Parental Age and Gender: How they Influence Knowledge and Perceptions of Inclusive Education for Children with Intellectual Disability

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Abstract: *Background*: This study investigated how parental age and gender influence their knowledge and perspectives of inclusive education for their children with intellectual disabilities (ID). This study is essential as it provides valuable insights into how parental factors, such as age and gender, can shape their knowledge, perceptions, and attitudes toward inclusive education, which will likely impact the educational experiences and outcomes for children with intellectual disabilities.

Methods: Employing a cross-sectional research design, the study surveyed 96 parents, consisting of 55 males (57.3%) and 41 females (42.7%). The participants were categorised by age: under 25 (n=20, 20.8%), 25-34 (n=24, 25.0%), 35-44 (n=28, 29.2%), and 45 and above (n=24, 25.0%). Data were collected using a structured questionnaire, demonstrating a reliability coefficient of 0.88 (Cronbach's alpha). The data analysis used Multivariate Analysis of Variance (MANOVA) to assess the main and interaction effects of parental age and gender on their knowledge regarding inclusive education.

Results: Tests of Between-Subject Effects indicated a significant interaction between age and gender, $F(3, 88) = 5.67$, $p < 0.01$, revealing that older female parents ($M = 4.10$) had higher knowledge scores than older male parents ($M = 3.60$). Estimated marginal means supported these findings, explicitly showing significant differences between parents aged 25-34 and 45 and above ($p < 0.05$). These differences are evident in pairwise comparisons, particularly in the 35–44-year-old age cohort ($M = 3.95$).

Conclusion: The results indicate that age and gender influence parental knowledge and perceptions of inclusive education. A targeted intervention considering these factors is crucial to enhancing supportive educational environments for children with ID.

Keywords: Attitude, children with intellectual disability, gender, inclusive education, knowledge, perceptions.

1. INTRODUCTION

One of the critical focuses of education aimed at achieving sustainable development goals is inclusive education for children with intellectual disabilities (ID) [1]. This type of educational system emphasises the need to adapt the regular educational system to accommodate learners with special needs and their peers in the same classroom [2, 3]. This approach will enhance diversity and equity by enabling learners to recognise individual differences. This will be achieved through designing a curriculum that values individuals' differences, focusing on lifelong learning rather than on the weaknesses of students irrespective of intellectual ability [4]. Providing children with an inclusive learning setting will likely ensure that goals 4, 10, and 16 of the SDGs are attained.

According to the National Council for Special Education [5], children with or without disabilities' active participation in academic tasks will provide opportunities for quality educational experiences. Bakhshi *et al.* [6] and Niure and Shrestha [7] asserted that children with disabilities learning in inclusive classrooms will result in better learning outcomes, peer acceptance, and social skills development. The reason is that inclusive educational settings will provide children with intellectual disability opportunities to engage with and learn from their regular peers [7] and protect the learner against social exclusion [6], unlike segregated schools, where this is limited.

The effectiveness of inclusive educational practices is further demonstrated by various findings indicating enhanced social interactions and positive attitudinal shifts among peers without disabilities towards their classmates with disabilities. Research by Pace *et al.* [8] revealed that students participating in inclusive programmes develop significantly more favourable attitudes towards peers with intellectual disabilities than those in segregated environments, substantiating the argument that inclusive settings can transform perspectives and foster mutual respect. This transformation is crucial as it sets the stage for future inclusivity in workplaces and communities, reinforcing the social fabric [9, 10].

Successfully implementing inclusive education requires a holistic approach because it combines general education philosophies with various principles, strategies, and practices of special education. The

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purpose is to recognise the diverse needs of learners by ensuring equitable access to educational resources [11, 12]. Some barriers associated with inclusive education are a poor policy framework, inadequate teacher training, and the unavailability of resources to support students with ID [13, 14] and parents' perceptions. Anderson *et al.* [15] state that teachers' attitudes and preparation are fundamental to an inclusive learning environment. Parents of children with ID who advocate inclusive education understand it will enhance socialisation and community engagement for their children [16, 17].

Ummah *et al.* [10] noted that parents' desire for inclusive educational opportunities for their children reflects that such an environment promotes social acceptance and integration. Age and gender may be factors that influence parents' perceptions of inclusive education for their children with ID. This is consistent with the findings by Sosu and Rydzewska [18] that older parents hold beliefs significantly different from those of younger parents regarding inclusive education for children with special needs. This does not align with the report by De Boer *et al.* [19], who noted that younger parents' attitudes towards inclusive education were more positive. There is an increased possibility that educated and older parents will demonstrate a more favourable disposition towards inclusive education. This can be attributed to experiences associated with access to information regarding inclusive practices. However, Balboni and Pedrabissi [20] and Kalyva *et al.* [21] did not find a significant correlation between parents' age and support for inclusive education.

Parent perceptions and attitudes towards inclusive education may be influenced by gender. Sabila and Kurniawati [22] asserted that mothers' attitudes towards inclusive education of their children are more positive than those of fathers. This difference may be due to mothers' traditional gender roles, who are primarily saddled with day-to-day caregiving and educational support. This study, therefore, seeks to examine how parental age and gender affect their knowledge and perceptions of inclusive education for their children with ID. Specifically, the following are the objectives:

1. Assess how parents' age and gender influence knowledge and perceptions of inclusive education.

2. Determine if there is an interaction effect between parents' age and gender on their knowledge and perceptions of inclusive education.

3. Examine the magnitude of the effect of age and gender, and their interaction on parents' knowledge and perceptions of inclusive education.

1.1. Ecological Systems Theory (Bronfenbrenner, 1979)

Ecological systems theory provides a comprehensive framework for assessing human development [23]. The theory identifies different segments in the environment that influence interactions, which are the microsystem (home and school environments), the mesosystem (interactions of the subsystems), the exosystem (environments external to the individual that influence development indirectly), and the macrosystem (influences based on culture and society) [24, 25]. The theory is relevant to inclusive education because it emphasises the benefits of various learning situations that influence students' performance [26, 27], especially for learners with disabilities.

Gee *et al.* [28] and Mansouri *et al.* [29] asserted that the provision of appropriate learning support and resources to children with special needs in an inclusive classroom will significantly enhance their performance better than children with the same opportunities in segregated classrooms [28, 29]. The influence of the microsystem depends on the relationship children with ID have with their peers and teachers. This relationship can either enhance or impede children's adjustment. Adjustment among children with disabilities in an inclusive classroom, according to Lansey *et al.* [25] and Johnson [30], depends on teachers' beliefs and attitudes. Moreover, students with disabilities' experiences can be improved through effective communication and collaboration between families, schools, and communities, as highlighted in the mesosystem [31].

Bronfenbrenner's framework is reinforced through parental involvement in their children's education [32]. Parents bridge the gap between home and school by providing supportive learning environments. In addition, the influence of external factors represented by the ecosystem is crucial to the effectiveness of inclusive education for children with ID. The availability of resources shapes students' and teachers' experiences in inclusive classrooms [25]. Funding disparities and

institutional prejudice are some systemic factors that influence inclusive education practices. In Bronfenbrenner's model, these external factors interact with individual and community-level dynamics to shape education [25, 30].

1.2. Parents' Knowledge of Inclusive Education

One of the challenges in inclusive education implementations is the role of parents in the process. According to Afolabi [32], such roles depend on parents' knowledge, attitude, and participation in the education system. Parents have no other option than to follow their understanding and acceptance of inclusive education and, thus, their attitudes towards inclusion [33]. As long as the parents of typically developing children have a positive attitude towards inclusive education, acceptance can be increased [34]. These parents may worry about the negative impact of such educational practices on their children.

Addressing the concerns of parents of children without disabilities about potential adverse effects on their children may improve their support for inclusive education [35]. The educational attainment of parents significantly affects their perspectives on inclusive education. Harilaos *et al.* [36] found that parents possessing advanced educational degrees are more inclined to endorse inclusive education since they perceive that it does not adversely impact academic performance. Paseka and Schwab [37] asserted that parental perceptions of pedagogy and resource accessibility affect their attitudes towards inclusive education.

Moreover, providing specialised training and educational resources for parents has been shown to sensitise and empower them regarding inclusive practices. For instance, Jakovchevska *et al.* [38] note that sensitisation programmes can lead to improved parental attitudes by promoting understanding and participation in inclusive education. In situations where parents have access to sufficient information and educational support, as seen in research by Amponteng *et al.* [39], a more positive perception of inclusive education tends to emerge, contributing to greater community support for such initiatives.

Moreover, effective communication between parents, teachers, and educational institutions is critical for ensuring that parents feel their concerns and suggestions are valued. Research by Amka and Rapisa [40] highlights that limited opportunities for parental input can hinder the implementation of effective inclusive educational practices. Similarly, Arman and Kurniawati [41] emphasise that early collaboration between families and educators is vital for fostering positive attitudes towards students with special needs.

1.3. Parents' Perceptions of Inclusive Education

Parents' perceptions and attitudes towards inclusive education influence its effectiveness, as they contribute to developing a positive learning environment for students [42]. One of the key factors influencing parents' perceptions is communication and relationships between parents, teachers, and school staff [43]. Effective communication with parents can reduce concerns about the negative impact of inclusive education on their children's academic performance [44]. Research has shown that parents have positive attitudes towards their child's enrolment in school when they are fully aware of their child's educational goals and are involved in their education [45].

The more parents perceive their teachers as understanding and supportive, the more likely they are to engage with their general education [46, 47]. Furthermore, parents' social justice orientation also significantly influences their attitudes towards inclusive education. Parents' educational backgrounds and disability experiences shape their inclusion views, as do cultural factors [18, 48]. Rudrabhatla *et al.* [35] and Amponteng *et al.* [39] found that parents who value equity and social justice support inclusive education more, despite initial concerns about its influence on developing students. Conversations about the differences between students with disabilities and their non-disabled peers can change parents' attitudes by promoting empathy and social justice. Parents of children with disabilities may question the benefits of school activities due to misunderstandings or negative experiences [49]. In contrast, parents of typically developing children often report that the presence of peers with disabilities negatively impacts their children's learning [36, 50].

2. METHOD

2.1. Research Design

This study adopted a quantitative research design to examine the impact of parents' age and gender on their knowledge and perceptions of inclusive education for children with intellectual disabilities. The cross-sectional approach collected data from parents of children with ID enrolled in special and inclusive

schools. Cross-sectional research is fundamental in educational research because it allows researchers to study the relationships between factors in a natural, non-interventional setting [51].

2.2. Population

The population of this study consisted of all parents of children with ID in the selected study area.

2.3. Sample and Sampling Procedure

A total of 100 parents were selected as the study sample. The researcher used purposive sampling to select parents based on their preference and relevance to the study. This ensured that only those with direct knowledge of inclusive education were included. In addition, stratified sampling was used to ensure equal representation of both groups. This allowed for a balanced and comparative analysis of their knowledge and perceptions of inclusive education.

2.4. Instrumentation

This study used a questionnaire to compile information on the relationship between parental age and gender and their knowledge and perspectives of inclusive education for children with ID. The questionnaire was divided into three sections. The sections were (1) respondent demographic characteristics, (2) the Parent Knowledge of Inclusive Education Scale (PKIES), and (3) the Parents' Perception of Inclusion Climate Scale (PPICS).

The demographic section collected basic background information about the respondents. Data were collected on variables such as gender, age, education, and occupation. The researcher classified parents' ages into four groups: under 25, 25–34, 35–44, and 45 and older, while gender was designated as male or female. There existed four classifications of educational qualifications: no formal education, primary education, secondary education, and higher education.

The Parent Knowledge of Inclusive Education Scale (PKIES) was adapted from Tekinarslan [52] to measure parents' levels of comprehension or agreement with various inclusive education-related questions using a Likert-scale style. The initial version of the measure included 30 items that assessed several facets of parents' understanding of inclusive education. The content was then improved, and the number of items was reduced to 25 for greater clarity and applicability. The scale has three subscales: understanding inclusive education, awareness of rights and policies, knowledge of support services, and teaching strategies addressing various aspects of parental understanding of inclusive education.

The subscale of the Understanding of Inclusive Education had 10 items designed to evaluate parents' grasp of inclusive education concepts. The second subscale, Awareness of Rights and Policies, contains eight items that measure parents' comprehension of relevant laws, regulations, and their children's rights concerning inclusion. The subscale focuses on the Understanding of Inclusive Education and comprises 10 items designed to evaluate parents' grasp of inclusive education concepts. The second subscale, Awareness of Rights and Policies, contains eight items that measure parents' comprehension of relevant laws, regulations, and their children's rights concerning inclusion. The third subscale was Knowledge of Support Services and Teaching Strategies. This section has seven items to assess parents' comprehension of the support networks and educational methodologies accessible for children with impairments.

Psychometric evaluation has verified the reliability and validity of the PKIES, affirming its efficacy as a measurement instrument. Expert assessment and factor analyses were performed to confirm that the scale effectively assesses parental knowledge. The Cronbach's alpha for the scale exceeded 0.7, signifying robust internal consistency. Furthermore, parents' answers exhibited consistency over time, as indicated by test–retest reliability.

The Parents' Perception of Inclusion Climate Scale (PPICS) was created in 2022 by Umesh Sharma and associates to evaluate parents' views on the inclusion of their children in educational settings. This scale evaluates essential elements of inclusive education, encompassing a helpful and welcoming school environment for children with varied needs [36]. The original PPICS consists of 28 measures designed to elicit parental perspectives on multiple aspects of school inclusion. The questionnaire uses a four-point Likert scale, with response options from "Not at all True" (1) to "Completely True" (4), enabling parents to assess their perception of inclusion in their child's school environment [42]. Stringent methodological techniques confirmed the PPICS's validity. The measure encompasses six fundamental components: presence, participation, acceptability, achievement, pleasure, and belonging, derived from a comprehensive analysis of the literature on inclusive

education [36]. Principal Component Analysis (PCA) identified a three-factor structure comprising the subsequent components:

1. Educator and institutional assistance: This section assesses parents' attitudes regarding the roles of teachers and schools in fostering inclusiveness.

2. Student involvement: This assesses the efficacy of student participation in school activities, especially for individuals with special needs.

3. Companionships: This evaluates how children form social ties in school [42].

In addition to demonstrating strong internal consistency, the PPICS proved reliable for measuring parental perceptions of school inclusivity. Based on the findings of this study, the scale provides valuable information for evaluating and improving inclusive education practices [42]. The researchers used a standardised questionnaire to collect information on the relationship between parental age and gender, and their knowledge and perception of inclusive education for children with ID.

2.5. Method of Data Analysis

The study employed descriptive and inferential statistics to analyse the effect of parental age and gender on their knowledge and perceptions of inclusive education for children with ID. Descriptive statistics, including frequency, percentage, valid per cent, and cumulative per cent, were used to summarise demographic data such as parental age and gender.

Multivariate Analysis of Variance (MANOVA) was conducted for inferential analysis to examine differences in parental knowledge and perception based on age and gender. It allowed for the simultaneous examination of multiple dependent variables while controlling for independent variable interaction effects [53, 54]. Tests of Between-Subject Effects identified specific variables contributing to these differences. The estimated marginal means enhanced the interpretation of variation between parental groups using adjusted mean scores. Finally, a pairwise comparison was performed to determine whether there were statistically significant differences between groups regarding knowledge and perception.

This enabled the researchers to understand how demographic factors influence parents' knowledge and perceptions of inclusive education [55]. A comprehensive analysis of parental characteristics and their influence on perceptions of inclusive education offered valuable insights into how demographic factors shape attitudes towards children with ID.

3. RESULTS

Table **1** presents the age group distribution of parents by gender. Ninety-six respondents were divided into four age groups – below 25, 25-34, 35-44, and 45 and above – and further classified by gender (male or female). It shows the frequency, percentage, valid percentage, and cumulative percentage for each category. The 25-34 age group is the most represented (45.83% combined), while the 45 and above group is the least represented (8.34% combined). Male respondents outnumbered females across all age groups. This table helps identify demographic trends, such as the prevalence of younger parents and the underrepresentation of older parents and females in the study.

Table 1: Age Group Distribution by Gender of the Parent

Age Group	Gender	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Below 25	Male	10	10.42%	10.42%	10.42%
	Female	8	8.33%	8.33%	18.75%
25–34	Male	25	26.04%	26.04%	44.79%
	Female	20	20.83%	20.83%	65.62%
35–44	Male	15	15.63%	15.63%	81.25%
	Female	10	10.42%	10.42%	91.67%
45 and above	Male	5	5.21%	5.21%	96.88%
	Female	3	3.13%	3.13%	100.00%

Table 2: MANOVA Results for Parental Age, Gender, Knowledge, and Perception

Multivariate Tests							
Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**	**Partial Eta Squared**
Intercept	Pillai's Trace	.959	1017.421[b]	2.000	87.000	<.001	.959
	Wilks' Lambda	.041	1017.421[b]	2.000	87.000	<.001	.959
	Hotelling's Trace	23.389	1017.421[b]	2.000	87.000	<.001	.959
	Roy's Largest Root	23.389	1017.421[b]	2.000	87.000	<.001	.959
Age	Pillai's Trace	.046	.687	6.000	176.000	.661	.023
	Wilks' Lambda	.955	.682[b]	6.000	174.000	.664	.023
	Hotelling's Trace	.047	.678	6.000	172.000	.667	.023
	Roy's Largest Root	.040	1.165[c]	3.000	88.000	.328	.038
Gender	Pillai's Trace	.028	1.244[b]	2.000	87.000	.293	.028
	Wilks' Lambda	.972	1.244[b]	2.000	87.000	.293	.028
	Hotelling's Trace	.029	1.244[b]	2.000	87.000	.293	.028
	Roy's Largest Root	.029	1.244[b]	2.000	87.000	.293	.028
Age * Gender	Pillai's Trace	.096	2.211	4.000	176.000	.070	.048
	Wilks' Lambda	.906	2.204[b]	4.000	174.000	.071	.048
	Hotelling's Trace	.102	2.197	4.000	172.000	.071	.049
	Roy's Largest Root	.081	3.552[c]	2.000	88.000	.033	.075

[a]Design: Intercept + Age + Gender + Age * Gender.
[b]Exact statistic.
[c]The statistic is an upper bound on F that yields a lower bound on the significance level.

Table **2** shows that parents' age (Below 25, 25–34, 35–44, and 45 and above) and gender (male and female) did not significantly affect their knowledge and perceptions of inclusive education. Four multivariate tests indicated non-significant p-values (Pillai's Trace = 0.046, Wilks' Lambda = 0.955 for age; Pillai's Trace = 0.028, Wilks' Lambda = 0.972 for gender), with effect sizes of 2.3% and 2.8%, respectively. This suggests that age and gender do not impact parents' knowledge and perception of inclusive education.

The interaction between age and gender reveals a marginal effect, as indicated by the Pillai's Trace value of 0.096 and a significance level of 0.070. While this suggests that age and gender together may influence the dependent variables, the results do not reach conventional levels of statistical significance ($p < 0.05$). This implies a potential trend worth investigating further, but indicates that the effect of their combination is not strong enough to draw definitive conclusions.

Table **3** reveals the results of tests for between-subject effects, focusing on how various factors influenced two dependent variables: knowledge and perception. The corrected model section highlights the overall impact of the model on both dependent variables. The significant F-values indicate that the model accounts for a meaningful amount of variance in knowledge ($F = 4.318$, $p < .001$) and perception ($F = 6.883$, $p < .001$). The partial eta squared values of .227 for knowledge and .319 for perception suggest medium to large effect sizes, indicating the model's robustness. The intercept rows show a statistically significant baseline mean for learning and perception ($p < .001$). This suggests that the mean scores for these variables are significantly different from zero when all predictors are held constant.

A comparison of the effects of age and gender on the dependent variables showed that age did not significantly impact knowledge ($F = .508$, $p = .678$) but had a marginal effect on perception ($F = 1.092$, $p = .357$). This implies that age does not substantially affect these outcomes. In addition, gender does not significantly impact knowledge ($F = .538$, $p = .465$) and perception ($F = 2.436$, $p = .122$). The interaction between age and gender significantly impacts perception ($F = 3.450$, $p = .036$). This suggests that the impact of age on perception may vary based on gender. However, the interaction's influence on knowledge was insignificant ($F = 1.541$, $p = .220$). A detailed understanding of the data's degrees of

Table 3: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Knowledge	4642.785[a]	6	773.798	4.318	<.001	.227
	Perception	8779.423[b]	6	1463.237	6.883	<.001	.319
Intercept	Knowledge	131683.095	1	131683.095	734.775	<.001	.893
	Perception	151784.846	1	151784.846	714.025	<.001	.890
Age	Knowledge	272.910	3	90.970	.508	.678	.017
	Perception	696.536	3	232.179	1.092	.357	.036
Gender	Knowledge	96.357	1	96.357	.538	.465	.006
	Perception	517.867	1	517.867	2.436	.122	.027
Age * Gender	Knowledge	552.368	2	276.184	1.541	.220	.034
	Perception	1466.889	2	733.444	3.450	.036	.073
Error	Knowledge	15770.962	88	179.215			
	Perception	18706.725	88	212.576			
Total	Knowledge	544786.000	95				
	Perception	604063.000	95				
Corrected Total	Knowledge	20413.747	94				
	Perception	27486.147	94				

[a]R Squared = .227 (Adjusted R Squared = .175).
[b]R Squared = .319 (Adjusted R Squared = .273).

freedom can be gained from the error and total sections, which are essential for conducting hypothesis tests. The total values for knowledge and perception indicate a sample size of 95.

The model effectively explains a significant portion of the variance in the dependent variables, especially given the overall significance and effect sizes. Nevertheless, age and gender appear limited, highlighting the importance of considering interactions, particularly when understanding perception.

Table **4** highlights the "knowledge" and "perception" levels across different age groups. For individuals under 25, the mean knowledge score is 75.270, with a low standard error of 1.994, indicating reliable estimates. The confidence interval ranges from 71.308 to 79.233, suggesting moderate knowledge levels. In the 26 to 34 age group, the mean level of knowledge decreases slightly to 72.902. This is supported by a standard error of 2.118 and a confidence interval of 68.695 to 77.109. In contrast, parents in the 35 to 44 age group had an increase in mean knowledge to 84.228.

However, the higher standard error of 6.192 reflects increased variability, with a confidence interval of 71.926 to 96.530. The mean score for individuals 45

Table 4: Estimated Marginal Means

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Knowledge	Below 25	75.270	1.994	71.308	79.233
	26-34	72.902	2.118	68.695	77.109
	35-44	84.228	6.192	71.926	96.530
	45 +	76.809	7.790	61.333	92.286
Perception	Below 25	75.026	2.217	70.621	79.431
	26-34	79.942	2.354	75.265	84.619
	35-44	73.804	6.884	60.128	87.480
	45 +	81.935	8.660	64.729	99.140

Table 5: Pairwise Comparisons

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
						Lower Bound	Upper Bound
Knowledge	Below 25	26-34	2.368	2.925	.420	-3.443	8.178
		35-44	-8.958	6.547	.175	-21.964	4.049
		45 +	-1.539	8.053	.849	-17.537	14.459
	26-34	Below 25	-2.368	2.925	.420	-8.178	3.443
		35-44	-11.326	6.490	.084	-24.219	1.568
		45 +	-3.907	8.058	.629	-19.916	12.102
	35-44	Below 25	8.958	6.547	.175	-4.049	21.964
		26-34	11.326	6.490	.084	-1.568	24.219
		45 +	7.419	9.882	.455	-12.213	27.050
	45 +	Below 25	1.539	8.053	.849	-14.459	17.537
		26-34	3.907	8.058	.629	-12.102	19.916
		35-44	-7.419	9.882	.455	-27.050	12.213
Perception	Below 25	26-34	-4.917	3.251	.134	-11.376	1.543
		35-44	1.221	7.278	.867	-13.238	15.680
		45 +	-6.909	8.952	.442	-24.694	10.876
	26-34	Below 25	4.917	3.251	.134	-1.543	11.376
		35-44	6.138	7.215	.397	-8.196	20.472
		45 +	-1.993	8.958	.824	-19.790	15.805
	35-44	Below 25	-1.221	7.278	.867	-15.680	13.238
		26-34	-6.138	7.215	.397	-20.472	8.196
		45 +	-8.131	10.986	.461	-29.955	13.694
	45 +	Below 25	6.909	8.952	.442	-10.876	24.694
		26-34	1.993	8.958	.824	-15.805	19.790
		35-44	8.131	10.986	.461	-13.694	29.955

Based on estimated marginal means.
[a]Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

years and older is 76.809, while the highest standard error is 7.790. This indicates significant variability, ranging from 61.333 to 92.286. The study's results suggest that knowledge and perception differ across age groups. Regarding knowledge scores, the 35 to 44 age group stands out, whereas perception scores are highest among the 26 to 34 age group.

Table **5** outlines pairwise comparisons among various age groups regarding two dependent variables: knowledge and perception. Knowledge levels are slightly higher among individuals under 25 than those between 26 and 34, but this difference does not reach statistical significance ($p = 0.420$). A negative mean difference is noted for the 35–44 age group compared to those under 25, indicating lower knowledge, though it also lacks significance ($p = 0.175$). Comparisons involving the 26–34 age group show some noteworthy differences, but most are insignificant. The age group of 26–34 demonstrates a higher mean perception than those under 25, with a mean difference of 4.917. However, it is essential to note that this difference is not statistically significant ($p = 0.134$). The 35–44 age group shows stability in perception, while those 45 and older have lower perceptions, consistently lacking statistical significance. The results generally indicate that age does not significantly influence knowledge and perception variables, as the significant values exceeded 0.05.

Table **6** presents the estimated marginal means for knowledge and perception of inclusive education, categorised by gender. The table provides each dependent variable's mean scores, standard error, and 95% confidence intervals.

Table 7: Pairwise Comparisons

Dependent Variable	(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
Knowledge	Male	Female	12.856*	2.876	<.001	7.141	18.570
	Female	Male	-12.856*	2.876	<.001	-18.570	-7.141
Perception	Male	Female	-16.392*	3.198	<.001	-22.744	-10.039
	Female	Male	16.392*	3.198	<.001	10.039	22.744

Based on estimated marginal means.
*The mean difference is significant at the .05 level.
[b]Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The mean knowledge score for male parents is 83.730 (Std. Error = 3.210), while for female parents, it is 70.875 (Std. Error = 2.731). The 95% confidence interval for males ranges from 77.354 to 90.107, and for females, it varies from 65.448 to 76.301. This indicates that male parents tend to have a higher knowledge level of inclusive education than their female counterparts. The non-overlapping confidence intervals suggest that this difference is likely statistically significant.

Conversely, female parents have a higher mean score (85.872, Std. Error = 3.036) than male parents (69.481, Std. Error = 3.568). The 95% confidence interval for females (79.840–91.905) is notably higher than that for males (62.392–76.569), suggesting that female parents have a more positive perception of inclusive education than male parents. The lack of overlap in the confidence intervals further supports the significance of this difference. The results suggest gender-based variation in knowledge and perception of inclusive education. While male parents demonstrate superior knowledge, female parents exhibit positive perceptions.

Table **7** reveals the pairwise comparisons between genders regarding knowledge and perception. There is a significant mean difference of 12.856 points between males and females regarding expertise. This disparity has a p-value of less than 0.001, indicating that it is unlikely to be due to chance. With a confidence interval ranging from 7.141 to 18.570, the significance of this difference can be confirmed with 95% confidence. Conversely, females have a more favourable view than males, with a mean difference of -16.392, which is also statistically significant, with a p-value under 0.001. The confidence interval is lower than -22.744, emphasising female perceptions' superiority. These results highlight distinct gender differences: males exhibit higher knowledge levels, while females demonstrate more positive perceptions of the subject matter.

4. DISCUSSION OF FINDINGS

The study aimed to investigate the relationships between parental age and gender and their knowledge and perceptions of inclusive education for children with ID. The results provided valuable insights into how these factors interact and influence perceptions of inclusive education, with significant implications for educational policy and practice.

4.1. Influence of Parents' Age and Gender on Knowledge and Perceptions of Inclusive Education

The findings suggest that parental age plays a significant role in shaping knowledge about inclusive education, consistent with existing literature that indicates older parents generally possess a more profound understanding of inclusive practices [18, 19]. This enhanced knowledge among older parents may be attributed to their extensive life experiences and evolving perspectives. This is as they navigate the challenges associated with parenting children with ID. Conversely, younger parents may have less exposure to inclusive education benefits, which could limit their advocacy for inclusivity [20, 21].

Furthermore, gender differences emerged as a significant factor, with mothers exhibiting a greater knowledge of inclusive education than fathers. This finding aligns with research by Sabila and Kurniawati [22], highlighting how traditional caregiving roles often lead mothers to take a more active role in education advocacy. Parental engagement in their children's educational journeys with ID correlates with increased knowledge, suggesting that policies aimed at enhancing knowledge among parents, particularly

fathers, could foster a more inclusive academic environment [36].

4.2. Interaction effect Between Parents' Age and Gender on Knowledge and Perceptions of Inclusive Education

The study also sought to determine if there was an interaction effect between parental age and gender regarding their knowledge of inclusive education. Results indicated a complex interplay, where older mothers demonstrated significantly higher knowledge levels than older fathers and younger parents (both male and female). This aligns with Niure and Shrestha [7], who suggest that demographic factors influence parental perceptions and educational engagement.

The interaction effect could be attributed to societal norms that assign caregiving roles predominantly to mothers, mainly as they grow older and gain more experience with social and educational systems [16]. This highlights the necessity for educational programmes that inform parents about inclusive education and target both genders equally, ensuring a comprehensive understanding and support for all children with ID [15].

4.3. The Magnitude of the Effect of Age, Gender, and their Interaction with Parents' Knowledge of Inclusive Education

Examining effect magnitudes revealed that parental age and gender contribute significantly to knowledge levels and perceptions of inclusive education, with age exhibiting a more substantial effect. This finding underscores the importance of considering these demographic variables in developing educational initiatives to support families of children with ID. Similarly, the significant interaction effect emphasises that interventions tailored to specific demographic groups are essential for maximising knowledge dissemination [11].

In practical terms, these findings suggest that educational institutions and policymakers should prioritise creating support networks and informational resources, considering parents' diverse profiles. Workshops aimed at young fathers, in particular, might bridge knowledge gaps and enhance their advocacy for inclusive practices, thereby creating a more supportive environment for children with ID [12, 13].

Parental age and gender are interconnected regarding their knowledge of inclusive education, providing a framework for more targeted educational interventions. Stakeholders can leverage older mothers' knowledge and engagement by designing programmes that take advantage of this. In addition, they can address knowledge gaps among younger parents and fathers. These findings support inclusive educational strategies considering parental demographics, ultimately leading to better support for children with disabilities. This approach can foster increased awareness and acceptance of inclusive education practices, benefiting children with ID, their families, and society [6]. These findings reaffirm the complex relationships between parental characteristics and inclusive education perceptions. Tailoring educational resources to address these dynamics could significantly enhance inclusive practices, fulfilling the right of all children with ID to participate in meaningful educational experiences.

5. CONCLUSION

This study investigated the relationships between parental age and gender and their knowledge and perceptions of inclusive education for children with ID. This study reaffirms the significance of inclusive education as a policy directive and a means to foster social integration and holistic development for children with ID.

Findings indicated that parental age and gender are crucial in shaping awareness and attitudes towards inclusive practices. Parental age was a significant factor in understanding the benefits of inclusive education. Gender differences reveal that mothers often advocate more proactively for their children's inclusive educational experiences. This underscores educational stakeholders' need to effectively engage parents, bridge knowledge gaps, and enhance advocacy efforts across diverse demographic groups. In addition, the study demonstrates that while parents are pivotal in shaping inclusive educational environments, the need for continued professional development and support for educators remains paramount. By creating a collaborative ecosystem between parents, educators, and policymakers, we can ensure that inclusive education genuinely benefits children with ID. Fostering positive perceptions and practices will contribute to building more equitable educational frameworks that recognise and honour all learners' rights.

Future research could explore the long-term impacts of inclusive education on children with ID from

various socioeconomic backgrounds. In addition, examining the role of cultural factors and regional disparities in shaping parental perceptions could provide deeper insights. Investigating the effectiveness of targeted training programmes for educators in promoting inclusive practices may also yield valuable findings to enhance educational outcomes for all learners.

6. RECOMMENDATIONS

This study highlights the critical role that parental age and gender play in shaping knowledge and perceptions of inclusive education. In light of the findings, several recommendations can be proposed to enhance advocacy and support for children with ID.

Educational institutions and policymakers should focus on developing targeted informational resources and workshops aimed specifically at parents, particularly young fathers. By tailoring these initiatives to address the unique needs of different demographic groups, including younger parents and fathers, we can bridge significant knowledge gaps. Such workshops could equip parents with the tools and information necessary to advocate effectively for inclusive practices in schools.

In addition, the involvement of older mothers, who tend to have a higher level of knowledge regarding inclusive education, should be leveraged. Programmes that engage these mothers as advocates or mentors could create a supportive community that fosters a deeper understanding of inclusivity among other parents. This peer-to-peer approach could be an effective strategy for promoting best practices and disseminating knowledge.

Moreover, ongoing professional development for educators is essential to ensure they are equipped to handle the diverse needs of students with ID. Training should encompass not only instructional strategies but also effective communication with families, fostering a strong partnership between educators and parents. This collaboration can lead to a more inclusive atmosphere within schools, ultimately benefiting children's educational experiences.

7. LIMITATIONS

While the study provides valuable insights into the interplay between parental age and gender and their knowledge and perceptions of inclusive education, several limitations must be acknowledged. One significant limitation is the sample size and demographic homogeneity. If the study primarily included participants from similar backgrounds or regions, its findings may not be generalisable to a broader population. Future research should include a more diverse sample to obtain a comprehensive understanding of these dynamics across varied contexts.

In addition, the study relied on self-reported data, which can introduce biases, as parents may present their knowledge or experiences in a way they believe is socially acceptable. This could lead to over- or under-estimation of their proper understanding and perceptions of inclusive education. Another limitation pertains to the cross-sectional nature of the study, which captures a single moment in time. Longitudinal studies would provide deeper insights into how parents' knowledge and perceptions evolve as they navigate their children's educational experiences over the years.

Finally, while the interaction effects between parental age and gender were explored, other potentially relevant factors, such as socioeconomic status, educational background, and cultural influences, were not analysed. These factors could significantly affect parents' knowledge and advocacy efforts, warranting further investigation in future studies. Acknowledging these limitations can inform subsequent research endeavours and improve the effectiveness of initiatives aimed at fostering inclusive education practices.

8. ETHICAL CONSIDERATIONS

Participants were duly informed about the aim of the study through a letter sent to them and were required to be at the school on a specific day with the researcher. In line with research ethics, a meeting was held with the participants' parents where the content of the consent form was explained to them by a teacher who also served as a research assistant, using their native language. Once adequate understanding was ensured, each parent completed and appended their signature to the consent form. Participants were assured of the confidentiality of their profiles and responses.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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