Relationship between affiliate stigma, stress, and perceived quality of life among parents of children with Down syndrome

Abstract

Background

To examine the relationship between affiliate stigma, stress, and perceived quality of life among parents of children with Down syndrome (DS).

Method

Seventy-eight parents of children with DS completed the Affiliate Stigma Scale (ASS), Caregiver Burden Inventory (CBI), and Care-related Quality of Life (CarerQol) scales.

Results

Pearson correlations revealed that parents did not feel stigmatized for having a child with DS (M = 30.51, SD = 10.47) and reported a low caregiver burden (CBI Total M = 19.73, SD = 12.72). The relatively lower caregiving burden, challenges, and future barriers in the DS group explained its lesser stigma, higher quality of life, and greater happiness compared to ASD and CP groups.

Conclusion

Healthcare professionals who provide rehabilitation services to children with DS need to be more aware of the needs of families and caregivers and educated about how to best support them.

Keywords: *stigma; Down syndrome; quality of life; caregiver burden; stress*

Summary:

- Rehabilitation programs should include comprehensive family support systems that address both the children's needs and the parents' mental health and well-being.
- Time management training and resources should be integrated into rehabilitation services to alleviate parental stress.
- Tailored intervention programs should be developed to meet the specific needs of parents and children with different disabilities, enhancing the effectiveness of the support provided.

1. Introduction

The birth of a child with Down syndrome (DS) can have a profound impact on the family system, influencing social, emotional, cognitive, and behavioral processes.[1,2] Parents of children with DS often face significant stress and uncertainties regarding their child's health, frequent medical appointments, and the additional responsibilities of caring for children with special needs.[3,4]. These challenges can disrupt family dynamics and careers, leading to family tensions[6]. Additionally, parents in eastern and developing countries, including Malaysia, may encounter cultural stigmatization and social embarrassment, which can further impact their quality of life.[5] Compared to Western countries, particularly those that are developed and have a more established support system for children with special needs, stigmatization and social embarrassment are generally higher in Eastern cultures[8]. This may be associated with Western culture being known for endorsing more objective and scientific beliefs about disabilities and mental health. In contrast, Eastern culture tends to attribute greater supernatural, moral, and psychosocial causes of stigma[7,8]. These personal factors can lead to self-stigmatization and affiliate stigma[9].

According to Gau et al.,[10] families of children with DS tend to experience higher stress levels than families of typically developing children. In comparison to parents of children with other neurodevelopmental disorders, such as autism spectrum disorder (ASD) and different types of intellectual disability, parents of children with DS experience significantly lower levels of parenting stress.[11] This could be due to several distinctive traits of children with DS, typically characterized as sociable, cheerful, and affectionate.[12] This may encourage positive interactions and lead to better perceptions of children from their parents. Nevertheless, several factors linked to higher parenting stress in parents of children with DS have been identified. Some of the children with DS characteristics which include age,[13] low social desirability,[14] and behavioral issues[15] such as irritability and hyperactivity[16] could contribute to the high level of stress among the parents.

Parents of children with DS may face additional care requirements and social challenges that can impact their quality of life (QOL).[5,17] Previous studies have indicated a high prevalence of emotional exhaustion[18] and reduced mental health among parents or caregivers of children with DS, causing them to require additional assistance to manage their children.[19] The burdens that parents might face in society include social embarrassment, which could adversely affect QOL.[5] In addition, the severity of their child's condition could also influence QOL, because some children with DS may require additional care and medical attention over others.

Although research has explored affiliate stigma, stress levels, and QOL in parents of children with various disorders, few studies have focused specifically on parents of children with DS, particularly in Malaysia.[20] A single study in Malaysia indicated that parents of children with DS generally reported good QOL, however, QOL was also relatively lower in families with more members and affected by parental worry towards the child with DS, highlighting the need for further exploration.[21] Understanding and addressing the burdens and social challenges faced by parents provide dual benefits: preventing caregiver burnout and health issues, and ensuring that their children receive high-quality care services.[22] Therefore, this study aimed to examine the extent of affiliate stigma experienced by parents of children with DS and explore the interrelationships between affiliate stigma, parenting stress, and QOL among parents of children with DS in Malaysia. The second objective was to evaluate the relationship between affiliate stigma, parenting stress, and quality of life among parents of children with Down syndrome in comparison to previously published data on parents of children with autism and cerebral palsy. It was hypothesized that higher levels of stigma are associated with increased stress levels and decreased quality of life. These findings will contribute to a better understanding of the affiliate stigma experienced by these parents and provide valuable insights for both parents and healthcare providers.

2. Materials and Methods

2.1 Procedure

Seventy-eight parents, each with a child(ren) aged 2-18 years and diagnosed with DS, participated in this study. To be eligible for this study, participants were required to be parents of children with a confirmed diagnosis of Down syndrome (DS), have the ability to read English, and reside in Malaysia. Parents of children with diagnoses other than DS were excluded from participation. The participants in this study were recruited from all 12 states and the two federal territories of Peninsular Malaysia, including Northern, East Coast, Central, and Southern regions. The invitation to participate in the study was sent to the WhatsApp group of the Down Syndrome Association Malaysia (PSDM), a major non-profit organization that advocates for the welfare of individuals with Down Syndrome and its affiliate members. The participants completed an online survey, and consent was obtained at the beginning of the survey. Data collection took place over nine weeks from February to April 2023. The study protocol was approved by the Ethics Committee of Universiti Kebangsaan Malaysia (JEP2023-028).

2.2 Instruments

The survey consisted of 60 questions divided into four sections: (a) demographic information, (b) Affiliate Stigma Scale, (c) Caregiver Burden Inventory, and (d) CarerQOL. The questions were presented in various formats, such as short answer, multiple-choice, and Likert scales, and were conveyed in English. It was expected that participants would complete the questionnaire within 20-30 minutes. The same survey was successfully conducted in previous studies involving parents of children with ASD.[23]

2.2.1 Affiliate Stigma

The Affiliate Stigma Scale (ASS) is a measure of self-stigma in individuals caring for relatives with mental illness or intellectual disability.[24] This scale comprises 22 items categorized into three domains (subscales): Cognitive (7 items), Affective (7 items), and

Behavior (8 items). Each item is rated on a 4-point Likert scale, ranging from “strongly disagree” to “strongly agree.” A higher total score indicates a higher level of stigma. The ASS has demonstrated strong psychometric properties, including high internal consistency (α = 0.85–0.94), good person separation reliability (coefficient = 0.88–0.99), and both predictive and concurrent validity. [24,25]

2.2.2 Caregiver Burden Inventory

The Caregiver Burden Inventory (CBI) is a 24-item scale to assess the caregiver burden.[26] This inventory includes five domains (subscales): Time Dependency (5 items), Developmental Aspects (5 items), Physical Health (4 items), Emotional Health (5 items), and Social Relationships (5 items). Each item is rated on a 5-point Likert scale, ranging from “not at all disruptive” to “very disruptive.” A higher total score represented an increased level of caregiving stress. Scores approaching or slightly exceeding 24 suggest a need for caregiver respite, whereas scores exceeding 36 indicate a risk of caregiver burnout. CBI has demonstrated high internal consistency across its five dimensions, with coefficient alpha values of .85, .85, .86, .73, and .77, reported for Time Dependency, Developmental Aspects, Physical Health, Emotional Health, and Social Relationships, respectively.[27]

2.2.3 CarerQOL

The CarerQoL evaluates the quality of life of informal caregivers of individuals with physical and mental health problems.[28] It is divided into two parts: the 7-item CarerQoL-7D, offering a comprehensive portrayal of the caregiving situation, and the single-item CarerQoLVAS, assesses well-being. The CarerQoL-7D items are rated on a 3-point Likert scale (“no,”

“some,” “a lot of”), and a higher total score indicates more favorable care situations. The CareQoL-VAS item is rated on an 11-point Likert scale ranging from “completely unhappy” (0) to “completely happy” (10). The CarerQoL has demonstrated promising validity and feasibility within a diverse sample of informal caregivers.[29]

2.3 Data Analysis

Descriptive statistics were used to summarize the demographic characteristics of the participants, as well as the distribution of their responses to the survey instruments. For the Affiliate Stigma Scale (ASS) or CarerQoL-7D; both are interpreted as continuous measures, with higher scores indicating greater stigma or lower quality of life, respectively. For descriptive purposes, ASS scores were categorized into tertiles, following common practice. For the Caregiver Burden Inventory (CBI), scores above 36 have been suggested as indicating a need for respite care[26], and this threshold was used to identify high burden in our analysis.

Pearson's correlations were computed to examine the relationships between affiliate stigma, stress, and quality of life. Furthermore, ordinary least square (OLS) regression was conducted to assess the impact of affiliate stigma (Cognitive, Affective, Behavior) on caregiving stress (Time-Dependence, Developmental Aspects, Physical Health, Emotional Health, Social Relationships) and caregiver quality of life (CarerQoL-7D, CarerQoL-VAS), while controlling for key demographic factors, including the parents' relationship with the child (i.e., sex: mother or father), ethnicity, education, and household income. Effect sizes were calculated for each effect in the models—partial η^2: small = .01, medium = .06, large = .14.[30]

In a supplementary analysis, the participants (parents of children with DS) were compared to parents of children with autism (ASD), or cerebral palsy (CP) obtained from previous research by Chu et al.[31] More specifically, multivariate analysis of covariance (MANCOVA) was conducted using the ASS total, CBI total, CarerQoL-7D, and CarerQoLVAS scores as the dependent variables. The type of parental group (DS, ASD, or CP) served as the independent variable, while their relationship with the child was the covariate. If necessary, post-hoc pairwise comparisons of marginal means were performed at the Bonferroni-corrected alpha level.

The assumptions required for multivariate tests were met. Normality was established through skewness scores ranging from 0.26 to 2.20 and through visual inspection of the variable distributions. Further, the analysis of plots of residuals and standardized residuals confirmed

the linearity, homogeneity of variance, and normality of the residuals. All analyses were performed using Statistical Analysis System (SAS) version 9.4.

3. Results

Sample Demographics

Table 1 presents the participants' demographic profiles. The majority of participants were mothers, accounting for 85.9% of the sample. Ethnicity-wise, the study's ethnic distribution showed a higher number of Malay participants, constituting 87.2% of the respondents, followed by Chinese (6.4%), Indian (3.8%), and Bumiputera Sabah (2.6%). This distribution is in line with the Malaysian population composition, where Malays make up 61.7%, followed by Chinese (20.8%), and Indian (6.2%).[32,33] Thus, it is noteworthy that the study is more likely to reflect Malay religious and cultural values. Regarding education and income level, over half of the participants held a bachelor's (34.6%) and/or master's degree (25.6%), and nearly half fell into the M40 category (47.4%), followed by the B40 (38.5%), and T20 (14.1%) categories. The income categories reflect Malaysian monthly household disposable income levels: B40 (USD745), M40 (USD1698), and T20 (USD4207). This distribution suggests that the sample has a relatively higher income level than the general Malaysian population, where the B40 category constitutes the majority.[33] Overall, the sample has relatively higher education and income than the general Malaysian population.

[insert table 1 here]

Parents' Affiliate Stigma, Caregiving Stress, and Quality of Life

Table 2 presents the scale and subscale scores of ASS, CBI, and CarerQoL. The overall stigma score (M = 30.51, SD = 10.47) indicated that parents did not feel stigmatized for having children with DS.

The parents also reported a low caregiver burden (CBI Total $M = 19.73$, $SD = 12.72$) [26]. Nevertheless, the domain scores suggested they might need time management assistance ($M = 11.29$, $SD = 4.48$).

The CarerQOL scores indicated that the parents perceived their caregiving situation as moderately fair (7D $M = 10.36$, $SD = 2.09$), and they were generally happy (VAS $M = 8.68$, $SD = 1.88$). However, it was noteworthy that they reported experiencing some mental health issues, such as stress, fear, gloominess, depression, and concern about the future.

The subgroup analysis showed that parents' levels of stigma, stress, and quality of life did not differ significantly by their child's age (2-6, 7-12, or 13-18 years old), regardless of whether their relationship with the child was controlled for (Wilks' $\lambda = 0.82$, F (8, 142) = 1.81, $p = .080$) or not (Wilks' $\lambda = 0.82$, F (8, 144) = 1.87, $p = .070$).

Correlations between Stigma, Stress, and Quality of Life

Table 2 presents the correlations between the scale and the subscale scores. Overall, there were strong correlations among parents' affiliate stigma, caregiving burden, and quality of life (r = –.53-.58). The relationship between the two subscales of CarerQoL, 7D and VAS, was moderately high ($r = .40$). All these correlations were statistically significant and in the expected direction. It was noteworthy that the correlations of Time Dependency with stigma and quality of life were not significant.

[insert table 2 here]

Impact of Stigma on Stress and Quality of Life

Table 3 presents the OLS regression results predicting the parents' stress and quality of life-based on their experienced stigma. After accounting for the parents' sex, ethnicity, education, and household income, a heightened level of affective stigma was significantly related to increased caregiving stress stemming from physical and mental health challenges (both $p < .01$). The magnitude of these effects was moderately large (partial $\eta^2 = .10$-.14).

[insert table 3 here]

Comparisons with Parents of Children with Autism and Cerebral Palsy

The multivariate test in MANCOVA was significant (Wilks' $\lambda = 0.49$, F (8, 438) = 23.29, $p < .001$), indicating significant differences among the three parental groups (DS, ASD, CP) across the four scores (ASS total, CBI total, CarerQoL-7D, CarerQoL-VAS). The univariate test results further showed significant group effects for each of these scores (all $p < .001$). As presented in Table 4, pairwise group comparisons revealed that the DS parents had significantly lower affiliated stigma and caregiving stress and significantly higher quality of life and general happiness compared to both the ASD and CP parents (all corrected $p < .01$). However, the ASD and CP groups did not differ significantly on any of these variables (all corrected $p > .05$).

[insert table 4 here]

4. Discussion

Our findings indicate that parents of children with DS experience minimal affiliate stigma, suggesting they do not feel stigmatized due to their children's condition. This implies that these parents have not internalized negative societal views or experience feelings of inferiority due to their children's condition, suggesting that the parents in our sample possess a resilient mindset and have managed to navigate the challenges of stigma effectively. As Quine and Pahl[34] pointed out, parents who are part of support groups have the opportunity to learn valuable information, resources, and experiences regarding their child's condition. This is similar to the parents in our study, who were part of the PSDM. This exposure likely equips them with a comprehensive understanding of their children's conditions and empowers them to counteract societal misconceptions effectively. Furthermore, the communal nature of support

groups fosters a sense of belonging and shared experiences.[35] This platform allows parents to engage in dialogue, share challenges, and derive mutual support. This peer connection facilitates the exchange of coping strategies, thereby strengthening resilience in the face of potentially stigmatizing attitudes.

Contrary to the outcomes observed by Gau et al.[10] and Fucà et al.,[11] who suggested higher levels of parenting stress, our study indicated that parents experienced a low level of caregiver burden. Nevertheless, parents reported the highest level of stress within the "TimeDependency" dimension, as reflected by the mean score of 11.29. This outcome implies that parents might benefit from assistance in managing their time effectively as they navigate the multifaceted demands of caring for children with DS. The intricate caregiving process, encompassing medical appointments, additional responsibilities, and the unique needs of children with DS,[17] likely contributes to the time management challenges faced by parents. Research indicates that a strong support system significantly reduces caregiver burden and stress.[36] As underlined by Mugno et al.,[37] family support plays a pivotal role in improving parents' mental health and reducing distress. Similarly, literature has shown that the lack of moral and practical support within the family system impacts the well-being and socialization of these families, in Malaysia.[38] Considering this, we recommend the establishment of a comprehensive support group that not only includes fellow parents but also integrates health professionals such as doctors, clinical psychologists, counselors, audiologists, and speech language therapists, which could offer not only emotional solace but also equip parents with effective strategies to navigate the challenges of caregiving, ultimately diminishing their burden and enhancing their overall quality of life.

QOL is essential to parents' well-being and ability to cope with the demands of caring for children with DS. Our results indicated that parents reported a better caregiving situation. However, a closer look reveals a noteworthy difficulty for parents managing daily activities while providing care, suggesting potential challenges in balancing caregiving responsibilities with other life demands. This result aligns with previous research stating that parents often face

juggling acts when caring for children with special needs.[17] Furthermore, a high level of overall happiness among parents of children with DS was noted, suggesting that parents find meaning and fulfillment in their caregiving role,[39] which might be influenced by their children's sociable, cheerful, and affectionate traits.[12] It was also noted that around 44.9% of parents received good support from family, friends, and others when carrying out the care task, which can be associated with improved caregiver health and QOL.[36] This shows that a robust support system may equip parents with the coping mechanisms and resilience needed to effectively navigate the challenges associated with caring for children with DS.

The relationships observed in our results show an association between stigma, stress, QOL, and overall happiness among parents of children with DS, which sheds light on the intricate dynamics that shape their caregiving experiences. The correlations revealed in our study highlight nuanced relationships and provide valuable insights into the multifaceted challenges faced by these parents. The findings from our study showed a positive correlation between stigma and stress that resonates with the existing literature[40] and suggests that heightened levels of perceived stigma are associated with increased caregiving stress. Furthermore, our study found that parents who experienced higher levels of stigma tended to perceive lower QOL and overall happiness, emphasizing the potential negative impact of stigma on well-being. This finding is consistent with previous studies showing a significant association between stigma and QOL.[41] Additionally, our study revealed negative associations between stress and both quality of life and overall happiness, implying that higher stress levels are linked to reduced well-being and happiness among parents of children with DS, consistent with the findings of previous studies.[42–44] These findings collectively highlight the significance of addressing stigma-related challenges in interventions and support services for parents of children with DS to promote their overall well-being and coping abilities.

The analysis of the results in this study indicates that the nature of the disabilities present in DS, ASD, and CP has different impacts on factors such as affiliated stigma, caregiving stress, quality of life, and general happiness. It was found that DS parents experience significantly

lower levels of affiliated stigma and caregiving stress, and higher levels of quality of life and general happiness compared to ASD and CP parents. This suggests that the disabilities among DS, ASD, and CP have different effects on the variables examined. Children with ASD have pervasive symptoms of social interaction and more challenging behaviors such as rigidity, tantrum-throwing, and self-harming, all of which may require frequent and prolonged intervention sessions with varying professions within the allied health system.[45] Given the nature of its condition, the non-linear process from identification to further familial support of children with ASD may add additional burden on the caregivers.[46] Children with CP commonly display different levels of physical disabilities where extensive daily care is needed, especially in moderate and severe CP.[47] These features of disabilities in ASD and CP result in a higher caring burden that decreases the quality of life and happiness of the parents.[48,49] Consistent with the findings of previous research, which demonstrated a correlation between high caregiving burdens and low quality of life and more severe affiliate stigma in mental disorders,[50] it can be inferred that the relatively lower caring burden experienced by individuals with DS is associated with significantly lower levels of affiliate stigma, as supported by this study. While caregiving tasks that are more difficult tend to increase both affiliate stigma and self-stigma, this is not the case for parents of children with DS. Additionally, compared to individuals with ASD and CP, parents of children with DS may face fewer caregiving challenges and future barriers. This study acknowledges that, while parents of children with DS may generally have a better overall quality of life compared to those with ASD or CP, variations within the DS group should not be overlooked. Parents of children with DS may experience varying stress factors that evolve, influenced by changes in developmental stages, family dynamics, and external circumstances. Providing timely and appropriate support—such as early intervention programs, caregiver counseling, and inclusive community services—remains a critical factor in enhancing the well-being of parents of children with DS.

The demographic analysis revealed that the majority of participants who completed the

survey were mothers, similar to previous studies,[51–53] highlighting their central role in caregiving for children with DS. A higher proportion of Malay participants may reflect the religious and cultural values prevalent in the Malaysian context. The high number of participants from Kelantan can be attributed to the existence of two PSDM affiliate groups in that region, potentially fostering a supportive environment for research participation. Additionally, a significant portion of the parents held a bachelor's or master's degree, indicating a relatively well-educated sample. Considering the better caregiving situation and high overall happiness of parents, the findings from our study support those of a previous study, which demonstrated the association of higher education level with higher QOL of parents of children with DS.[52] Intriguingly, the income distribution revealed that most participants fell within the low and middle levels of income classification. This contrasts with a previous study that associated the highest QOL scores with caregivers with the highest monthly income.[54] This inconsistency may be attributed to various contextual factors, suggesting that financial wellbeing does not necessarily correlate linearly with QOL in the caregiving context. While our study did not explore the direct relationships between demographic variables and caregiving experiences, the insights provided by the demographic section highlight the complexity of the factors influencing parents of children with DS in Malaysia. Future research could delve deeper into the influence of demographic variables on parental experiences, caregiving stress, and quality of life to gain a more comprehensive understanding of the unique challenges and strengths faced by parents of children with DS in Malaysia. Such insights would be valuable for tailoring support interventions and policies to meet the needs of this population better and enhance their overall well-being.

Although the three groups were comparable in parents' employment status (57.9%-65.5% employed; $\chi^2(2) = 1.45$, $p = .484$), there were significant group differences in gender and education level. The ASD group included a higher proportion of male parents ($\chi^2(2) = 7.49$, $p = .024$), while the DS group had a higher level of parental education ($\chi^2(10) = 22.30$, $p = .014$). These dissimilarities may have influenced group differences in stigma, caregiver burden, and

QOL. Future research should aim to match or statistically control for these variables to better isolate the effects attributable to diagnostic group differences.

One of the limitations of this study is that all participants were recruited solely from a support group, indicating that most of them possessed prior knowledge and assistance in caring for children with DS. This recruitment approach may have contributed to the relatively low levels of affiliate stigma and stress reported, as support group members often benefit from shared resources, emotional support, and coping strategies. Consequently, these findings may not fully represent the experiences of parents who lack access to such support networks, potentially limiting the generalizability of the results to the broader population of Malaysian parents with DS children. The smaller sample size becomes another limitation of this study; hence the finding makes this study less generalizable to all Malaysian parents with DS children.

Data from this study was collected online, so the researchers might have overlooked potential parents with limited internet and smartphone access. Despite this, this study demonstrates a significant correlation between affiliate stigma, stress, and perceived quality of life among parents with DS children.

For future research, recruiting participants from diverse sources, such as hospitals, community-based service centers, and special education schools, would be beneficial for encompassing a wider audience with varying educational and income backgrounds. Future research is suggested to apply mixed methods in collecting data to gain a more comprehensive understanding of the relationship between the variables. Nonetheless, this study serves as the first to determine the levels of stigma, stress, and quality of life among parents with DS in Malaysia.

5. Conclusion

This study found that parents of children with Down syndrome are happy and content with their current caregiving status. These parents experienced low affiliate stigma and low caregiver burden. Although parents are effectively supported by helpful resources, one of the dimensions

parents are most concerned about is "Time-Dependency". Parents discovered they devote more time to their children, neglecting others, including themselves. As a result, it is critical to strengthen parents' resilience further and to learn appropriate coping methods for dealing with upcoming stress and stigma. This study highlights the need for tailored support interventions and policies in Malaysia, aligned with cultural and religious values, to address parents' challenges. Creating an inclusive environment, promoting awareness, and strengthening social support networks can enhance parents' QOL. Future research should consider demographic variables to inform targeted interventions. Collaborative efforts with healthcare providers, support organizations, and stakeholders will better support families affected by DS, fostering a more inclusive society and empowering parents and children with DS.

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Table 1. Demographic Profiles of Study Participants (N = 78)

Variable	%
Parent's relationship to the child (i.e., sex)	
Mother	85.9
Father	14.1
Ethnicity	
Malay	87.2
Chinese	6.4
Indian	3.8
Bumiputera Sabah	2.6
Education	
SPM	12.8
STPM	3.8

Diploma	21.8
Degree	34.6
Master's	25.6
Doctoral	1.3
Monthly household income category	
B40 (USD745)	38.5
M40 (USD1698)	47.4
T20 (USD4207)	14.1

Note. SPM = *Sijil Pelajaran Malaysia* (Malaysian Certificate of Education). SPM is a national examination taken by secondary school students in Malaysia, STPM = *Sijil Tinggi Persekolahan Malaysia* (Malaysian Higher School Certificate). STPM is one of the pre-university examinations in Malaysia, B40 = Bottom 40%, M40 = Middle 40%, T20 = Top 20%.

Table 2. Descriptive Statistics and Correlations of Stigma, Stress, and Quality of Life (N = 78).

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. ASS Affective	1.00											
2. ASS Cognitive	.83***	1.00										
3. ASS Behavioral	.79***	.79***	1.00									
4. ASS Total	.94***	.94***	.92***	1.00								
5. CBI Time Dependency	.20	.14	.10	.16	1.00							
6. CBI Developmental Aspects	.55***	.48***	.48***	.54***	.48***	1.00						

7. CBI Physical Health	.55***	.43***	.28*	.45***	.40***	.64***	1.00					
8. CBI Emotional Health	.65***	.59***	.62***	.66***	.25*	.66***	.37***	1.00				
9. CBI Social Relationships	.49***	.47***	.50***	.52***	.23*	.54***	.35**	.70***	1.00			
10. CBI Total	.61***	.52***	.48***	**.58*****	.70***	.88***	.75***	.73***	.69***	1.00		
11. CarerQoL-7D	–.51***	–.51***	–.47**	**–.53*****	–.20	–.45***	–.42***	–.45***	–.33**	**–.48*****	1.00	
12. CarerQoL-VAS	–.48***	–.43***	–.38**	**–.46*****	–.22	–.43***	–.47***	–.31**	–.31**	**–.46*****	**.40*****	1.00
M	10.46	9.78	10.27	30.51	11.29	2.56	3.05	1.28	1.54	19.73	10.36	8.68
SD	4.02	3.64	3.57	10.47	4.48	3.75	3.39	2.42	2.85	12.72	2.09	1.88

Note. ASS = Affiliate Stigma Scale, CBI = Caregiver Burden Inventory. *p < .05, **p < .01, ***p < .001.

Table 3. OLS Regression Results (N = 78)

	DV = Time Dependency				DV = Development Aspects				DV = Physical Health				DV = Emotional Health				DV = Social Relationships			
Parameter	*b*	*SE*	*p*	*ES*	*b*	*SE*	*p*	*ES*	*b*	*SE*	*p*	*ES*	*b*	*SE*	*p*	*ES*	*b*	*SE*	*p*	*ES*

Intercept	6.93	5.32	.198		_ 4.17	3.83	.281		2.22	3.13	.481		_ 3.65	2.16	.096		_ 3.40	2.86	.240	
Sex				0.01				0.00				0.00				0.00				0.00
Female	1.43	1.64	.385		_ 0.54	1.18	.651		0.42	0.96	.664		_ 0.09	0.67	.897		0.39	0.88	.663	
Male (ref.)																				
Ethnicity				0.04				0.00				0.01				0.05				0.04
Bumiputera Sabah	_ 5.47	3.82	.158		_ 0.05	2.75	.986		0.49	2.24	.828		1.09	1.55	.486		2.07	2.06	.319	
Chinese	_ 1.16	2.37	.627		_ 0.55	1.71	.747		0.89	1.39	.527		_ 0.50	0.97	.607		_ 0.93	1.28	.468	
Indian	0.84	3.25	.798		0.71	2.34	.763		1.26	1.91	.511		_ 2.25	1.32	.094		_ 1.90	1.75	.283	
Malay (ref.)																				
Education				0.00				0.04				0.05				0.03				0.07
SPM	1.31	5.05	.796		0.47	3.63	.898		_ 2.19	2.96	.462		_ 0.13	2.05	.951		1.36	2.72	.618	

STPM	1.84	5.60	.744		0.21	4.03	.959		_3.99	3.29	.229		_0.72	2.27	.753		_1.22	3.01	.686	
Diploma	1.65	4.87	.735		1.44	3.51	.683		_2.13	2.86	.459		0.56	1.98	.778		0.77	2.62	.770	
Degree	2.01	4.84	.679		0.93	3.48	.790		_1.81	2.84	.527		0.00	1.97	1.000		0.01	2.60	.997	
Master's	1.69	4.90	.731		2.32	3.53	.513		_1.07	2.88	.710		0.31	1.99	.878		1.29	2.63	.627	
Doctoral (ref.)																				
Household income				0.01				0.00				0.07				0.01				0.02
B40	0.68	2.14	.750		0.59	1.54	.703		_1.12	1.25	.374		0.30	0.87	.735		_1.09	1.15	.347	
M40	_0.30	1.83	.869		0.29	1.32	.828		_2.05	1.07	.061		_0.18	0.74	.808		_1.02	0.98	.301	
T20 (ref.)																				
Affiliated stigma																				
Affective	0.33	0.30	.273	0.02	0.37	0.22	.091	0.04	0.56	0.18	**.002**	0.14	0.33	0.12	**.009**	0.10	0.25	0.16	.122	0.04

Cognitive	_ 0.07	0.29	.797	0.00	0.01	0.21	.960	0.00	0.09	0.17	.583	0.00	0.00	0.12	.984	0.00	0.03	0.16	.865	0.00
Behavioral	_ 0.12	0.28	.660	0.00	0.15	0.20	.454	0.01	_ 0.31	0.16	.061	0.05	0.14	0.11	.223	0.02	0.20	0.15	.191	0.03

Table 3. OLS Regression Results (N = 78) (continue)

	DV = CarerQoL-7D				DV = CarerQoL-VAS			
Parameter	*b*	*SE*	*p*	*ES*	*b*	*SE*	*p*	*ES*
Intercept	14.91	2.04	.000		11.57	1.88	.001	
Sex								0.00
Female	0.57	0.63	.369	0.01	_0.30	0.58	.612	
Male (ref.)								
Ethnicity				0.04				0.07
Bumiputera Sabah	_0.99	1.47	.500		0.40	1.35	.769	
Chinese	0.10	0.91	.914		_1.08	0.84	.203	
Indian	1.72	1.25	.174		_2.31	1.15	.049	
Malay (ref.)								
Education				0.03				0.08
SPM	_0.60	1.86	.746		_1.76	1.79	.327	
STPM	_1.16	1.87	.537		_2.12	1.98	.289	
Diploma	_1.01	1.88	.593		_0.94	1.72	.589	

Degree	−0.71	1.94	.716		−0.40	1.71	.817	
Master's	−1.45	2.15	.502		−0.43	1.73	.803	
Doctoral (ref.)								
Household income				0.05				0.02
B40	−1.54	0.82	.065		0.92	0.76	.228	
M40	−1.09	0.70	.126		0.61	0.65	.346	
T20 (ref.)								
Affiliated stigma								
Affective	−0.22	0.12	.065	0.05	−0.13	0.11	.223	0.02
Cognitive	−0.14	0.11	.212	0.02	−0.07	0.10	.517	0.01
Behavioral	0.05	0.11	.634	0.00	−0.03	0.10	.736	0.00

Note. DV = dependent variable; SE = standard error; ES = effect size (partial η^2).

The analysis involved regressing each dependent variable—five Caregiver Burden Inventory scores (Time-Dependence, Developmental Aspects, Physical Health, Emotional Health, Social Relationships) and two CarerQOL scores (CarerQoL-7D, CarerQoL-VAS)—on the independent variables, which included three Affiliate Stigma Scale scores (Cognitive, Affective, Behavior). Control variables such as the parents' relationship with the child, ethnicity, education level, and household income were also included in the regression models.

Table 4. Estimated Group Means and Results of Pairwise Comparisons

DV	DS	ASD	CP	p_1	p_2	p_3

ASS Total	30.08 (1.30)	37.85 (1.04)	38.37 (1.78)	<.001	<.001	1.000
CBI Total	17.36 (1.93)	27.65 (1.55)	30.29 (2.64)	<.001	<.001	1.000
CarerQoL-7D	10.49 (0.31)	8.72 (0.25)	9.15 (0.43)	<.001	.017	1.000
CarerQoL-VAS	8.84 (0.25)	7.12 (0.20)	7.57 (0.34)	<.001	.004	.679

Note. ASS = Affiliate Stigma Scale, CBI = Caregiver Burden Inventory, DV = dependent variable, DS = down syndrome, ASD = autism, CP = cerebral palsy.
M (*SE*). $p^1 = p$ value for comparing DS vs. ASD. $p^2 = p$ value for comparing DS vs. CP. $p^3 = p$ value for comparing ASD vs. CP.