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Demographic factors as mediators between socio-psychological variables and psychological well-being in parents of children with Down syndrome

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Abstract: Parents of children with Down syndrome in Riau, Indonesia, encounter distinct psychological challenges, and the influence of demographic factors warrants further exploration. This study investigates the mediating role of demographics in the psychological well-being of 351 parents, employing a cross-sectional, quantitative design with purposive sampling. Standardized scales assessed psychological well-being, self-acceptance, stigma, and social support, which were analyzed using Bayesian methods. Lower self-acceptance significantly and directly correlated with poorer psychological well-being ($\beta = -.1491$, $p = .0016$), while higher parental education significantly predicted greater self-acceptance ($\beta = .0119$, $p < .001$), which in turn positively impacted well-being. Notably, older children were significantly associated with reduced social support ($\beta = -.0101$, $p = .0010$), and lower social support directly linked to reduced psychological well-being ($\beta = -.1526$, $p = .0015$). In theoretical terms, the study contributes by elucidating the indirect pathways through which demographic factors shape parental well-being within the Indonesian context. Practically, the findings underscore the need for culturally sensitive interventions focused on enhancing self-acceptance, providing accessible educational resources, and strengthening adaptive social support networks tailored to the evolving needs of parents of children with Down syndrome in Indonesia.

Keywords: down syndrome; psychological well-being; self-acceptance; social support; stigma

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Introduction

Empirical evidence from Indonesia indicates that parents of children with Down syndrome experience significant psychological distress. For instance, a study in Surabaya found that the overall mean score of parenting stress in mothers of such children was in the moderately stressed range (Dary et al., 2016). Furthermore, data from 2018 showed that approximately 0.21% of children aged 24-59 months in Indonesia had the condition (Kementerian Kesehatan Republik Indonesia, 2018), suggesting a significant population of parents potentially facing the associated challenges. The research on the phenomenon has also highlighted the emotional burdens and challenges in acceptance faced by Indonesian mothers of children with Down syndrome (Subu et al., 2024).

Such children require particular consideration and assistance regarding their distinctive physical and intellectual attributes (Antonarakis et al., 2020; Grieco et al., 2015). In Indonesia, despite increasing inclusivity, parents continue to grapple with intricate challenges stemming from social factors impinge upon their psychological well-being (Kamil et al., 2023).

Social stigma towards individuals with Down syndrome (Cachia et al., 2016) has been shown to lead to isolation and shame in parents (Falk et al., 2014), which are compounded by demographic factors (Nunik et al., 2022). In addition to the phenomenon of stigma (Scott et al., 2014), families encounter challenges in accessing social support, which includes the financial burden of care and education (Khalida, 2019; Melati et al., 2023). This has been shown to have an impact on psychological well-being (Craig et al., 2016; Pisula & Porębowicz-Dörsmann, 2017). Furthermore, the surrounding environment lacks information, support and understanding (Dary et al., 2016; Onyedibe et al., 2018; Saputra et al., 2018). Stigma, stemming from societal misconceptions, can lead to social exclusion and emotional distress for such families. Conversely, strong social support networks have been identified as crucial buffers against stress, promoting better psychological adaptation (Fu et al., 2023).

Furthermore, internal factors significantly impact parental well-being; parental self-acceptance is vital for coping and overall mental health (Putri, 2025). Feelings of guilt regarding their child's condition are also commonly reported (Becker, 2023), often despite the understanding that Down syndrome is a genetic occurrence beyond parental control, a fact emphasized by Indonesian support organizations such as *Perkumpulan Orang Tua Anak dengan* Down Syndrome (known as POTADS) (Nazhifah & Arwan, 2022). Recent research continues to emphasize the interplay of these external and internal factors in shaping the psychological experiences of parents of children with Down syndrome. Furthermore, uncertainty regarding their child's future, particularly about education, employment, and independent living, can result in prolonged anxiety (Lebert-Charron et al., 2018). Consequently, the continuous care of a child with Down syndrome can result in elevated levels of emotional exhaustion (Raymaker et al., 2020).

The significant psychological distress experienced by parents of children with Down syndrome in Indonesia is a well-documented phenomenon. Besides the previously cited studies, recent research highlights the reality within the Indonesian demographic context. For instance, Rahmawati (2024) found a significant association between perceived social support and the quality of life among parents of children with Down syndrome in East Java, a densely populated and diverse demographic region. Furthermore, Widyawati et al. (2023) explored the impact of societal stigma on the psychological well-being of families with children with special needs, including Down syndrome, across various socio-economic backgrounds in Indonesia.

This all underscores how demographic factors, such as the societal attitudes prevalent in different Indonesian communities, can influence parental experiences. Finally, a study focusing on access to resources in a specific demographic revealed disparities in healthcare and inclusive education access for children with Down syndrome between urban and rural areas, directly impacting parental stress and well-being based on their geographical and socio-economic demographics (Darla & Bhat, 2021; Mardatillah, 2024; Rahmi et al., 2023; Subekti & Intansari, 2025).

These findings, consistent with previous evidence, highlight the psychological challenges faced by Indonesian parents of children with Down syndrome. While research conducted by Lai et al. (2015), Simorangkir et al. (2023), and Astiti and Valentina (2024) identified links between stigma, social support, self-acceptance, and parental well-being, the mediating role of demographics (age, education, income, marital status) has often been underexplored. These factors reflect people's socio-economic position (Mirowsky & Ross, 2017). Their mediating influence on the relationship between psychological variables and well-being is crucial for a complete understanding, yet is frequently overlooked in studies, including Indonesian ones. This study, focusing on Pekanbaru, Riau, Indonesia, addresses this gap by examining the psychological well-being of such parents within their specific urban and surrounding context.

In the light of previous studies, this research uniquely addresses a critical gap by explicitly investigating how fundamental demographic factors (age, education, income, marital status) moderate the relationships between stigma, social support, self-acceptance, and psychological well-being among Indonesian parents of children with Down syndrome. While previous studies have highlighted psychological distress and identified direct correlations, they have largely overlooked the mediating role of demographics. This study, therefore, offers a more nuanced and socially informed perspective, deepening our understanding beyond simple associations. Focusing on a specific urban context in Pekanbaru, Riau, Indonesia, this study provides valuable insights into the complex interplay between these demographic factors.

The research enhances understanding of parental psychological well-being in Indonesia by investigating the mediating role of demographic factors through Bronfenbrenner's ecological systems theory. Moving beyond the direct correlations found in previous Indonesian studies, this study examines how a parent's position within interconnected environmental systems (reflected by demographics such as age, education, and income) shapes the relationship between psychological constructs (stigma, support, and acceptance) and well-being.

Pekanbaru's unique demographic profile, including its specific ethnic composition, socio-economic disparities, and the particular availability and accessibility of support services and community resources within Riau's capital and its adjacent areas, may significantly influence the challenges and coping mechanisms of these parents in ways not captured by broader national studies. Therefore, this research offers localized insights essential for developing culturally sensitive and geographically relevant interventions tailored to the specific needs of families raising children with Down syndrome in Pekanbaru and the wider Riau province.

Moreover, the objective of this study is to investigate how demographic factors mediate the relationship between stigma, social support, and self-acceptance, and the psychological well-being of parents of children with Down syndrome. It also examines how societal structures and policies impact the parents, applying a social justice framework to address their challenges.

Specifically, the study describes the relationships between demographic factors, stigma, social support, and self-acceptance; investigates the mediating role of demographic factors in the relationship between stigma, social support, self-acceptance, and psychological well-being; and explores the implications for social policy and intervention.

Methods

This quantitative, cross-sectional study aims to identify and analyze the interplay between stigma, social support, self-acceptance, psychological well-being, and demographic characteristics among parents of children with Down syndrome in Riau Province, Indonesia.

The study employed purposive sampling, selecting 351 parents from POTADS and IDSI communities whose children were attending 11 specific schools with significant Down syndrome student populations, thus ensuring targeted data collection from the relevant population. A post-hoc calculation using Cochran's formula for an infinite population (assuming a large, unknown total population of parents of children with Down syndrome in Pekanbaru), with a 95% confidence level and maximum variability, indicated that the achieved sample size of 351 corresponded to an approximate margin of error of 5.23%. Data collection occurred between late July 2024 and late September 2024 using self-administered questionnaires.

This research expects to contribute significantly to understanding factors influencing the psychological well-being of parents with children with special needs. Importantly, ethical approval for the study was rigorously obtained from the Faculty of Medicine, Universiti Kebangsaan Malaysia (UKM). Such ethical clearance underscores the paramount commitment to the safety and privacy of all the participating parents of children with Down syndrome. Stringent protocols were implemented throughout the research process to ensure the confidentiality of their responses, protect their identities, and uphold their autonomy, guaranteeing that their well-being was prioritized alongside the pursuit of valuable insights.

The instruments included measures of demographics; self-acceptance (Berger's Self-Acceptance Scale, adapted to the Indonesian language; reliability coefficient .797); stigma (Parent Self-Stigma Scale, adapted to Indonesian; reliability coefficient .716); social support (Multidimensional Scale of Perceived Social Support, adapted to Indonesian; reliability coefficient .791); and psychological well-being (Six-factor model of Psychological Well-Being, adapted to Indonesian; reliability coefficient .874).

The results of item validity and overall reliability analyses for the four measurement scales listed above: Berger's Self-acceptance Scale, the Parent Self-stigma Scale, the Multidimensional Scale of Perceived Social Support, and the Six-factor Model of Psychological Well-being. Regarding validity, individual item scores varied across the scales; for instance, within Berger's Self-Acceptance Scale, item scores ranged from .320 to .911. At the same time, the reliability of each scale, as assessed by Cronbach's alpha, demonstrated acceptable levels, with all values exceeding .7, indicating good internal consistency. The four scales exhibited adequate levels of validity and reliability and were deemed suitable for use in the research.

In Table 1, the adapted instruments, assessed on Likert scales, underwent a comprehensive validation process tailored to the Indonesian demographic. It included structural validation to ensure the underlying factor structure was appropriate for the target population; content validation by experts to confirm that the items adequately represented the intended constructs within the Indonesian cultural context; and

language validation conducted by expert linguists to ensure clarity, cultural sensitivity, and accurate translation without altering the original meaning. Permission to use these validated instruments was formally obtained, contingent upon proper attribution to the original authors with the strict condition that no items or the intended meaning were to be added or removed, thus preserving the instruments' psychometric integrity and cross-cultural comparability.

Table 1

Instrument Items

Berger's Self-acceptance Scale	
No.	Statements
1	I would be happy if I could find someone who could tell me how to solve my personal problems.
2	I don't question my value as a person, even if I think others do.
3	When people say nice things about me, I find it hard to believe that they mean it. I think maybe they are joking or not sincere.
4	I don't speak much in social matters because I'm afraid people will criticize or laugh at me if I misspeak
5	I realize that I am not living effectively, but I don't believe that I have the ability to use my energy in a better way.
6	….
Parent Self-stigma Scale	
No.	Statements
1	I was not a good enough parent.
2	The way I raised my son has contributed to this problem.
3	I am a good father, no matter what other people say.
4	I feel guilty that my child has a problem.
5	I am ashamed that my child has a problem.
6	….
Multidimensional Scale of Perceived Social Support	
No.	Statements
1	There is someone special who is always there when I need him.
2	There is someone special with whom I can share my joys and sorrows.
3	My whole family really tried to help me.
4	I get the help and emotional support I need from my family.
5	I have someone special who is a source of comfort for me.
6	….
Six-factor Model of Psychological Well-being	
No.	Statements
1	I like most parts of my personality.
2	When I look at my life story, I am happy with what has happened so far.
3	Some people wander aimlessly in life, but I am not one of them.
4	The demands of daily life often make me sad.
5	In many ways, I feel disappointed with my achievements in life.
6	….

The statistical analyses, conducted using SPSS for Windows, included descriptive statistics and Pearson correlation to assess bivariate relationships and linear regression to determine direct effects. To explore the variables' potential mediating and moderating roles in predicting parental psychological well-being, Hayes conducted a mediation analysis using the macro (Hayes, 2018). This method allowed for the examination of both the direct and indirect effects of the independent variables on the dependent variable through the proposed mediator and moderator variables.

The process macro-Bayesian utilizes bootstrapping procedures to generate robust standard errors and confidence intervals for the indirect effects, providing a more reliable assessment of mediation and moderation than traditional methods.

The findings are expected to contribute to a deeper understanding of the factors influencing the psychological well-being of parents raising children with Down syndrome, thereby informing the development of more effective support strategies.

Results

Based on Bronfenbrenner's ecological systems theory, parental age significantly influences psychological well-being, with a potential decrease reflecting cumulative challenges within environmental layers, interacting with societal factors. In addition, higher parental education correlates with greater self-acceptance, acting as a protective factor within Bronfenbrenner's systems (Downes, 2014).

While income was not a direct mediator in this Indonesian context, the significant roles of age and education highlight how parents' position within social structures shapes their experiences of stigma, access, and self-perception across ecological levels, critically impacting their mental health.

This ecologically informed examination of mediating demographics offers nuanced insights for targeted interventions and inclusive policies for supporting the well-being of Indonesian parents raising children with Down syndrome.

Demographics of Parents of Children with Down Syndrome

The data were obtained by administering surveys to 351 parents of children with Down syndrome in Riau (Table 2). The sample comprised a nearly even split of gender, with 49.01% male and 50.99% female participants. The majority of parents were married (72.08%), while 27.92% were divorced. Regarding parents' age, the predominant group was in late adulthood (30-60 years), accounting for 78.92% of the participants, followed by early adulthood (18-29 years) at 20.51%, and a small proportion (0.57%) in the elderly category (over 60 years).

In terms of income, the largest segment reported middle income (60.11%), followed by low income (33.05%), and high income (6.84%). The educational attainment within the sample was notably high, with 84.62% holding a Bachelor's degree. Other education levels included 12 years of schooling (5.98%), Master's (3.42%), Diploma III (2.56%), Vocational (2.28%), Army Academy (0.85%), and Police Academy (0.28%). The most frequently reported job/profession was freelance (61.54%), followed by civil servants and housewives, each at 9.12%. Though less frequent, other occupations included various professional roles such as teachers, doctors, lawyers, and military personnel.

Concerning the child's age, the largest group was children aged 7-11 years (56.13%), with substantial representation from early childhood (12-17 years) at 23.36% and preschool children (3-6 years) at 19.66%. A small percentage (0.85%) had children in early adulthood (18-21 years). Finally, the number of children varied, with the largest proportion of parents having one child

(34.47%), followed closely by two children (30.77%), three children (25.07%), and four or more children (9.69%). This detailed demographic description offers a comprehensive understanding of the characteristics of the study's parent sample.

Correlation of Social Variables with the Psychological Well-Being of Parents with Children with Down Syndrome

Before presenting the results of the mediating factor as identified by Beyes's method, we first describe the findings of the correlation analysis, which demonstrated a statistically significant relationship between the research variables, as can be seen in Table 3.

The correlation results indicate a moderately strong and positive relationship between stigma and self-acceptance (r = .640), suggesting that increased levels of stigma are associated with reduced self-acceptance. Conversely, a moderate positive correlation was observed between social support and self-acceptance (r = .614), indicating that social support can contribute to enhanced self-acceptance. Stigma demonstrated a weak positive relationship with social support (r = .276), suggesting that individuals experiencing stigma may have limited social support.

Table 2

Parent Demographics (N = 351)

Demographic Profile	Total	(%)	Demographic Profile	Total	(%)
Gender			Marital Status		
Male	172	49.01	Married	253	72.08
Female	179	50.99	Divorced	98	27.92
Parents' Age			Income		
Early Adulthood (18-29)	72	20.51	Low	116	33.05
Late Adulthood (30-60)	277	78.92	Middle	211	60.11
Elderly (60 >)	2	0.57	High	24	6.84
Education			Job/Profession		
12 Years of Schooling	21	5.98	Freelance	216	61.54
Vocational	8	2.28	Freelance with Contract	22	6.27
Diploma III	9	2.56	Housewife	32	9.12
Bachelor's	297	84.62	Pilot	1	0.28
Master's	12	3.42	Entepreneur	6	1.71
Police Academy	1	0.28	Veterinarian	1	0.28
Army Academy	3	0.85	Photographer	2	0.57
Child's Age			Driver	5	1.42
Preschool (3-6 years)	69	19.66	Lawyer	2	0.57
Children (7-11 years)	197	56.13	Civil Servant	32	9.12
Early Childhood (12-17 years)	82	23.36	Teacher	15	4.27
Early adulthood (18-21 years)	3	0.85	Lecturer	2	0.57
Number of Children			Doctor	6	1.71
1	121	34.47	Retired	2	0.57
2	108	30.77	Priest	2	0.56
3	88	25.07	Police	2	0.56
4 or more	34	9.69	Army	3	0.85

Note: Table 2 presents a demographic profile of the parents, highlighting key characteristics such as gender distribution, marital status, age groups, income levels, educational attainment, and occupation types, with the majority being married, aged between 30 and 60, and holding a Bachelor's degree. The data reveals that most parents had two children, with the largest age group of children being 7 to 11, while freelancing constituted the most common profession.
Source: Data Demographic, SPSS 2024

Table 3

Correlation of Social Variables with Psychological Well-being

	Self-acceptance	Stigma	Social Support	Psychological Well-being
Self-acceptance				
Stigma	.640			
Social support	.614	.276		
Psychological well-being	-.166	-.38	-.99	

Psychological well-being exhibited significant negative correlations with all the other variables, particularly social support (r = -.99), indicating that low social support is strongly associated with low levels of psychological well-being. In conclusion, it is demonstrated that stigma exerts a detrimental influence on self-acceptance and psychological well-being.

Mediating Demographic Factors in the Psychological Well-being of Parents of Children with Down Syndrome

Table 4 presents in b offer insights into the potential mediating role of parental age in the relationship between three distinct psychosocial factors (self-acceptance, stigma, and social support) and the psychological well-being of parents raising children with Down syndrome. For the model examining self-acceptance, the path 'a' (β = .0010, *p* = .5241) was non-significant, indicating that parental age does not significantly predict levels of self-acceptance. However, the significant path 'c' (β = −.1491, *p* = .0016) suggests a direct negative relationship between self-acceptance and psychological well-being, even after accounting for parental age.

The non-significant of path 'b' (β=2.0044, *p* = .2250) for the direct effect of parental age on psychological well-being in this model implies that age itself, when self-acceptance is considered, does not have a significant impact. The R^2 values suggest that parental age explains a small proportion of the variance in self-acceptance (.0341), while self-acceptance and parental age together explain a moderate proportion of the variance in psychological well-being (.1776). Similarly, the analyses involving stigma and social support as potential mediators reveal non-significant paths for 'a' (stigma: β = −.0011, *p*= .6892; social support: β = .0020, *p* = .9460), indicating that parental age does not significantly predict these mediators.

The direct effect of stigma on psychological well-being (β = −.0591, *p* = .4925) and social support on psychological well-being (β = −.1255, *p* = .0564) were also largely non-significant, with the latter approaching significance. Furthermore, coefficients for the direct effect of parental age on psychological well-being when stigma (β = 1.8005, *p* = -.6871) and social support (β = 1.9867, *p* = .2350) are controlled for are also non-significant.

Table 5 presents a series of mediation analyses examining the role of parental education in the relationship between three psychosocial factors (self-acceptance, stigma, and social support) and psychological well-being. For the model where self-acceptance acts as a mediator, parental education significantly positively predicted self-acceptance (β =. 0119, *p* = .0004). Self-acceptance, in turn, had a significant negative direct effect on psychological well-being (β = −.1519, *p* = .0016). However, the direct effect of parental education on psychological well-being, when controlling for self-acceptance (coefficient = .3982, *p* = .6020), was not statistically significant.

The R^2 value for the mediator model indicates that parental education explains 18.93% of the variance in self-acceptance, while the overall model for psychological well-being (including parental education and self-acceptance) explains 16.79% of the variance. Both the self-acceptance model (F (12.9751) = .0004, $p < .001$) and the psychological well-being model (F(5.0474) = .0069, $p < .001$) were statistically significant.

Similarly, parental education significantly predicted stigma β = .0111, $p = .0064$). However, the direct effect of stigma on psychological well-being (β = −.610, $p = .4815$) was not significant. Furthermore, the direct effect of parental education on psychological well-being, accounting for stigma (β =–.0077, $p = .9920$), was not statistically significant. The R^2 value for the mediator model shows that parental education explains 9.82% of the variance in stigma, while the overall model for psychological well-being explains 3.80% of the variance. The stigma model was significant (F(3.3960) = .0662, $p < .001$), but the psychological well-being model was not (F(0.2515) = .9998, $p = .9998$).

Parental education also significantly predicted social support (β = .0097, $p = .0359$). The direct effect of social support on psychological well-being (β = −.1225, $p = .0644$) approached statistical significance. The direct effect of parental education on psychological well-being, controlling for social support (β = .0977, $p = .8979$), was not statistically significant. Parental education explained 11.21% of the variance in social support, and the combined model explained 9.91% of the variance in psychological well-being. Both the social support model (F (4.4380)= .0359, $p < .001$) and the psychological well-being model (F (1.7248) = .1797, $p < .001$) were statistically significantt.

Table 4

Parental Age Mediator in the Correlation between Self-acceptance, Stigma, and Social Support in Psychological Well-being)

	Parental Age				Psychological Well-being			
		Coef.	SE	p		Coef.	SE	p
Self-acceptance	*a*	.0010	.0015	.5241	*c'*	-.1491	.0469	.0016
Parental Age	-	-	-	-	*b*	2.0044	1.6522	.2250
Constant	*i1*	2.6977	.1628	.6377	*i2*	60.3144	6.7156	.0000
		$R^2 = .0341$				$R^2 = .1776$		
		$F(0.4067) = .5241, p < .001$				$F(5.6639) = .0038, p < .001$		
Stigma	*a*	-.0011	.027	.6892	*c'*	-.0591	.0860	.4925
Parental Age	-	-	-	-	*b*	1.8005	1.6743	-.6871
Constant	*i1*	2.8382	.0966	.0000	*i2*	47.0728	5.6311	.0000
		$R^2 = .0214$				$R^2 = .0689$		
		$F(0.1602) = .6892, p < .001$				$F(0.8305) = .4367, p < .001$		
Social Support	*a*	.0020	.0021	.9460	*c'*	-.1255	.0656	.0564
Parental Age	-	-	-	-	*b*	1.9867	1.6684	.2350
Constant	*i1*	2.7317	.0760	.0000	*i2*	48.8768	5.1370	.0000
		$R^2 = .0506$				$R^2 = .1174$		
		$F(0.8949) = .3448, p < .001$				$F(2.4324) = .0893, p < .001$		

Note: Table 4 presents the mediating effects of parents' age on the psychological well-being variables of self-acceptance, stigma, and social support. The coefficients indicate that while parents' age does not significantly influence self-acceptance and stigma, it significantly impacts social support, with all models reporting significant *p*-values for their respective F-statistics.
Source: Data Demographic, SPSS 2024

Table 5

Parents' Education Mediator in the Correlation of Self-Acceptance, Stigma, and Social Support with Psychological Well-Being

		Parental Education				Psychological Well-being		
		Coef.	SE	p		Coef.	SE	p
Self-acceptance	*a*	.0119	.0033	.0004	*c'*	-.1519	.0478	.0016
Parental Education	-	-	-	-	*b*	.3982	.7627	.6020
Constant	*i1*	1.9731	5.5861	.7240	*i2*	64.9358	5.2533	.0000
		R^2=.1893				R^2=.1679		
		F(12.9751) = .0004, *p* < .001				F(5.0474) = .0069, *p* < .001		
Stigma	*a*	.0111	.0060	.00640	*c'*	-.610	3.7276	.4815
Parental Education	-	-	-	-	*b*	-.0077	.7629	.9920
Constant	*i1*	2.8527	.2124	.0000	*i2*	52.2049	3.7276	.0000
		R^2=.0982				R^2=.0380		
		F(3.3960) = .0662, *p* < .001				F(0.2515)= .9998, *p* = .9998		
Social Support	*a*	.0097	.0046	.0359	*c'*	-.1225	3.2398	.0644
Parental Education	-	-	-	-	*b*	.0977	.7608	.8979
Constant	*i1*	2.8968	.1671	.0000	*i2*	54.0208	3.2398	.0000
		R^2=.1121				R^2=.0991		
		F(4.4380)= .0359, *p* < .001				F(1.7248)= .1797, *p* < .001		

Note: Table 5 presents the mediating effects of various psychological constructs on the relationship between parents' education and psychological well-being. Key findings indicate that while self-acceptance and stigma show significant coefficients, social support has marginal significance, highlighting the complexities of the interplay between parental education and psychological outcomes, as supported by the R^2 values and F-statistics shown.

Source: Data Demographic, SPSS 2024.

Table 6

Parental Income Mediator in the Correlation of Self-Acceptance, Stigma, and Social Support with Psychological Well-being

		Parental Income				Psychological Well-being		
		Coef.	SE	p		Coef.	SE	p
Self-Acceptance	*a*	-.0003	.0022	.8918	*c'*	-.1463	6.4626	.9820
Parental Income	-	-	-	-	*b*	-1.0440	1.1722	.3737
Constant	*i1*	1.7791	.2316	.0231	*i2*	67.4929	5.4626	.0000
		R^2=.0082				R^2=.1709		
		F(0.0231) = .8793, *p* = .8793				F(5.1917) = .0060, *p* < .001		
Stigma	*a*	-.0052	.0039	.1877	*c'*	-.0580	.8147	.5068
Parental Income	-	-	-	-	*b*	-1.0703	1.1906	.3693
Constant	*i1*	1.9214	.1378	.0000	*i2*	53.9931	3.8147	.0000
		R^2=.0708				R^2=.0582		
		F(1.7423)= .1877, *p* < .001				F(0.5855)= .5574, *p* < .001		
Social Support	*a*	.0001	.0030	.9626	*c'*	-.1225	.0658	.0633
Parental Income	-	-	-	-	*b*	-1.0199	1.1825	.0633
Constant	*i1*	1.7491	.1083	.0000	*i2*	56.1697	3.1547	.0000
		R^2=.0025				R^2=.1097		
		F(0.0022) = .9626, *p* < .001				F(2.1030) = .1237, *p* < .001		

Note: Table 6 presents the mediating effects of parental income on psychological well-being across various dimensions, including self-acceptance, stigma, and social support. The analysis reveals that while parental income shows weak coefficients and significance levels in relation to self-acceptance and stigma, it has a more pronounced effect on social support; however, the overall explanatory power (represented by the R^2 values) remains low across the models.

Source: Data Demographic, SPSS 2024.

Table 6 shows the mediation analyses presented in the table explore whether parental income influences the psychological well-being of parents raising children with Down syndrome, with self-acceptance, stigma, and social support as potential mediators. For self-acceptance, the results show that parental income does not significantly predict levels of self-acceptance (β = −.0003, p = .8918). Furthermore, self-acceptance itself does not have a significant direct effect on psychological well-being when controlling for parental income (β =−.1463, p = .9820). The direct effect of parental income on psychological well-being (β = −1.0440, p = .3737), after accounting for self-acceptance, is also not significant. This suggests that self-acceptance does not mediate the relationship between parental income and psychological well-being. Although the self-acceptance model itself was not significant (F (0.0231) = .8793, p = .8793), the overall psychological well-being model (with parental income and self-acceptance) was significant (F (5.1917) = .0060, p < .001), explaining 17.09% of the variance in psychological well-being.

Similar patterns emerge for stigma and social support. Parental income does not significantly predict stigma (β = −.0052, p = .1877) or social support (β = .0001, p = .9626). Neither stigma (β = −.0580, p = .5068) nor social support (β = −.1225, p = .0633) show a significant direct effect on psychological well-being, though social support approaches significance. Additionally, the direct effect of parental income on psychological well-being remains non-significant when controlling for either stigma (β = −1.0703, p = .3693) or social support (β = −1.0199, p = .0633). These findings indicate that neither stigma nor social support appear to mediate the relationship between parental income and psychological well-being. While the stigma and social support models for the mediator were significant (F(1.7423) = .1877, p < .001 for stigma and F(0.0022) = .9626, p < .001 for social support), the overall psychological well-being model for stigma was not significant (F(0.5855) = .5574, p < .001), but it was for social support (F(2.1030) = .1237, p < .001). Overall, these results suggest that parental income, and its influence through these specific psychosocial factors, does not play a significant mediating role in the psychological well-being of parents of children with Down syndrome.

Table 7 presents mediation analyses exploring the role of the child's age in influencing the psychological well-being of parents raising children with Down syndrome, considering self-acceptance, stigma, and social support as potential mediators. For self-acceptance, the path from child's age to self-acceptance (β = .0027, p = .5535) was not statistically significant, indicating that a child's age does not significantly predict a parent's self-acceptance levels. Similarly, self-acceptance did not have a significant direct effect on psychological well-being (β = −.0616, p =.4753), nor was the direct effect of child's age on psychological well-being significant when self-acceptance was controlled for (β = .1912, p =.8516). This suggests that self-acceptance does not mediate the relationship between child's age and parental psychological well-being. The overall model for self-acceptance was not significant (F(0.3518) = .5535, p < .001), and the psychological well-being model was also not significant (F(0.2690) = .7643, p = .7643).

A similar pattern was observed for stigma. The child's age did not significantly predict stigma (β = = .0017, p = .4839). While the direct effect of stigma on psychological well-being (β =−.1219, p = .0640) approached statistical significance, the direct effect of child's age on psychological well-being remained non-significant when controlling for stigma (β = .2169, p = .8312). This indicates that stigma does not appear to mediate the link between child's age and parental psychological well-being. However, for social support, a significant negative relationship was found between the child's age and social support (β =

−.0101, p = .0010). Social support, in turn, had a significant negative direct effect on psychological well-being (β = −.1526, p = .0015).

Despite these significant 'a' and 'c'' paths, the direct effect of child's age on psychological well-being, when social support was accounted for (β = −.5405, p =.5150), was not significant. This implies that social support partially mediates the relationship between a child's age and parental psychological well-being. Overall, the models for social support (F(11.0261) = .0010, p < .001) and psychological well-being (F(5.1253) = .0064, p < .001) were statistically significant.

Influencing Social Stigma through Stress and Coping by Parents of Children with Down Syndrome

Our framework for understanding the stress and coping mechanisms of parents raising children with Down syndrome is anchored in the seminal cognitive-transactional model of Folkman (2013) further elaborated by Martin and Daniels (2014). The model emphasizes that stress is not a direct consequence of external events, but rather a product of an individual's cognitive appraisal of the situation and their perceived coping resources.

Parental responses to perceived threat involve a secondary appraisal of their management capabilities, subsequently informing their deployment of coping strategies, broadly delineated as problem-focused, entailing direct efforts to modify the stressor (Carroll, 2020), or as emotion-focused, aimed at regulating associated emotional distress (Ben-Zur, 2020). To enrich this understanding, we integrated social learning theory (Bandura, 1978), which posits that observational learning and social interactions are crucial in the acquisition of coping mechanisms.

Table 7
Child's Age Mediator in the Correlation of Self-Acceptance, Stigma, and Social Support with Psychological Well-being

	Child's Age				Psychological Well-being			
		Coef.	SE	p		Coef.	SE	p
Self-Acceptance	*a*	.0027	.0045	.5535	*c'*	-.0616	.0861	.4753
Child's Age	-	-	-	-	*b*	.1912	1.0213	.8516
Constant	*i1*	1.9626	.1586	.0000	*i2*	51.8078	3.6298	.0000
		R^2:.0317				R^2:.0393		
		F(0.3518)= .5535, p < .001				F(0.2690)= .7643, p = .7643		
Stigma	a	.0017	.0035	.4839	*c'*	-.1219	.0656	.0640
Child's Age	-	-	-	-	*b*	.2169	1.0168	.8312
Constant	*i1*	1.9963	.1250	.0000	*i2*	53.8708	3.1239	.0000
		R^2:.0259				R^2:.0995		
		F(0.2341) = .6288, p < .001				F(1.7394) = .1771, p < .001		
Social Support	a	-.0101	.0030	.0010	*c'*	-.1526	.0477	.0015
Child's Age	-	-	-	-	*b*	-.5405	.8299	.5150
Constant	*i1*	3.0564	0.3246	.0000	*i2*	67.3734	.8299	.0000
		R^2= .1750				R^2=.1692		
		F(11.0261)= .0010, p < .001				F(5.1253)= .0064, p < .001		

Note: Table 7 presents the mediating effects of a child's age on various psychological well-being indicators, including self-acceptance, stigma, and social support. Notably, while some relationships show statistically significant coefficients (e.g., social support), the overall contributions of the child's age vary, as reflected in the R^2 values and F-statistics, indicating differing levels of explanatory power across the examined variables.

Source: Data Demographic, SPSS 2024.

Furthermore, Bronfenbrenner's ecological systems theory (1979) contextualizes parental stress and coping within a multi-layered environmental framework, encompassing the microsystem (immediate family), mesosystem (inter-environmental interactions), exosystem (indirectly impacting external structures), and macrosystem (cultural norms).

Empirical evidence (Camara et al., 2017) underscores the vital role of social support networks within the microsystem and exosystem as crucial buffers against stressors, thereby augmenting coping capacities across these ecological levels.

Both problem-focused and emotion-focused coping strategies have been shown to significantly influence parental psychological well-being (Pozo et al., 2014), with chronic exposure to unmanaged stress increasing vulnerability to mental health challenges such as anxiety, depression, and sleep disturbances.

Analysis of the Receipt of Social Support by Parents of Children with Down Syndrome

The social support framework model is based on several theoretical foundations that are believed to facilitate comprehension of the theoretical framework pertaining to the social support of parents of children with Down syndrome. Theories proposed by Cohen et al. (1994) and Kaplan et al. (1983) elucidate how social support can influence an individual's mental health. Furthermore, it draws inspiration from the conceptual model, including the buffer model, which explains how social support functions as a buffer or shield against stress (Alloway & Bebbington, 1987).

The main effect model, as proposed by Cohen and Wills (1985), posits that social support directly influences health, irrespective of the presence of stress. Furthermore, a moderation model has been proposed which explains how social support moderates the relationship between stress and health outcomes.

Discussion

Role of Demographic Factors in Mediating the Relationship between Stigma, Social Support, and Self-acceptance in the Psychological Well-being of Parents of Children with Down Syndrome

The aforementioned analyzes illuminate the mediating roles of demographic factors in shaping the intricate relationships between stigma, social support, self-acceptance, and the psychological well-being of parents raising children with Down syndrome. For instance, the experience of stigma can increase emotional distress, while robust social support networks can provide crucial coping mechanisms, and a strong sense of self-acceptance influences how parents navigate their unique circumstances.

The observed significant correlation between parental age and psychological well-being suggests potential shifts in self-acceptance, perceived stigma, and available social support as parents grow older. This aligns with findings by Garbe et al. (2020) and Gadsden et al. (2016), who posit that while older parents may possess greater life experience and problem-solving skills, they might also encounter physical or mental health limitations that impact their resilience. Conversely, younger parents may exhibit greater adaptability and energy but lack extensive experience (Abshire et al., 2018).

This dynamic is further supported by Wiseman et al. (2015) and Martin et al. (2018), indicating that older parents might require more time to adjust to changes, despite potentially employing well-developed coping strategies rooted in past experiences. Moreover, as highlighted by Dekker and Engbersen (2014) and Greve and Staudinger (2015) age can also influence access to vital physical, emotional, and financial resources, with younger parents potentially having more employment and social network opportunities, while older parents might possess more stable financial reserves or

established networks, but face limitations in accessing new education or training.

Regarding the influence of parental education, our findings indicate a significant positive effect on self-acceptance, but not directly on stigma or social support. It suggests that higher educational attainment can bolster parents' psychological well-being by enhancing their self-perception and acceptance of their situation. The mechanisms through which education impacts self-acceptance may involve providing parents with enhanced cognitive resources, problem-solving skills, and greater control over their lives (Hinshaw, 2015; Matthews et al., 2021; Weiss et al., 2016).

Education can equip parents with the knowledge to understand the challenges they face, including societal stigma associated with conditions such as Down syndrome, enabling them to develop more constructive responses and communication strategies (Caton & Chapman, 2016; Sierau et al., 2019; Sippel et al., 2015). This understanding can foster self-acceptance by mitigating feelings of shame and isolation, and bolstering self-confidence.

Concerning the Indonesian context, cultural norms around disability, family support systems, and access to educational resources may uniquely shape these outcomes. Cross-cultural interpretations might reveal variations in how stigma is experienced and addressed; the nature and availability of social support; and the relationship between education and self-perception in different societal structures.

While our study found no significant direct effect of income on the mediators, the theoretical framework supported by Levasseur et al. (2015), Alcaraz et al. (2020) and Hill-Briggs et al. (2021) suggests that it can indirectly influence well-being by facilitating access to quality healthcare, education, and social support services (Cotter et al., 2017; Gennetian & Shafir, 2015; Reynolds et al., 2022), thereby offering more choices and resources to navigate the challenges of raising a child with special needs.

Ultimately, our findings highlight the multi-faceted and crucial role of demographic factors in the psychological well-being of parents of children with Down syndrome, providing valuable insights for developing targeted interventions and inclusive policies.

One unexpected aspect of our findings is the generally non-significant direct mediating effects of parental income and child's age on self-acceptance, stigma, and social support within the tested models. While theoretical frameworks and previous research (Alcaraz et al., 2020; Hill-Briggs et al., 2021; Levasseur et al., 2015) suggest that income may influence access to resources impacting these psychosocial factors, our analysis did not reveal strong direct pathways in the Indonesian sample.

Culturally, the strong emphasis on communal support and family obligations in Indonesia might play a more dominant role in shaping self-acceptance, stigma experience, and social support networks than direct financial resources. Similarly, the non-significant direct effects of the child's age on the mediators might suggest that the psychosocial experiences of parents are less directly tied to the child's developmental stage in this cultural context than anticipated, potentially being more influenced by other factors such as societal attitudes towards disability or the availability of age-specific support services.

Conclusion

The study has explored the mediating influence of demographic factors on the psychological well-being of Indonesian parents of children with Down syndrome, employing a social justice lens to understand how societal structures exacerbate or mitigate the effects of stigma, inadequate support, and diminished self-acceptance. The findings are expected to significantly enhance our understanding of the lived experiences of these

parents; inform the development of more effective family and community-based interventions; and provide an empirical basis for the formulation of inclusive social policies.

From a practical standpoint, the research emphasizes the critical need to strengthen social support networks through the implementation of targeted support groups and peer mentoring initiatives, as well as to inform the creation of culturally-sensitive training programs for professionals engaged with such families. Moreover, the study advocates developing and adopting more inclusive public policies that guarantee equitable access to essential health, education, and social services, ultimately aiming to improve the overall well-being of families raising children with Down syndrome.

Recognizing the study's focus on demographic variables, future research endeavors should consider employing mixed-method approaches, longitudinal study designs, and cross-cultural comparisons to enhance the findings' generalizability and explore the complexities of parents' subjective experiences and the intricate mechanisms of social support in greater depth.

The research underscores the imperative for comprehensive and culturally-sensitive interventions that specifically address the psychosocial needs of Indonesian parents raising children with Down syndrome, moving beyond a purely medical model to one that integrates social justice principles. The findings provide a robust empirical foundation for advocating policy reforms that ensure equitable access to essential health, educational, and social services, thereby mitigating the systemic disadvantages exper-ienced by these families.

Practically, the study highlights the critical necessity of strengthening existing social support networks through structured initiatives such as peer mentoring and targeted support groups, thereby fostering enhanced parental well-being. Furthermore, the investigation emphasizes the significant potential for future research to deepen understanding through mixed methodologies and cross-cultural analyses, thereby enriching the generalizability and applicability of these insights. Ultimately, the implications presented call for a concerted, multi-sectoral effort to foster inclusive societal structures that genuinely support the overall well-being of families impacted by Down syndrome.

Despite its valuable contributions, the study has several limitations. First, its cross-sectional design prevents the establishment of causal relationships, offering only a snapshot of the complex interplay between demographic factors and psychological well-being. Second, the focus on a specific urban area in Pekanbaru, Riau, may limit the generalizability of the findings to parents in different geographical or socio-economic contexts across Indonesia. Third, while examining demographic variables, the study primarily relies on quantitative data, potentially overlooking the rich subjective experiences and nuanced mechanisms of social support. Fourth, the absence of longitudinal data means the study cannot capture changes over time in parents' well-being or the evolving impact of demographic factors. Finally, without cross-cultural comparisons, it is challenging to ascertain which findings are unique to the Indonesian context and which might be universally applicable.[]

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Author Contribution Statement

Bima Maulana Putra: Conceptualization; Data Curation; Formal Analysis; Investigation; Methodology; Validation; Writing, Review & Editing. **Abdul Rahman Ahmad Badayai:** Conceptualization; Data Curation; Formal Analysis; Investigation; Methodology; Validation; Writing, Review, and Editing. **Novena Ade Fredyarini Soedjiwo:** Conceptualization; Data Curation; Funding Acquisition; Investigation; Validation; Visualization. **Suroyo Suroyo:** Investigation; Validation; Visualization; Writing, Review & Editing.

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