Association between parent mental health and pediatric TBI: Epidemiological observations from the 1987 Finnish Birth Cohort

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ABSTRACT

Background: This study examined whether parental mental illness has implications for child risk for TBI. **Method:** Data on 60,069 Finnish children born in 1987 and their parents were examined for demographic and mental health related variables in relationship with pediatric TBI. Altogether, 15 variables were derived from the cohort data with ICD-10 F-codes being available for mental health diagnoses for all parents. Bivariate and multivariate analyses were carried out using inpatient and outpatient diagnoses of child TBI. **Results:** Paternal disorders due to psychoactive substance use [F10-F19] was associated with an increase inpatient TBI (OR=1.51; CI=1.07-2.14). Mood disorders [F30-F39] were associated with higher rates of outpatient TBI (OR=1.42; CI=1.06-1.90). Paternal personality and behavioral disorders [F60-F69] were linked with a two fold increase in risk across both categories of child TBI (OR=2.35; CI=1.41-3.90) and (OR=2.29; CI=1.45-3.61) respectively. Among the maternal mental health factors associated with child TBI, schizophrenia and other non-mood psychotic disorders [F20-F29] were associated with an increase in iTBI (OR=1.78; 1.22-2.59). Mothers having mood disorders [F30-F39] were more likely to have had a child who experienced an iTBI (OR=1.64; CI=1.20-2.22). Mothers with personality and behavioral disorders [F60-F69] were also found to have had children with an increased risk for iTBI (OR=2.30; CI=1.14-3.65). **Conclusion:** Taken together, these data should call attention to methods and strategies designed to augment and support caregiving environments with modalities that can foster mutually supportive households in cooperation with parents who have been diagnosed with a mental disorder.

Key words: Traumatic brain injury; mental health; adolescent; child

What is already known on this subject
- Children born to mothers with intellectual disabilities are at an increased risk for injuries.

- Parent education, socioeconomic status and experience in child rearing are protective against pediatric TBI.

What this study adds
- A diagnosis of mental ill health among parents represents a potential threat to their capacity to effectively modify pediatric TBI risks.

- A diagnosis of mental ill health among fathers is associated with increased risk for pediatric TBI.

INTRODUCTION

Traumatic brain injuries (TBI) occur when a mechanical force to the head distorts brain function. This distortion may or may not be accompanied by unconsciousness, but can lead in severe cases to permanent disability or death [1]. Worldwide, more than 10 million people are affected by TBI each year [2], with some 57 million living with lingering neurological consequences [1].

Among children and adolescents, TBIs are especially common. They affect 865 children per 100,000 annually worldwide, and can detrimentally affect neurodevelopmental growth, learning and behavior [3,4]. In addition, costs for treating TBIs among the pediatric population are often greater than those for adults because they include expenditures for acute treatment and long-term rehabilitation as well as loss of productivity for parents and guardians [5].

Pediatric TBI has received increased attention in recent years as research seeks to understand socio-environmental and ecological factors which represent TBI risk for pediatric populations [6]. According to ecological systems theory, parents and caregivers of children are of key importance as socio-environmental contributors to child development [7]. Because of this they are presumed to have a capacity to modify risk in a child's milieu [8]. However, understanding this dynamic is complicated by the fact that gaps remain in research concerning threats to parental capacity. Controlled experiments have reinforced the importance of parental factors and the role that they have in modifying environmental susceptibility to TBI [9]. However, it is unclear whether threats to parent capacity actually translate into heightened TBI risk profiles for children under their care.

Serious mental illness for example, may require episodes of long term care, potentially disrupting child care and supervision [10]. Serious mental health conditions may also be accompanied by therapeutic modalities requiring the administration of narcotics. These drugs in turn may impair judgment, reduce physical mobility and decrease reaction times.

Additionally, serious health conditions among caregivers have been known to affect children psychologically [11]. Recent evidence has also shown that children also suffer psychosocially [12] and as such they may be more susceptible to risk behaviors as they attempt to cope with parental illness or the absence of a caregiver under treatment [13,14].

Mental illness and its association with child TBI risk in particular, has only received cursory attention and mostly in the context of abuse. A recent study in Sweden however, did demonstrate that children born to mothers with an intellectual disability, were at increased risk of injury [15]. Because the etiology of injuries is similar to that of TBI, what remains unexplored is whether other forms of parental mental illness may have an effect on the child's risk for TBI. The role of fathers, and their mental health, are too also notably absent in past research. The aim of this study was to

determine whether mental illness, as a threat to caregiver capacity, has implications for child risk for TBI. This study focuses on parent mental health with poor mental health potentially representing a threat to caregiver capacity in a given caregiving scenario.

SUBJECTS AND METHODS

Cohort description

The data for this study were obtained from the 1987 Finnish Birth Cohort. This cohort uniquely identifies 60,069 children within administrative health registers. This includes all live births and still-births of infants weighing more than 500 g or having a gestational age of 22 weeks or more born in Finland in 1987. In this study we included 59,476 children with complete data from 1987 to 2012. The cohort and its members are described in detail elsewhere [16]. Ethical approval for cohort data use was obtained from the National Institute for Health and Welfare (§ 28/2009) and all register keepers gave their permissions to use their sensitive data in this study.

Background variables

Two categories of pediatric TBI were defined. The first category was derived from children who had received a diagnosis of TBI serious enough to require at least one overnight stay in emergency care. This category was termed “inpatient TBI (iTBI)”. The second category included children who had received a diagnosis of TBI which was not serious enough to warrant hospitalization [17]. This was termed “outpatient TBI (oTBI)”, and the data were available from 1998 onwards. These two groups represented proxies for moderate and mild TBI respectively.

Several pre-injury factors have been associated with child TBI in the literature. These include the child's sex, household socioeconomic status (SES) and the mother's age [18]. Other factors include post disaster related stress [19], children residing in households with adults unrelated to them [20] and stressful economic circumstances which predispose children to stressed parenting and abuse [21].

Altogether, 15 variables were derived from the cohort data. These included categorical variables concerning parent mental health diagnoses in addition to factors such as household socioeconomic status, parenting situation and parent education. Each parent's age at the time of the birth of the child was included as a continuous variable. Household SES was considered based on the entries for the parent occupation and education with the information provided for the determination of SES being derived from standardized classifications compiled by Statistics Finland [22]. SES was determined based on the highest maternal and paternal education at the end of follow-up. ICD-10 codes were available for inpatient and outpatient mental health diagnoses for all parents. Inpatient mental health diagnoses were used in all analyses.

The ICD-10 codes representing each of the mental health diagnoses which were considered are as follows: F10-F19 Mental and behavioral disorders due to psychoactive substance use; F20-F29 Schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders; F30-F39 Mood [affective] disorders; F40-F48 Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders; F50-F59 Behavioral syndromes associated with physiological disturbances and physical factors; F60-F69 Disorders of adult personality and behavior F70-F79 Intellectual disabilities; F80-F89 Pervasive and specific developmental disorders; F90-F98 Behavioral and emotional disorders with onset usually occurring in childhood and adolescence; F99-F99 Unspecified mental disorder.

Statistical analysis

Bivariate analyses were conducted to examine the extent to which the child TBI variables were

associated with the selected independent variables. ANOVA was used for parent age. The chi^2 test was used for the remaining categorical variables. Multivariate logistic regression was then carried out using those variables which were found to be statistically significantly associated with child TBI in the bivariate analyses. The results of the bivariate analyses are reported as proportions or means (age) along with their corresponding p-values. The results for the multivariate analyses have been reported as adjusted odds ratios (OR) with their corresponding 95% confidence intervals (95%CI). The threshold for statistical significance for both bivariate and multivariate analyses was set at $p < 0.05$. All analyses were carried out using Stata 12 [23].

RESULTS

During the period under study 1,295 (2.18%) children under 18 years of age were diagnosed with a TBI requiring at least a one night of hospitalization. During the same period, 1,637 (2.75%) of children were diagnosed with a TBI but were discharged without hospitalization. The mean age for cohort members with a brain injury requiring a hospital stay at the time of diagnosis was 11.4 years with a standard deviation (SD) of 6.76 years. During the period under study, 658 cohort participants died, with 36 of these participants having been diagnosed with a TBI at some point during their cohort participation. The average age of death for a cohort member who died during the period under study was 12.7 years (SD=9.67 years). Twenty-five percent (n=165) of these deaths occurred during the first year of life. In absolute numbers, male children were heavily overrepresented in both categories of TBI.

Bivariate analyses

Among the included pre-injury risk factors that were studied (Table 1), being male was a risk factor for iTBI ($p<0.01$) and oTBI ($p<0.01$). Being an older parent at the time of the child's birth was found to be universally protective ($p<0.01$). Residing in a two-parent household was protective for oTBI ($p<0.01$). Low SES households had higher rates of both categories of TBI ($p<0.01$). Higher educational attainment revealed decreases in TBI susceptibility.

Among the paternal mental health variables examined, disorders due to psychoactive substance use [F10-F19] was associated with an increased risk for iTBI ($p=0.01$) and oTBI (<0.01) respectively. The presence of paternal mood disorders [F30-F39] also increased the risk for oTBI ($p=0.01$), as well as behavioral syndromes associated with physiological disturbances and physical factors [F50-F59] ($p=0.02$). Paternal personality and behavioral disorders [F60-F69] among fathers increased the risk for both categories of TBI ($p<0.01$). Other variables either did not have sufficient numbers of cases to measure an association or no cases at all. Maternal disorders (schizophrenia, schizotypal, delusional and other non-mood psychotic disorders) [F20-F29] were a risk factor for iTBI ($p<0.01$). Mood disorders [F30-F39] ($p<0.01$) and disorders of personality and behavioral disorders [F60-F69] (<0.01) were significantly associated with iTBI.

Multivariate analyses

Within a multivariate model which considered parent education and SES (Table 2), male children were more likely to have experienced iTBI (OR=1.58; CI=1.41-1.77) and oTBI (OR=1.53; CI=1.39-1.70). Each unit increase in parent age at the time of the child's birth, was associated with a approximately 2% decrease in risk for TBI. This was observed for both parents and both categories of TBI (CI=0.97-0.99). A non co-parenting environment was not significantly associated with iTBI, however there was an increased risk for oTBI (OR=1.28; CI=1.06-1.56) in such households. High SES was accompanied by a decreased risk of iTBI (OR=0.81; CI=0.70-0.95), with low SES households demonstrating an increased risk of oTBI (OR=1.21; CI=1.08-1.36), but the observed risk for iTBI (OR=1.21; CI=0.89-1.15) did not reach statistical significance.

Paternal education was associated only at the level of tertiary degree and only for oTBI (OR=0.69; CI=0.58-0.82), where it had a protective effect. Maternal education was not associated with iTBI at

any educational level. However, there existed a near linear association between education level and oTBI; (OR=1.27, OR=1.10, OR=0.81, and OR=0.78 respectively). However, the association with maternal upper secondary education did not reach statistical significance (p=0.07).

Several of the examined parent mental health variables were found to be associated with child TBI. Paternal disorders due to psychoactive substance use [F10-F19] were associated with an increase in iTBI (OR=1.51; CI=1.07-2.14) and oTBI (OR=1.51; 1.11-2.06). Mood disorders [F30-F39] were associated with a marked increase in child oTBI (OR=1.42; CI=1.06-1.90). Personality and behavioral disorders [F60-F69] were found to be linked with a more than two fold increase in risk across both categories of child TBI (OR=2.35; CI=1.41-3.90) and (OR=2.29; CI=1.45-3.61) respectively.

Among the maternal mental health factors associated with child TBI, schizophrenia and other non-mood psychotic disorders [F20-F29] were associated with an increase in iTBI (OR=1.78; 1.22-2.59). Mothers having mood disorders [F30-F39] were more likely to have had a child who experienced an iTBI (OR=1.64; CI=1.20-2.22). Mothers with personality and behavioral disorders [F60-F69] were also found to have had children with an increased risk for iTBI (OR=2.30; CI=1.14-3.65).

DISCUSSION

The present study highlights several areas of interest concerning the epidemiology of risk factors for childhood TBI. Notably it reveals parent-level mental health variables which are potentially linked with risk for TBI.

Child level factors and risk for TBI

The only child level factor examined in this study for its association with risk for TBI was the child's sex. We observed differences between male and female children in both categories of TBI. This observation in differential risk, has been reflected in the majority of research literature for not only TBI [24], but also for other types of injuries [25]. Several underlying hypotheses have surfaced as plausible explanations for these differences. Parent rearing practices for example which may involve approval of high risk activities for boys and not for girls is commonplace. Additionally there exists some evidence to support the additive influence of media and social norms which support and reinforce greater risk taking behavior among boys. These influences extol strength and competitive play for boys as opposed to consensus-building and cooperative play for girls [26]. Research also points toward innate sex differences in temperament, with girls having lower levels of anger and impulsivity compared to boys [27].

Parent level factors and risk for TBI

With increasing parent age at the time of the child's birth, we observed a small but statistically significant protective effect. It is plausible that higher levels of household stability exists among older parents. With increasing age, parents are more likely to have improved economic security, higher levels of education and experience specific to childrearing. The latter two of these potentially contributes to heightened awareness of injury related risks and greater attention to prevention via active choices which are deterministic in scope [28]. Greater household economic security can also translate into bicycle helmets, stair gates and bed rails being more commonplace in such households.

With regard to co-parenting status, we did not observe a significant relationship between TBI and households having only one caregiver for the more “severe” category of TBI. However, there existed a nearly three-fold increase in risk for TBI not requiring hospitalization. Existing research suggests that single parent households may overcompensate in the absence of a second parent.

Central to the argument here is that that there appears to be a lower threshold for taking a child to a hospital in the event of an injury. It may be hypothesized that the single parent may not have had the benefit of a “second set of eyes” to determine situational severity of the circumstances surrounding a head injury. Caution then might be expressed by taking the child in for examination, as opposed to not. This could account for higher numbers of lower severity cases among the single parent group. This may also viewed in light of the child's response in the conversion from a dual parent to a single parent household. Children in these situations are more likely to exhibit externalizing problems such as aggression, noncompliance and conduct behaviors. Internalizing problems such as anxiety, depression and withdrawal in addition to social problems may also represent increased risk scenarios [29].

Educational attainment among parents has long been linked to improved well-being for children. TBI is no different in this case. Such parents may not only have accumulated knowledge concerning situations which may represent risk, but may often also have greater access to information about preventing risk as well as how to respond more effectively when presented with risk scenarios.

Parent mental illness and child TBI

This study documents, that poor mental health among parents represent a potential threat to their capacity to effectively modify TBI related risks within child environments. Notably it also documents the effect of paternal mental illness and its relationship with child TBI.

Among the paternal mental health variables, we noted increases in risk for iTBI and oTBI , for fathers having received a diagnosis of a mental disorder as a result of psychoactive substance use. These observations are in line with studies documenting drug misuse and abuse among parents and its association with child abuse. In particular, alcohol abuse among either parent in the home is commonly cited as a risk factor for not only abuse, but as a contributing factor in the impaired ability to effectively mitigate TBI related risks either in the home or elsewhere [30]. Alcohol-related impaired parenting, physical abuse and neglect have been the subject of substantial research in Finland [31], with state-wide public health initiatives designed to mitigate alcohol related harms [32].

Paternal mood disorders represented increased risk for children in the form of oTBI. Depression is perhaps the most common mood disorder and may arise from a variety of social, environmental, medical or other triggers. Mood disorders more broadly may also be substance-induced. There is often a significant bi-directional interaction between substance-abuse, depression and TBI, with substance abuse and mood disorders acting as potential triggering mechanisms for the other [33]. Why a relationship would exist for oTBI and not iTBI is somewhat unclear. It is plausible that early warning signs of mood instability become evident before serious incidents arise resulting in iTBI. Persons with mood instabilities are also likely to be under clinical supervision and a medication regiment to reduce possible harms to themselves or others. Paternal personality and behavioral disorders heightened the risk for child TBI. Persons with untreated behavioral disorders, have the potential to be a risk not only to themselves but to others [32].

Maternal mental illness demonstrated different association patterns, particularly for iTBI. Schizophrenia and psychotic disorders were linked with TBIs requiring hospitalization. Husted and colleagues found that childhood trauma, was higher among children under the care of mothers with psychotic disorders [34,35]. Additionally Fisher et al. reported that severe physical abuse from mothers that started before age 12 years was associated with maternal psychosis. In the same study they reported that paternal maltreatment was unrelated to psychosis, which the present study confirms [36].

Maternal mood and personality disorders were also connected with increased levels of iTBI. In a

recent study from Japan, maternal postpartum depression was found to be implicated in the unintentional injury of infants up to 4 months of age [37]. While rare, postpartum psychosis, represents a psychiatric emergency and may also represent a significant risk for children if undetected. Mothers with borderline personality disorder, were found to have a lower levels of maternal affection [38]. A delayed onset of maternal affection after childbirth has previously been implicated in higher rates of non-accidental injury among children [39].

Parents having diagnoses falling within the ranges of ICD-10 references F70 and F99 were not represented in the cohort data. These individuals rarely becoming parents due to the severity of the illnesses in these categories. Some disorders, such as profound mental retardation, may result in an incapability of carrying a fetus to term [40].

Strengths and limitations

Several strengths contribute to the validity and reliability of of the data contained in this study. The data used were derived from a complete and intact census of all infants born in a single year in Finland. The data from administrative registers also includes information on both parents and their significant diagnoses. Additionally, Finnish national registers are known internationally to be of high quality and well-suited for research purposes [41].

However, several potential limitations do exist to the information presented here. One potential weakness concerns the observation of increasing parent age being protective. We did not account for a possible confounding effect of birth order in the analyses. It may be possible that with increasing numbers of births, parents are subsequently older and have potentially gained skills from the rearing of a first (or second) child. This may account for some degree of rising levels of what might be assumed from the data to be “safer” parenting. It is entirely possible also that this effect is only observed after a certain number of births as there is some research which indicates that this effect is possibly canceled out in large families where supervision levels are less optimal.

The lack of a clinically determined severity is a weakness of the study. This is the case for both the child TBI diagnoses as well as the diagnoses of the mental health states of their parents. This limitation prevents these data from being comparable with studies which include clinical severity information. Furthermore, psychosocial inheritance was also not possible to ascertain from the register data. Finally, because information relating to the cause and circumstances of the TBI is not recorded in the data register, it is not possible to discern whether TBI diagnoses were the result of physical abuse, events linked with high risk recreational activities or co-morbidities inherent in the child.

CONCLUSIONS AND PUBLIC HEALTH POLICY IMPLICATIONS

This study demonstrated that parent mental health should be considered when examining the socio-environmental TBI risk profiles of children. While additional research is needed to clarify the actual mechanisms of injury risk, taken together, these data should call attention to methods and strategies designed to augment and support caregiving environments with modalities that can foster mutually supportive households in cooperation with parents who have been diagnosed with a mental disorder. Support may come in the form of interventions and preventive measures involving family counseling and educational measures designed to provide support to households with a parent having a diagnosis which may contribute to child TBI risk. It is important to consider these data with a view towards providing support to not only parents, but to families comprehensively such that mutually supportive environments may maximize safety in the home and related environments.

Conflicts of Interest and Source of Funding:

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Table 1. Bivariate analyses of demographic and caregiver health variables and their relationship with child TBI: The 1987 Finnish Birth Cohort

	Inpatient Child	p-value	Outpatient Child	p-value	No TBI†

	TBI (95%CI or %)		TBI (95%CI or %)		(95%CI or %)
Child sex					
Male	805 (62.2)	<0.01	1,004 (51.2)	<0.01	29,630 (50.9)
Female	490 (37.8)	-	633 (38.7)	-	28,551 (49.1)
Parent age at child birth					
Fathers (mean)	30.7 (30.4-31.0)	<0.01	30.8 (30.5-31.1)	<0.01	31.3 (30.4-31.0)
Mothers (mean)	28.4 (28.1-28.7)	<0.01	28.3 (28.1-28.6)	<0.01	29.0 (28.9-29.0)
Co-parenting					
Yes	1,220 (2.16)	0.37	1,523 (2.70)	<0.01	54,963 (97.84)
No	75 (2.41)	-	114 (3.66)	-	3,042 (97.59)
Socio-economic position					
Upper	345 (1.87)	<0.01	408 (2.21)	<0.01	40,056 (97.68)
Lower	520 (2.15)	0.68	663 (2.74)	0.86	34,489 (97.80)
Manual worker	351 (2.57)	<0.01	466 (3.41)	<0.01	44,872 (97.94)
Father's education					
Primary	337 (2.29)	0.29	451 (3.06)	<0.01	43,795 (97.86)
Upper secondary	601 (2.32)	0.03	770 (2.98)	<0.01	32,931 (97.94)
Lower tertiary	156 (1.91)	0.07	217 (2.65)	0.56	50,158 (97.78)
Tertiary degree	201 (1.87)	0.02	199 (1.86)	<0.01	47,659 (97.76)
Mother's education					
Primary	228 (2.42)	0.08	328 (3.48)	<0.01	48,980 (97.87)
Upper secondary	602 (2.24)	0.35	806 (3.00)	<0.01	31,895 (97.87)
Lower tertiary	290 (2.11)	0.57	314 (2.29)	<0.01	44,757 (97.80)
Tertiary degree	175 (1.85)	0.02	189 (2.00)	<0.01	48,911 (97.76)
Father's mental health diagnoses					
F10-F19	34 (3.32)	0.01	44 (4.30)	<0.01	57,191 (97.84)
F20-F29	17 (2.86)	0.25	24 (4.04)	0.05	57,604 (97.83)
F30-F39	34 (2.77)	0.15	48 (3.91)	0.01	56,988 (97.84)
F40-F49	6 (1.78)	0.61	12 (3.55)	0.37	57,849 (97.82)
F50-F59	ND	-	2 (11.76)	0.02	58,164 (97.82)
F60-F69	16 (5.08)	<0.01	20 (6.35)	<0.01	57,882 (97.84)
Mother's mental health diagnoses					
F10-F19	7 (1.94)	0.76	1.75	0.19	57,828 (97.82)
F20-F29	29 (3.86)	<0.01	24 (3.20)	0.46	57,459 (97.84)
F30-F39	44 (3.53)	<0.01	40 (3.21)	0.33	56,979 (97.85)
F40-F49	14 (3.46)	0.08	16 (3.95)	0.14	57,790 (97.83)
F50-F59	1 (4.55)	0.45	1 (4.55)	0.61	58,160 (97.82)
F60-F69	12 (4.51)	<0.01	11 (4.14)	0.17	57,927 (97.83)

ND=Categories with no data and/or cell sizes too small for analysis excluded
† Calculated based on the in-patient child TBI data

Table 2. Multivariate analyses of demographic and caregiver health variables and their relationship with child TBI: The 1987 Finnish Birth Cohort

	Inpatient Child TBI OR (95%CI)	p-value	Outpatient ChildTBI OR (95%CI)	p-value
Child sex				
Male	1.58 (1.41-1.77)	<0.01	1.53 (1.39-1.70)	<0.01
Parent age at child birth				
Fathers	0.98 (0.97-0.99)	<0.01	0.99 (0.97-0.99)	<0.01
Mothers	0.98 (0.97-0.99)	<0.01	0.98 (0.97-0.99)	<0.01
Co-parenting				
No	1.08 (0.85-1.36)	0.53	1.28 (1.06-1.56)	0.01
Socio-economic position*				
Upper	0.81 (0.70-0.95)	0.01	0.90 (0.78-1.04)	0.15
Manual worker	1.21 (1.07-1.38)	<0.01	1.21 (1.08-1.36)	<0.01
Father's education†				
Primary	1.01 (0.89-1.15)	0.83	1.08 (0.96-1.21)	0.19
Upper secondary	1.07 (0.95-1.19)	0.27	1.07 (0.96-1.19)	0.20
Lower tertiary	0.89 (0.75-1.05)	0.17	1.01 (0.87-1.17)	0.92
Tertiary degree	0.96 (0.79-1.15)	0.63	0.69 (0.58-0.82)	<0.01
Mother's education†				
Primary	1.09 (0.94-1.26)	0.26	1.27 (1.12-1.43)	<0.01
Upper secondary	0.99 (0.89-1.12)	0.96	1.10 (0.99-1.22)	0.07
Lower tertiary	0.99 (0.86-1.13)	0.84	0.81 (0.72-0.92)	<0.01
Tertiary degree	0.92 (0.77-1.10)	0.34	0.78 (0.65-0.92)	<0.01
Father's mental health diagnoses				
F10-F19	1.51 (1.07-2.14)	0.02	1.51 (1.11-2.06)	<0.01
F20-F29	1.30 (0.81-2.12)	0.28	1.46 (0.97-2.20)	0.07
F30-F39	1.27 (0.90-1.79)	0.18	1.42 (1.06-1.90)	0.02
F40-F49	0.79 (0.35-1.77)	0.57	1.24 (0.70-2.21)	0.47
F50-F59	ND	-	ND	-
F60-F69	2.35 (1.41-3.90)	<0.01	2.29 (1.45-3.61)	<0.01
Mother's mental health diagnoses				
F10-F19	0.86 (0.40-1.81)	0.68	1.33 (0.78-2.28)	0.29
F20-F29	1.78 (1.22-.2.59)	<0.01	1.12 (0.74-1.69)	0.59
F30-F39	1.64 (1.20-2.22)	<0.01	1.14 (0.82-1.56)	0.44
F40-F49	1.59 (0.93-2.71)	0.09	1.41 (0.85-2.33)	0.18
F50-F59	2.08 (0.28-15.46)	0.48	1.57 (0.21-11.71)	0.66
F60-F69	2.03 (1.14-3.65)	0.02	1.41 (0.77-2.60)	0.26

*Adjusted for parent education
ND=Categories with no data and/or cell sizes too small for analysis excluded
†Adjusted for household SES