Research Paper

Parental risk factors for childhood maltreatment typologies: A data linkage study

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A B S T R A C T

Introduction. – Child maltreatment (CM) encompasses a range of abusive acts which rarely occur in isolation. Therefore, rather than focusing on specific forms of abuse, a more methodologically sound approach may be to concentrate research on subgroups of CM. Knowledge of the context in which different types of abuse occur is limited, and specific types of maltreatment may occur in the presence of certain parental and familial risk factors.
Objective. – This study aimed to examine the common and specific effects of well documented parental risk factors on CM subgroups.
Method. – Participants were randomly selected from the total birth cohort of all children born in Denmark in 1984. Data were then linked to information drawn from the Danish health and social registries.
Results. – Four distinct subgroups were used; no-abuse, sexual abuse, emotional abuse and co-occurring abuse. All risk factors had significant bivariate associations with the CM subgroups relative to the no-abuse category. Multivariate analysis demonstrated both shared and unique effects, with family dissolution as a strong predictor of all three CM subgroups.
Conclusion. – Findings indicated certain parental risk factors increase a child's risk of experiencing all forms of maltreatment, whilst others constitute unique risk for specific CM subgroups.

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1. Introduction

Child maltreatment encompasses physical, sexual, emotional/ psychological abuse and neglect and has consistently been shown to predict poor health outcomes (Kessler et al., 2010; Felitti et al., 1998; Widom et al., 2012); higher health care utilization (Chartier, Walker, & Naimark, 2010); lower academic attainment and employment status (Fernandez et al., 2015). Given these adverse consequences, the prevention of child maltreatment remains a high global public health priority (Gilbert et al., 2009). There is wide variation in prevalence estimates of child maltreatment and evidence suggests that up to 82% of cases are perpetrated by parents or parental figures making detection and disclosure more difficult (Radford, Corral, Bradley, & Fisher, 2013). One preventative strategy is to identify key antecedents that place children at greater risk of being maltreated. By firmly establishing these risk factors, it may be possible to develop interventions targeted at those who are most vulnerable and to intervene at the earliest stage possible. The risk factors that may lead to childhood maltreatment, however, are complex and intertwined (MacKenzie, Kotch, & Lee, 2011). Indeed, there is a general consensus that child maltreatment is better understood using an ecological framework; i.e. child maltreatment involves a complex multitude of factors that include; the individual, family, community and culture all of which are highly interrelated (Belsky, 1980, 1993; Bronfenbrenner & Morris, 2006; MacKenzie et al., 2011; Sethi et al., 2013).

Several population based longitudinal studies have examined a range of parental characteristics and family environments as risk

factors for child maltreatment using samples from the UK (Sidebotham, Golding, & ALSPAC Study Team, 2001), US (Hussey, Chang, & Kotch, 2006) and Australia (Doidge, Higgins, Delfabbro, & Segal, 2017). Similar profiles of risk emerged across the studies, for example, lower educational achievement, history of substance misuse and a previous history of psychiatric illness were all associated with child maltreatment (Doidge et al., 2017; Sidebotham et al., 2001).

Other studies have focused on isolated factors such as the association between parental mental health difficulties and child maltreatment (O'Donnell et al., 2010; O'Donnell et al., 2015; Stith et al., 2009). In a large community sample, parental history of depression, mania, or schizophrenia conferred a two to threefold increase in the rates of physical, sexual, or any type of maltreatment. Higher associations were reported for parental history of antisocial personality disorder with a six-fold increase in risk for offspring physical abuse (Walsh, MacMillan, & Jamieson, 2003). Further, mothers with a serious mental illness were nearly three times more likely to have their child placed into out of home care than mothers without a serious mental illness (Park, Solomon, & Mandell, 2006) More recently, O'Donnell et al. (2015) found 48% of children with a maltreatment allegation had a mother with a history of contact with mental health services.

Child maltreatment often co-occurs in adverse family environments characterized by substance misuse and a history of violence within the home (Felitti et al., 1998). Dube et al. (2001) examined alcohol misuse and multiple forms of child maltreatment (e.g. physical and sexual abuse, household dysfunction) and found maternal, paternal, or bi-parental alcohol abuse conferred a two-to-three-fold increase in adverse childhood experiences compared to non-alcohol abusing parents. Walsh et al. (2003) also found that parental substance abuse was associated with more than a two-fold increase in risk of child physical and sexual abuse, which further increased for bi-parental substance misuse. Households with a history of violence also have been argued to be a high-risk environment for child maltreatment. For example, Taylor, Guterman, Lee, and Rathouz (2009) reported that mothers who experience intimate partner violence (IPV) were at greater risk for maltreating their children compared to mothers not exposed to IPV. This finding remained even after controlling for mother's parenting stress, major depression and other covariates associated with IPV and child maltreatment. Data from the National Survey of Children's Exposure to Violence reported that 60% of children exposed to neglect and more than 70% childhood sexual abuse also witnessed IPV. Further analyses revealed that exposure to IPV conferred a 3-to 9-fold increase in risk of experiencing child maltreatment and other forms of family violence (Hamby, Finkelhor, Turner, & Ormrod, 2010). These findings lend support to the poly-victimization model which highlights that victimization often co-occurs during childhood (Finkelhor, Ormrod, & Turner, 2007) and is associated with higher rates of lifetime re-victimization (Widom, Czaja, & Dutton, 2008).

Other familial risk factors identified in the literature include demographic predictors such as parental age, family structure and socio-economic status. Research suggests that young mothers in particular confer a strong risk for maltreatment (Sidebotham et al., 2001; Stier, Leventhal, Berg, Johnson, & Mezger, 1993) with stronger associations found in relation to offspring neglect (Connell-Carrick, 2003). It is difficult to establish whether such effects are causal, however, given that young maternal age is highly associated with other factors such as low SES and lower educational attainment. Sedlak and colleagues (2010) found that, compared to children living with married biological parents, those whose single parent had a live-in partner had an 8-fold increase in child maltreatment with, over 10 times the rate of abuse, and nearly 8 times the rate of neglect. However, some studies have not found this association when other

factors such as parental background and socioeconomic status are taken into account (Sidebotham, Heron, & Study Team 2006). Low socioeconomic status has consistently been shown to be a robust predictor of child maltreatment. Sidebotham et al. (2006) found that measures of deprivation (e.g., parental unemployment) conferred the strongest risk factor for child maltreatment even when controlling for other parental factors.

Overall, our knowledge of the shared and unique effects of risk factors on child maltreatment remains poorly understood. There are likely to many reasons for this. First, as discussed, it is difficult to establish the unique effect of risk factors as many are highly intertwined (e.g., Belsky, 1980). Second, the impact of particular risk factors may affect children differently depending on the type of maltreatment that occurs (Gilbert et al., 2009). Further, studies have tended to focus on a single risk factor in isolation without controlling for other correlated variables. For example, some studies focus on a narrow range of experiences (usually sexual and physical abuse), which limits knowledge on broader aspects of childhood maltreatment (e.g., Fergusson et al., 2013; Springer et al., 2007). As such, statistical methodologies are required that allow us to examine the impact of risk factors on maltreatment experiences that differ both quantitatively and qualitatively. Person-centred statistical techniques (e.g., latent class analysis) provide an appropriate analytical framework as this type of analysis maximizes the homogeneity within groups, (i.e., individuals within a class would respond similarly to certain maltreatment items) and the heterogeneity between groups, (i.e., individuals between classes will respond differently) (Roesch, Villodas, & Villodas, 2010). Such methods may prove useful in our attempts to establish how certain risk factors may differentially be associated with child maltreatment subgroups. The current study aimed to contribute to the existing literature by examining the associations between a range of familial risk-factors and different subgroups of child maltreatment based on a nationally representative sample of young Danish adults (aged 24). The analyses aimed to first estimate the risk associated with each predictor in bivariate analyses, and secondly, how these risks changed when entered into a multivariate analysis to estimate the unique effect of each predictor while controlling for others. Investigating a number of previously reported risk-factors simultaneously would allow for a more complete understanding of the key familial risk factors for different types of child maltreatment.

2. Method

2.1. Data

A stratified random probability survey was conducted in Denmark by the Danish National Centre for Social Research between 2008 and 2009 in order to retrieve mental health related data from young Danish people. Statistics Denmark randomly selected 4718 participants, who were aged 24 in 2008, from the total birth cohort of Denmark in 1984. Structured interviews were conducted by trained interviewers either in the home or via the telephone. A total of 2980 interviews were successfully conducted, equating to a response rate of 63%. To increase the number of participants, who had been victims of childhood abuse and neglect, children who had been in child protection, were over-sampled by a ratio of 1:2 of "child protection cases" versus "non-child protection cases." A child protection case was defined as a case when the council (according to the files of local social workers) had provided support for the child and the family or placement with a foster family due to concerns about the well-being and development of the child. A total of 852 interviews were conducted with individuals who had been previously identified by the Danish authorities as child protection cases. Each participant in the survey

provided their civil registry number (CPR). The CPR identifies people at the individual level nationally and allows information to be collated across different registries.

Data were then linked with Danish Civil Registration System (CRS) and the Danish health and social registers (see Pedersen, Gøtzsche, Møller, & Mortensen, 2006; Thygesen, Daasnes, Thaulow, & Brønnum-Hansen, 2011, for more detailed information on the Danish registers). Statistics Denmark make data available on the relevant variables, which are matched using the individual CPR. Identification of individuals is not possible as the 10-digit CPR numbers were scrambled prior to release. The data is also protected by initial password and access requires the correct 'token code' to be entered; this is a numeric code that changes every minute and provided by a digital key.

2.2. Sample characteristics

The sample was 52.2% ($n = 1555$) male and 47.8% female ($n = 1425$). The majority of the sample were students in higher education receiving no wages (36.7%) or working full time in excess of 30 hours per week (38.3%). Most participants either owned or rented their own private accommodation (93.7%) and almost half were cohabiting (40%) or married (6%). All analyses were conducted using a weight variable to account for the oversampling of child protection cases so that findings are representative of the total Danish population of young people aged 24 years with a weighted child protection status of 6.3% of the total sample.

2.3. Measures

2.3.1. Child maltreatment

Participants were asked 20 questions across four domains of childhood maltreatment:

- physical abuse, (e.g., Have you ever been beaten with an object, such as a whip or coat hanger);
- emotional abuse, (e.g., Have you ever been addressed in a humiliating [being called lazy, stupid, or useless] manner by parents/guardians);
- neglect (e.g., Were you ever occasionally starved due to lack of food or no one was available to prepare meals);
- sexual abuse (e.g., Did you ever experience forced/completed intercourse).

Using the Danish registers, we selected a range of parental demographic and familial variables. The variables were computed using the timeframe 1980–1996 that included four years prior to the birth of the child and up until the child was 12 years of age. This criterion was selected to cover the time frame for the child maltreatment questions that were asked in regards to childhood (< 12 years).

2.3.2. Teenage mother

We assessed whether the participants mother had been a teenager herself when she gave birth, this variable was created with mothers aged under 20 years.

2.3.3. Parental history of violence

This variable is comprised of information based on whether either parent was a victim of violence that led to hospitalization and professional assessment of the injury being wilfully inflicted by others. It also included whether either parent was convicted of a violent crime which includes persons convicted of violence of various degrees of seriousness, including manslaughter, grievous bodily harm, assault, coercion and threats (this category does not include unintended manslaughter resulting from traffic accidents, or rape, which belongs to the category of sexual offences). This variable was created by combining data from the CRS, Criminal Statistics Register and hospital admission data.

2.3.4. Family deprivation

Deprivation was defined as parental unemployment (for either one or both parents) with more than 21 weeks unemployment during a calendar year for any five or more years of the child's first 18 years according to registers of Income Compensation Benefits, Labour Market research and Unemployment Statistics.

2.3.5. Family dissolution

Family dissolution was defined as the child having experienced divorce, separation and/or the death of a parent.

2.3.6. Parental mental health

Psychiatric disorders included ICD 8/10 diagnoses of any mood, anxiety and delusional disorder recorded for parents between 1980 and 1996. When a person has contact with a psychiatric hospital or department in Denmark, they receive an ICD diagnosis code that is recorded on the Psychiatric Central Register. The diagnosis is made by a psychiatrist. For this study, we combined information on the Psychiatric Central Register and CRS to identify which participants had received a diagnosis of any anxiety (ICD-10 F40–F49;) mood disorder (ICD-10 F30-F39) and any delusional disorder (ICD-10 F22).

2.3.7. Parental alcohol/drug abuse

Alcohol and drug abuse were defined as the presence of official hospital records of alcohol/drug related conditions, both physical (e.g. alcohol poisoning, liver damage attributed to alcohol abuse) or mental/behavioral (e.g. ICD diagnosis of alcohol use disorder).

2.4. Statistical analysis

Armour et al., 2014 conducted series of latent class models ranging from two to six classes. The four-class solution was considered the best fitting model based on a series of fit indices and the substantive meaning of the latent classes. The models were estimated using robust maximum likelihood (Yuan & Bentler, 2000). The relative fit of the models were compared using three information theory based fit statistics:

- the Akaike Information Criterion (AIC);
- the Bayesian Information Criterion (BIC);
- sample size adjusted Bayesian Information Criterion (ssaBIC).

The model that produces the lowest values can be judged the best model. Evidence from simulation studies have indicated that the BIC as the best information criterion for identifying the correct

Table 1
Fit indices from latent class analysis (Armour et al., 2014).

Classes	Log likelihood	AIC	BIC	SSABIC	Entropy	LRT P
2 class	−7203.97	14,495.93	14,741.92	14,611.65	0.94	3203.93 0.40
3 class	−6953.96	14,031.92	14,03.90	14,206.91	0.97	503.01 0.91
4 class	−6751.79	13,669.59	14,167.56	13,903.84	0.94	401.95 0.74
5 class	−6682.01	13,572.02	14,195.99	13,865.54	0.94	138.65 0.71
6 class	−6634.11	13,518.23	14,268.19	13,871.02	0.94	95.23 0.78

AIC: Akaike Information Criterion; BIC: Bayesian Information Criterion; SSAIC: sample size adjusted Bayesian Information Criterion; LRT: Lo-Mendell-Rubin adjusted likelihood ratio test.

number of classes (Nylund, Asparouhov, & Muthen, 2007). Bivariate associations between the classes and the familial variables were conducted using chi square tests and multivariate analyses were conducted using multinomial logistic regression with the non-abused class being treated as the reference group.

3. Results

The fit statistics for the latent class model are presented in Table 1. A four-class model was the best representation of the data. The largest class was a non-abused class, which displayed the lowest probabilities of all 20 items ($n = 2570$, 86.2%). The emotional abuse class ($n = 289$, 9.7%) had high probabilities of endorsing emotional maltreatment items and negligible probabilities of endorsing physical abuse and neglect items. The sexual abuse class ($n = 59$, 2%) had the highest probabilities, across all classes, of endorsing sexual abuse items. The co-occurring abuse class ($n = 63$, 2.1%) was characterized by high levels of co-occurring physical abuse, emotional abuse, and neglect and moderate levels of sexual abuse experiences. The gender composition for the maltreatment subgroups was relatively similar with females comprising of 50.8% of the co-occurring class; 46.7% of the emotional abuse class and 45.3% of the baseline class. However, in regards to the sexual abuse class clear gender differences emerged with 88.1% of this class being female.

In total, 411 participants reported childhood maltreatment (13.8%). The bivariate associations between the previously identified maltreatment typologies and the risk factors are presented in Table 2. All of the parental risk factors were statistically associated with class membership. An examination of the adjusted residuals (AR; ± 1.96 indicative of significant difference in expected vs. observed counts) indicated that, in the presence parental risk factors, counts were higher than expected for the three maltreatment subgroups and lower than expected for the baseline class. The only exceptions were for the parental violence ($AR = 1.0$), drug and alcohol abuse ($AR = 1.7$) and unemployment ($AR = 1.6$) risk factors and the sexual abuse group. The strongest association was between family dissolution and co-occurring abuse ($AR = 8.0$).

The results from the multinomial logistic regression analysis are presented in Table 3. In this model, the baseline/no abuse group served as the reference category. The overall model was statistically significant ($\chi^2(18) = 191.66$, $P < .001$). When entered into the multinomial model, a number of the predictors, which had previously demonstrated bivariate associations, became statistically non-significant. Overall, the most consistent and strongest predictor was family dissolution. Relative to the baseline class, respondents in the three maltreatment subgroups were significantly more likely to have experienced family dissolution (ORs ranging from 2.20 to 5.54). There were also a number of specific effects. Relative to the baseline class, those in the co-occurring abuse class were more likely to have grown up in an environment with parental violence ($OR = 2.26$) and family deprivation ($OR = 2.83$). Those in the emotional abuse class were more likely to have had a teenage mother ($OR = 1.82$) and a parent with mental illness ($OR = 1.71$). There were no unique predictors of membership of the sexual abuse group.

4. Discussion

This study aimed to examine a range of parental characteristics and familial risk factors for different types of childhood maltreatment based on a nationally representative sample of young Danish adults (aged 24). Results from the multivariate analysis demonstrated both shared and specific effects. Findings indicated that

Table 2
Counts and percentages of maltreatment classes and parental predictors.

Predictor	Co-occurring abuse	Sexual abuse	Emotional abuse	Baseline	χ^2 (df) P
Teenage Mother	9 (14.3%)	< 6	33 (11.5%)	108 (4.2%)	38.98 (3) < 0.001
Parental violence	17 (27.4%)	6 (10.2%)	37 (12.8%)	144 (5.6%)	64.48 (3) < 0.001
Parental drug/alcohol abuse	12 (19%)	6 (10.3%)	25 (8.7%)	119 (4.6%)	34.478 (3) < 0.001
Family Deprivation	45 (72.6%)	23 (39.7%)	128 (44.3%)	708 (27.5%)	90.80 (3) < 0.001
Family dissolution	52 (83.9%)	32 (55.2%)	163 (56.6%)	817 (31.8%)	144.11 (3) < 0.001
Parental Mental illness	7 (11.1%)	< 6	26 (9.0%)	96 (3.7%)	25.17 (3) < 0.001

For data security purposes, cell counts lower than 6 were omitted from the table.

Table 3
Sociodemographic factors and ICD 10 diagnoses predicting child maltreatment subgroups.

Predictor	Co-occurring abuse		Sexual abuse		Emotional abuse	
	β (SE) *P*	OR (95% CI)	β (SE) *P*	OR (95% CI)	β (SE) *P*	OR (95% CI)
Teenage mother	0.33 (0.39) 0.39	1.39 (0.65, 2.97)	−0.6 (0.58) 0.91	0.94 (0.30, 2.93)	**0.60 (0.22)** **< 0.001**	**1.82 (1.18, 2.81)**
Parental violence	**0.81 (0.32)** **< 0.05**	**2.26 (1.21, 4.22)**	0.10 (0.48) 0.84	1.11 (0.43, 2.86)	0.32 (0.21) 0.14	1.38 (0.91, 2.10)
Parental drug/alcohol abuse	0.28 (0.37) 0.45	1.31 (0.64, 2.71)	0.55 (0.47) 0.24	1.73 (0.69, 4.31)	−0.04 (0.25) 0.87	0.96 (0.59, 1.57)
Family deprivation	**1.04 (0.31)** **< 0.001**	**2.83 (1.53, 5.23)**	0.16 (0.31) 0.60	1.18 (0.65, 2.14)	0.28 (0.15) 0.054	1.32 (0.99,1.75)
Family dissolution	**1.73 (0.37)** **< 0.001**	**5.54 (2.69, 11.42)**	**0.88 (0.30)** **< 0.001**	**2.42 (1.35, 4.32)**	**0.79 (0.14)** **< 0.001**	**2.20 (1.67, 2.90)**
Parental mental illness	0.36 (0.43) 0.41	1.43 (0.61, 3.33)	−1.66 (1.23) 0.18	0.19 (0.02, 2.11)	**0.54 (0.25)** **< 0.05**	**1.71 (1.06, 2.77)**

B: regression coefficient; SE: standard error; *P*: probability value; significant *P* values are in bold; OR (95% CI): odds ratio with 95% confidence intervals.

family dissolution was a shared risk factor for all three maltreatment groups and this risk factor represented the greatest overall risk (*OR*s 2.20–5.48). Evidence on the effects of family dissolution and the association with child maltreatment are inconsistent. For example, findings from the Fourth National Incidence Study of Child Abuse and Neglect (NIS-4) study revealed an eight-fold increase in maltreatment risk for children from single parent backgrounds (Sedlak et al., 2010) whilst, studies have found when controlling for other risk factors family separation was no longer significantly associated with maltreatment (Sidebotham et al., 2006). The particularly strong effect for the co-occurring abuse group however, is consistent with findings from The National Survey of Children's Exposure to Violence (NatSCEV) that reported children from single parent and reconstituted families were more likely to report polyvictimization experiences (Finkelhor, Turner, Hamby, & Ormrod, 2011). A possible explanation for the discrepant findings on family dissolution may be the result of how this factor is defined. For example, in the current study, family dissolution included parental divorce, separation or death, which may account for such strong effects. Whilst fewer studies have explored parental death as a risk factor for maltreatment, Brown and colleagues (1998) identified this as a significant risk factor for sexual abuse but not physical abuse and neglect. Fergusson and colleagues (2013) conceptualised parental changes (i.e., family dissolution) in the same manner as the current study and found that it was significantly associated with sexual abuse, however, other forms of abuse were not investigated.

With regards to unique predictors of specific types of abuse, several notable findings emerged. First, there were no unique predictors of sexual abuse, which was an unexpected finding, however, there were many factors that displayed low cell counts in terms of sexual abuse which may mean that these findings lacked the statistical power to detect significant associations. A history of parental violence was associated with a two-fold increase in risk for individuals exposed to co-occurring maltreatment experiences. This finding supports previous studies evidencing the co-occurrence of family violence and maltreatment (Dong et al., 2004; Hamby et al., 2010; Taylor et al., 2009). A further unique predictor of co-occurring maltreatment was family deprivation (defined as chronic unemployment), which is also consistent with studies highlighting the robust association between low socioeconomic status and child maltreatment (e.g., Drake & Johnsen-Reid, 2014; Sidebotham et al., 2006).

Two parental factors emerged as significant predictors of emotional abuse. Firstly, being a teenage parent conferred nearly a two-fold increase in risk for emotional abuse. Previous studies have explored parental age (< 20 years) and found that maternal youth was a risk factor for physical and sexual abuse (MacMillan et al., 2013; Brown et al., 1998), yet both studies failed to account for emotional or co-occurring types of maltreatment. Importantly, the increased risk of maltreatment among young mothers in this study was only evident for emotional abuse which may perhaps reflect that there are certain characteristics that teenage mothers face that may place them at heightened risk for this type of maltreatment, such as lower educational level, social isolation, and a poor understanding of child development (Sidebotham et al., 2001). Second, parental mental illness was a unique predictor of emotional maltreatment. Research on risk factors for emotional abuse remains an underdeveloped area in child maltreatment, despite being the more common form of abuse (Hibbard et al., 2012). However, the association between parental mental ill health and emotional abuse may be partly explained through negative parenting behaviors and parental withdrawal, which has been noted in parents suffering depression (Foster, Garber, & Durlak, 2008).

Parental substance abuse (drug and alcohol) was not significantly associated with any of the maltreatment groups. This finding is largely inconsistent with previous studies that have documented a link between parental substance misuse and maltreatment risk (Dube et al., 2001; Walsh et al., 2003). However, UK data did find significant associations between self-reported parental substance misuse and registered maltreatment, but when entered into a multivariate framework this association was no longer significant (Sidebotham et al., 2001). This may indicate that substance misuse may be indirectly associated with other background factors, which may increase the risk of maltreatment, but it is not a causal factor itself. Another possible explanation may relate to the construction of this variable using administrative data. This variable was based on hospital admission data that included addiction or poisoning due to drugs and diagnoses that are associated with long-term alcohol abuse (e.g., cirrhosis of the liver, chronic pancreatitis). Therefore, this is a highly conservative measure of substance misuse and findings should be interpreted with this in mind.

There are several research and clinical implications that can be derived from the current study. Collectively, findings demonstrate that child maltreatment may emerge in many different contexts and certain parental and familial factors may increase a child's risk of experiencing all forms of maltreatment, whilst other factors constitute unique risk for specific types. From a research perspective, the utility of person-centred approaches (e.g., latent class analysis) in the field of child maltreatment research has recently been examined (Debowska, Willmott, Boduszek, & Jones, 2017). The benefits of this type of analysis not only identifies patterns of occurrence and co-occurrence of maltreatment experiences but permits exploration of unique and shared risk factors for different types of child maltreatment and the psychosocial consequences across the lifespan. From a clinical perspective, this information can be applied to the development of preventive strategies and to guide clinicians towards more tailored interventions for both parents and children. For example, parental violence was a unique predictor for the co-occurring abuse class which supports previous studies that have identified the links between domestic violence and child physical and emotional abuse (Berzenski & Yates, 2011). Clinical and child protective services should therefore investigate the extent of family dysfunction and target interventions that incorporate all forms of family violence. The identification of unique predictors of emotional maltreatment also pose important research and clinical implications. Research into emotional maltreatment has increased in the past few years, however, it remains the most understudied form of child maltreatment. This is possibly due to difficulties in how it is defined and that it is more difficult to detect (Hart & Glaser, 2011). Further, the finding that being a teenage mother was significantly associated with emotional abuse has important implications in identifying an area to target intervention for young mothers. Many parenting programmes such as the Nurse Family Partnership (NFP) that are offered during pregnancy through to the child's early years have been shown to be effective for young mothers. Whilst the NFP does not necessarily target emotional abuse, by educating young mothers on the health and developmental needs of their child, promoting positive coping skills and self-sufficiency, this programme has demonstrated effectiveness in reducing maltreatment in young/at risk parents (see Olds, Sadler, & Kitzman, 2007, for a review).

The findings of this study should be interpreted in light of some methodological limitations. First, a challenge with linked administrative data is that information is collected for other purposes and researchers do not get to decide what variables are collected. For example, the parental substance misuse variable was constructed using information derived from hospital admissions data that documented conditions involving long-term alcohol abuse, therefore the current analyses are likely an under-representation of such

associations with child maltreatment. Second, analyses were based on data of young Danish adults, which limits the generalizability of the findings. However, several of parental risk factors that emerged in this study are consistent with those reported in UK, US and Australian samples (Doidge et al., 2017; Hussey et al., 2006; Sidebotham et al., 2001). Third, maltreatment was self-reported and subsequently may be subject to recall biases, psychopathology and measurement error (Hardt & Rutter, 2004). Finally, data collected on parental mental health and substance abuse based on records of hospital admissions may be an under-representation as many individuals with such problems do not seek treatment.

In conclusion, this study adds valuable population-based data on the role of various parental and family environmental factors that may confer risk for child maltreatment. The findings of this study highlight that, at least between the four years prior to the birth of their child and the first 12 years of the child's life, there were several factors associated with different types of maltreatment. With the exception of family dissolution, the current study also indicated that there are factors that uniquely confer risk to one form of maltreatment over the other. Ultimately, this study should highlight that a number of parental characteristics and adverse family environmental factors can confer risk for child maltreatment and that these factors occur in a variety of contexts.

5. Funding Source

Disclosure of interest

The authors declare that they have no competing interest.

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