-level response distributions and the previously established three-factor structure were also evaluated. The complete sample-specific psychometric findings are presented in the Results section.

Data Collection Process

Data collection was carried out online in April 2025 using a digital survey platform (Google Forms). The survey link was distributed via social media platforms, online parent groups, and communication networks commonly used by parents of preschool-aged children. Before accessing the questionnaire, participants were presented with an informed consent form that explained the purpose of the study, voluntary nature of participation, confidentiality of responses, and the right to withdraw at any time without penalty. Only participants who provided consent were able to proceed to the survey. No personally identifiable information was collected. All responses were recorded anonymously and used solely for scientific research purposes. The average completion time for the questionnaire was approximately 10–12 minutes. Ethical approval for the study was obtained from the Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee (Approval No: 2024/70). The study was conducted in accordance with ethical principles governing research with human participants.

Data Analysis

Prior to the analyses, the dataset was screened, coded, and checked for completeness. For inferential

analyses, participants with bachelor's, master's, and doctoral degrees were combined into a "bachelor's degree and above" category to avoid unstable estimates based on sparse postgraduate groups. The resulting educational-level variable comprised primary school, middle school, high school, and bachelor's degree and above. The six descriptive parent-age categories presented in Table 1 were also consolidated into three broader groups for the regression analyses: 22–30 years, 31–35 years, and 36 years and above. This recategorization eliminated the sparsely populated oldest age category and provided more stable estimates. All categorical predictors were dummy-coded. The regression models therefore included one parameter for parent gender, two for household income, two for parent age, two for employment status, three for educational level, three for number of children, and one each for child gender, prior preschool education experience, institution type, and place of residence, yielding 17 predictor parameters in total. The model intercept was estimated separately and was not included in the numerator degrees of freedom.

In the first stage, descriptive statistics were computed for the total scale score and each subdimension, including means, standard deviations, medians, minimum and maximum values, and skewness and kurtosis coefficients. Distributional assumptions were evaluated using the Shapiro–Wilk test (Shapiro & Wilk, 1965). The results indicated significant deviations from normality for all scale scores ($p < .001$). In addition, the distributions were negatively skewed and showed clustering toward the upper end of the response scale, suggesting potential ceiling effects. These distributional characteristics were taken into account when selecting subsequent inferential procedures (Field, 2013).

Internal consistency was evaluated using raw Cronbach's alpha and McDonald's omega. Raw alpha coefficients were calculated from the item covariance matrix, whereas omega coefficients were estimated using Pearson item correlations. Corrected item-total correlations and mean inter-item correlations were also based on Pearson correlations. Alpha-if-item-deleted coefficients and item-level response distributions were examined for Home-Based Engagement. Because raw alpha incorporates differences in item variances, it was not expected to correspond exactly to the standardized alpha implied by the mean inter-item correlation. An ordinal confirmatory factor analysis was conducted using the weighted least squares mean- and variance-adjusted estimator to examine the previously established three-factor structure. Model fit was evaluated using the comparative fit index, Tucker–Lewis index, root mean square error of approximation with its 90% confidence interval, and standardized root mean square residual. Standardized

factor loadings were also examined, with particular attention to the Home-Based Engagement items.

Demographic group differences were examined using the Mann–Whitney U test for two-group comparisons and the Kruskal–Wallis H test for comparisons involving three or more groups. The Benjamini–Hochberg false discovery rate correction was applied separately to the 10 demographic comparisons conducted for each engagement outcome. FDR-adjusted demographic group-comparison results were reported as q values. When a Kruskal–Wallis test remained significant after FDR correction, Dunn pairwise comparisons were conducted, and the resulting p values were separately adjusted using the Benjamini–Hochberg procedure within the relevant set of post hoc comparisons. Effect sizes were reported as r for Mann–Whitney U tests and ordinal epsilon-squared for Kruskal–Wallis tests. Ordinal epsilon-squared was calculated as $\epsilon^2 = H/(N - 1)$.

Multiple linear regression models were estimated using ordinary least squares to examine adjusted associations between demographic characteristics and the parent engagement outcomes. Separate models were estimated for Total Parent Engagement and each subdimension. Conventional overall OLS F tests were used to evaluate model-level statistical significance. Because the outcomes were bounded averaged Likert-type scores and showed ceiling effects, HC3 heteroskedasticity-consistent standard errors were used for coefficient-level inference. Unstandardized coefficients, HC3 standard errors, 95% confidence intervals, and coefficient-level p values were reported together with R^2 and adjusted R^2 . Residual-versus-fitted plots and Cook's distance values were examined as diagnostic checks. Statistical interpretations were based on individual coefficients and reference-group contrasts rather than unreported omnibus tests for multi-category predictors. Because mothers constituted 90.9% of the sample, the multivariable regression analyses were repeated using only the 451 maternal respondents. This sensitivity analysis was conducted to determine whether the principal regression patterns were influenced by the small group of fathers. As in the primary analyses, HC3 standard errors were used for coefficient-level inference.

Results

Preliminary Analyses

Preliminary analyses were conducted to examine the distributional and psychometric characteristics of the Parent Engagement in Early Childhood Education Scale scores. As presented in Table 2, the mean Total Parent Engagement score was 3.73 (SD = 0.21). The mean subdimension scores were 3.74 (SD = 0.25) for Knowledge and Expectations, 3.77 (SD = 0.28) for Trust

and Communication, and 3.63 (SD = 0.29) for Home-Based Engagement. Home-Based Engagement therefore had the lowest mean score, although scores across all dimensions were concentrated near the upper end of the four-point scale.

The Shapiro–Wilk tests indicated significant departures from normality for the total score and all three subdimensions (all $p < .001$). The distributions were negatively skewed, particularly for Total Parent Engagement, Knowledge and Expectations, and Trust and Communication. Given these distributional characteristics and the observed ceiling effects, nonparametric tests were used for demographic group comparisons.

Internal Consistency and Supplementary Psychometric Analyses

Table 3 presents the internal consistency estimates for the scale scores. Cronbach's alpha was .78 for the total scale, .61 for Knowledge and Expectations, .77 for Trust and Communication, and .48 for Home-Based Engagement. The corresponding McDonald's omega estimates were .80, .64, .79, and .52. Although omega produced slightly higher estimates than alpha, it did not eliminate the reliability concern associated with Home-Based Engagement.

Because Home-Based Engagement demonstrated low internal consistency, additional item-level analyses were conducted. Corrected item–total correlations for its five items ranged from .16 to .38, and the mean Pearson inter-item correlation was .17. Alpha-if-item-deleted coefficients ranged from .39 to .51. Removing the item with the weakest corrected item–total correlation increased alpha only marginally, from .48 to .51. No item was therefore removed because the improvement was limited and deleting the item would have altered the content coverage of the original validated subdimension.

Item-level distributions indicated substantial clustering in the highest response category. Depending on the item, between 61.5% and 82.7% of respondents selected the highest response option. This restricted variability may have contributed to the weak inter-item correlations, although it cannot fully account for the low reliability estimate.

An ordinal confirmatory factor analysis using the weighted least squares mean- and variance-adjusted estimator was conducted to examine the previously established three-factor structure. The model demonstrated acceptable overall fit, $\chi^2(272) = 451.86$, $p < .001$, CFI = .955, TLI = .950, RMSEA = .037, 90% CI [.031, .043], and SRMR = .051. Standardized factor loadings ranged from .53 to .81 for Knowledge and Expectations, from .49 to .79 for Trust and Communication, and from .31 to .59 for Home-Based Engagement.

The CFA supported the overall three-factor structure. However, the comparatively weak factor loadings and low internal consistency of Home-Based Engagement indicated that its composite score contained considerable measurement error. Findings involving this subdimension were therefore regarded as preliminary and interpreted cautiously.

Demographic Differences in Parent Engagement

To obtain more stable estimates, participants with bachelor's, master's, and doctoral degrees were combined into a "bachelor's degree and above" category. The revised educational-level variable comprised primary school ($n = 44$), middle school ($n = 77$), high school ($n = 148$), and bachelor's degree and above ($n = 227$).

Following this recategorization, Total Parent Engagement differed significantly across educational groups, $H(3) = 14.82$, $p = .002$, FDR-adjusted $q = .021$, $\epsilon^2 = .030$. Although statistically significant, the effect size was small. FDR-adjusted Dunn comparisons indicated that respondents with bachelor's degrees or above reported lower Total Parent Engagement than respondents with primary school education (adjusted $p = .009$). The remaining pairwise differences were not statistically significant after correction.

Home-Based Engagement differed significantly according to the number of children in the household, $H(3) = 37.21$, $p < .001$, $q < .001$, $\epsilon^2 = .075$. This was the largest demographic effect identified in the group comparisons. FDR-adjusted Dunn tests showed that respondents with one child reported higher scores than respondents with two children (adjusted $p = .006$), three children (adjusted $p < .001$), and four or more children (adjusted $p = .003$). No statistically significant differences were found among the two-child, three-child, and four-or-more-child groups after correction. The findings therefore indicated a distinction between one-child and multiple-child households rather than a strictly monotonic decline across all categories.

Place of residence was also associated with Home-Based Engagement. Respondents living in urban areas reported higher scores than those living in rural areas, $U = 12,554.50$, $p = .004$, $q = .013$, $r = .12$. The magnitude of this difference was small.

Home-Based Engagement also differed across the revised educational groups, $H(3) = 17.96$, $p < .001$, $q = .002$, $\epsilon^2 = .036$. FDR-adjusted Dunn comparisons indicated that respondents with bachelor's degrees or above reported higher Home-Based Engagement than respondents with middle school education (adjusted $p = .018$) and high school education (adjusted $p = .011$). The difference between the primary school and bachelor's-degree-and-above groups was not statistically significant after correction (adjusted $p =$

.083). Given the limited reliability of the subdimension, these educational differences should be interpreted cautiously.

No statistically significant differences remained after FDR correction for parent gender, child gender, household income, parent age, employment status, prior preschool education experience, or institution type. Similarly, no FDR-adjusted demographic differences were identified for Knowledge and Expectations or Trust and Communication.

Demographic Variables Associated With Home-Based Engagement

The second research question focused specifically on the demographic variables associated with Home-Based Engagement. The clearest difference concerned the number of children in the household. Respondents with one child reported higher Home-Based Engagement than respondents with multiple children. However, the multiple-child groups did not differ significantly from one another after correction.

Urban respondents also reported higher Home-Based Engagement than rural respondents, although this difference was small. Educational level was associated with Home-Based Engagement at the univariate level, with the bachelor's-degree-and-above group reporting higher scores than the middle school and high school groups.

These findings indicate demographic associations rather than causal effects. Moreover, because Home-Based Engagement demonstrated low internal consistency, the magnitude and stability of these differences remain uncertain.

Multivariable Analyses

Multiple linear regression models were estimated using ordinary least squares to examine the adjusted associations between demographic characteristics and parent engagement outcomes. Conventional overall OLS F tests were used to evaluate model-level statistical significance. HC3 heteroskedasticity-consistent standard errors were used for coefficient-level inference, including standard errors, confidence intervals, and p values. All demographic variables were entered simultaneously, and the revised four-category educational-level variable was used in each model. The numerator degrees of freedom correspond to the 17 predictor parameters entered into each model after category consolidation and dummy coding; the intercept was not included in this count.

Total Parent Engagement

The overall OLS model predicting Total Parent Engagement was statistically significant, $F(17,$

478) = 4.03, $p < .001$, $R^2 = .125$, adjusted $R^2 = .094$. The coefficient-level results reported below are based on HC3 heteroskedasticity-consistent standard errors.

Compared with respondents who had completed primary school, respondents with middle school education reported lower Total Parent Engagement, $b = -0.146$, robust SE = 0.045, 95% CI [-0.235, -0.057], $p = .001$. Lower scores were also observed among respondents with high school education, $b = -0.166$, robust SE = 0.044, 95% CI [-0.253, -0.079], $p < .001$, and those with bachelor's degrees or above, $b = -0.153$, robust SE = 0.043, 95% CI [-0.238, -0.068], $p < .001$.

No other individual demographic coefficient or reference-group contrast was statistically significant. These coefficients should be interpreted cautiously because the model explained only a modest proportion of the variance and did not include potentially relevant relational or program-level variables.

Knowledge and Expectations and Trust and Communication

The model predicting Knowledge and Expectations explained 7.4% of the variance, $R^2 = .074$, adjusted $R^2 = .041$. The model predicting Trust and Communication explained 6.8% of the variance, $R^2 = .068$, adjusted $R^2 = .035$. Neither model produced statistically significant individual demographic coefficients or reference-group contrasts at $p < .05$. These results were consistent with the limited demographic differentiation identified in the nonparametric comparisons.

Home-Based Engagement

The overall OLS model predicting Home-Based Engagement was statistically significant, $F(17, 478) = 3.58$, $p < .001$, $R^2 = .113$, adjusted $R^2 = .081$. The regression coefficients, standard errors, confidence intervals, and coefficient-level p values were estimated using HC3 robust inference.

Compared with respondents with one child, respondents with two children reported lower Home-Based Engagement, $b = -0.160$, robust SE = 0.042, 95% CI [-0.243, -0.077], $p < .001$. Lower scores were also observed among respondents with three children, $b = -0.251$, robust SE = 0.049, 95% CI [-0.347, -0.155], $p < .001$, and four or more children, $b = -0.218$, robust SE = 0.053, 95% CI [-0.322, -0.114], $p < .001$.

Rural residence was associated with lower Home-Based Engagement relative to urban residence, $b = -0.092$, robust SE = 0.038, 95% CI [-0.167, -0.017], $p = .016$.

After controlling for the remaining demographic variables, none of the educational-level contrasts with the primary school reference group was statistically

significant for Home-Based Engagement. Relative to primary school education, the coefficients were $b = 0.021$, $p = .721$, for middle school education; $b = 0.047$, $p = .394$, for high school education; and $b = 0.073$, $p = .181$, for bachelor's degree and above. Thus, the educational differences observed in the univariate analysis were not supported by the adjusted reference-group comparisons.

Sensitivity Analysis Restricted to Mothers

Because the sample consisted predominantly of mothers, the multivariable regression analyses were repeated using only the 451 maternal respondents. The mother-only analyses produced substantively similar results. As in the primary regression analyses, coefficient-level standard errors and p values were based on the HC3 estimator.

Relative to mothers with one child, Home-Based Engagement remained lower among mothers with two children, $b = -0.157$, $p < .001$; three children, $b = -0.246$, $p < .001$; and four or more children, $b = -0.211$, $p < .001$. Rural residence also remained negatively associated with Home-Based Engagement, $b = -0.089$, $p = .021$.

Statistically significant educational-level contrasts remained evident for Total Parent Engagement, whereas none of the educational-level contrasts was statistically significant for Home-Based Engagement in the adjusted mother-only model. These sensitivity results indicated that the principal regression patterns were not driven by the small group of fathers. Nevertheless, the strong maternal predominance of the sample limits the generalizability of the findings to fathers.

Overall, demographic differences were limited in the Knowledge and Expectations and Trust and Communication dimensions. The clearest differences involved Home-Based Engagement, particularly in relation to family size and residential context. Respondents with one child and those living in urban areas reported higher Home-Based Engagement after the remaining demographic characteristics were controlled. However, Home-Based Engagement demonstrated low internal consistency, and its regression model explained only a limited proportion of the variance. These associations should therefore be regarded as preliminary and require replication using a psychometrically stronger measure and more representative samples.

Discussion

Table 2
Descriptive Statistics and Distributional Characteristics of Parent Engagement Scores

Measure	N	M	SD	Median	Min	Max	Skewness	Kurtosis	Shapiro–Wilk W	p
Total Parent Engagement	496	3.73	0.21	3.80	2.92	4.00	-1.14	1.21	0.911	< .001
Knowledge and Expectations	496	3.74	0.25	3.78	2.56	4.00	-1.21	2.02	0.908	< .001
Trust and Communication	496	3.77	0.28	3.91	2.46	4.00	-1.47	2.40	0.800	< .001
Home-Based Engagement	496	3.63	0.29	3.60	2.40	4.00	-0.41	-0.48	0.902	< .001

Note. Scores were calculated as item means and ranged from 1 to 4, with higher scores indicating greater parent engagement. M = mean; SD = standard deviation; Min = minimum; Max = maximum.

Table 3
Internal Consistency and Item-Level Evidence for the Parent Engagement Scores

Scale or subdimension	Items	Raw α	ω	Corrected item–total correlations	Mean Pearson inter-item correlation
Total Parent Engagement	25	.78	.80	.24–.56	.15
Knowledge and Expectations	9	.61	.64	.25–.48	.15
Trust and Communication	11	.77	.79	.32–.59	.24
Home-Based Engagement	5	.48	.52	.16–.38	.17

Note. Cronbach's alpha coefficients were calculated from the raw item covariance matrix. McDonald's omega coefficients were estimated using Pearson item correlations. Corrected item–total correlations and mean inter-item correlations were also based on Pearson correlations. Because raw alpha incorporates differences in item variances, it does not necessarily correspond exactly to the standardized alpha implied by the mean inter-item correlation. The low reliability of Home-Based Engagement indicates substantial measurement error; findings involving this subdimension should therefore be regarded as preliminary.

Table 4
FDR-Corrected Demographic Differences in Parent Engagement

Outcome	Demographic variable	Test statistic	p	FDR-adjusted q	Effect size
Total Parent Engagement	Educational level	H(3) = 14.82	.002	.021	$\epsilon^2 = .030$
Home-Based Engagement	Number of children	H(3) = 37.21	< .001	< .001	$\epsilon^2 = .075$
Home-Based Engagement	Educational level	H(3) = 17.96	< .001	.002	$\epsilon^2 = .036$
Home-Based Engagement	Place of residence	U = 12,554.50	.004	.013	r = .12

Note. Only demographic group comparisons that remained statistically significant after the Benjamini–Hochberg false discovery rate correction are presented. The correction was applied separately to the 10 demographic comparisons conducted for each engagement outcome. FDR-adjusted demographic group-comparison results are reported as q values. Dunn pairwise comparisons were separately adjusted using the Benjamini–Hochberg procedure within each set of post hoc comparisons. For Kruskal–Wallis tests, ordinal epsilon-squared was calculated as $\epsilon^2 = H/(N - 1)$. Effect size r is reported for the Mann–Whitney U test. FDR = false discovery rate.

Table 5
Multiple Regression Models Predicting Parent Engagement

Outcome and predictor	B	Robust SE	95% CI	p
Total Parent Engagement				
Middle school (ref. primary school)	-0.146	0.045	[-0.235, -0.057]	.001
High school (ref. primary school)	-0.166	0.044	[-0.253, -0.079]	< .001
Bachelor's degree and above (ref. primary school)	-0.153	0.043	[-0.238, -0.068]	< .001
Home-Based Engagement				
Two children (ref. one child)	-0.160	0.042	[-0.243, -0.077]	< .001
Three children (ref. one child)	-0.251	0.049	[-0.347, -0.155]	< .001
Four or more children (ref. one child)	-0.218	0.053	[-0.322, -0.114]	< .001
Rural residence (ref. urban residence)	-0.092	0.038	[-0.167, -0.017]	.016
Middle school (ref. primary school)	0.021	0.059	[-0.095, 0.137]	.721
High school (ref. primary school)	0.047	0.055	[-0.061, 0.155]	.394
Bachelor's degree and above (ref. primary school)	0.073	0.055	[-0.034, 0.180]	.181

Note. Unstandardized regression coefficients are reported. SE = standard error; CI = confidence interval; ref. = reference category. The reported model-level F tests are conventional OLS F tests. Coefficient-level standard errors, confidence intervals, and p values are based on the HC3 heteroskedasticity-consistent covariance estimator. Only statistically significant coefficients are presented for Total Parent Engagement. Educational-level coefficients are additionally presented for Home-Based Engagement to show that the univariate educational differences were not supported by the adjusted reference-group comparisons.

The present study aimed to examine parental engagement in early childhood education within the Turkish context by conceptualizing engagement as a multidimensional construct and investigating its associations with demographic characteristics. Overall, the findings indicate that parental engagement levels were generally high among parents of preschool-aged children; however, this high level of engagement was not uniform across dimensions. While parents reported consistently high scores in Knowledge and Expectations and Trust and Communication, more pronounced variability emerged in Home-Based Engagement. Demographic differences were largely confined to this dimension, suggesting that parental engagement in Türkiye may be broadly endorsed at the level of beliefs, expectations, and school-related communication, yet enacted unevenly when it comes to practices embedded in the home context. This pattern aligns with conceptualizations of parent engagement as a complex and context-sensitive construct shaped by both relational and structural conditions rather than a single, homogeneous behavior (Fantuzzo et al., 2013; Weiss et al., 2010; Manzon et al., 2015).

One notable feature of the findings is the overall concentration of parental engagement scores near the upper end of the scale, indicating generally high reported engagement. This pattern may be interpreted, in part, through the normative status of parent engagement in early childhood education, where engagement is widely framed as a desirable and expected parental role. Previous research has shown that conceptual ambiguity surrounding parent engagement may lead parents to interpret engagement in broad or aspirational terms, potentially contributing to elevated self-reports (Gross et al., 2020). In the Turkish context, this tendency may be further reinforced by policy discourses that increasingly emphasize parents as active partners in children's education and highlight family-school collaboration as a central principle of early childhood programs (MoNE, 2024a; MoNE, 2024b). From a theoretical perspective, the prominence of high engagement scores is also consistent with frameworks that position program-family partnerships as a core and valued component of early childhood education systems (Halgunseth et al., 2009). At the same time, the clustering of scores near the scale ceiling suggests that reported engagement may reflect not only actual practices but also socially desirable responding shaped by institutional expectations and dominant educational narratives.

Parental engagement did not manifest uniformly across its dimensions, and the observed differentiation among subdimensions provides an important insight into how engagement is enacted in early childhood education contexts. In the present study, Knowledge

and Expectations and Trust and Communication were characterized by consistently high scores, whereas Home-Based Engagement was comparatively lower. This pattern may be understood by considering the differing visibility and structure of these engagement forms. School-related dimensions of engagement, such as communication with teachers and alignment with educational expectations, are often more explicitly defined, institutionally encouraged, and socially recognized. In contrast, home-based engagement encompasses practices that are less observable, less standardized, and more dependent on families' individual circumstances. Prior research has similarly emphasized that parent engagement comprises distinct dimensions that may not develop in parallel and may respond differently to contextual constraints (Gross et al., 2022). From a broader perspective, this distinction also mirrors the differentiation between center-oriented practices and child-focused practices, with the latter often requiring greater initiative, sustained effort, and contextual adaptation within the home environment (OECD, 2011). In line with the Social Exchange Model of Family Engagement, the enactment of home-based practices is particularly sensitive to family-level resources, suggesting that high engagement in school-related domains does not automatically translate into equally strong engagement at home (Halgunseth et al., 2009).

The clearest demographic difference in Home-Based Engagement concerned the number of children in the household. Respondents with one child reported higher scores than respondents with two, three, or four or more children. However, the multiple-child groups did not differ significantly from one another. The result should therefore be interpreted as a distinction between one-child and multiple-child households rather than as evidence of a progressive decline with each additional child. One possible explanation is that home-based practices require time, attention, and opportunities for individual interaction, which may be distributed across several children in larger households. This interpretation is compatible with the Social Exchange Model's emphasis on finite family-level resources (Halgunseth et al., 2009). Turkish research has likewise identified time constraints, caregiving responsibilities, and competing family demands as potential barriers to sustained participation (Çakmak, 2010; Orçan Kaçan et al., 2019). Nevertheless, these mechanisms were not directly measured in the present study and should be examined in future research.

In addition to family structure, residential context emerged as a meaningful factor in shaping home-based engagement. Parents residing in urban areas reported higher levels of home-based engagement compared to those living in rural settings, although the magnitude of this difference was modest. One possible explanation is that residential settings differ in access

to educational materials, informational support, and community-based learning opportunities. Recent qualitative evidence from rural Türkiye has documented spatial inequalities in families' experiences of preschool access and adequacy (Dikmen & Gökalep, 2026). However, the present study did not directly measure resource availability, service access, or community support. The observed rural-urban difference should therefore be interpreted as a contextual association rather than evidence of a specific explanatory mechanism. From a theoretical standpoint, the Social Exchange Model emphasizes the role of program-community partnerships and the broader ecological context in enabling family engagement (Halgunseth et al., 2009). When such supports are limited or less accessible, as may be the case in some rural settings, families may face additional barriers to sustaining engagement practices beyond the school context. Within Türkiye, previous research has similarly pointed to persistent challenges in translating policy-level emphasis on parent involvement into everyday practices, particularly in contexts marked by structural and resource-related constraints (Filik Uyanık, 2018). Taken together, the urban-rural differences observed in this study underscore the importance of contextual sensitivity when interpreting parental engagement and caution against assuming uniform opportunities for engagement across residential settings (OECD, 2011).

Educational level produced different patterns across the total score and Home-Based Engagement. For Total Parent Engagement, the adjusted contrasts indicated lower scores among the middle school, high school, and bachelor's-degree-and-above groups than among the primary school reference group. In contrast, the univariate Home-Based Engagement analysis showed higher scores in the bachelor's-degree-and-above group than in the middle and high school groups, but none of the educational-level contrasts remained significant in the adjusted model. These findings do not support a simple linear relationship between education and engagement. They may reflect differences among engagement dimensions, correlations between education and other demographic characteristics, or response patterns across educational groups. Because these explanations were not tested directly, the educational findings should be interpreted descriptively and examined further in future research.

The multivariable regression analyses further contribute to the interpretation of these findings by demonstrating that demographic characteristics explained only a modest proportion of variance in parental engagement outcomes. Although statistically significant adjusted educational contrasts were identified for Total Parent Engagement, and family-size and residence contrasts were identified

for Home-Based Engagement, the models explained only modest proportions of variance. The limited explanatory power indicates that demographic characteristics capture only part of the variation in parent engagement. Engagement in early childhood education is widely conceptualized as a relational and contextually embedded process shaped by interactions among families, children, educational institutions, and communities (Halgunseth et al., 2009; Weiss et al., 2010). As such, it cannot be fully accounted for by demographic indicators alone. Factors such as program quality, teacher practices, parent-teacher relationships, cultural norms, and individual beliefs are likely to play a substantial role in shaping engagement, yet these variables extend beyond the scope of demographic modeling. Previous syntheses of the literature similarly emphasize that demographic characteristics tend to exert small and indirect effects on parent engagement when considered alongside relational and institutional factors (Gross et al., 2022). Accordingly, the modest explanatory power is consistent with the view that parent engagement is shaped by demographic, relational, institutional, and cultural conditions operating together.

Finally, the present study makes a substantive contribution to the literature on early childhood education in Türkiye by addressing a longstanding gap in empirical research on parent engagement. Despite increasing policy-level emphasis on family participation in education, the concept of engagement in the Turkish context has largely been framed and examined through the lens of parent involvement, with limited attention to its multidimensional and relational nature (Kaya, 2023; Kaya, 2024). By adopting a validated, multidimensional measure of parent engagement and examining demographic patterns within a relatively large convenience sample, this study provides one of the first detailed quantitative examinations of parental engagement in early childhood education in Türkiye. In doing so, it moves beyond descriptive accounts of involvement to capture differentiated engagement practices across home and school contexts. The findings also respond to calls in the national literature for more nuanced and evidence-based examinations of parent engagement, particularly in relation to persistent structural and contextual challenges (Filik Uyanık, 2018; Serdaroğlu & Bekir, 2024). Taken together, the study offers initial empirical evidence for future research and practice by clarifying how parental engagement is distributed across dimensions and demographic contexts in Türkiye, thereby strengthening the conceptual and empirical grounding of this field.

Conclusion

This study examined parental engagement in early childhood education in Türkiye as a multidimensional

construct encompassing Knowledge and Expectations, Trust and Communication, and Home-Based Engagement. Overall, parents reported high levels of engagement, particularly in school-facing dimensions such as expectations, knowledge, and communication. However, engagement was not uniform across domains. The most meaningful variation was concentrated in Home-Based Engagement, which was comparatively lower than the other subdimensions and showed systematic differences across key demographic characteristics. In both univariate and multivariable analyses, home-based engagement tended to be lower among families with more children and among those living in rural settings, suggesting that engagement enacted in the home environment may be more sensitive to structural constraints and contextual opportunities than engagement expressed through beliefs, expectations, and school communication. Together, these findings support the view that parental engagement is broadly endorsed in principle but unevenly supported in practice, particularly in the home context. However, the Home-Based Engagement score demonstrated low internal consistency, and the corresponding associations should be treated as preliminary. The findings indicate one-child versus multiple-child and urban versus rural differences rather than establishing the mechanisms underlying these patterns.

The results suggest that early childhood education policies and program-level practices in Türkiye may benefit from shifting from general encouragement of parent engagement toward more targeted support for Home-Based Engagement, which appears to be the dimension in which the clearest demographic differences were observed in this sample. First, early childhood programs may consider integrating low-burden, high-feasibility home learning routines into their family outreach efforts. Practical tools such as short activity menus, weekly “micro-practices” (e.g., shared reading, everyday math talk, structured play prompts), and examples of learning opportunities embedded in daily routines can make home-based engagement more accessible, particularly for families experiencing time and resource constraints.

Second, the observed difference between one-child and multiple-child households underscores the need for supports that acknowledge competing demands within multi-child households. Programs may consider differentiated guidance for parents with multiple children, such as strategies for managing shared learning activities across siblings, rotating one-to-one interaction time, or using group-based home activities that simultaneously support multiple children. Designing materials that explicitly address “how to do this with more than one child” can increase feasibility and reduce the implicit assumption that engagement requires intensive one-to-one time.

Third, the rural–urban disparity in home-based engagement highlights the importance of improving access to family support mechanisms in rural contexts. This does not necessarily require resource-intensive interventions. Scalable options such as mobile-friendly guidance, short video demonstrations, parent messaging groups facilitated by teachers, and community-based partnerships that expand access to books and learning materials may help reduce contextual barriers. Importantly, these strategies should be implemented in culturally responsive ways and framed as supportive rather than evaluative, given that home-based engagement is closely tied to families’ everyday realities.

Finally, the limited demographic differentiation in Knowledge and Expectations and Trust and Communication suggests that these scores were relatively homogeneous in the present sample. However, the strong ceiling effects mean that this homogeneity may partly reflect restricted score variability. Existing school–family communication channels may nevertheless provide a practical route for offering optional guidance on home-based learning practices.

Limitations

Several limitations should be considered. The most important concerns the measurement of Home-Based Engagement, which constituted the main focus of several findings. This five-item subdimension demonstrated low internal consistency, with $\alpha = .48$ and $\omega = .52$. Corrected item–total correlations ranged from .16 to .38, and its standardized factor loadings ranged from .31 to .59. Although the ordinal CFA supported the overall three-factor structure, acceptable global model fit does not eliminate the subdimension-level reliability problem. The clustering of responses in the highest category may have restricted score variability and weakened inter-item relationships. Consequently, Home-Based Engagement scores contain substantial measurement error, and the demographic associations involving this outcome may be attenuated, unstable, or sample-specific. These findings should therefore be regarded as preliminary rather than definitive. A second limitation concerns the strong maternal predominance of the sample. Mothers constituted 90.9% of participants, meaning that the findings primarily represent maternal reports and cannot be generalized confidently to fathers. Although the mother-only sensitivity analysis produced substantively similar regression patterns, it does not compensate for the limited representation of fathers. Third, convenience sampling with snowball features and online recruitment limits the representativeness of the sample. Parents with internet access and connections to the networks through which the questionnaire was distributed may differ from other parents in Türkiye.

The urban predominance of the sample further limits broader generalization. Fourth, the study relied on self-reported engagement. Because engagement is socially valued, responses may have been influenced by social desirability. The pronounced ceiling effects also reduced variability and may have limited the detection of demographic differences. The moderate internal consistency of Knowledge and Expectations ($\alpha = .61$; $\omega = .64$) should likewise be considered when interpreting findings for that dimension. Fifth, the cross-sectional design supports associations but not causal or directional conclusions. Explanations involving time constraints, resource availability, self-evaluation, or access to educational opportunities were not directly tested. Finally, the regression models explained only modest proportions of variance and did not include potentially important relational and program-level factors, such as teacher outreach, school climate, parent-teacher trust, family routines, or access to learning resources.

Future Research Avenues

Future research can extend this work in several ways. First, longitudinal designs are needed to examine how parent engagement evolves over time and how demographic and contextual factors shape trajectories of engagement across children's early education experiences. Such designs would also allow stronger inferences regarding directionality between family characteristics and engagement practices. Second, mixed-methods studies could deepen understanding of why home-based engagement varies across family size and residential context. Qualitative interviews or focus groups with parents and teachers may clarify specific barriers, culturally grounded meanings of "engagement," and the types of supports families perceive as most feasible and respectful. Third, future research should incorporate program- and relationship-level predictors alongside demographics, such as teacher outreach practices, perceived school climate, parent-teacher trust, and access to learning resources. Including these variables may improve explanatory power and better reflect the multilevel nature of parent engagement. Fourth, measurement-focused research should re-examine the Home-Based Engagement items in more diverse Turkish samples. Future studies should evaluate whether the weak reliability reflects item heterogeneity, restricted variance, contextual interpretation, or insufficient coverage of home-based practices. Item revision or expansion, test-retest reliability, and replication of the factor structure should be considered before strong substantive conclusions are drawn from this subdimension. Fifth, future samples should include more balanced numbers of mothers and fathers and greater representation of rural families. Such designs would permit more credible examination of whether engagement patterns differ according to parent gender and residential context.

Finally, once the Home-Based Engagement findings have been replicated using psychometrically stronger measures, intervention studies may evaluate low-cost strategies designed to support home-based practices in multiple-child households and rural settings.

Declarations

Acknowledgments

The authors would like to thank all parents who voluntarily participated in the study.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethics Statements

Ethical approval for this study was obtained from the Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee (Approval No: 2024/70). The study was conducted in accordance with the ethical standards for research involving human participants.

Conflict of Interest

The authors declare that they have no conflict of interest.

Informed Consent

Informed consent was obtained electronically from all participants prior to participation. Participation was voluntary, and responses were collected anonymously.

Data availability

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

AI Disclosure Statement

The authors used ChatGPT (OpenAI, GPT-5.5) solely to assist with English language editing, grammar correction, and improving the clarity of the manuscript. The AI tool was not used to generate the study design, analyses, results, interpretations, or scientific conclusions. All AI-assisted edits were carefully reviewed, verified, and, where necessary, revised by the authors, who take full responsibility for the final content of the manuscript.

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