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Parental Stress Among Fathers and Mothers of Children With Intellectual Disabilities: A Field Study in the Provinces of Tlemcen and Skikda

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Abstract:

This study aimed to assess the level of parental stress among fathers and mothers of children with intellectual disabilities and to examine differences in parental stress according to parent gender, geographic location (Tlemcen vs. Skikda), and educational level (secondary vs. university). A comparative descriptive design was adopted. Data were collected in March 2022 from a convenience sample of 35 parents (14 fathers and 21 mothers) using the Parental Stress Scale (Berry & Jones, 1995), in the version whose factor structure was re-examined and adapted to the Algerian context by Hamoudi and Kharbach (2018). Results showed that parental stress was moderate for 77.1% of the participants and high for 22.9%, with no participant at a low level. Independent-samples *t* tests revealed no statistically significant differences in parental stress by gender ($t(33) = 0.108, p = .91$), geographic location ($t(33) = -0.891, p = .379$), or educational level ($t(33) = -0.818, p = .419$); effect sizes were small (Cohen's $d = 0.04-0.30$). Because of the small sample and limited statistical power, these nonsignificant results should not be interpreted as evidence of no difference in the population. The findings are discussed in light of these limitations, and recommendations are made for parent counseling and support programs and for future research with larger samples.

Keywords: parental stress; intellectual disability; fathers and mothers; Parental Stress Scale; Algeria

Introduction and Statement of the Problem:

Intellectual disability is a condition characterized by deficits in intellectual functioning, in which the level of intellectual performance falls markedly below average and is accompanied by impairments in adaptive behavior; it manifests during the developmental period. This condition affects the individual's relationship with the self and the environment, as well as daily participation in social life (Wadi, 2009, p. 33).

Intellectual disability is no longer understood solely as a fixed attribute of the individual. The American Association on Intellectual and Developmental Disabilities emphasizes significant limitations in both intellectual functioning and adaptive behavior, and stresses that functioning depends on the fit between the person's capacities and the supports available (Schalock et al., 2010). Under this "systems of supports" view, the family is the first and most enduring source of support, and its capacity to provide it is shaped by the psychological condition of the parents.

Parental stress is generally conceptualized as an aversive psychological reaction that arises when the perceived demands of parenting exceed the resources a parent believes are available (Abidin, 1995; Deater-Deckard, 1998). International research indicates that parents of children with intellectual disabilities tend to report higher stress and distress than parents of typically developing children (Hastings & Beck, 2004; Olsson & Hwang, 2001), with child behavior problems among the most consistent correlates (Baker et al., 2002; Hastings, 2002). Findings on whether mothers and fathers experience equal stress have been mixed (Beckman, 1991; Olsson & Hwang, 2001), and evidence on how stress varies by region and education in the Algerian context is limited. This study is an exploratory contribution toward filling that gap.

The impact of this disability is not confined to the child. Parents who care for children with intellectual disabilities face multiple stressors that may interfere with their daily lives and psychological adjustment. Accordingly, the present study sought to answer the following questions:

- What is the level of parental stress among fathers and mothers of children with intellectual disabilities?
- Are there statistically significant differences between fathers and mothers in parental stress scores?

- Are there statistically significant differences in parental stress scores according to geographic location (Tlemcen vs. Skikda)?
- Are there statistically significant differences in parental stress scores according to educational level (secondary vs. university)?

Significance of the Study:

The study is significant in three respects. Theoretically, it provides data on parental stress, measured with a two-dimensional Algerian adaptation of the Parental Stress Scale, and interprets them within established stress and coping models. Practically, a descriptive profile, even from a small sample, offers a preliminary basis for deciding whether support services should address mothers alone or both parents, and whether they should differ by region or educational background. Methodologically, it reports effect sizes, confidence intervals, and a power analysis alongside significance tests, so that readers can judge how precisely differences were estimated and what size of difference the design could detect.

Research Hypotheses :

- There are statistically significant differences between fathers and mothers in parental stress scores.
- There are statistically significant differences in parental stress scores according to geographic location.
- There are statistically significant differences in parental stress scores according to educational level.

No hypothesis was formulated for the first question because it is descriptive. Hypotheses were tested at a significance level of $\alpha = .05$ (two-tailed tests).

Research Objectives:

The present study aims to:

- Identify the level of parental stress among fathers and mothers of children with intellectual disabilities.
- Examine the significance of differences in parental stress scores among these parents according to selected demographic variables (gender, geographic location, and educational level).

Definition of Terms:

Parental Stress:

Parental stress is defined as the extent to which parents respond to the various life variables associated with their parental role, which may lead to undesirable outcomes at either the physical or the emotional level. It is operationally defined as the total score a parent obtains on the Parental Stress Scale (Berry & Jones, 1995) used in this study, which ranges from 14 to 70; higher scores indicate higher parental stress.

Intellectual Disability:

Spitz (1963) defined intellectual disability as a state of delayed mental development in which the intelligence quotient falls below 70 on a standardized individual intelligence test (as cited in Al-Shinawi, 1997, p. 40). This is consistent with the criteria of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association [APA], 1994), which require three criteria for the diagnosis of mental retardation: an intelligence quotient of approximately 70 or below, significant deficits in adaptive behavior in areas such as communication and self-care, and onset before the age of 18 years. The fifth edition (APA, 2013) replaced this term with intellectual disability (intellectual developmental disorder), placing greater emphasis on adaptive functioning alongside intellectual abilities.

Theoretical Framework: Parents' Reactions to Intellectual Disability:

Parents' reactions vary when they discover that their child has an intellectual disability. The most prominent reactions include the following (Abd al-Aziz, 2008, p. 207):

- **Shock:** It differs from one family to another. Parents feel completely helpless when confronting reality, and this is expressed in questions of disbelief.
- **Denial:** It takes several forms. Parents may deny the diagnostic results, deny the child's existence in order to preserve their social standing, or a family may conceal the disability by sending the child to permanent residential centers.
- **Anger and guilt:** These may be directed toward one of the spouses or toward the child with the intellectual disability.
- **Sadness and depression:** The first effect of these emotions is often on the mother, owing to her mistaken belief that she is the cause of what has happened.
- **Rejection:** It is clearly manifested in neglect, nonacceptance of the disability, and resentment of the child's presence.
- **Differential treatment:** Some families of children with intellectual disabilities treat their typically developing children differently from those with intellectual disabilities, which has negative effects on the child's adaptive life within the family and society.

These reactions are not a fixed sequence of stages; they may overlap, recur, and fluctuate. Olshansky (1962) described the recurring grief of parents of children with intellectual disabilities, often renewed at milestones such as school entry, as "chronic sorrow." Stress may therefore be re-activated across the child's life span rather than confined to the period after diagnosis.

Theoretical Models for Understanding Parental Stress:

Two complementary frameworks help to interpret the construct measured here. The transactional model (Lazarus & Folkman, 1984) holds that stress lies not in the event itself but in its appraisal: a demand is stressful when it is appraised

as threatening or as exceeding one's coping resources, so two parents facing the same disability may experience different levels of stress.

The Double ABCX model (McCubbin & Patterson, 1983) distinguishes the stressor (A), the family's resources (B), and the family's definition of the situation (C), which together shape the outcome (X); the "double" component refers to the pile-up of demands over time and to new coping resources. A child's disability is a chronic stressor likely to generate such a pile-up (care routines, appointments, financial strain).

Linking the Scale Dimensions to the Theoretical Framework:

The two scale dimensions map onto these models. Dimension 1 (satisfaction) captures the positive appraisal of parenting, the rewards that may buffer stress; Dimension 2 (demands) captures the perceived load of the role. Because satisfaction items are reverse scored, low satisfaction combined with high demands yields a high total. A total can, however, conceal different profiles: a parent with high demands but preserved satisfaction may obtain the same total as one with moderate demands and low satisfaction.

Methodology:

Research Design:

The study adopted a comparative descriptive design because of its suitability to the study's objectives, as it allows the phenomenon to be measured, classified, and interpreted, and statistically significant differences between groups to be examined.

The design contrasts pre-existing groups (fathers versus mothers, Tlemcen versus Skikda, secondary versus university education) on one continuous outcome, the total Parental Stress Scale score. The grouping variables were not manipulated and data were collected once, so the design can show whether groups differ on average in the sample but not why, or whether one variable causes another.

Delimitations of the Study :

- **Temporal delimitation:** The study instrument was administered in March 2022.
- **Spatial delimitation:** The study was conducted with participants from the provinces of Tlemcen and Skikda.
- **Human delimitation:** 35 parents (fathers and mothers) of children with intellectual disabilities.

Participants:

The sample consisted of 35 parents (14 fathers and 21 mothers) of children with intellectual disabilities in the provinces of Tlemcen and Skikda. Their characteristics are presented in Table 1. The sample was selected using a convenience (nonprobability) method from among the parents who could be reached at the time of administration.

Table 1. Characteristics of the Participants (N = 35)

Variable	Category	Frequency	Percentage (%)
Gender	Father	14	40.0
	Mother	21	60.0
Geographic location	Tlemcen	19	54.3
	Skikda	16	45.7
Educational level	Secondary	12	34.3
	University	23	65.7

Note. Percentages are calculated from the total sample (N = 35).

Table 1 shows that mothers made up 60.0% of the sample, Tlemcen contributed 54.3%, and university-educated parents were nearly twice as numerous (65.7%) as those with secondary education (34.3%). Three features deserve attention. The groups are unequal in size, and the smallest (secondary education, $n = 12$) yields an imprecise mean. The three grouping variables overlap, since each participant belongs to one gender, one province, and one educational category, so the comparisons are not independent analyses and the cross-classification (for example, university-educated mothers in Skikda) is not reported. Finally, in a convenience sample the large university-educated share may reflect who was accessible rather than the profile of parents in either province.

Instruments:

Description of the Scale

The study used the Parental Stress Scale developed by Berry and Jones (1995), whose factor structure was re-examined in the Algerian context and whose scoring scale was adapted by Hamoudi and Kharbach (2018). Items are rated on a five-point Likert-type scale, and the Algerian version consists of 14 items distributed across two dimensions:

- **Dimension 1: Parental satisfaction with the parental role.** This dimension comprises eight items (1, 2, 3, 4, 10, 11, 13, and 14), which are positively worded and reverse scored.
- **Dimension 2: Demands of parental roles.** This dimension comprises six items (5, 6, 7, 8, 9, and 12), which are negatively worded and scored directly.

The scoring method is presented in Table 2. The total score on the scale ranges from 14 (minimum) to 70 (maximum) and was divided into three levels of parental stress, as shown in Table 3.

Table 2. Scoring Method of the Parental Stress Scale

Dimension	Very much	Much	Moderately	Little	Very little
Dimension 1: Parental satisfaction with the parental role	1	2	3	4	5
Dimension 2: Demands of parental roles	5	4	3	2	1

Note. After scoring, higher scores indicate higher parental stress on both dimensions.

Table 2 shows that the same response options are scored in opposite directions on the two dimensions. Dimension 1 items express satisfaction, so strong agreement indicates low stress and is reverse scored (“very much” = 1 point). Dimension 2 items express burden, so strong agreement indicates high stress and is scored directly (“very much” = 5 points). This places all 14 items in one direction, so that a higher score always means more stress and the items can be summed.

Table 3. Levels of Parental Stress

Level of parental stress	Score range
Low	14–21
Moderate	22–38
High	39–70

Table 3 divides the score range (14 to 70) into three bands. As average scores per item on the 1–5 scale, the low band corresponds to averages up to 1.50, the moderate band to 1.57–2.71, and the high band to 2.79 and above. Two cautions follow. The moderate band is very wide (17 points), so it includes parents near the low band as well as parents just below the high band. The high band also begins at an item average of about 2.8, below the midpoint of the response scale (3.0; a total of 42). The bands are therefore descriptive categories, not clinically validated thresholds, and no validation of these cut-offs is reported here.

Psychometric Properties of the Scale:

Validity. Hamoudi and Kharbach (2018) re-examined the validity of the scale in the Algerian context by assessing construct validity through factor analysis, using principal component analysis with orthogonal rotation. The analysis yielded two factors with eigenvalues of 3.45 and 3.19, which together explained 47.48% of the total variance, an acceptable proportion. Items 1, 5, 6, 7, 14, 15, 17, and 18 loaded on the first factor (parental satisfaction with the parental role), and Items 9, 10, 11, 12, 13, and 16 loaded on the second factor (demands of the parental role), according to the numbering of the original 18-item version. Four items were deleted, and the remaining 14 items were renumbered in the present article.

Reliability. The reliability of the scale was estimated using Cronbach’s alpha, which was .80, indicating high reliability (Hamoudi & Kharbach, 2018).

Three points aid interpretation. The eigenvalues (3.45 and 3.19) exceed the conventional threshold of 1.0, and the two-factor solution is consistent with the satisfaction–demands separation used here, although the explained variance (47.48%) leaves more than half of the variance unexplained. A Cronbach’s alpha of .80 indicates good internal consistency in the validation sample, but reliability is a property of scores in a particular sample and may differ in a small sample of parents of children with intellectual disabilities. Finally, because item deletion and renumbering were done by the adaptation authors, item numbers here differ from the original 18-item version. The reliability coefficient for the present sample could not be computed from the information available.

Statistical Analysis:

Data were analyzed using SPSS. The statistical procedures employed were as follows:

- Means, standard deviations, frequencies, and percentages, together with 95% Wilson confidence intervals for the overall proportions.
- The Shapiro–Wilk and Kolmogorov–Smirnov tests (with Lilliefors correction) to examine whether the distribution of scores within each group deviated significantly from normality.
- Independent-samples *t* tests to examine the significance of differences between groups, with 95% confidence intervals for the mean differences.
- Effect size (Cohen’s *d*; Cohen, 1988), calculated from the reported means and standard deviations using the pooled standard deviation.

In addition, four supplementary analyses were computed from the reported means, standard deviations, and group sizes, without the raw data: (a) Welch’s *t* test, a robust alternative when group sizes are unequal (Delacre et al., 2017); (b) Holm’s sequential adjustment of the three *p* values (Holm, 1979); (c) approximate 95% confidence intervals for Cohen’s *d*, based on the large-sample standard error; and (d) a sensitivity power analysis based on the noncentral *t* distribution (see Faul et al., 2007). Sensitivity analysis was preferred to “observed power,” which is merely a transformation of the *p* value (Hoenig & Heisey, 2001).

Results

Verification of the Normality of Distribution

Table 4. Kolmogorov–Smirnov and Shapiro–Wilk Tests of Normality of Parental Stress by Study Variables

Variable	Category	Kolmogorov–Smirnov			Shapiro–Wilk		
		D	df	p	W	df	p
Gender	Father	.166	14	.200*	.914	14	.178
	Mother	.167	21	.131	.954	21	.396
Geographic location	Tlemcen	.111	19	.200*	.984	19	.979
	Skikda	.125	16	.200*	.933	16	.273
Educational level	Secondary	.186	12	.200*	.953	12	.678
	University	.136	23	.200*	.935	23	.141

Note. D = Kolmogorov–Smirnov statistic with Lilliefors correction; W = Shapiro–Wilk statistic; df = degrees of freedom (equal to group size). * This is a lower bound of the true significance, as reported by SPSS.

Table 4 shows that the Shapiro–Wilk test, which is the more appropriate test for small group sizes ($n < 50$), did not indicate a statistically significant deviation from normality in any of the six groups (p values ranged from .141 to .979). The Kolmogorov–Smirnov test with Lilliefors correction pointed in the same direction ($p \geq .131$). Nonsignificant results on these tests do not mean that the distribution is in fact normal; they indicate only that no evidence of deviation from normality was found, and the power of these tests is limited in small samples. This provisionally supports the use of the independent-samples t test, provided that it is considered together with the assumptions of independence of observations and similarity of group variances.

Results for the First Question: Level of Parental Stress

Table 5. Frequency Distribution of Parental Stress Levels ($N = 35$)

Level of parental stress	Frequency (n)	Percentage (%)	95% CI for proportion (%)
Low	0	0.0	[0.0, 9.9]
Moderate	27	77.1	[61.0, 87.9]
High	8	22.9	[12.1, 39.0]
Total	35	100.0	

Note. Confidence intervals were calculated using the Wilson method. Level was determined according to the score ranges in Table 3. The overall mean of the total score is approximately 36.06, calculated from the means of fathers and mothers in Table 9. No inferential test (chi-square goodness-of-fit) was conducted on this distribution, because the study does not assume a theoretically justified expected distribution, and because omitting the empty category (low) would have changed the research question.

Table 5 shows that most of the participating parents (27 of 35, i.e., 77.1%; 95% CI [61.0, 87.9]) had moderate parental stress, whereas 22.9% (8 participants; 95% CI [12.1, 39.0]) had high parental stress, and no participant was recorded at the low level (0 of 35; upper limit of the confidence interval = 9.9%). The overall mean of the total score is approximately 36 out of 70, which is close to the upper limit of the moderate category (38). These are descriptive results that pertain to the convenience sample studied, and the width of the confidence intervals reflects its small size.

Reading Table 5 yields four observations. (1) Central tendency: the overall mean of about 36.06 corresponds to an average item score of about 2.58 on the 1–5 scale, below the scale midpoint. (2) Distribution: roughly three of four parents fall in the moderate band and one in four in the high band. (3) The empty low band: with a mean near 36 and a within-group standard deviation of about 3.8, the upper limit of the low band (21) lies almost four standard deviations below the mean, so very few parents would be expected there; likewise, the high cut-off (39) lies about 0.8 standard deviations above the mean, which under approximate normality corresponds to roughly one-fifth of the sample, close to the 22.9% observed. (4) Precision: the confidence intervals are wide (61.0% to 87.9% for the moderate level), so the proportions describe this sample and are imprecise estimates of the population. The small standard deviation relative to the 56-point score range also suggests a fairly homogeneous sample, which further limits the chance of detecting group differences.

Tables 6, 7, and 8 present the distribution of parental stress levels by gender, geographic location, and educational level, respectively.

Table 6. Parental Stress Levels by Gender

	Moderate	High	Total
Father	10 (71.4)	4 (28.6)	14 (100.0)
Mother	17 (81.0)	4 (19.0)	21 (100.0)
Total	27 (77.1)	8 (22.9)	35 (100.0)

Note. Values are n (%). Percentages are calculated within each category (row), except for the total row, which is calculated from $N = 35$. No participant was recorded at the low level; therefore, this level is not included in the table. Table 6 shows that the moderate level predominated among both fathers (71.4%) and mothers (81.0%), and that the high level was recorded for 28.6% of fathers (4 of 14) and 19.0% of mothers (4 of 21). This describes the distribution of the sample only; it was not tested inferentially and does not permit causal inferences.

Table 7. Parental Stress Levels by Geographic Location

	Moderate	High	Total
Tlemcen	13 (68.4)	6 (31.6)	19 (100.0)
Skikda	14 (87.5)	2 (12.5)	16 (100.0)
Total	27 (77.1)	8 (22.9)	35 (100.0)

Note. Values are n (%). Percentages are calculated within each category (row), except for the total row, which is calculated from $N = 35$. No participant was recorded at the low level; therefore, this level is not included in the table. Table 7 shows that the moderate level predominated in both provinces (68.4% in Tlemcen and 87.5% in Skikda), and that the proportion of the high level in the sample was higher in Tlemcen (31.6%, 6 of 19) than in Skikda (12.5%, 2 of 16). This is a description of the sample only; the small cell counts (2 and 6) make these percentages unstable, and the table does not permit the inference that a difference exists between the two provinces.

Table 8. Parental Stress Levels by Educational Level

	Moderate	High	Total
Secondary	9 (75.0)	3 (25.0)	12 (100.0)
University	18 (78.3)	5 (21.7)	23 (100.0)
Total	27 (77.1)	8 (22.9)	35 (100.0)

Note. Values are n (%). Percentages are calculated within each category (row), except for the total row, which is calculated from $N = 35$. No participant was recorded at the low level; therefore, this level is not included in the table. Table 8 shows that the distributions across the two levels were similar in the two categories: the proportion at the high level was 25.0% among parents with a secondary education (3 of 12) and 21.7% among those with a university education (5 of 23), and the moderate level predominated in both categories (75.0% and 78.3%). This describes the distribution of the sample and does not permit causal inferences.

Tables 6 to 8 call for two cautions. First, the high-stress cells contain very few participants (2 to 6), so reclassifying a single participant shifts percentages by 4 to 8 points (for example, 1 of 14 fathers = 7.1 points; 1 of 12 secondary-educated parents = 8.3 points); apparent contrasts such as 31.6% versus 12.5% in Table 7 are therefore unstable. Second, banding discards information: fathers and mothers have practically identical means (36.14 and 36.00) yet differ by 9.6 percentage points in the share classified as high (28.6% versus 19.0%), although exactly four parents in each group fall in that band. Because expected counts in the high cells are below 5, Fisher's exact test rather than chi-square would be appropriate for future inferential comparisons. The continuous-score tests in Tables 9 to 11 are more informative for the hypotheses.

Results for the First Hypothesis

Hypothesis: There are statistically significant differences between fathers and mothers in parental stress scores.

Table 9. Results of the t Test for Differences Between Fathers and Mothers in Parental Stress

Group	n	M	SD	Mean difference (95% CI)	t	df	p	d
Father	14	36.14	3.99	0.14 [-2.54, 2.82]	0.108	33	.91	0.04
Mother	21	36.00	3.70					

Note. n = group size; M = mean; SD = standard deviation; CI = confidence interval; d = Cohen's d (based on the pooled standard deviation). Mean difference = mean of the first row minus mean of the second row. The independent-samples t test was conducted assuming equal variances ($df = n_1 + n_2 - 2$). Confidence intervals and effect sizes were calculated from the reported means and standard deviations and may differ in the second decimal place from SPSS output because of rounding.

Table 9 shows that no statistically significant differences in parental stress emerged between fathers ($M = 36.14$, $SD = 3.99$) and mothers ($M = 36.00$, $SD = 3.70$), $t(33) = 0.108$, $p = .91$, $d = 0.04$, 95% CI [-2.54, 2.82], which is a very small effect size. Accordingly, the data did not support the first hypothesis in this sample. However, the width of the confidence interval (from approximately -2.5 to +2.8 points) means that the data do not rule out a small difference in the population; the absence of significance should therefore not be understood as proof that no differences exist.

The interpretation can be organized in four steps. **Statistical result:** $p = .91$, so there is no basis for rejecting the null hypothesis. **Size:** the difference of 0.14 points is about 0.25% of the 56-point range and about 0.01 points per item, which is practically negligible. **Precision:** the 95% confidence interval (-2.54 to 2.82 points) is compatible with population differences of two to three points in either direction; in standardized units the approximate interval for d (-0.64 to 0.71) makes a large difference ($|d| \geq 0.80$) unlikely but does not exclude small-to-moderate ones. **Meaning:** fathers and mothers reported essentially the same stress, but the sample is too small to show that the groups are equivalent, which would require an equivalence test against a predefined smallest effect of interest (Lakens, 2017).

Results for the Second Hypothesis:

Hypothesis: There are statistically significant differences in parental stress scores according to geographic location.

Table 10. Results of the t Test for Differences in Parental Stress by Geographic Location

Group	n	M	SD	Mean difference (95% CI)	t	df	p	d
Skikda	16	35.43	3.59	-1.14 [-3.75, 1.47]	-0.891	33	.379	0.30
Tlemcen	19	36.57	3.92					

Note. n = group size; M = mean; SD = standard deviation; CI = confidence interval; d = Cohen's d (based on the pooled standard deviation). Mean difference = mean of the first row minus mean of the second row. The independent-samples t

test was conducted assuming equal variances ($df = n_1 + n_2 - 2$). Confidence intervals and effect sizes were calculated from the reported means and standard deviations and may differ in the second decimal place from SPSS output because of rounding.

Table 10 shows that no statistically significant differences in parental stress emerged between parents in Skikda ($M = 35.43$, $SD = 3.59$) and parents in Tlemcen ($M = 36.57$, $SD = 3.92$), $t(33) = -0.891$, $p = .379$, $d = 0.30$, 95% CI $[-3.75, 1.47]$, which is a small effect size. Accordingly, the data did not support the second hypothesis in this sample, although the wide confidence interval does not rule out a practically meaningful difference in either direction.

Following the same steps, the difference of 1.14 points (Skikda lower) is nonsignificant ($p = .379$) and represents about 2% of the score range, or 0.08 points per item. The effect ($d = 0.30$) is small by Cohen's (1988) benchmarks, which are rough reference points rather than rigid rules (Lakens, 2013). The interval (-3.75 to 1.47 points; approximately -0.97 to 0.37 in d units) extends further toward lower stress in Skikda and does not exclude a large difference in that direction. The direction agrees with Table 7, where more parents in Tlemcen were classified as high, but neither finding is reliable at this sample size. The result is best described as inconclusive rather than as evidence of similarity between the provinces.

Results for the Third Hypothesis

Hypothesis: There are statistically significant differences in parental stress scores according to educational level.

Table 11. Results of the *t* Test for Differences in Parental Stress by Educational Level

Group	<i>n</i>	<i>M</i>	<i>SD</i>	Mean difference (95% CI)	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Secondary	12	35.33	3.86	-1.10 $[-3.82, 1.62]$	-0.818	33	.419	0.29
University	23	36.43	3.70					

Note. n = group size; M = mean; SD = standard deviation; CI = confidence interval; d = Cohen's d (based on the pooled standard deviation). Mean difference = mean of the first row minus mean of the second row. The independent-samples t test was conducted assuming equal variances ($df = n_1 + n_2 - 2$). Confidence intervals and effect sizes were calculated from the reported means and standard deviations and may differ in the second decimal place from SPSS output because of rounding.

Table 11 shows that no statistically significant differences in parental stress emerged between parents with a secondary education ($M = 35.33$, $SD = 3.86$) and those with a university education ($M = 36.43$, $SD = 3.70$), $t(33) = -0.818$, $p = .419$, $d = 0.29$, 95% CI $[-3.82, 1.62]$, which is a small effect size. Accordingly, the data did not support the third hypothesis in this sample, although the wide confidence interval does not rule out a practically meaningful difference in either direction. For educational level, the difference of 1.10 points (secondary lower than university) is nonsignificant ($p = .419$) and small ($d = 0.29$), about 2% of the score range. The interval (-3.82 to 1.62 points; approximately -0.99 to 0.41 in d units) again does not rule out a sizeable difference. Although the direction runs counter to the expectation that higher education is protective, the magnitude is small, the interval includes zero, and no mechanism was tested, so the direction should not be interpreted substantively.

Summary of Hypothesis Testing:

Table 12 consolidates the three tests and adds Holm-adjusted p values, which correct for three tests on the same participants, and approximate confidence intervals for the standardized effect size.

Table 12. Summary of Hypothesis Tests, Adjusted p Values, and Standardized Effect Sizes

Hyp.	Comparison (first – second)	Mean difference [95% CI]	<i>t</i> (<i>df</i> = 33)	<i>p</i>	Holm <i>p</i>	<i>d</i> [approx. 95% CI]	Decision
H1	Fathers – Mothers	0.14 $[-2.54, 2.82]$	0.108	.910	1.000	0.04 $[-0.64, 0.71]$	Not supported
H2	Skikda – Tlemcen	-1.14 $[-3.75, 1.47]$	-0.891	.379	1.000	-0.30 $[-0.97, 0.37]$	Not supported
H3	Secondary – University	-1.10 $[-3.82, 1.62]$	-0.818	.419	1.000	-0.29 $[-0.99, 0.41]$	Not supported

Note. Hyp. = hypothesis; Holm p = Holm-adjusted p value; CI = confidence interval; d = Cohen's d , signed to match the direction of the mean difference (Tables 9 to 11 report its absolute value). Confidence intervals for d are approximate and were based on the large-sample standard error of d . Holm-adjusted p values were computed from the three reported p values and are capped at 1.000.

Table 12 shows the same pattern for all hypotheses: none was supported, all effects were small or negligible, and every interval for d includes zero while extending to moderate values. The Holm adjustment does not change the conclusions, since no unadjusted p value approached .05; the relevant concern is not false positives but false negatives, addressed next. Welch's t test gave the same conclusions: $t(26.5) = 0.105$, $p = .917$ for gender; $t(32.7) = -0.897$, $p = .376$ for location; and $t(21.6) = -0.812$, $p = .426$ for education.

Sensitivity Power Analysis:

Because every test was nonsignificant, the key question is what size of difference the design could detect. Table 13 reports the smallest standardized difference detectable with 80% power (two-tailed, $\alpha = .05$) and the power to detect conventional effect sizes.

Table 13. Sensitivity Power Analysis for the Three Independent-Samples *t* Tests ($\alpha = .05$, Two-Tailed)

Comparison	Group sizes	Minimum detectable <i>d</i> (80% power)	Power for <i>d</i> = 0.20	Power for <i>d</i> = 0.30	Power for <i>d</i> = 0.50	Power for <i>d</i> = 0.80
Gender	14 vs. 21	1.00	.09	.13	.29	.61
Geographic location	16 vs. 19	0.98	.09	.14	.30	.63
Educational level	12 vs. 23	1.03	.08	.13	.28	.59

Note. Power values were computed from the noncentral *t* distribution using the actual group sizes. Minimum detectable *d* is the smallest effect size that would be detected with a probability of .80.

Table 13 indicates low sensitivity. Only differences of about one pooled standard deviation ($d \approx 1.0$, or roughly 3.7 to 3.9 score points) could be detected with 80% probability; the probability of detecting a moderate difference ($d = 0.50$) was only 28% to 30%, and even a large difference ($d = 0.80$) would be detected only 59% to 63% of the time. For small differences ($d = 0.20$ to 0.30), power was 8% to 14%. A nonsignificant result is therefore uninformative about moderate differences, and the confidence intervals are the more honest summary of what the data can say (Cumming, 2014). Detecting $d = 0.50$ with 80% power would require about 64 participants per group (128 in total), and detecting $d = 0.30$ about 176 per group (352 in total), assuming equal group sizes.

Discussion:

Level of Parental Stress:

The results showed that parental stress was moderate for most participants (77.1%) and high for about a quarter of them (22.9%), with no participant at the low level; the overall mean (approximately 36 points) also approaches the upper limit of the moderate category (38 points). This may indicate that caring for a child with an intellectual disability imposes continuous demands on parents that may make stress present among most parents to varying degrees. Other factors, such as family and social support and religious and cultural beliefs, may play a role in keeping stress at a moderate level for most parents; however, these factors were not measured in the present study, and this explanation therefore remains a hypothesis that requires testing. In addition, these results pertain to a small convenience sample and cannot be generalized to the population of parents.

The predominance of the moderate band can be read through the models introduced earlier. In the transactional view, moderate stress may reflect substantial demands partly offset by parents' resources and positive appraisals; in the Double ABCX view, the chronic stressor generates a pile-up of demands whose translation into distress depends on resources and the family's definition of the situation. Because these were not measured, these readings remain hypotheses.

Two limits should be stated. The study had no comparison group of parents of typically developing children, so it cannot show that these parents are more stressed than others; the literature on elevated stress (Hastings & Beck, 2004; Olsson & Hwang, 2001) is an external reference, not a finding of this study. Moreover, only the total score was analyzed; since one total can arise from different combinations of satisfaction and demands, separate analysis of the two dimensions could reveal profiles with different implications for intervention.

Differences by Gender, Geographic Location, and Educational Level:

The results revealed no statistically significant differences in parental stress by gender, geographic location, or educational level. Effect sizes were very small for gender ($d = 0.04$) and small for geographic location ($d = 0.30$) and educational level ($d = 0.29$) (Cohen, 1988). The absence of differences between fathers and mothers may be explained by their sharing the same daily demands of caring for the child and the consequences of the same disability, and the absence of differences between the provinces of Tlemcen and Skikda may be explained by the similarity of the general cultural and service context in which the families live; these are possible explanations that the study did not test.

Gender. The near-identical means are compatible with both parents sharing the demands of the same child and family circumstances. Alternatives should be considered: the scale measures general parenting stress and may be insensitive to role-specific stressors (caregiving workload for mothers, financial pressure for fathers); the father group was the smallest ($n = 14$); and if some fathers and mothers were spouses, correlated scores would make the groups look more similar than independent samples would.

Geographic location. Tlemcen and Skikda are both in the north of the country, and their cultural and service contexts may be similar. A province is, however, a coarse unit: availability of specialized centers, distance to services, and urban or rural residence vary within provinces and were not measured. The slightly higher mean and higher share of high-stress parents in Tlemcen point in the same direction, but given the wide intervals and small counts this is a question for larger samples, not a finding.

Educational level. Education could act in opposing ways: it may increase access to information and services while also increasing awareness of long-term challenges and expectations of the role, leaving small net differences. The secondary–university dichotomy is coarse, and education is closely related to income and occupation, which were not measured.

Interpreting the Nonsignificant Results:

These results should be treated with caution. The small sample size (35 participants) and the unequal group sizes reduce the statistical power of the tests. Therefore, the absence of statistical significance does not mean that there are no differences in the population, particularly because the confidence intervals for the mean differences were wide and the effect size for geographic location and educational level was approximately 0.30. Verifying this requires larger samples.

The central principle is that absence of evidence is not evidence of absence (Altman & Bland, 1995). The sensitivity analysis showed adequate power only for very large differences, and the intervals leave practically important differences plausible, particularly for location and education. Future work could use samples large enough to give narrow intervals and equivalence tests when the aim is to show that groups do not differ by more than a stated margin (Lakens, 2017).

Conclusion:

The study concluded the following:

- In this sample, the moderate level of parental stress predominated among fathers and mothers of children with intellectual disabilities: 77.1% had moderate stress and 22.9% had high stress, and no case was recorded at the low level.
- No statistically significant differences in parental stress emerged between fathers and mothers ($p = .91$).
- No statistically significant differences in parental stress emerged by geographic location ($p = .379$).
- No statistically significant differences in parental stress emerged by educational level ($p = .419$).

Given the small sample, these nonsignificant results do not permit a firm conclusion that there are no differences in the population.

Overall, stress was common, typically moderate, and similar across the groups compared. The study's main contribution is preliminary data and a transparent analytic framework, including effect sizes, confidence intervals, and a power analysis. Its main constraint is precision: the design could detect only large differences, so whether stress differs by gender, province, or education remains open.

Limitations of the Study :

- The small sample size (35 participants) and the unequal group sizes limit the generalizability of the findings and the statistical power of the tests.
- The study used a nonprobability convenience sample, was limited to two provinces, employed a cross-sectional design, and relied on a self-report instrument.
- The study relied on the psychometric properties reported by Hamoudi and Kharbach (2018) without presenting validity and reliability indices calculated on the present sample.
- Other variables that may influence parental stress, such as the severity of the disability, the child's age, family income, and social support, were not controlled.
- Three separate t tests were conducted without adjustment for multiple comparisons, and no inferential test was conducted on the distribution of stress levels.
- The article does not report whether fathers and mothers in the sample belong to the same families. If they do, the independence assumption of the t test is violated for the gender comparison.
- The study had no comparison group of parents of typically developing children, and it analyzed the total score only, without separate analysis of the satisfaction and demands dimensions.
- Levene's test for equality of variances was not reported, and the cut-offs defining the stress bands have not been clinically validated. The three comparisons involved overlapping groups of the same participants and were not adjusted for covariates.

Recommendations and Suggestions :

- Develop counseling and therapeutic programs and psychological and social support directed at parents of children with intellectual disabilities, given the absence of the low level of stress in this sample and the high level of stress among about a quarter of it.
- Involve both fathers and mothers in counseling programs rather than restricting them to mothers, in light of the absence of statistically significant differences between them in stress levels in this sample.
- Organize counseling and awareness campaigns for parents about the characteristics of intellectual disability and ways of dealing with it.
- Provide educational and care opportunities by establishing specialized schools and centers that implement programs designed for this group, and by bringing health, psychological, and educational services closer to families.
- Prepare teachers and specialists for the inclusion of children with intellectual disabilities in educational institutions.
- Strengthen scientific research in the field of intellectual disability and special education, and conduct studies with larger and more representative samples that include additional variables (severity of disability, child's age, income, and social support), while examining the psychometric properties of the scale in the sample studied.

Directions for Future Research:

- Use larger samples, preferably probability-based or stratified by province and setting (urban or rural). As shown in the sensitivity analysis, roughly 128 participants in total would be needed to detect a moderate difference ($d = 0.50$), and about 350 for a small-to-moderate difference ($d = 0.30$).
- Include a comparison group of parents of typically developing children, and analyze the two dimensions of the scale separately in addition to the total score.
- Measure plausible predictors and moderators identified in the literature, including severity of the disability, child behavior problems, child age, family income, social support, and coping strategies, and model them using regression or multilevel approaches.

- Record whether fathers and mothers belong to the same family, and if they do, use dyadic analyses that take the interdependence of spouses into account (Kenny et al., 2006).

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