

Impact of family and caregiver factors on development and behaviours in maltreated young children

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ABSTRACT

Introduction: This study aimed to evaluate the prevalence of developmental and emotional/behavioural concerns in maltreated children and to examine the impact of adverse family/caregiver risk factors on these outcomes.

Method: We analysed family demographic and baseline data of 132 maltreated children and their caregivers from a family support programme in Singapore. We examined the associations of 3 main risk factors (i.e., caregiver mental health, educational attainment, and family socio-economic status [SES]) with developmental/behavioural outcomes using multivariable logistic regression, controlling for caregiver relationship to the child. Caregiver mental health was assessed using the Patient Health Questionnaire 9 (PHQ-9) and General Anxiety Disorder 7 (GAD-7) tools. Developmental/behavioural outcomes were assessed using the Ages and Stages Questionnaires (ASQ-3), ASQ-Social-Emotional (ASQ-SE), and the Child Behaviour Checklist (CBCL).

Results: The children ranged in age, from 2 months to 3 years 11 months (median age 1.7 years, interquartile range [IQR] 0.9–2.6). Among caregivers, 86 (65.2%) were biological mothers, 11 (8.3%) were biological fathers, and 35 (26.5%) were foster parents or extended family members. Low family SES was associated with communication concerns on the ASQ-3 (adjusted odds ratio [AOR] 3.04, 95% CI 1.08–8.57, $P=0.04$). Caregiver mental health concerns were associated with increased behavioural concerns on the CBCL (AOR 6.54, 95% CI 1.83–23.33, $P=0.004$) and higher scores on the ASQ-SE (AOR 7.78, 95% CI 2.38–25.38, $P=0.001$).

Conclusion: Maltreated children with caregivers experiencing mental health issues are more likely to have heightened emotional and behavioural concerns. Those from low SES families are also at increased risk of language delay, affecting their communication.

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Keywords: behaviours, caregiver mental health, child development, child maltreatment, paediatrics

CLINICAL IMPACT

What is New

- One of the first locally conducted prospective studies of family/caregiver risk factors for maltreated young children aged between 0–3 years.
- Findings from the study help justify the necessity to provide support for these high-risk children and their families.

Clinical Implications

- Having caregivers with mental health concerns was significantly associated with increased emotional/behavioural concerns in maltreated children.
- Maltreated children from low socio-economic status-families were also at increased risk of language delay, affecting their communication.

INTRODUCTION

Child maltreatment is defined as the neglect and abuse of children under 18 years old. It encompasses physical/emotional ill-treatment, sexual abuse, negligence and/or exploitation that causes harm to the child.¹ Evidence has shown that Adverse Childhood Experiences (ACEs), such as maltreatment experienced during childhood, have a significant impact on the developing brain especially in the first 1000 days of life.^{2,3}

These negative experiences may result in disruption of the brain architecture with an impact on early childhood development, socio-emotional competence and behaviours resulting in problems with attention and emotional regulation.⁴⁻⁶ The impact persists with far-reaching effects and difficulties into adulthood.^{7,8,9} It worsens economic and social outcomes, such as school participation/

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achievement, increased welfare- dependency, addiction, risky sexual behaviours and violence.¹⁰ From a public health perspective, child maltreatment incurs a high lifetime cost per victim and creates a significant economic burden for the society.¹¹

The impact of ACEs on brain development and multiple body systems has now been documented with substantial international data. Considering that maltreated children are at an increased risk of developmental, physical, behavioural, and mental health problems, early identification of their needs is imperative to help improve both their short- and long-term outcomes.²⁻⁶ Moreover, there is also increasing evidence that the effects of ACEs in early childhood outcomes may be buffered by early intervention and participation in psychotherapeutic home visiting.^{12,13} With this background knowledge and the recognition of a gap in the local support provided for maltreated children and their families, the Division of Medicine at KK Women's and Children's Hospital (KKH) in Singapore initiated and led a home visitation programme called Anchor with the help of philanthropic funding from Temasek Foundation, to identify and support this high-risk group.¹⁴

The adverse effects of childhood maltreatment in middle childhood, adolescence and adulthood are well-documented by a vast number of studies as described above, but there is relatively less literature reporting the association of maltreatment with developmental outcomes in early childhood. With a paucity of data on the impact of ACEs on developmental and socio-emotional outcome in maltreated young children, the aim of the current study was to evaluate the prevalence of developmental and emotional/behavioural concerns in a cohort of maltreated children and to identify the impact of adverse family/caregiver risk factors on behavioural and developmental outcomes. This would also allow better understanding of the baseline profile/needs of the children and their families that are being enrolled into the programme.

METHOD

A prospective cohort study of children and caregivers/families enrolled into the Anchor home visitation programme from September 2020 to June 2023, at KKH, the largest women's and children's hospital in Singapore was undertaken. Children seen at KKH for suspected maltreatment below the age of 4 years old were referred to the programme.

The programme inclusion criteria targeted children under the age of 4 years for suspected maltreatment. Their siblings living in the same

household (under the age of 4 years) were also eligible. The programme was not offered to children who have sustained extrafamilial maltreatment and children whose families were under any other community home visitation programmes.

Half of the caregivers for the maltreated children that were referred, agreed to be screened to enter the programme for support. The remaining caregivers declined the Anchor programme with reasons such as "feeling overwhelmed", or already receiving support from other community agencies (also an exclusion criterion for the programme). After obtaining caregiver consent, the child and family underwent comprehensive screening to assess developmental/socio-emotional profile and caregiver mental health status and for provision of further recommendations and interventions with follow-up. The interventions were delivered through home visitation by a community health visitor supported by doctors, psychologist, and medical social workers.¹⁴ Family demographic data, baseline and follow-up assessment data were collected to track progress of the child and family. The study was approved and conducted in accordance with SingHealth Centralised Institutional Review Board (CIRB ref 2019/2683).

An interim cross-sectional study of the family demographic data and baseline assessment data was required to understand the profile and needs of the children and their families before commencing support. The Anchor programme's supporting philanthropic organisation and healthcare professional team also required the demographic data and baseline assessment data to be analysed for results to justify the necessity of the support provided by the programme.

Demographic data

From the family demographic data collected, specific data on caregiver mental health status, educational attainment and family income were used for analysis, as these are well-recognised risk factors in current literature.^{8,9} This data was obtained through an initial interview conducted with the primary caregiver by the Anchor professional. Educational attainment of the primary caregiver was stratified as low if the caregiver had completed ≤ 12 years of formal education. This cutoff value of 12 years was selected because in Singapore, it is compulsory for all citizens to complete 6 years of primary school education and 4 years of secondary school education, which can be extended from a total of 10 to 12 years depending on an individual's academic progression. Family socio-economic status (SES) was stratified into 2 discreet family groups, PCI (per capita

income) $\leq$ SGD650 and PCI of $>$ SGD650 per month. Family PCI of $\leq$ SGD650 per month was defined as low SES, as per Singapore's national benchmark when considering financial assistance and relief eligibility.¹⁵

Caregiver mental health status

Mental health screening of the primary caregiver was conducted using the Patient Health Questionnaire 9 (PHQ-9) and the General Anxiety Disorder 7 (GAD-7) tools to objectively assess the presence or absence of mental health concerns.^{16,17} These tools encompass the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) depression/anxiety diagnostic criteria, translating the frequency of self-reported symptoms into tabulated scores. Presence of caregiver mental health concerns was defined as PHQ-9 and/or GAD-7 score of 10 and above (Table 1) for the purpose of the study, as guided by the KKH Psychiatry specialist to help streamline referrals to hospital mental health services during the Anchor programme.

Child outcome measures

ASQ-3

The Ages and Stages Questionnaires-3 (ASQ-3) is a validated developmental screening tool for children, which measures development in 5 domains: communication, gross motor, fine motor, problem solving and personal social.¹⁸ Responses of "yes", "sometimes" and "not yet" to questions under each domain are scored as 10, 5 and 0 points, respectively. The total domain scores were tabulated by adding points from each domain item and comparing them to cut-off scores from a normative sample. When the child scored close to or below the cutoff (a score equal or more than 1 or 2 standard deviations [SD] below the mean score), they were considered to have developmental concerns and being "at risk" for developmental delays. To enhance this study, a further sub-analysis was done for the communication and problem-solving domains. This is because language and cognition are important skills to develop early as they are predictors of school readiness, especially for children from high-risk families whereby there is growing interest on ways to improve their long-term educational outcomes.^{19,20}

ASQ-SE

The Ages and Stages Questionnaires-Socio-Emotional (ASQ-SE) is a validated developmental screening tool for children to help evaluate

socio-emotional capabilities with item questions covering different behavioural aspects.²¹ Each scoring item is rated with one of three possible responses — most of the time, sometimes and rarely/never — then added up into a total score and compared to cut-off score from a normative sample. When the child scored close to or above the cutoff, they were considered to have socioemotional concerns.

CBCL

Child Behavioral Checklist (CBCL) is another tool to help evaluate behavioural/emotional concerns. The CBCL quantifies total, internalising and externalising problems scores based on parental responses of their child's behavioural or emotional difficulties. Each item was scored on a 3-point scale (0=not true [as far as you know], 1=somewhat true, and 2=very true/often true). Internalising problems include the withdrawn/depressed and anxious syndrome scales, while externalising problems include the oppositional, aggressive behaviour and overactive syndrome scales. When the tabulated scores (T scores) suggested borderline or clinically significant internalising, externalising or both behaviours, these were considered clinically significant or concerning.

Analytical strategy

Statistical analysis and data extraction were done using Stata version 11 (StataCorp, College Station, TX, US). Frequencies (percentages) and median (interquartile range [IQR]) were reported for categorical and numerical variables, respectively. With the categorical groups as described above, multivariable logistic regression methods were used to compute adjusted odds ratio (OR) and look for any associated increased risk of behavioural or developmental concerns within our cohort of maltreated children when there were other family or caregiver factors present as they entered the programme. Caregiver relationship to the child was added to the multivariable logistics regression models to control for confounding effect of caregivers being non-biological parents. Statistical significance was set at P value <0.05 and 95% confidence intervals were calculated for all ORs. Pairwise deletion analysis was used when there were missing data from incomplete questionnaires.

RESULTS

Study participant profile

The sample for this study included a total of 132 children over a 34-month period from September 2020 to June 2023. The children were aged from 2

months to 47 months old. Among them, 74 (58%) were below 2 years of age (median age 1.7 [IQR 0.9–2.6] in years), with 69 (52%) being male.

The primary caregivers of the children at the time of enrolment into the programme consisted of biological mothers, fathers, or foster parents or extended family members of the children. The median age of primary caregivers was 32 years old (IQR 28.0–35.0), with only 121 of the 132 primary caregivers disclosing their ages. Out of the 132 primary caregivers, 86 (65.2%) were biological mothers and 11 (8.3%) were biological fathers. The remaining 35 (26.5%) caregivers were foster parents or extended family members of the children. For this subgroup of caregivers, the caregivers were either the biological parents or extended family members before the children became looked-after children due to their

maltreatment episode. For caregiver mental health status, 27 (21%) of the 128 primary caregivers who responded had raised scores on the PHQ-9 and/or GAD-7. Low SES was seen in 45% of the families while 50% of the primary caregivers had completed ≤ 12 years of formal education. These are summarised in Table 1.

The developmental outcomes based on ASQ-3 and the behavioural concerns and socio-emotional outcomes based on the CBCL and ASQ-SE, respectively, are shown in Table 2. Overall, 99 (75%) of the 132 children screened at enrolment had scores of at least 1 SD below the mean cut-off in any domain on the ASQ-3. The domains with the highest percentage of delay were personal-social skills (60 [45%]), communication (58 [44%]), and problem-solving skills (54 [41%]). On the ASQ-SE, 37 (28%) of the 131

Table 1. Demographic profile of study cohort and mental health status of primary caregiver.

Variable	Total (n)	n (%) / median (IQR)
Child's age (years) at first assessment	128	1.7 (IQR 0.9–2.6)
Child's sex	132	
Female		63 (47.7%)
Male		69 (52.3%)
Child's ethnicity	132	
Chinese		49 (37.1%)
Malay		66 (50.0%)
Indian		14 (10.6%)
Others		3 (2.3%)
Caregiver age (years) at child's enrolment	121 ^a	32.0 (IQR 28.0–35.0)
Caregiver relationship to child	132 ^b	
Biological mother		86 (65.2%)
Biological father		11 (8.3%)
Non-biological parents		35 (26.5%)
Caregiver education ≤ 12 years of formal education	114 ^c	57 (50.0%)
Social economic status PCI $\leq$ SGD650	114 ^d	51 (44.7%)
Presence of caregiver mental health concerns	128 ^e	
PHQ-9 score 10 and above and/or GAD-7 score 10 and above		27 (21.1%)
PHQ-9 score 10 and above		22 (17.2%)
GAD-7 score 10 and above		20 (15.6%)

^a n=121, 11 caregivers either declined or did not declare their age during interview.

^b n=132, 86 caregivers were recorded as biological mothers, 11 caregivers were recorded as biological fathers whilst 35 were either extended family members or fosters carers recorded as caregivers at time of entry into programme.

^c n=114, 18 caregivers either declined or did not declare their educational attainment during interview.

^d n=114 because 18 caregivers either declined or did not declare their income during interview.

^e n=128, 4 caregivers either declined or did not fill up the questionnaire completely.

GAD-7: General Anxiety Disorder 7; PCI: per capita income; PHQ-9: Patient Health Questionnaire 9; SGD: Singapore dollars

Table 2. Outcomes of developmental and socio-emotional behavioural screening using the ASQ-3, ASQ-SE and CBCL.

	Normal n (%)	With concerns (or significant) n (%)	Total numbers n (%)
ASQ-3 (overall)	33 (25%)	99 (75%)	132 (100%)
ASQ-3 (communication)	74 (56.1%)	58 (43.9%)	132 (100%) ^a
ASQ-3 (gross motor)	97 (73.5%)	35 (26.5%)	132 (100%)
ASQ-3 (fine motor)	93 (70.5%)	39 (29.5%)	132 (100%)
ASQ-3 (problem solving)	78 (59.1%)	54 (40.9%)	132 (100%)
ASQ-3 (personal social)	72 (54.5%)	60 (45.5%)	132 (100%)
ASQ-SE	94 (71.8%)	37 (28.2%)	131 (100%) ^b
CBCL	85 (72%)	33 (28.0%)	118 (100%) ^c

^a n=132 because 1 extra patient with only ASQ-3 Communication section completed.

^b n=131 because 1 of the original 132 ASQ-SE was not completed.

^c n=118 because 14 of the original 132 CBCL questionnaires were not completed.

ASQ-3: Ages and Stages Questionnaires-3; ASQ-SE: Ages and Stages Questionnaires-Socio-Emotional; CBCL: Child Behavioral Checklist

children cohort had raised scores while 33 (28%) of the 118 children cohort had clinically significant raised T scores above the cut-off on the CBCL.

Risk factors or exposures

The major risk factors evaluated for an association with developmental, behavioural, socio-emotional concerns were caregiver mental health status, caregiver education attainment ≤ 12 years and low family SES and controlling for caregiver relationship to the child.

As seen in Table 3, overall concerns in the ASQ-3 and in the problem-solving domain were not associated with any of the 3 risk factors, while a low family SES was significantly associated with scores below the cut-off in the communication domain with an adjusted odds ratio (AOR) of 3.04 (95% CI 1.08–8.57], $P=0.04$). Caregiver mental health and caregiver education status were not significantly associated with delay in the communication domain.

Table 4 demonstrates the association of caregiver mental health concerns with raised scores on the ASQ-SE (AOR 7.78, 95% CI 2.38–25.38, $P=0.001$). Caregiver education and low family SES were not significantly associated with raised ASQ-SE scores. A significant association was seen between increased behavioural concerns on the CBCL and caregiver mental health concerns (AOR 6.54, 95% CI 1.83–23.33, $P=0.004$). Caregiver education and low family SES were not significantly associated with increased behavioural concerns on the CBCL.

DISCUSSION

Our study showed that among our cohort of maltreated children, low family SES was significantly associated with delay in the communication domain of ASQ-3. A significant interaction exists between poverty and its cofactors, such as maternal stress, malnutrition, overcrowding, lower parental educational levels with associated structural brain changes and resultant behavioural, cognitive and academic difficulties.²² Another study by Justice et al. confirmed the Family Stress Model as a viable representation of the adverse effects of poverty and proposed that the language skills in toddlers may be affected by poverty through caregiver stress, depression and dysregulated parent-child interaction.²³ Our study also found a significant association between presence of caregiver mental health concerns, such as anxiety and depression, with both lower socio-emotional competence on the ASQ-SE and behavioural concerns on the CBCL. There is compelling evidence globally that mental health symptom of mothers has been associated with unfavourable outcomes in various domains of development in young children. Wall-Wieler et al. in their study demonstrated that early childhood exposure to maternal depression was associated most strongly with vulnerabilities related to social-competence and emotional-maturity.²⁴ Woolhouse et al. also found that maternal depressive symptoms were associated with significantly increased odds of child emotion or behavioural difficulties.²⁵ Indeed, caregiver mental depression is one of the most

Table 3. Multivariable association of caregiver/family risk factors and developmental concerns on ASQ-3.

Risk factors	ASQ-3 Concerns (1 SD/ 2 SD score in any areas)			ASQ-3 Communication Concern (1 SD/2 SD score)			ASQ-3 Problem Solving Concern (1 SD/2 SD score)		
	Yes n (%)	No n (%)	Adjusted OR (95% CI)	Yes n (%)	No n (%)	Adjusted OR (95% CI)	Yes n (%)	No n (%)	Adjusted OR (95% CI)
Caregiver mental health concerns									
Yes	18 (66.7%)	9 (33.3%)	0.63 (0.21–1.85)	11 (40.7%)	16 (59.3%)	0.81 (0.28–2.37)	11 (40.7%)	16 (59.3%)	2.07 (0.72–5.97)
No	76 (76.8%)	23 (23.2%)	Reference group	45 (45.5%)	54 (54.5%)	Reference group	41 (41.4%)	58 (58.6%)	Reference group
Caregiver ≤12 years of formal education									
Yes	43 (75.4%)	14 (24.6%)	0.74 (0.26–2.17)	28 (49.1%)	29 (50.9%)	0.84 (0.29–2.42)	22 (38.6%)	35 (61.4%)	0.82 (0.29–2.29)
No	39 (69.6%)	17 (30.4%)	Reference group	21 (37.5%)	35 (62.5%)	Reference group	20 (35.7%)	36 (64.3%)	Reference group
Lower SES PCI ≤SGD650									
Yes	39 (76.5%)	12 (23.5%)	1.47 (0.50–4.29)	30 (58.8%)	21 (41.2%)	3.04 (1.08–8.57)*	20 (39.2%)	31 (60.8%)	1.06 (0.38–2.91)
No	42 (67.7%)	20 (32.3%)	Reference group	19 (30.6%)	43 (69.4%)	Reference group	23 (37.1%)	39 (62.9%)	Reference group
Caregiver relationship to child									
Biological mother	59 (68.6%)	27 (31.4%)	0.54 (0.17–1.74)	38 (44.2%)	48 (55.8%)	1.42 (0.49–4.11)	32 (37.2%)	54 (62.8%)	0.56 (0.20–1.57)
Biological father	11 (100.0%)	0 (0.0%)	Not applicable	6 (54.5%)	5 (45.5%)	2.01 (0.28–14.30)	3 (27.3%)	8 (72.7%)	0.12 (0.01–1.42)
Non-biological parents	29 (82.9%)	6 (17.1%)	Reference group	14 (40.0%)	21 (60.0%)	Reference group	19 (54.3%)	16 (45.7%)	Reference group

Family/caregiver factors added to multivariable logistics regression models include caregiver mental health concerns, caregiver education attainment <12 years, low family socio-economic status and caregiver relationship to child.

* OR with $P < 0.05$

ASQ-3: Ages and Stages Questionnaires-3; CI: confidence interval; OR: odds ratio; PCI: per capita income; SES: socio-economic status; SGD: Singapore dollars; SD: standard deviation

Table 4. Multivariable association of caregiver/family risk factors and significant socioemotional concerns or internalising/externalising behaviours.

Risk factors	ASQ-SE (1SD/2SD score in any areas)			CBCL Concerns		
	Yes n (%)	No n (%)	Adjusted OR (95% CI)	Yes n (%)	No n (%)	Adjusted OR (95% CI)
Caregiver mental health concerns						
Yes	14 (51.9%)	13 (48.1%)	7.78 (2.38–25.38)*	14 (56.0%)	11 (44.0%)	6.54 (1.83–23.33)*
No	22 (22.7%)	75 (77.3%)	Reference group	18 (20.7%)	69 (79.3%)	Reference group
Caregiver ≤12 years of formal education						
Yes	14 (24.6%)	43 (75.4%)	0.65 (0.19–2.17)	20 (39.2%)	31 (60.8%)	1.93 (0.52–7.18)
No	15 (26.8%)	41 (73.2%)	Reference group	10 (19.2%)	42 (80.8%)	Reference group
Lower SES PCI ≤SDG650						
Yes	13 (25.5%)	38 (74.5%)	0.87 (0.26–2.91)	18 (39.1%)	28 (60.9%)	1.80 (0.50–6.42)
No	14 (22.6%)	48 (77.4%)	Reference group	8 (14.0%)	49 (86.0%)	Reference group
Caregiver relationship to child						
Biological mother	23 (27.1%)	62 (72.9%)	0.57 (0.16–2.09)	18 (24.0%)	57 (76.0%)	0.64 (0.17–2.44)
Biological father	3 (27.3%)	8 (72.7%)	0.60 (0.07–5.05)	6 (60.0%)	4 (40.0%)	1.76 (0.12–26.37)
Non-biological parents	11 (31.4%)	24 (68.6%)	Reference group	9 (27.3%)	24 (72.7%)	Reference group

Family/caregiver factors added to multivariable logistics regression models include caregiver mental health concerns, caregiver education attainment <12 years, low family socio-economic status and caregiver relationship to child.

* OR with $P < 0.05$

ASQ-SE: Ages and Stages Questionnaires-Socio-Emotional; CBCL: Child Behavioral Checklist; CI: confidence interval; OR: odds ratio; PCI: per income capita; SES: socio-economic status; SD: standard deviation; SGD: Singapore dollars

important factors contributing to toxic stress response and its potential disruption of brain-circuitry during sensitive developmental periods.³ Shonkoff et al. have described the eco-bio-developmental framework of the development and impact of toxic stress on the developing brain.³ A recent systematic review also found evidence that maternal depression was associated with maladaptive emotion processing in the offspring through biological and social mechanisms.²⁶

Our study adds to the current literature on the prevalence of delayed development and socio-emotional competence in maltreated children in the early years and the influence of adverse family risk factors between the critical years of 0–3. More than a quarter of the cohort had concerns for socio-emotional competence or behavioural difficulties. Nearly 40% of the cohort presented with concerns in the domains of communication or problem-solving skills. Our study analysed the communication and problem-solving domains on the ASQ-3 separately because current literature suggests significant associations of delay in these domains with subsequent cognitive ability at ages 5–7 years, and the recognition that language skills was significant determinants of cognitive, education and health-related outcomes.^{27,28}

Reporting on the Fragile Families and Child Well-Being study, Berger and Font suggested a strong association of early childhood maltreatment with delayed cognitive skills and behaviour problems at age 3.²⁹ The authors postulated that the maltreatment caused a disruption in the parent-child attachment, with resultant insecure, avoidant, or disorganised attachment orientation, creating a predominant pathway which gave rise to maladaptive behavioural and affective responses on the part of the child, particularly anxiety, depression and externalising problems.²⁹ Similarly, a review study by Jaffe demonstrated that children aged under 3 were at the highest risk of victimisation from abuse or neglect, and that child victims of maltreatment were at an elevated risk of psychopathology.³⁰ The author posited that this increased psychopathological risk was mediated through increasing threat sensitivity, decreasing responsivity to reward and deficits in emotional recognition and understanding.³⁰

For local context, the prevalence of developmental delay in our study was significantly higher than the reported prevalence of delay in a low-risk birth cohort at 2 years of age in Singapore.³¹ Similarly, the prevalence rate of 28% for social

or behavioural difficulties seen in our study was much higher than the estimated prevalence of 12% in preschool children in a local community sample.³² Similar to our study findings where only 25% of the cohort had typical development in all domains, a large Australian population study by Green et al. demonstrated that only 30% of the children exposed to maltreatment were on track in all developmental domains, with approximately half demonstrating delays in communication, cognitive or socio-emotional domains at age 5.³³ With both local and international studies suggesting significantly higher prevalence of both developmental and emotional or behavioural concerns in maltreated children as compared to the general population, it is imperative to support this high-risk group of children and their families.^{31–35}

Our various findings contributed to the increasing literature on the convergence of multiple risk factors that result in a final pathway leading to the increased risk of developmental and behavioural concerns in maltreated children. Given the significant impairments seen in maltreated children, early identification and intervention is essential to break the cycle of toxic stress and improve outcomes across the life span. The positive effects of family-focused programmes have been well documented.³⁶ The authors found significant effect sizes for interventions focusing on improving parenting skills and interventions providing social and/or emotional support.³⁶ These included cognitive behavioural therapy, home visitation, parent training, and family-based/multisystemic interventions including that of substance abuse.³⁶

Our study was one of the first locally conducted prospective studies for high-risk young children aged between 0–3 years who have been maltreated. A specific study of associated family risk factors locally helps to enhance Anchor programme's home visiting support. Data capture in this programme have been detailed, starting from the structured and systematic screening during recruitment, and right down to the evaluation and intervention process within the program itself. Providing targeted intervention in the presence of specific risk factors would assist in optimising the outcomes for the high-risk family and child. Results from this study suggest that maltreated children from lower SES families may need targeted support in language development. Also, working towards supporting caregiver's mental health well-being can potentially have a positive effect on behaviours among maltreated children.

Sample size could be one of the limitations of this study. However, with the programme recruitment still ongoing, a larger sample size can be obtained in the future and retrospective re-analysis can be done consequently to strengthen the statistical significance. Another potential limitation was the use of caregiver-answered questionnaires, which could risk introducing potential bias. Apart from caregiver-answered questionnaires/tools, multisource feedback, such as preschool feedback, could also be considered to offset any under-reporting or over-reporting of the children's developmental skills or behaviours by their caregivers. Although the children were presenting to KKH for the first time for suspected maltreatment, some might have already been implicated with previous recurrent maltreated episodes or even exposed to multiple forms of maltreatment that had neither been disclosed at the point of referral to the programme, nor documented in the hospital data system as the children/families have not had previous hospital referrals. These data that were difficult to capture may have confounding effects. As child maltreatment is only one form of ACEs, further studies might need to be considered to address the intricate interplay of other ACEs among our high-risk children and the effects that they could have if more significant family or social history transpire during the follow-up and support of the families and children during the duration of the programme. The future analysis of long-term follow-up data of the children and their families after they have commenced on support may also help to uncover any other possible confounding risk factors. After all, families involved in child maltreatment are often complex.

CONCLUSION

In summary, this study has allowed us to evaluate the impact of family and caregiver risk factors that are associated with poorer outcomes in maltreated children. Among maltreated children, having caregivers with mental health concerns was significantly associated with increased emotional/behavioural concerns. Maltreated children from low SES families were also at increased risk of language delay, affecting their communication. This contributes towards the current limited literature and understanding of risk factors that predict poorer outcomes among maltreated children. This also justifies the necessity of the family support provided by the programme to improve outcomes.

Declaration

The authors declare that there is no conflict of interest.

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