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Maternal physical and mental health in children with Down syndrome

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Abstract

Objective—To identify the relationship between characteristics of the child with Down syndrome and the health of their mother.

Study design—Families with a child/young adult with Down syndrome (<25 years) provided information related to the health of the child, functioning and behaviour and the health and wellbeing of the mother (n=250).

Results—The mean physical health score of mothers was 50.2 (SD= 9.6). Factors associated with lower mean physical health scores were: child having a current heart problem (p=0.036), a higher BMI (p=0.006) and higher (poorer) scores on the Developmental Behaviour Checklist (DBC). Better physical health scores were seen in mothers whose children required no help/supervision in learning new skills (p=0.008) and domestic tasks (p=0.014). The mean mental health score of mothers was 45.2 (SD= 10.6), significantly lower than the norm of 50 (p<0.0001). Associated child factors included current ear problems (p=0.079), muscle/bone problems (p=0.004), >4 episodes of illness in past year (p=0.016), and higher scores on the DBC (p<0.0001).

Conclusions—The most important predictors of maternal health were children's behavioural difficulties, everyday functioning and current health status. Mothers of children with Down syndrome appear to experience poorer mental health and may require greater support and services to improve behaviour management skills for their child and their own psychological well-being.

Down syndrome is the most common genetic cause of intellectual disability, occurring in ~1/1000 live births in Western Australia.[1] Therefore, mothers of children with Down syndrome represent a substantial proportion of mothers of children with intellectual disability. In one study this group of mothers was reported as experiencing better psychological well-being when

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compared with mothers of children with autism or Fragile X syndrome.[2] Although experience of stress for mothers of children with Down syndrome may be lower in early childhood when compared with mothers of children with other intellectual disabilities, their stress levels have been shown to increase at a significantly higher rate as the child grows up.[3] It is possible that as the child enters late childhood and middle adolescence, difficulty in obtaining services and uncertainty about the child's future may promote stress.[3]

Stress can be defined as the balance between external environmental demands and the perceived internal ability to respond, and may occur when the demands prevent the pursuit of other life objectives.[4] It is important to discern factors that modify caregiver stress. Several authors have proposed potential buffers, including: 1)Child characteristics (e.g., age, sex, behaviour); [3–7] 2) Disability characteristics (e.g., burden of disease);[4, 7, 8, 9] 3) Caregiver characteristics (eg age, marital status and satisfaction, coping style);[8, 10, 11] 4) Family characteristics (eg functioning, resources); [4, 5, 9, 11–13] 5) Sociological characteristics (eg social support, employment, socio-economic status);[8, 11, 14] and, 6) System characteristics (e.g. family-centred care) [6]

The present population-based study examines multidimensional characteristics of the child with Down syndrome and how these characteristics are associated with maternal health and psychological well-being, as measured by the SF12.[15] Specifically, we wanted to examine how health status, communication, behaviour and level of functioning of the child with Down syndrome relate to maternal health.

METHODS

In 2004 all individuals with Down syndrome aged between 0 and 25 years currently living in Western Australia were identified from the IDEA (Intellectual Disability Exploring Answers) database. The IDEA database uses multiple sources.[16] Ethical approval for the study has been provided by the Ethics Committee of the Women's and Children's Health Services in Western Australia.

With the approval of the Ethics Committee of the Women's and Children's Health Services in Western Australia and the backing of the Down syndrome parent support group, families of 500 children/young adults with Down syndrome registered with Disability Services Commission and able to be contacted, were invited to participate in the Down Syndrome NOW (Needs, Opinions, Wishes) study. The questionnaire consisted of two parts. Part 1 pertained to the individual with Down syndrome and included information on health, functioning and service needs, whilst Part 2 pertained to the health and well-being of their family. The measures used in this analysis are described in Table I (available at www.jpeds.com). Pilot testing with 13 families ensured that the questionnaire was relevant and captured important resource, health, functional and family characteristics whilst being sensitive to the complexity of ongoing care giving demands.

Data collection was completed during 2005 with a total response fraction of 73% (n = 363/500). Three quarters of families chose to complete the questionnaire on paper, 12.6% online and 12.4% by telephone interview. There were 18 questionnaires with missing data from the SF-12 measure, 25 questionnaires were completed by the child's father, and 70 questionnaires (short version) contained responses only to Part 1. To provide a more homogenous cohort for analysis, these 113 questionnaires were excluded, leaving a total of 250 questionnaires completed by the child's mother.

The Physical Component Score (PCS) and Mental Component Score (MCS) measures were calculated using the algorithm provided in the scoring manual.[15] The scores are derived through norm-based scoring methods using the 2002 US population so that the general

population has a mean score of 50 and SD of 10 for both scales. All scores above or below 50 can be interpreted as above or below the general population norm. The SF12 has been validated as an appropriate measure in the Australian population.[17]

Univariate linear regression analyses were conducted separately with the SF-12 version-2 Physical Component Scale (PCS) and the Mental Component Scale (MCS) as the outcome variables of interest. We specifically selected the variables from the child's health status, behaviour, communication and function that we thought would have the greatest effect on maternal health. These included the existence of specific health conditions (such as heart or bowel), the number of health conditions, number of episodes of illness over the last year, Developmental Behaviour Checklist (DBC)[18] scores, Social Communication Questionnaire[19] (SCQ) score, level of communication and understanding, level of independence in day to day activities as scored in the WeeFIM (modified for questionnaire use)[20] and the Body Mass Index (BMI). We considered the following as possible confounders: child's age and mother's age at the time of questionnaire completion, number of siblings, metropolitan/rural living, sex of the child and family income. These have been taken into account in each of the final multivariate models. The statistical package STATA 9 was used for this analysis.[21]

RESULTS

Comparison of those included and not included in this analysis showed no significant difference in age group of the child, sex, child's place of birth, number of siblings, maternal education, mother's work status, family income or having a partner. There were differences between the groups in use of private health insurance (62% of those included had health insurance compared with 50% of those excluded, p=0.03), experiencing financial stress (46% of those included indicated "they could save a bit every now and then" compared with only 36% of those excluded, p=0.07), birth order of child (30% of children of those included were first-born compared with 45% of those excluded, p=0.02) and metropolitan or rural residence (29% of those included were from rural WA compared with only 15% of those excluded, p=0.04).

The majority (70.8%) of participating families lived in the metropolitan area. Of the 250 mothers completing the questionnaire, 237 were biological mothers, 11 were adoptive mothers, one was a foster mother and one was a stepmother. The mean age of the mothers at the time the questionnaire was completed was 44.4 years and the majority (88%) were married or in a *de facto* relationship. Just over a third (38.6%) of the mothers had obtained university qualifications and half (50.2%) were in full or part-time work. The combined gross income of families in 2004 was reported as < $26 000 (Australian dollars) by 26.2%, $26 000 to $51 999 by 30%, and > $51 999 by 43.8%. However, nearly half (46.5%) of the families described a high level of financial stress. The mean age of the child with Down syndrome was 11.9 years, and there were slightly more males (54.4%) than females (45.6%). Only 7.2% of the children with Down syndrome had no siblings, with the majority (58.4%) having 2 or 3 siblings. In those families with siblings the child with Down syndrome was the eldest in 22.4%.

The majority (60.9%) of children had 1 or 2 current health problems, with 8.9% having four or more and 16.6% having no current health problems. The most commonly reported were eye, ear and muscle/bone problems, in 52%, 32% and 22% respectively (co-occurring in a number of these). Although almost all (89.6%) mothers reported at least one episode of illness for their child during 2004, the vast majority of children (84%) did not require hospital admission. Using a cut-off of 44 (sensitivity/specificity of ~ 83%) we found that nearly a third (66/211, 31.3%) of children had scores above the clinical threshold for abnormal developmental behaviour.[22] There were almost equal proportions of males and females (p=0.99). There were slightly higher proportions of children with abnormal scores in the 5–9 year age group (39.6%) and 10–13

years (37.8%), but no statistically significant differences between age groups. For children aged 12 years and older, the majority needed help with money management, shopping, using public transport and meal preparation.

The average maternal PCS score was 50.2 (SD: 9.6), significantly higher than but within 1 SD of the Australian female norm of 48.4[23] (p=0.015). The univariate analyses found that lower mean physical health scores (ie, worse physical health) were observed in mothers of children with current heart problems (mean: 44.2; SD: 12.5) ($p = 0.036$) (Table II A; available at www.jpeds.com). There was no significant difference in maternal physical health based on the number of current health problems in the child nor episodes of illness. Lower physical health scores were seen in mothers of children who had higher DBC scores (ie, more dysfunctional personalities, emotions and behaviour), with significant differences seen in the disruptive/antisocial and anxiety subscales. There was no significant difference in maternal physical health based on the child's ability to be understood, but mothers had significantly better physical health if their child understood all conversations. Significantly better physical health scores were seen in mothers of children who required no help/supervision in learning new skills (Table II A) and domestic tasks (Table II B; available at www.jpeds.com).

The average maternal MCS score was 45.2 (SD: 10.6), which is significantly lower than but within 1 SD of the Australian female norm of 51.4[23] ($p < 0.0001$). Mother's mental health improved with maternal age overall (by a factor of 0.16 per year of age, p=0.05). In relation to child's age group the effect was not linear with the scores being lowest in those aged 10–13 years, significantly higher (p=0.02) in those aged 14–17 years and intermediate in those under 9 years. Once the effect of mother's age on mental health was adjusted for, the co-occurring effect of child's age group on mother's mental health was no longer significant.

In the univariate analyses, worse maternal mental health was associated with the child with Down syndrome having current ear problems and current muscle/bone problems (Table III A). Compared with mothers of children with one episode of illness in 2004 those whose children had 4–6 or ≥ 7 episodes also had poorer mental health. Across all subscales, significantly lower mental health scores (ie, worse mental health) were seen in mothers of children with higher DBC scores (ie, more dysfunctional personalities, emotions and behaviour) ($p < 0.001$). Better mental health was observed in mothers of children who were able to make themselves understood to strangers in comparison to those only able to make their basic needs known.

With respect to functional ability, higher mental health scores (ie, better mental health) were seen in mothers of children who, compared with those who needed help, required no help/supervision in dressing waist down, problem solving (Table III A) and, in children above 12 years, using the telephone ($p = 0.083$) and at social events (Table III B). Also, significantly better mental health was also seen in mothers of older children when only supervision was required for the daily activities of meal preparation, money management, using the telephone, using public transport, shopping, and at social events, compared with those mothers whose children required help for these tasks (Table III B).

In the final multivariate model the only child variables shown to affect maternal physical health positively were those observed on basic functional activities using the WeeFIM and in advanced functional activities in the community. Mothers of children who required no help/supervision in learning new skills, domestic tasks, public transport, and shopping, showed significantly higher mean physical health scores. On the other hand, mothers of children who scored higher on the DBC disruptive/antisocial scale (ie, more disruptive/antisocial behaviour) displayed lower mean physical health scores ($p = 0.043$) (Table II A).

The final multivariate model showed the child variables positively associated with better maternal mental health were no help/supervision needed for dressing waist down, problem

solving (Table III A) and using the telephone, and supervision needed using the telephone, using public transport, and at social events (Table III B). Significantly lower mental health scores were seen in mothers of children who had current muscle/bone problems, ≥ 3 current health problems, 4–6 episodes of illness in 2004, ≥ 7 episodes of illness in 2004, and children who had more dysfunctional personality, emotions and behaviour (Table III A).

DISCUSSION

This study found that the most important predictors of maternal health, particularly mental health, were the child's behavioural difficulties, the child's level of everyday functioning, the child's progress in community participation involving shopping and travel, and to a lesser degree, the child's current health status.

The major strength of our study is that we have a population-based cohort of families each with a child with Down syndrome with measures of both maternal health (physical and mental) and a wide range of child characteristics. In addition, we had a high response to questionnaires (73%). To our knowledge, there have been no studies that have investigated the impact on mother's health of specific functional deficits or medical problems in the child with Down syndrome. Other strengths of our study are that the cohort covers a wide range of ages (0–25 years) and we have taken into account potentially confounding factors in the multivariate analysis.

We acknowledge that the study has some limitations. Our follow-up of non-respondents was compromised because it was a requirement to outsource the distribution and collection of the questionnaires. Although our overall response fraction for the questionnaire was high, only the short version of the questionnaire was received from 70 participants who were thus ineligible for this present analysis. Comparison of responders and non-responders suggests some minimal bias towards the exclusion of more disadvantaged families. A statistical limitation was that the multivariate model became unstable when dealing with small sample sizes for some characteristics (eg in examining the association between a current heart problem and maternal health).

We found that the mental health of mothers was strongly influenced by child behaviour and caregiving demands. These results are similar to studies of psychological stress in caregivers of children with disability or chronic disease.[4, 12, 13] Given this, we were not surprised to find that the average mental health score of the mothers in our study (45.2; SD: 10.6) was significantly lower than the average score reported for both South Australia (51.4; SD: 9.5) [23] and Western Australia (51.8; 95% CI: 51.3-52.2).[24] Interestingly, the effect of caregiving on maternal physical health appeared less dramatic. The average physical health score derived from this dataset was 50.2 (SD: 9.6), significantly better than the South Australian average of 48.4 (SD: 10.7) and similar to the average for Western Australia (50.1; 95% CI:49.7–50.4) [24]. Given the relationship between socio-economic disadvantage and health one could postulate that any selection bias inherent in our data could have resulted in an overestimate of physical health in relation to the total population of mothers of children with Down syndrome. In general there is much less research relating to the physical health of mothers caring for disabled children.[4, 6, 7, 9, 12, 13]

In our investigation, child characteristics shown to affect maternal physical health positively involved the child's everyday functioning. In particular, mothers of children who showed independence in learning new skills, accessing public transport, participating in chores, and shopping, reported better physical health. These results are in keeping with a study on a cohort of caregivers of children with cerebral palsy, in which decreased caregiving demands (ie, higher functional ability of the child) were shown to be associated with better physical health.[4]

However they are in contrast to four studies of other disabling childhood conditions (including cerebral palsy and Rett syndrome) that found no relationship between the degree of the child's functional status and maternal physical health.[6, 7, 9, 12]

In our multivariate analysis for maternal physical health we showed that mothers of children who scored higher on the disruptive/antisocial subscale of the DBC displayed worse physical health. Similarly, the DBC used by Raina et al[4] showed that child behaviour problems were inversely related to maternal physical health in children with cerebral palsy. Our study has corroborated earlier findings that behaviour problems are the single most important child characteristic that predicts maternal psychological well-being.[4, 6] We found significantly worse mental health in mothers of children who scored higher in the DBC across all six subscales. A number of previous studies report higher levels of stress in mothers of children with more maladaptive behaviours.[25–28]

Intellectual disability appears to predispose individuals to emotional and/or behavioural problems. This "dual diagnosis" is well-documented in adulthood where adults with intellectual disability have been found to be at an increased risk of mental disorders,[29] and the evidence has now extended to adolescents and children as well.[30, 31] Eisenhower et al[26] showed at age 3, behavioural problems in children with Down syndrome are comparable to those of typically developing children. However, over the next 2 years there was a relative increase in behaviour problems in their Down syndrome cohort and, in turn, maternal stress.

In our study, mothers of children with higher everyday functioning experienced better mental health. In particular, mothers reported better mental health if their children required no help or supervision in dressing, problem solving and, for children over 12 years, using the telephone. Similarly, mothers reported better mental health if their child aged over 12 years required supervision but no help in using the telephone, using public transportation and attending social events. Three other studies of children with disabilities (including cystic fibrosis, cerebral palsy and myelodysplasia) had similar findings, in that the more dependent the child the greater the mother's distress.[4, 8] However, four studies found no relationship between the degree of child's functional status and maternal mental health.[6, 7, 9, 12]

Significantly lower mental health scores were seen in mothers of children who had current musculoskeletal problems, 3 or more current health problems and ≥4 episodes of illness in 2004. Ours is the first study to investigate specific health characteristics in the child with Down syndrome and assess their impact on mothers' mental well-being. However in comparison to functional and behavioural attributes we found that the health of the child had perhaps less of an impact than we had anticipated.

In contrast to other studies which have not consistently demonstrated an association with poorer psychological well-being,[2, 32] our results suggest that mothers of children with Down syndrome do often experience poorer mental health. As a result they may require greater support and service provision to enhance both behaviour management skills and their own subsequent psychological well-being. Douma et al[33] showed that most (88.2%) parents of youths with intellectual disabilities had various support needs that were frequently unmet. In addition, the study found that the "parents who perceived both emotional and behavioural problems in their child needed support the most." As we have seen in our study, maladaptive child behaviour is the single most important child characteristic that predicts maternal stress. King et al[6] showed services are most beneficial when delivered in a family-centred manner and address parent-identified issues such as child behaviour problems. Service providers need to address both the child's and parents' problems, as well as the family's ability to deal with these problems. As Raina et al[4] stated, " Clearly, it is important for health care providers to assess how caregivers are affected by behavioural as well as 'functional' aspects of the child's

disability in the provision of comprehensive family-oriented services. In terms of prevention, providing parents with cognitive and behavioural strategies to manage their child's behaviours may have the potential to change caregiver health outcomes."

As endorsed by the biopsychosocial model of the International Classification of Functioning, Disability and Health (ICF)[34], it is the collective responsibility of society to enable the full participation of people with Down syndrome into all areas of society and community life. In future research, we need to look at the types and mix of support mothers of children with Down syndrome need and whether their needs are being met. Individuals in this investigation were between 0 and 25 years, but as they age families face new challenges, hence further research should explore the health of mothers of adults with Down syndrome.

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Table 1

Instruments used in Down syndrome NOW questionnaire that were included in analysis

Instrument	No. Items	Description of Instrument	Range of possible scores	Cohort mean (SD) & range of scores
SF12 Version 2[15] N = 250	12	Widely used and accepted generic measure of health status that covers the areas of physical functioning, pain, health, vitality, social functioning, and mental health. The higher the score the better the person's health.	0–100	PCS: 50.2 (9.6); 18.2–67.1 MCS: 45.2 (10.6); 2.6–66.8
WeeFIM[20] N = 223	18	Developed to measure the typical performance of children in essential self-care, mobility and communication-social learning skills. The higher the score the greater the child's ability to complete essential daily tasks without parental assistance or supervision. It was previously adapted for questionnaire format in a study of children with Down syndrome.[38]	18–126	Mean: 94.2 (25.6) Range: 24–126
Developmental Behaviour Checklist[18] N = 211	96	Assesses the behaviour and emotional disturbance in children and adolescents with mental retardation. 6 subscales. The higher the score the greater the child's behaviour and emotional disturbance.	0–300	Mean: 36.6 (22.6) Range: 1–106 Prop. ≥ 44: 31.3%
Social Communication Questionnaire[19] N = 213	40	A screening instrument for autism, previously known as the Autism Screening Questionnaire (ASQ) it helps evaluate communication skills and social functioning with all age groups with or without ID. Scores ≥ 15 recommended referral for a complete diagnostic evaluation	0–39	Mean: 11.1 (6.1) Range: 0–32

Table 2

Table 2a: Mother's Physical Component Score (PCS) According to Mother's and Child's Characteristics

Measure	N	Univariate Model - PCS		Multivariate Model - PCS	
		Effect Size	P-value	Effect Size	P-value
Health Characteristic					
No heart problems	234	Baseline			
Heart problems	11	−6.235	0.036	−0.993	0.746
No ear problems	164	Baseline			
Ear problems	77	2.404	0.07	2.142	0.095
No muscle/bone problems	188	Baseline			
Muscle/bone problems	53	−1.954	0.182	−2.118	0.165
Number of Health Problems					
None	39	Baseline			
1	77	−0.653	0.73	−0.541	0.767
2	66	−1.035	0.585	−1.900	0.329
≥ 3	53	−2.556	0.209	−1.174	0.556
Episodes of Illness					
1	35	Baseline			
2 or 3	74	−1.448	0.464	−1.296	0.515
4 to 6	59	1.647	0.423	−0.73	0.722
≥ 7	56	1.446	0.487	0.553	0.789
BMI z-score		−0.505	0.463	0.027	0.966
DBC					
Total		−0.062	0.04	−0.042	0.191
Autism Screening		−0.096	0.347	−0.025	0.813
Disruptive/antisocial		−0.323	0.025	−0.307	0.043
Self-absorbed		−0.143	0.376	−0.046	0.793
Communication		−0.472	0.225	−0.373	0.338
Anxiety		−1.576	0.004	−0.737	0.206
Social relating		−0.772	0.116	−0.167	0.742
Ability to be Understood					
Makes basic needs known only	31	Baseline			
Family understand only	95	1.692	0.409	−1.681	0.403
Strangers understand	86	0.378	0.855	−2.057	0.356
Ability to Understand					
Key words or none	15	Baseline			
Simple conversations	100	4.44	0.106	1.805	0.511
Most conversations	84	2.955	0.287	−0.519	0.861
All conversations	13	8.641	0.022	1.502	0.718
SCQ		−0.096	0.391	−0.294	0.013
WeeFIM					
Total		−0.003	0.921	−0.013	0.691
Dressing waist down					
Help needed	91	Baseline			
Supervision needed	20	0.959	0.692	0.772	0.726
No help/supervision	110	0.839	0.545	2.487	0.153
New Skills					
Help needed	99	Baseline			
Supervision needed	71	1.598	0.281	2.452	0.093
No help/supervision	44	4.601	0.008	4.350	0.014
Problem solving					
Help needed	122	Baseline			
Supervision needed	45	−0.396	0.896	2.184	0.200
No help/supervision	54	2.316	0.146	2.847	0.105

Table 2b: Mother's Physical Component Score (PCS) According to Mother's and Child's Characteristics

The following apply for individuals with DS >12years of age only -

Measure	N	Univariate Model - PCS		Multivariate Model - PCS	
		Effect Size	P-value	Effect Size	P-value
Domestic Tasks					
Help needed	48	Baseline			
Supervision needed	42	0.663	0.754	0.420	0.864
No help/supervision	41	5.317	0.014	4.263	0.096
Meal preparation					
Help needed	70	Baseline			
Supervision needed	45	2.703	0.169	2.433	0.257
No help/supervision	15	4.428	0.131	0.977	0.773
Money management					
Help needed	111	Baseline			
Supervision needed	15	4.54	0.108	4.447	0.178
No help/supervision	—	—	—	—	—
Phone					
Help needed	52	Baseline			
Supervision needed	35	0.519	0.815	−1.408	0.561
No help/supervision	36	2.199	0.317	2.440	0.363
Public transport					
Help needed	76	Baseline			
Supervision needed	26	1.439	0.551	0.197	0.944
No help/supervision	8	5.587	0.159	9.639	0.050
Shopping					
Help needed	95	Baseline			
Supervision needed	20	0.003	0.999	1.122	0.692
No help/supervision	12	4.421	0.159	6.384	0.096
Social events					
Help needed	55	Baseline			
Supervision needed	42	0.318	0.88	−2.324	0.306
No help/supervision	31	-0.914	0.933	−3.244	0.220

Table 3

Table 3a: Mother's Mental Component Score (MCS) According to Child Characteristics

Measure	N	Univariate Model - MCS		Multivariate Model - MCS	
		Effect Size	P-value	Effect Size	P-value
Health Characteristic					
No heart problems	234	Baseline			
Heart problems	11	0.547	0.867	−0.719	0.849
No ear problems	164	Baseline			
Ear problems	77	−2.569	0.079	−1.932	0.223
No muscle/bone problems	188	Baseline			
Muscle/bone problems	53	−4.699	0.004	−6.160	0.001
Number of Health Problems					
None	39	Baseline			
1	77	0.334	0.872	−0.163	0.942
2	66	0.873	0.683	−0.471	0.844
≥ 3	53	−3.583	0.109	−4.799	0.052
Episodes of Illness					
1	35	Baseline			
2 or 3	74	−3.17	0.134	−3.363	0.163
4 to 6	59	−5.324	0.016	−4.811	0.054
≥ 7	56	−8.346	<0.001	−8.669	0.001
BMI z-score		0.521	0.484	−0.003	0.997
DBC					
Total		−0.186	<0.001	−0.188	<0.001
Autism Screening		−0.572	<0.001	−0.552	<0.001
Disruptive/antisocial		−0.814	<0.001	−0.835	<0.001
Self-absorbed		−0.912	<0.001	−0.967	<0.001
Communication		−1.836	<0.001	−1.68	<0.001
Anxiety		−2.556	<0.001	−2.872	<0.001
Social relating		−1.614	0.002	−1.62	0.008
Ability to be Understood					
Makes basic needs known only	31	Baseline			
Family understand only	95	1.947	0.368	1.662	0.500
Strangers understand	86	5.853	0.008	4.357	0.112
Ability to Understand					
Key words or none	15	Baseline			
Simple conversations	100	0.251	0.098	0.58	0.862
Most conversations	84	4.542	0.123	4.006	0.264
All conversations	13	3.817	0.337	4.425	0.379
SCQ		−0.054	0.642	−0.220	0.119
WeeFIM					
Total					
Dressing waist down					
Help needed	91	Baseline			
Supervision needed	20	0.702	0.783	1.394	0.610
No help/supervision	110	3.674	0.013	5.363	0.014
New Skills					
Help needed	99	Baseline			
Supervision needed	71	1.859	0.259	1.719	0.359
No help/supervision	44	0.382	0.841	1.193	0.597
Problem solving					
Help needed	122	Baseline			
Supervision needed	45	1.201	0.503	0.585	0.783
No help/supervision	54	4.543	0.007	3.667	0.095

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Table 3b: Mother's Mental Component Score (MCS) According to Child's Characteristics

The following apply for individuals with DS >12years of age only -

Measure	N	Univariate Model - MCS		Multivariate Model - MCS	
		Effect Size	P-value	Effect Size	P-value
Domestic Tasks					
Help needed	48	Baseline			
Supervision needed	42	4.476	0.052	4.238	0.143
No help/supervision	41	2.973	0.199	4.215	0.160
Meal preparation					
Help needed	70	Baseline			
Supervision needed	45	4.848	0.019	3.731	0.136
No help/supervision	15	−2.782	0.36	−0.767	0.845
Money management					
Help needed	111	Baseline			
Supervision needed	15	4.987	0.082	4.818	0.208
No help/supervision	—	—	—	—	—
Phone					
Help needed	52	Baseline			
Supervision needed	35	4.286	0.072	5.783	0.045
No help/supervision	36	4.100	0.083	5.306	0.095
Public transport					
Help needed	76	Baseline			
Supervision needed	26	6.574	0.004	7.183	0.018
No help/supervision	8	5.641	0.122	7.405	0.149
Shopping					
Help needed	95	Baseline			
Supervision needed	20	5.088	0.047	4.03	0.229
No help/supervision	12	1.778	0.574	0.173	0.969
Social events					
Help needed	55	Baseline			
Supervision needed	42	6.133	0.004	7.366	0.004
No help/supervision	31	4.101	0.073	4.536	0.125