



GROWING UP IN SCOTLAND: Parenting and children's health

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This document is available from our website at www.scotland.gov.uk.

ISBN: 978-1-78045-198-5 (web only)

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

Produced for the Scottish Government by APS Group Scotland
DPPAS11599 (06/11)

Published by the Scottish Government, June 2011



GROWING UP IN SCOTLAND: Parenting and children's health

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Prepared for the Scottish Government: Children and Families Directorate by
the Scottish Centre for Social Research

Suggested citation: Parkes, A. and Wight D. (2011) *Growing Up in Scotland: Parenting and children's health*, Edinburgh: Scottish Government

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ACKNOWLEDGEMENTS

First and foremost, the authors of the report would like to thank all the families who have given up their time to take part in the study and have supported it continuously sweep by sweep.

The Growing Up in Scotland study is very much a collaborative venture. We owe a huge debt of gratitude to NatCen's operations and computing departments and to the team of interviewers and supervisors for conducting the interviews with such dedication and professionalism.

We would also like to thank everyone involved in the preparation of this report – particularly Wendy van Rijswijk and colleagues at the Scottish Government who provided feedback on early drafts.

Responsibility for the opinions expressed in this report, and for all interpretation of the data, lies solely with the authors.

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Introduction

The Scottish Government has placed the individual wellbeing of children and young people at the heart of its policy agenda on *Getting it Right for Every Child*, with a recognition of the important role of parents and other carers in providing “good basic care, stimulation and emotional warmth, guidance and boundaries, safety and stability”. It recognises that the challenges to successful parenting posed by family adversity may contribute to inequalities in health.

This report focuses on day-to-day parenting of young children in three ‘domains’: connection (love and togetherness), negativity (conflict and harsh discipline) and control (supervision, routine and regularity). The study uses data from the Growing Up in Scotland study (GUS).

Two main questions were investigated:

- Which aspects of day-to-day parenting are likely to be important for children’s health and health behaviours?
- Do variations in parenting account for social inequalities in child health outcomes?

Health outcomes and health behaviours

The study examines six child **health outcomes**:

- general health
- limiting long-standing illness
- social, emotional and behavioural difficulties
- dental health
- short-term health problems in the last year
- accidents and injuries

and four child **health behaviours**:

- physical activity
- ‘screen time’: watching television or using computers and games consoles
- fruit and vegetable consumption
- snacking on crisps, sweets and sugary drinks.

With the exception of accidents and injuries, which used data from all five sweeps, these outcomes were based on information reported by mothers at the fifth interview in 2009/10 when the study children were almost 5 years old (58 months).

Day-to-day parenting

Parenting behaviours covered three main domains: connection, negativity and control.

- **Connection** included a measure of early mother-infant attachment, a later measure of the warmth of the mother-child relationship and activities undertaken together.
- **Negativity** covered a measure of conflict in the mother-child relationship and parent's use of smacking as a disciplinary tool.
- **Control** comprised parental supervision, rule setting and the amount of household disorganisation or 'home chaos'.

All parenting behaviours were reported by the mother at interview. Mothers of the first birth cohort of GUS were surveyed every year from 2005/06, when their children were aged around 10 months old. Some parenting measures were drawn from sweeps 1 to 4; these measures therefore pre-dated most of the health information. In order to obtain a fuller picture of parenting this report also uses parenting measures collected at sweep 5.

In addition to individual measures or 'dimensions' of parenting, a composite measure or 'index' of parenting skills was devised. This index combined scores across various dimensions. Parents who had high scores on warmth, number of joint parent-child activities, supervision and rule-setting, but low scores on conflict and 'home chaos', were considered to be highly skilled on this parenting index. The report used the index to divide parents into three equal groups, with low, average and high parenting skills.

Which aspects of day-to-day parenting are associated with children's health and health behaviours?

The analysis of associations between parenting and each health outcome or health behaviour controlled for other important family characteristics known to influence poor health, including poverty and maternal mental health.

Low overall parenting skills as measured by the **parenting index** were associated with greater risk of a number of poorer health outcomes and health behaviours amongst children. In particular:

- **health outcomes** (see above)
 - the odds of children who experienced low parenting skills having social, emotional or behavioural difficulties were more than eleven times higher than for children experiencing high parenting skills
 - the odds of children with low-skilled parents experiencing poor health were two to four times higher than for children with high-skilled parents

- **health behaviours** (see above)

- the odds of children with low-skilled parents displaying unhealthy behaviour were 1.5 times higher than for children with high-skilled parents.

After allowing for other family influences on health, there were no associations between overall parenting skills and the number of health problems in the past year, and accidents and injuries over the first five years.

All three **domains of parenting** (connection, negativity and control) were related to one or more health outcomes and health behaviours. This suggests that a wide range of different parenting skills are important for health, although the following aspects of parenting appeared particularly relevant for specific outcomes:

- High levels of parent-child conflict were strongly associated with social, emotional and behavioural difficulties.
- Low parental supervision was associated with poor general health, limiting long-term illness and social, emotional and behavioural difficulties. The odds of children in the low supervision group having poor health were around twice as high as those for the high supervision group.
- Joint mother-child activities and parental rules appeared important for health behaviours. The odds of children who took part in few activities or had few rules showing unhealthy behaviours were between 1.5 and 2.6 times higher than those for children with a high number of joint activities or many rules.

Do variations in parenting account for social inequalities in child health outcomes?

It is known that child health and health behaviours vary according to socio-economic characteristics, with more disadvantaged groups experiencing poorer health. This report explored whether parenting behaviours also varied according to family circumstances, and if so whether differences in parenting offer an explanation for social inequalities in health.

A measure of social inequality was devised using an index of 'family adversity'. This combined eight different indicators of social inequality from maternal, family and area characteristics including poverty and maternal depression.

The findings showed that, in general, the higher the family adversity index score, the higher the prevalence of poor child health and health behaviours. There were two exceptions to this picture. In the case of limiting long-term illness, any family adversity was associated with a greater risk of illness but there was no clear increase in prevalence with higher family adversity. Physical activity showed no clear association with family adversity.

There was a strong patterning of parenting according to family adversity. Parents in families with higher adversity scores were less likely to have a warm relationship with their child, less likely to share joint activities, less likely to exercise control over their child's behaviour and less likely to have low levels of conflict.

In order to find out whether parenting skills explain some of the relationship between family adversity and health outcomes and behaviours, we examined whether the strength of association between adversity and health was reduced when parenting skills were taken into account. The results showed that:

- High parenting skill reduced the association between adversity and health by between 33% and 44% for poor general health, limiting long term illness, social, emotional and behavioural difficulties, and poor dental health.
- Parenting skill had a lesser effect on health problems (22%) and accidents and injuries (8%).
- Parenting skill accounted for between 32% and 54% of the association between adversity and screen time, fruit and vegetable consumption, snacking on crisps, sweets and sugary drinks.

Thus, not only is parenting skill itself related to child health and health behaviours, variations in parenting skill also explained some of the relationship between children's experience of family adversity and their health outcomes and health behaviours. Nevertheless, even after taking variations in parenting into account greater family adversity was still independently associated with poorer health outcomes for children.

Policy implications

It should be stressed that associations found between parenting and child health and health behaviours in this report are not in themselves evidence of causation. There are several limitations to the analysis that should be borne in mind when assessing any policy relevance:

- The study relies on mothers' reports of both parenting and children's health, which may have introduced an element of bias and overestimated the strength of associations.
- Several parenting behaviours were measured concurrently with health outcomes. This means that some of the associations found could be due to a child's health affecting parenting behaviour, rather than the other way round.
- Unmeasured factors may be responsible for many of the associations found, including genetic predispositions underlying both parenting behaviour and poor health.
- The study has a limited focus on mothers' parenting of children up to the age of 5, and more work is required to establish wider applicability to the role of fathers or non-biological parent figures, or to the parenting of older children.

Despite these limitations, the findings suggest that policy measures to strengthen parenting skills may benefit child physical and mental health and child health behaviours. It is beyond the remit of this report to suggest mechanisms for delivering better parenting, and measures could range from direct (e.g. parenting classes) to indirect (e.g. alleviating aspects of family adversity that impede good parenting). In what follows, the term 'parenting programmes' is intended to cover a range of options. The findings suggest that:

- Parenting programmes supporting a broad range of skills are likely to achieve more wide-ranging health improvements than programmes with a narrower focus on only one or two dimensions of parenting.
- Parenting that encompasses many joint mother-child activities and has rules to guide a child's daily activities may be optimal for good health behaviours.
- Parenting programmes may achieve the greatest health benefits for children with social, behavioural and emotional difficulties. Even if part of the association between parenting and behavioural/emotional difficulties is due to reverse causation, with children's difficulties leading to problems in parenting rather than the other way round, the findings underline the need to support parents of these children.
- Parenting programmes supporting general parenting skills may have less impact on health problems and on accidents and injuries. It is likely that other aspects of parenting, such as a good diet, a warm and safe living environment and ensuring that a child's immunisation record is complete, are more closely related to these health outcomes than the general parenting skills examined in this report.

The health benefits of better parenting appear greatest for those families that experience the highest levels of family adversity, so that policies which improve parenting may contribute to a reduction in health inequalities. The strong patterning of parenting according to family adversity in itself suggests that parents in more disadvantaged groups may need additional help in addressing obstacles to more skilful parenting of their children. Families experiencing adversity may benefit from support in multiple areas of parenting to promote a higher degree of connection and control, and lower conflict with children. More skilful parenting is likely to have wider benefits on children's overall development apart from health.

However, the findings suggest that the role of parenting in reducing health inequalities may be greater for some health outcomes and behaviours than others. Overall, programmes to improve parenting skills are likely to form only a partial solution to the reduction of social inequalities in health.



chapter
INTRODUCTION

1.1 Background

There is mounting evidence that parenting is associated with child and adolescent physical and emotional health (Repetti et al. 2002). Various aspects of parenting may be involved. A review for the World Health Organization has suggested connection (love), behavioural control, respect for individuality, modelling of appropriate behaviour and provision of resources as five essential dimensions of parenting for health (World Health Organization 2007). Estimates of the extent to which parenting is responsible for individual variation in children's health vary, depending on which dimension of parenting is considered and its relevance for a particular health outcome (McLeod et al. 2007a; McLeod et al. 2007b).

Parenting is socially patterned – that is, parents with different socio-economic characteristics approach their parenting role in different ways – and this may explain some of the inequalities in health outcomes that are found between different socio-economic groups (Conger et al. 1992; Dodge et al. 1994; Belsky et al. 2007; Conger and Donnellan 2007).

1.2 Policy relevance

The wellbeing of individual children and young people is the first value and principle stated in the Scottish Government's programme initiated in 2008, *Getting it Right for Every Child*. This builds on the issue of health inequalities highlighted in the Scottish Government report *Equally Well* (Scottish Government 2008, page 3), which stressed the need to address the "inter-generational factors that risk perpetuating Scotland's health inequalities from parent to child, particularly by supporting the best possible start in life for all children in Scotland".

Parents play a vital role in their children's health and wellbeing. The Scottish Government's 2005 report on *Health For All Children* refers to the importance of a child's caregivers, in providing "good basic care, stimulation and emotional warmth, guidance and boundaries, safety and stability".¹ With a clear reference to possible inequalities in parenting, it adds: "It is important to establish a picture of the ability of parents and caregivers to understand and meet the needs of their child. Family circumstances can have a significant impact on the ability and confidence of parents and caregivers to look after their child and encourage their progress and development" (Scottish Executive 2005, page 45).

There are similar policy concerns in England and Wales, with the *Healthy Child Programme* for the under fives now extended from age 5 to age 19 years, and

¹ A supplementary update to *Health For All Children* has also been published. See <http://www.scotland.gov.uk/Publications/2011/01/11133654/11>

recognition of the important role played by parenting: “The parent–child relationship is vital to children’s development, learning, achievement and wider wellbeing. Poor parenting is a risk factor for mental health problems while good parent-child relationships reduce the risk of children adopting unhealthy lifestyles, such as smoking” (Department of Health/Department for Children 2009, page 30).

Research evidence in this area will inform policy directed at reducing health inequalities by interventions that promote support for parents and effective parenting.

1.3 Other UK cohort studies

Much research on parenting comes from the US, although the UK can begin to draw on evidence gathered from recent UK cohort studies. The ALSPAC and Millennium Cohort Studies have found associations between parenting and children’s physical and mental health (Waylen et al. 2008; Lexmond and Reeves 2009), and support for the hypothesis that parenting is one way in which family socio-economic status (SES) impacts on children’s mental health (Kiernan and Huerta 2008). Data from the Millennium Cohort Study has been used to undertake an extensive exploration of which factors at age 3 predict a child’s development and health at age 5 (Hobcraft and Kiernan 2010). While this research is restricted to two health outcomes (social, emotional and behavioural difficulties, and general health) and uses only the sample of children surveyed in England, it includes parenting behaviours at age 3 as predictor variables. As such, results are compared with this report’s findings in Chapter 4.

1.4 Growing Up in Scotland

This report is based on analysis of the first five sweeps (2005/06 to 2009/10) of the Growing Up in Scotland study (GUS). Growing Up in Scotland (GUS) has collected measures of parenting at each interview, but so far there has been no comprehensive examination of associations between different components of parenting and child health and health behaviours. GUS research findings to date have accumulated evidence of socio-economic inequalities in child health and health behaviours, together with some evidence that parenting varies by socio-economic status, for example in relation to diet and exercise at sweep 3 (Marryat et al. 2009). The sweep 4 analysis of inequalities in health (Bromley and Cunningham-Burley, 2010) did not examine whether parenting helped to account for inequalities found across the whole sample. Its analysis of resilience among children in the most deprived groups suggested that some aspects of parenting (related to home learning environment) were important for avoiding negative outcomes in these groups.

1.5 Aims and scope of this report

This report has two aims. The first aim is to explore which aspects of parenting may be important for child health and health behaviours. The second is to investigate the extent to which variation in parenting practices may help to account for inequalities in child health and health behaviours associated with family adversity.

This study focuses on aspects of parenting that may be considered as ‘generic’ or ‘day-to-day’ in nature, pertaining to the overall quality of the parent-child relationship and parental control. It does not consider parenting that is likely to be associated only with specific health outcomes (such as parental control of diet, or parental modelling of physical exercise), although some parenting items that relate to specific behaviours have been used as part of more general measures.

The child’s main carer interviewed in the Growing Up in Scotland study was almost always the child’s mother. This study is restricted to 3,486 cases where the child’s natural mother has provided information at all five sweeps, ensuring that information on the child’s health and parenting was always given by the same respondent. However, this means that the study is essentially about mothering rather than fathering.

Associations between parenting and health are explored before and after adjustment for socio-demographics, family poverty and maternal depression, in order to see whether parenting may have effects over and above these other known influences on child health and health behaviours.

The study then investigates associations between an index of family adversity and health. This index is based on socio-demographics, family poverty and maternal depression. We explore whether inequalities in child health and health behaviours linked to family adversity are reduced when we account for variation in parenting behaviour. This would suggest that some of the variations in child health and health behaviours across children with different levels of family adversity are in fact explained by differences in the parenting behaviours they experience.

The analysis in this report uses information from families in the **birth cohort** that took part in all of the first five sweeps of GUS. Some families who initially took part in GUS did not do so for all of the subsequent sweeps. All of the statistics have been weighted by a specially constructed weight to adjust for non-response and sample selection. Both weighted and unweighted sample sizes are given in each table. Standard errors have been adjusted to take account of the cluster sampling.²

2 GUS has a two-stage sample design where individuals are selected from within a random selection of geographic areas known as clusters. The analysis adjusts for this design. For further details on the sample design and why the sample errors are adjusted please consult the GUS Data User Guide available at www.growingupinScotland.org.uk

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1.6 Technical Appendix

Readers interested in the details of the analyses should consult the Technical Appendix published alongside this report.

chapter

MEASURING CHILD HEALTH
AND FAMILY ADVERSITY

2

2.1 Introduction

This chapter describes the health and health behaviours of children in the Growing Up in Scotland study as they approached their fifth birthdays. It also develops a measure of family adversity (from various social background characteristics), and examines associations between child health and the adversity measure.

2.2 Key findings

- A minority of children were in poor general health (5%) or had a long-term illness that limited their daily activities (4%).
- More than one in ten children (13%) had mild or severe social, emotional and behavioural difficulties.
- Almost one in five children (18%) had three or more health problems in the past year, and 11% had experienced three or more accidents or injuries requiring medical attention since birth.
- A sizeable minority of children (17%) had some tooth decay.
- More than a third of children reported low physical activity (38%) and a similar proportion showed high screen time (39%).
- Around a third (35%) consumed snacks with a high sugar or fat content more than once a day, and two-thirds (69%) lacked a varied fruit and vegetable diet.
- Poor health and poor health behaviours are related.
- An index of family adversity was constructed using eight different indicators of health risk from maternal, family and area characteristics including poverty and maternal depression. Children who were reported to have higher levels of adversity were more likely to have poor child health and health behaviours, with the exception of physical activity.

2.3 Health measures

Six measures were selected to cover children's physical and mental health. Five of these measures were reported by the child's mother at sweep 5. They were:

- General health.
- Limiting long-term illness (whether the child has a persistent illness or disability that restricts his or her ability to play or participate in other activities that are normal for children of the same age).
- Social, behavioural and emotional difficulties (Strengths and Difficulties Questionnaire).

- Health problems (other than long-term illnesses) in the last 12 months.
- Dental health.

A further measure was taken from information reported by mothers at all five sweeps:

- Accidents or injuries for which the child was taken to the doctor, dentist, health centre, or hospital.

For ease of presentation, this report has used binary measures which split the children into two groups depending on their answers. The way in which this was done is explained in the following sections. Where possible, the aim is to create a meaningful split into children with poorer and better health, although for some measures the dividing line is necessarily somewhat arbitrary and reflects the need to have sufficient numbers in each group for analysis purposes. The health measures are summarised in Table 2.1 and explained in more detail below.

Table 2.1 Summary table of child health outcomes

		%	Bases	
			Weighted	Unweighted
General health	Very good or good	95	3304	3339
	Fair, bad or very bad	5	175	147
	Total	100	3478	3486
Limiting long-standing illness	No	96	3339	3359
	Yes	4	139	127
	Total	100	3478	3486
Total difficulties score (social, emotional and behavioural difficulties)	Normal	87	3002	3080
	Borderline or severe	13	430	366
	Total	100	3432	3446
Number of health problems last 12 months	0-2	82	2859	2904
	3 or more	18	619	582
	Total	100	3478	3486
Number of accidents/injuries requiring medical attention (total from sweep 1 to 5)	0-2	89	3104	3140
	3 or more	11	373	344
	Total	100	3477	3484
Dental health	No decay	83	2886	2969
	Decay, filling or tooth extracted	17	583	511
	Total	100	3469	3480

Note: Reported at sweep 5 (age 4-5 years) unless otherwise indicated

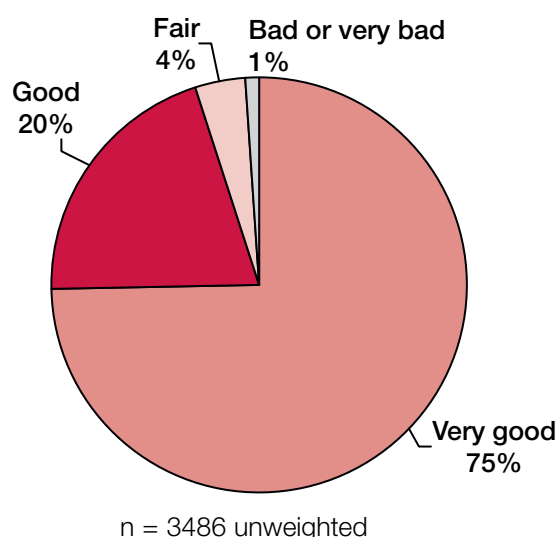
- Very few children reported poor general health (5%) or a limiting long-term illness (4%).
- A little more than one in ten children (13%) had mild or severe social, emotional and behavioural difficulties.

- Almost one-fifth (18%) had three or more health problems in the past year. Accidents and injuries were less common; 11% had experienced three or more accidents or injuries requiring medical attention since birth.
- Although the majority of children had no tooth decay, a sizeable minority of children (17%) reported having decay, a filling or a tooth extracted.

2.3.1 General health

Most mothers said their child's health was either 'very good' or 'good' with only 5% reporting their child's health as 'fair', 'bad' or 'very bad' (see Figure 2-A). In this report, we define this second group as being in poor general health when compared to most children. The prevalence of poor health was comparable to that found for 4-5 year-olds in the Scottish Health Survey 2008/9 (4%). As this is a key measure, variations in general health were compared across each of the health outcome measures discussed below.

Figure 2-A General health of child



2.3.2 Limiting long-term illness

A small percentage of mothers (4%) reported that their child had a limiting long-term illness. This figure is comparable to that found for 4-5 year olds in the 2008/09 Scottish Health Survey (3%). Compared with the whole sample, a much higher proportion of children with a limiting long-term illness (two out of every five, about eight times higher than in the whole sample) were in poor general health.

2.3.3 Social, behavioural and emotional problems

The Goodman Strengths and Difficulties questionnaire (SDQ) (Goodman 1997) was used to measure children's social, emotional and behavioural development. This report uses the total difficulties SDQ score, summarising information from 20 questions administered to mothers covering four domains of their children's mental health³. These domains comprised:

- Conduct problems: often fights, often has temper/tantrums, not generally obedient, argumentative with adults, can be spiteful to others.
- Inattention-hyperactivity: is restless/overactive, constantly fidgeting, easily distracted, cannot stop and think out before acting, does not see tasks through to end.
- Emotional symptoms: is often unhappy, often complains of headaches, many worries, nervous or clingy, many fears.
- Peer problems: is rather solitary, tends to play alone; does not have at least one good friend, not generally liked by other children, picked or bullied by other children, gets on better with adults than other children.

Mothers were asked whether each statement was 'not true' (0), 'somewhat true' (1) or 'certainly true' (2). This report divides children with scores in the normal range (0-13) from those with scores that were either moderate (14-16) or severe (17-40). Thirteen per cent of children had a total difficulties score that was indicative of, or bordered on, severe social, behavioural and/or emotional problems (sometimes referred to as 'poor mental health' in this report). A higher proportion of this group (16%) were in poor general health compared to the whole sample (5%). The percentage with moderate or severe difficulties is comparable to that found in earlier analysis of data from the slightly older child cohort in GUS (Bradshaw, 2010).

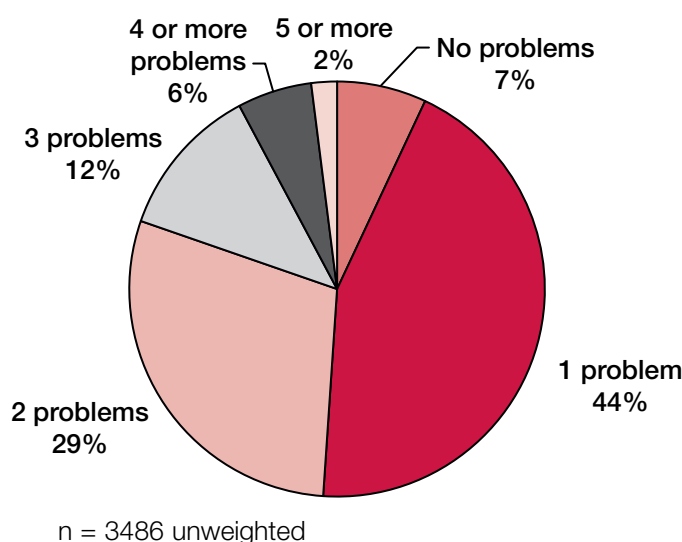
2.3.4 Health problems

Most children had at least one health problem in the 12 months before the sweep 5 interview (Figure 2-B). Problems reported by at least 5% of mothers were colds (84%), skin complaints (16%), ear or hearing problems (15%), chest infections (10%), eye or sight problems (9%), wheezing or asthma (6%) and sleeping difficulties (6%).

³ The SDQ comprises a further fifth, positive, 'pro-social' domain. Items contributing to the pro-social domain are not included in the total difficulties score and are therefore not considered in this report.

The survey did not collect information on the severity of different problems or whether they received medical attention, so this report uses the total number of problems as a measure of health. In this report we have differentiated those with three or more problems (18%) from the rest. In this group, 15% were in poor general health (about three times the proportion in the overall survey population).

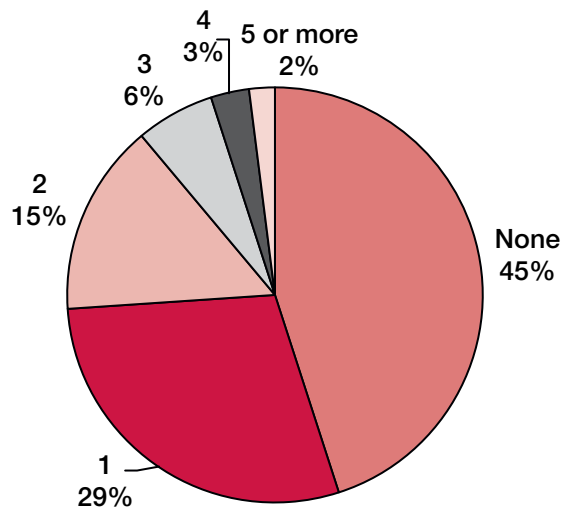
Figure 2-B Percentage of children with different numbers of health problems in last 12 months



2.3.5 Accidents and injuries

Around six in ten children had at least one accident or injury since birth for which their parent consulted a medical specialist (doctor, dentist, health centre, or hospital) (Figure 2-C). This report uses information across all sweeps to introduce more variability into the data compared to a measure based on sweep 5 data alone. We have differentiated those with three or more accidents or injuries (11% of the sample) from the rest. More of this accident-prone group were in poor general health than the whole sample (10% compared to 5%), but the difference was not statistically significant.

Figure 2-C Percentage of children according to number of accidents/injuries since birth



n = 3486 unweighted

2.3.6 Dental health

Mothers were asked about their child's current dental health and whether their child had ever had various types of dental treatment. A minority of children had been given one or more fillings (7%) or had one or more teeth extracted because of decay (3%). Most children (88%) were said by their mothers to have 'perfectly healthy' teeth, with 11% reporting some decay and 1% a lot of decay. These figures vary somewhat from official statistics on child dental health provided in the 2010 National Dental Inspection Program (Macpherson et al. 2010). Results from the inspection program show that 36% of Scottish children in P1 were found to have at least some obvious decay. The official statistics are provided via inspection by a dental health professional rather than by parental report. The lower figure in the GUS data therefore suggests that a reasonable proportion of mothers are not aware of tooth decay in their children.

In this report we have combined children who had experienced a filling and/or tooth extraction with those who their mothers said had any current decay. This gave 17% of children who were in poor dental health for their age group. The proportion of these children who were in poor general health (9%) was above the proportion in the whole population, but the difference was not statistically significant.

2.4 Health behaviour measures

Four child health behaviours were selected, all reported by mothers at sweep 5:

- Physical activity
- Screen time (time spent watching television and/or using a computer or games console)
- Fruit and vegetable consumption
- Snacking

For ease of presentation this report uses binary measures. The derivation of each measure is explained in the following sections and a summary is provided in Table 2.2.

Table 2.2 Summary of child health behaviour outcomes

		%	<i>Bases Weighted</i>	<i>Unweighted</i>
Physical activity	High	62	2161	2191
	Low	38	1304	1282
	Total	100	3466	3473
Screen time on term-time week day	Up to 2 hours	61	2090	2193
	More than 2 hours	39	1355	1259
	Total	100	3445	3452
Fruit and vegetable consumption previous day	5 or more different fruits and/or vegetables	31	1081	1160
	Fewer than 5 different fruits/vegetables	69	2390	2318
	Total	100	3471	3478
Frequency of sweets, crisps, sugary soft drinks	Less frequent	65	2271	2358
	Any more than once a day	35	1208	1128
	Total	100	3478	3486

Note: Reported at sweep 5 (age 4-5 years)

- More than a third of children reported low physical activity (38%) and a similar proportion showed high screen time (39%).
- Around a third (35%) consumed snacks with a high sugar or fat content more than once a day, and two-thirds (69%) lacked a varied fruit and vegetable diet.

2.4.1 Physical activity

Mothers were asked whether their child had done any of the following activities during the past week for at least ten minutes (including at school, pre-school or nursery): riding a bicycle, throwing or kicking a ball, running and/or jumping, playing on a trampoline, swimming, playing at a soft play area or ball swamp, playing at a play/swing park, or other activities (a list of activities was used to prompt parents).

The total time spent on each activity mentioned in the past week was recorded using the following 6-point scale: (1) less than 15 minutes (2) 15 minutes to less than 30 minutes (3) 30 minutes to less than 1 hour (4) 1 hour to less than 2 hours (5) 2 hours to less than 3 hours (6) 3 hours or more. This score was converted to an estimated active minutes per week using the midpoint of each time range for scores 2-5, 10 minutes for a score of 1 and 210 minutes for a score of 6. Times spent on different activities in a week were added together, and the total was divided by seven to give an approximate daily physical activity measure. This was divided into those above and below the minimum recommended daily 60 minutes of moderate to vigorous physical activity for this age group (National Institute for Health and Clinical Excellence 2009).

Just over a third of children (38%) fell below the guideline using this measure. Whilst the wide time ranges possible in some of the categories, especially those with the longest durations, may have resulted in over estimation of the number of children failing the guideline, the measure is likely to indicate children who are less physically active than their peers. The percentage estimated as meeting physical activity guidelines (62%) is similar to the 68% of all 2-4 year olds and 75% of 5-7 year olds reported meeting the guidelines in the 2008/09 Scottish Health Survey, although there were some differences in the questions used between GUS and the Scottish Health Survey.

2.4.2 Screen time

Total screen time was calculated from two questions that mothers were asked about how long their child usually spent watching TV or using computers or games consoles on an average term-time week day. Screen time has been used extensively as an indicator of sedentary activity. Excessive TV and electronic games use has also been associated with emotional and behavioural problems in children (Pagani et al. 2010; Page et al. 2010). There are no UK guidelines on the amount of screen time for young children, but this report has divided children into those spending up to 2 hours (61%) and those spending more than 2 hours using TV or electronic games (39%), reflecting United States and Australian recommended guidelines (Committee on Public Education 2001; Department of Health and Ageing 2004).

2.4.3 Fruit and vegetable consumption

This was derived from two questions about the number of different *types* of fruit and vegetables consumed the previous day. Fruit and vegetable consumption in the whole sample was generally low, with the average number of different types being 3.5 in the previous day and 7% consuming no fruit or vegetables.

The report divides children into a 'low consumption' group (those who had consumed less than five different fruits or vegetables, 69%) and a 'high consumption' group (those who had eaten five or more, 31%). This is an approximate measure for the number of children eating at least five portions (rather than different types) of fruit and vegetables recommended by UK Government guidelines (Food Standards Agency 2001).

2.4.4 Snacking on items with high sugar/fat content

Regular snacking on sweets or chocolate, sugary soft drinks (excluding fruit juices) or crisps was derived from three questions about the frequency of consumption of these items. 'Sweets' were defined as a whole packet of sweets or chocolate bar, not individual sweets. Frequency was measured using an 8-point scale: (1) more than once a day (2) once a day (3) 5 or 6 times a week (4) 2 to 4 times a week (5) once a week (6) 1 to 3 times per month (7) less often and (8) never.

Twenty-three per cent reported eating crisps, 49% eating sweets or chocolate and 41% consuming sugary drinks at least daily. These percentages are comparable to those found for all children aged 2-15 years in the Scottish Health Survey 2008/9, with 36% eating crisps, 53% sweets or chocolate and 37% consuming sugary drinks daily.

In terms of more frequent consumption, in the GUS data 15% of children consumed crisps, 10% sweets or chocolate and 29% sugary drinks more than once a day. In this report, children who consumed any of these high sugar or fat items more than once a day (35%) were contrasted with the rest (65%).

2.4.5 Associations between health behaviours and child health

Children with poor health behaviours were more likely to be in poor general and mental health (poor mental health being measured as having a moderate or severe total difficulties score). In addition, high screen time, regular snacking on sweets/crisps/sugary drinks and low fruit and vegetable consumption were all associated with poor dental health (Figure 2-D). The association between high screen time and poor dental health may be driven by the relatively high consumption of sugary snacks by children who watch a lot of TV (see Marryat et al. 2009).

Note that these associations do not indicate that health behaviours necessarily contributed towards poorer health. In some cases, poor health may limit a child's activities, or there may be other factors responsible for the associations found.

Figure 2-D Associations between health behaviours and poor health

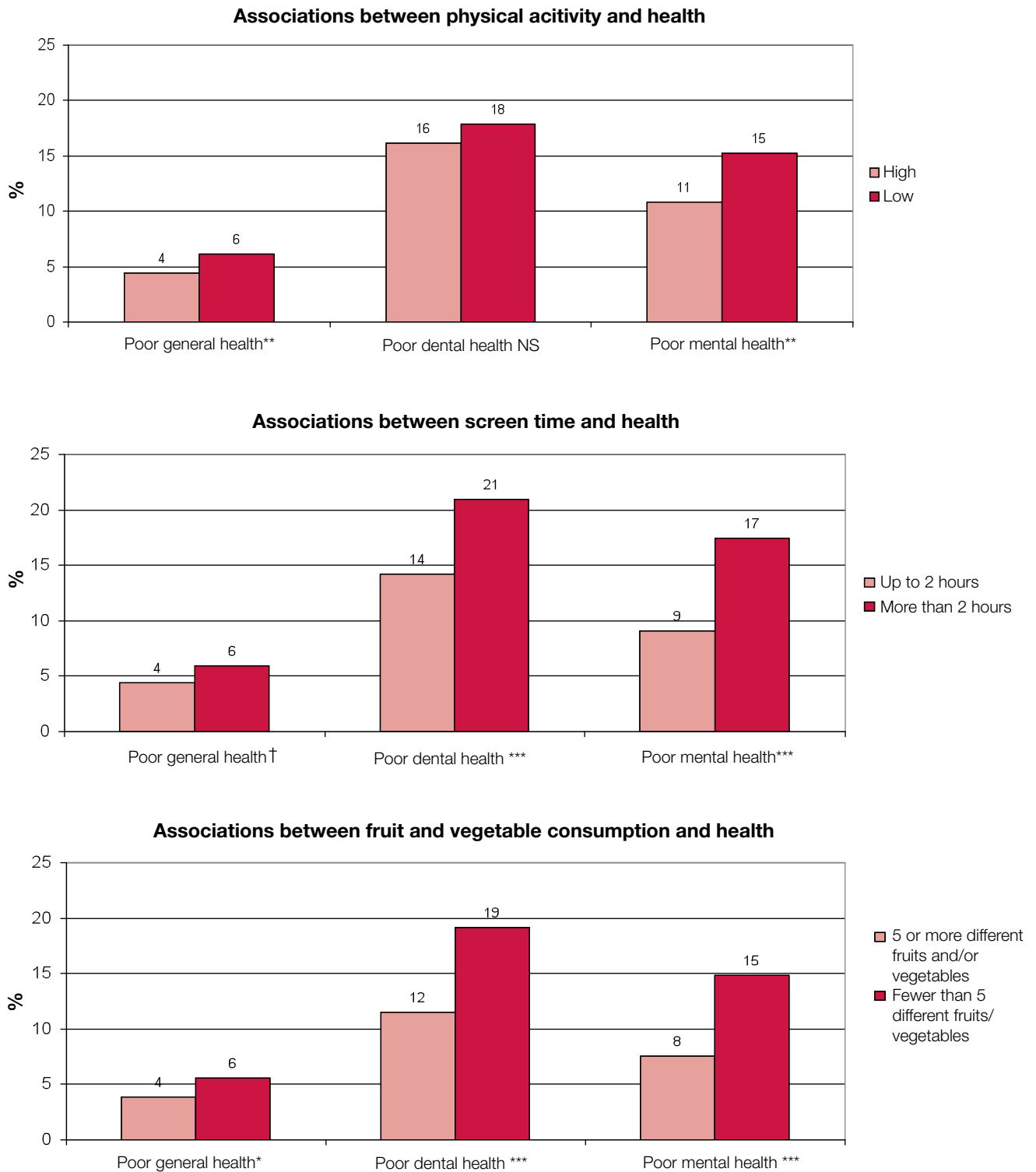
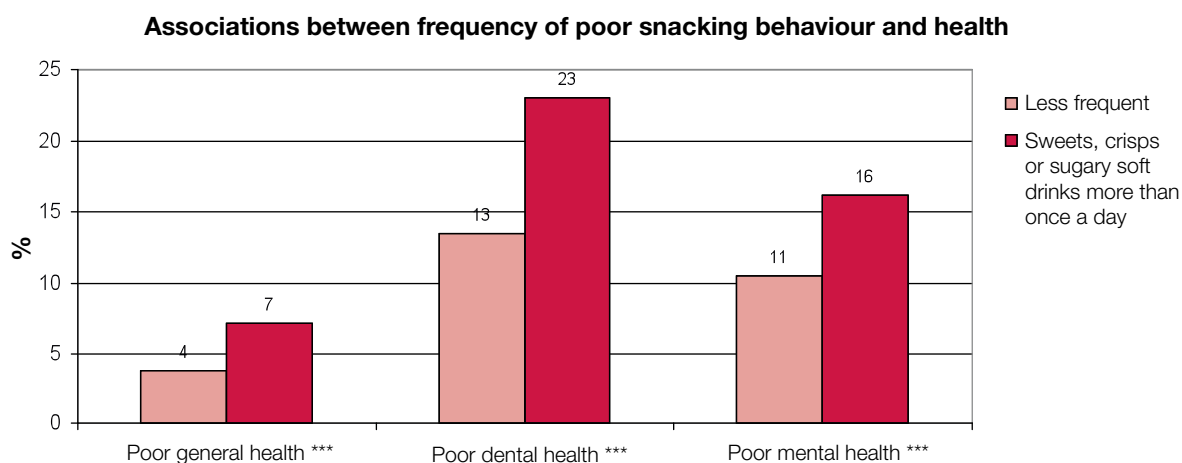


Figure 2-D Associations between health behaviours and poor health (contd.)



Note: Significance levels: † denotes $p < 0.1$, * $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$, NS = not significant

For full set of figures, see section 2.1 in the Technical Appendix.

2.5 Family adversity

Several characteristics of the mother and family were associated with poorer child health and health behaviours. The following characteristics of mothers were examined:

- Ethnicity
- Aged under 25 years at birth of cohort child
- No educational qualifications
- Maternal depression⁴.

In addition, the following family circumstances were considered:

- Natural father not present in household throughout sweeps 1 to 5
- Living in social rented housing (sweep 1)
- Low income (family in the lowest quintile (20%) of mean equivalised household income, at each of sweeps 1 to 5)
- Living in a deprived neighbourhood (in the highest SIMD⁵ quintile).

4 Measured using according to whether the mother's mean score SF-12 (Ware et al. 1996) Health Survey mental health items measured at sweeps 1, 3 and 5 was below 1 SD of mean sample population value, indicating maternal depression.

5 Scottish Index of Multiple Deprivation <http://www.scotland.gov.uk/Topics/Statistics/SIMD>

This report collectively terms the above factors as ‘family adversity’.

Table 2.3 shows the prevalence of these factors.

Table 2.3 Distribution of family adversity risk factors among the sample of natural mothers

		Column %	Bases	
			Weighted	Unweighted
Ethnic group	White	97	3358	3395
	Minority	3	119	90
Mother’s education sweep 1	Some qualifications	91	3165	3267
	None	9	310	217
Natural father in household sweeps 1-5	Yes	72	2516	2766
	No	28	962	720
Mother’s age at birth of cohort child	25 years or older	75	2621	2887
	Under 25 years	25	857	599
Housing tenure sweep 1	Owner/private rented	73	2548	2781
	Social rented	27	927	704
Area deprivation	Quintiles 1 to 4	77	2687	2902
	Most deprived quintile	23	791	584
Household income (mean sweeps 1-5)	Quintiles 2 to 5	70	2419	2692
	Lowest quintile	30	1042	778
Maternal depression (mean sweeps 1, 3, 5)	SF12 Normal range	85	2955	3027
	More than 1 SD below pop. mean score	15	523	459

The adversity factors are related to each other to some extent. For example, families on low incomes are more likely to live in social housing, and to live in deprived neighbourhoods than are those on high incomes, and young mothers are more likely to lack educational qualifications than older mothers.

We examined associations between these eight individual family adversity factors and child health and health behaviours using multivariate analyses⁶. The results showed that each individual adversity factor had a statistically significant association with one or more of the child health and health behaviour outcomes, even after controlling for the effect of other family adversity measures. This suggests that children in families who experience greater adversity may report poorer health outcomes, similar to findings in a large US study (Larson et al. 2008).

⁶ Detailed results available on request.

An index of family adversity was devised by counting the number of different factors experienced by the child's family. Table 2.4 shows the distribution of the number of adversity factors in the survey population. A large proportion of children (42%) experienced no adversity, and the maximum score was 7 out of a possible 8 (not shown). Because of low numbers, the top four categories were combined into a group with 5 or more factors (10%).

Table 2.4 Distribution of the number of adversity factors* in the Family Adversity Index in the Sample Population

		%	Bases	
			Weighted	Unweighted
Number of adversity factors	0	42	1478	1785
	1	17	598	640
	2	11	369	348
	3	11	368	287
	4	9	325	225
	5 or more	10	340	201

* Factors were minority ethnic group, mother with no educational qualifications, mother younger than 25 at birth of cohort child, maternal depression, biological father not present throughout sweeps 1 to 5, in social rented housing sweep1, in highest area deprivation quintile, in lowest quintile mean household equivalised income sweep 1- 5.

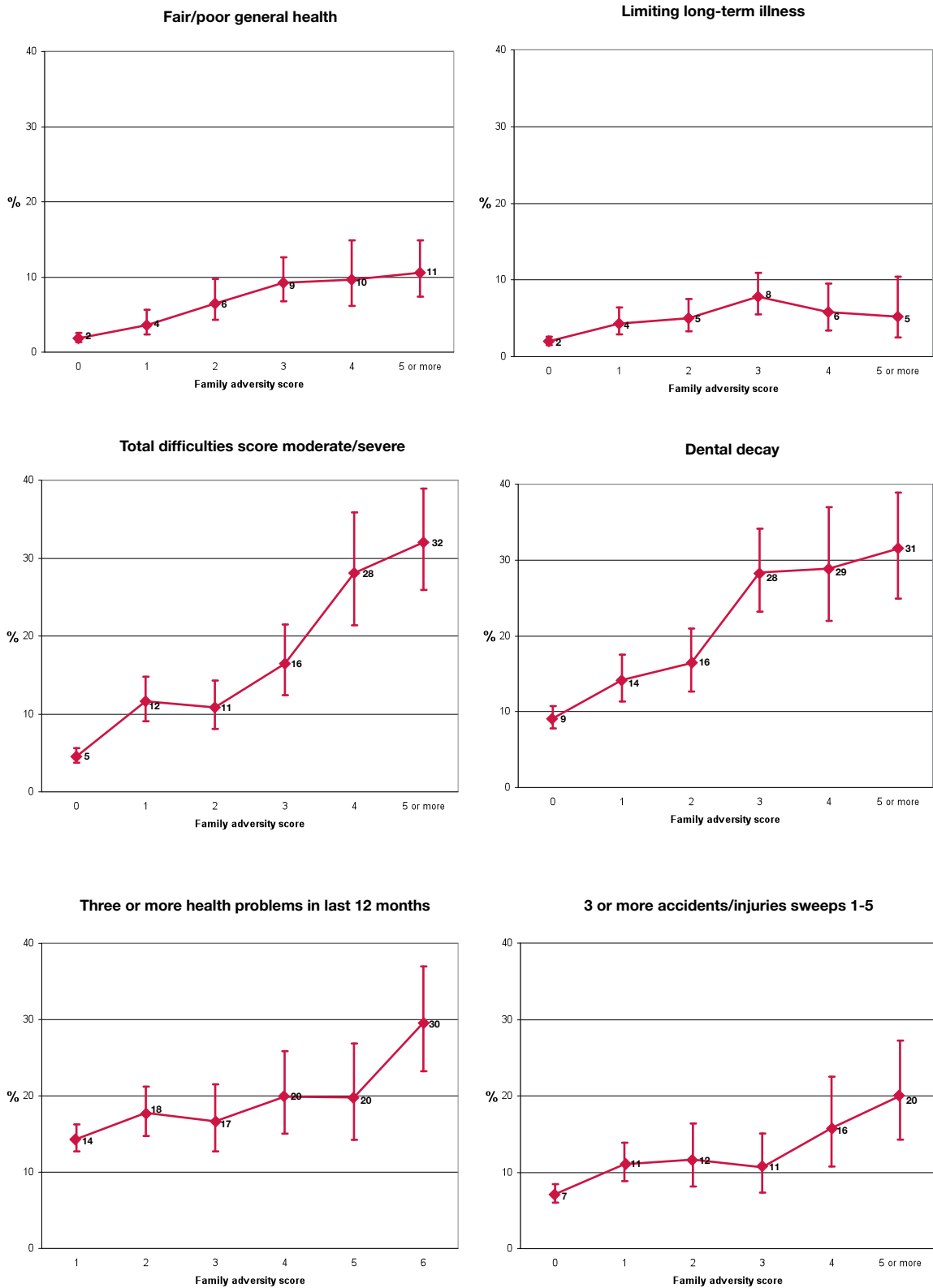
2.5.1 Associations between family adversity and child health

We examined associations between family adversity and each health outcome. All were statistically significant ($p < 0.001$).

Figure 2-E shows that the prevalence of poor health among children aged 4-5 increased with a greater number of family adversity factors, although the pattern of this increase varied somewhat across health outcomes. The increase with family adversity was particularly steep for poor mental health (difficulties score) and poor dental health. This suggests that these two outcomes are more strongly related to family adversity than the others.

An exception to the picture of worsening health with increased adversity was seen for limiting long-term illness. Compared to children in families with a zero family adversity score, levels of limiting long-term illness were greater in children with a family adversity score of one or more, but did not show a clear increase with a higher adversity score.

Figure 2-E Associations between health behaviours and poor health



Note: Bars show 95% confidence intervals. Overall associations between family adversity and poor health were all statistically significant ($p < 0.001$).

2.5.2 Associations between family adversity and health behaviours

The same analysis was undertaken for health behaviours. Associations between health behaviours and family adversity are presented in Figure 2-F.

Screen time, fruit and vegetable consumption and poor snacking were each significantly associated with family adversity ($p < 0.001$). There was an overall increase in poor behaviour with increasing adversity for these three behaviours – that is, children with greater levels of adversity tended to report poorer health behaviour – although the pattern of poor health behaviours in relation to family adversity varied according to the behaviour. Steeper increases with greater family adversity were found for screen time and poor snacking than for fruit and vegetable consumption.

Only physical activity did not show a clear trend with increasing family adversity despite previous research suggesting such a relationship. Previous analysis of GUS data found that lower levels of household income and greater area deprivation were both associated with a lower activity score for children who were almost 3 years old, although this score included time spent watching television and playing on computers in the activity measure, along with various active behaviours such as running, jumping and ball play (Marryat et al. 2009). Here we have separated out sedentary behaviour – watching TV and playing on computers and games consoles – from active behaviours and also looked at combined adversity rather than the relationship with individual background variables. The Scottish Health Survey (SHeS) 2008/9 found some evidence of inequalities in physical exercise across children aged between 2 and 15 years according to socio-economic status, although this depended on the measure of SES and the gender of the child. The SHeS analysis showed no variation with household income for boys or girls, but boys in areas of high deprivation were less likely to meet physical activity recommendations than those in more affluent areas, with no clear pattern for girls.

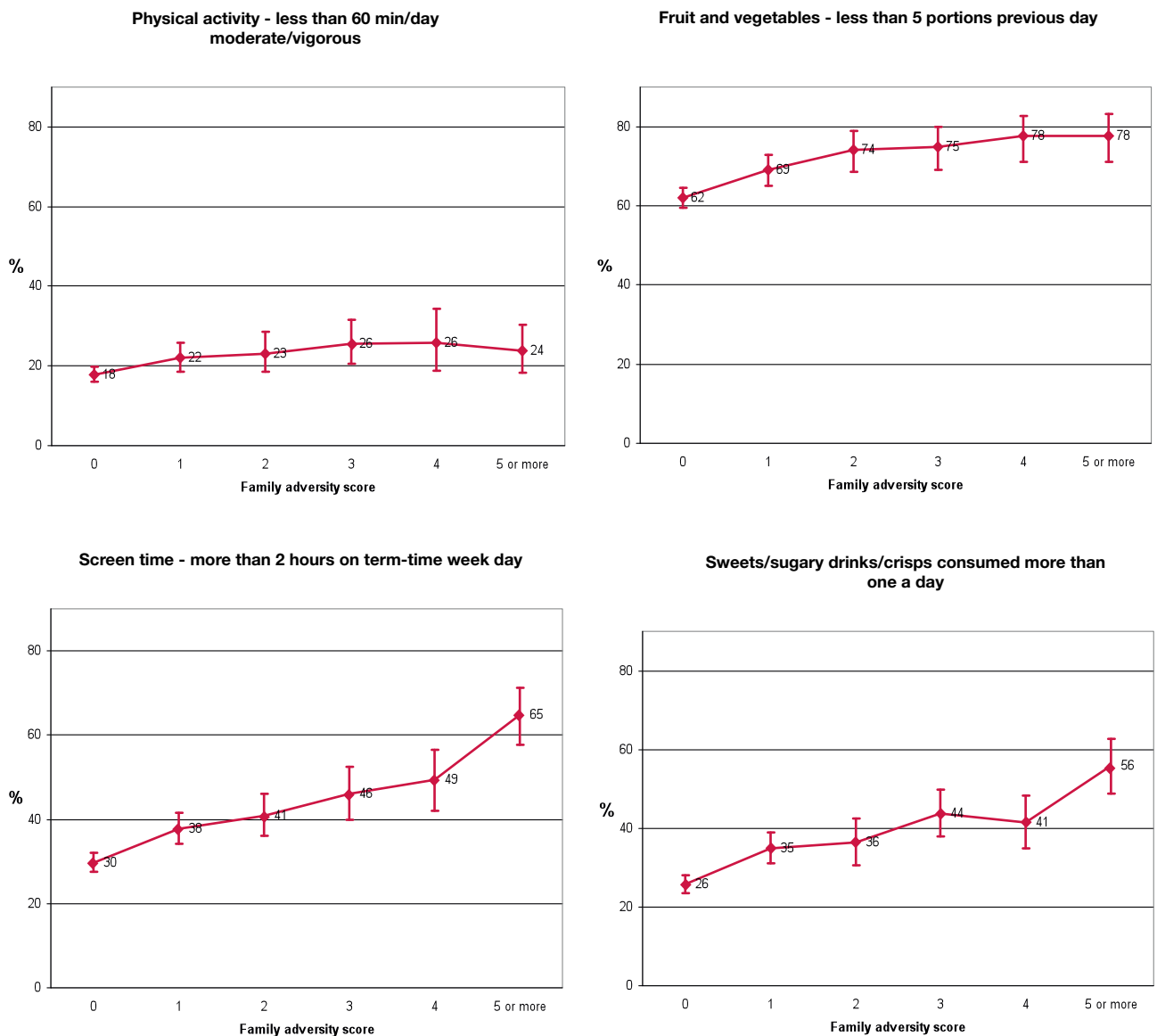
2.6 Summary

Health outcomes and health behaviours are related. Children with poor health behaviours were more likely to be in poor general and mental health (poor mental health being measured as having a mild or severe total difficulties score). In addition, high screen time, regular snacking on sweets/crisps/sugary drinks and low fruit and vegetable consumption were all associated with poor dental health (Figure 2.4).

Health outcomes and health behaviours are also associated with experience of family adversity. Children vary in the level of adversity they experience – a large proportion of children (42%) experienced no adversity, whereas around one in ten (10%) were reported to be experiencing five or more factors. Family adversity was statistically significantly associated with one or more of the child health and health behaviour outcomes, even after controlling for the effect of other family adversity measures.

Children who were reported to have higher levels of adversity were more likely to have poorer health outcomes – particularly poorer mental and dental health – and less healthy behaviour – higher screen time, lower fruit and vegetable consumption and greater snacking.

Figure 2-F Percentage of children with poor health behaviours according to number of family adversity factors



Note: Bars show 95% confidence intervals. Overall, associations between family adversity and poor health behaviours were statistically significant ($p < 0.001$), with the exception of family adversity and physical activity (not significant).

chapter
PARENTING MEASURES

3

3.1 Introduction

This chapter describes the measures of day-to-day parenting used in the study. It explains how individual measures were combined to give an index of overall parenting skills and examines whether, and how, parenting varies according to the level of family adversity.

3.2 Key findings

- Greater family adversity was associated with more negative parenting. The higher adversity the lower connection and control, and the greater negativity in parenting, although there were no clear associations between adversity and the mother-infant attachment or smacking measures.
- Parents were divided into three equal groups with low, average and high parenting skills. This measure of the level of parenting skill was associated with family adversity. Families in more adverse circumstances were more likely to be in the low and less likely to be in the high parenting skill group.
- In the group with no family adversity (e.g. those with a family adversity score of zero), the majority (80%) of parents had high or average parenting skills. However, amongst those with an adversity score of three or more, more than half of parents fell into the low parenting skills group.

3.3 Description of parenting measures

Growing Up in Scotland interviewers asked mothers about a number of different aspects, or dimensions, of day-to-day parenting of their child. These dimensions were grouped into three 'domains': connection, negativity and control – similar to other research (Belsky et al. 2007). Each domain contained two or three separate measures, or 'dimensions', of parenting as follows:

- Connection: mother-infant attachment, warmth of parent-child relationship, level of joint mother and child activities
- Negativity: parent-child conflict, use of smacking
- Control: parental supervision, rules and degree of 'home chaos'

For each dimension of parenting, groups of parents are compared with one another, rather than with any particular 'standard' or 'threshold' of good practice. Where possible the complete range of scores found for each measure of parenting behaviour was subdivided into tertiles, so that a third of parents fall into each band of scores. These bands are then compared with one another. For some parenting measures, because there were a large number of cases all with the same score, it was not possible to subdivide parents into three groups that were identical in size. Where groups were markedly unequal this has been highlighted in the descriptions of individual measures below.

3.3.1 Connection

Early mother-infant attachment was measured at sweep 1 using an abbreviated six-item version of the Condon mother-infant attachment scale (Condon and Corkindale 1998). Mothers were asked about their feelings for their child, with four different possible responses for each item. The scale had a low reliability⁷ (Cronbach alpha=0.52), and this should be borne in mind when interpreting the results. Mean scores were divided into tertiles indicating low, medium and high mother-infant attachment.

The **warmth of mother-child relationship** was measured at sweep 5 using seven items from the Pianta scale (Pianta 1992) (reliability acceptable, Cronbach alpha=0.67). Each item was scored as 1 definitely does not apply, 2 not really, 3 neutral, 4 applies sometimes, or 5 definitely applies. 'Can't say' responses were considered as missing. Scores were summed for parents who had completed all warmth items. A high number of parents scored the maximum of 35, and so the lowest third of parents (with scores between 7 and 33) were contrasted with the remainder (referred to as 'high warmth').

Information on each **mother's activities with their child** was measured at sweeps 2, 3 and 4. A count of the number of activities that the mother had carried out with the child in the past week was made for each of sweeps 2 to 4 (from a list of six: books/stories, played outdoors, painting or drawing, nursery rhymes or songs, letters or shape recognition, used a computer or games console). Mean scores were computed and divided into thirds: low (0 to 3 activities), medium (4 activities) and high (5 or 6 activities).

3.3.2 Negativity

Mother-child conflict was measured at sweep 5 using eight items from the Pianta scale (Pianta 1992) with items scored on a 4-point scale as for the Pianta warmth items (see above). Cronbach's alpha indicated good reliability (0.80). Scores were summed for parents who had completed all conflict items and grouped into thirds as 8-12 (lowest conflict), 13-18 (medium conflict), or 19-40 (high conflict).

Harsh discipline was measured at sweeps 2 and 4 from parents' replies to questions about whether they had ever smacked their child at sweep 2, and whether they had ever smacked, or smacked in the last year, at sweep 4. Any report of smacking was contrasted with no mention of smacking.

⁷ Reliability⁷ is used here to denote the internal consistency of items making up a parenting measure. Consistency is estimated using Cronbach's alpha, which is based on the average correlation between items. The value of Cronbach's alpha depends in part on the number of items in the scale, with a greater number of items resulting in higher alphas. While there is no firm consensus, a commonly accepted 'cut-off' of an alpha of 0.7 or more for items to be included in a scale is often lowered to 0.6, particularly for exploratory studies.

3.3.3 Control

Parental supervision was measured at sweep 4 using an abbreviated version of the Parent Supervision Attributes Profile Questionnaire (Morrongiello and Corbett 2006). Mothers were asked for their agreement with statements covering protectiveness (“I feel very protective of my child”, “I think of all the dangerous things that could happen”, “I keep my child from playing rough games or doing things where he/she might get hurt”) and supervision while the child plays outdoors (“I can trust my child to play by (him/herself) without constant supervision”, “I stay close enough to my child so that I can get to him/her quickly”, “I make sure I know where my child is and what he/she is doing”).

Answers were coded on a 5-point scale from 1 strongly agree to 5 strongly disagree. Item 4 was reverse-coded, and a mean score of the six items (Cronbach’s alpha=0.67, indicating acceptable reliability) was computed and divided into thirds of low, medium and high parental supervision.

Rules and routines were measured at sweeps 2 and 5. A count of the number of ‘rules’ or routines was derived from the following: ‘always’ responses to question on regular meals at sweep 2, a question on regular bedtime at sweep 5 and four questions at sweep 5 on whether the child had to tidy up toys, brush teeth, stay in room, and turn off TV or music in room (using 4-point scale – always/usually/sometimes/never or almost never). The number of rules was banded into low (0-3 rules), medium (4-5 rules) or high (all 6 rules). These bands were unequal in size, with 36% having low, 55% medium, and 10% high numbers of rules.

Home chaos was measured at sweep 5. This was an abbreviated version of the Confusion, Hubbub, and Order scale (Coldwell et al. 2006), devised as a measure of household disorganisation that captures noise, crowding, home ‘traffic’ (people coming and going) and a lack of routine or regularity. A number studies suggest that household disorganisation may impair effective parenting (Coldwell et al. 2006; Valiente et al. 2007; Deater-Deckard et al. 2009; Mokrova et al. 2010).

For the chaos scale, mothers were asked for their agreement with four items (Cronbach alpha=0.63, indicating acceptable reliability): “It’s really disorganised in our home”, “You can’t hear yourself think in our home”, “The atmosphere in our home is calm” and “First thing in the day, we have a regular routine at home”. The first two items were reverse coded. Mean scores were divided into three groups, indicating low, medium and high levels of chaos. Because of large numbers of tied scores these groups were unequal in size, with 49% in low, 16% in medium and 35% in high chaos homes.

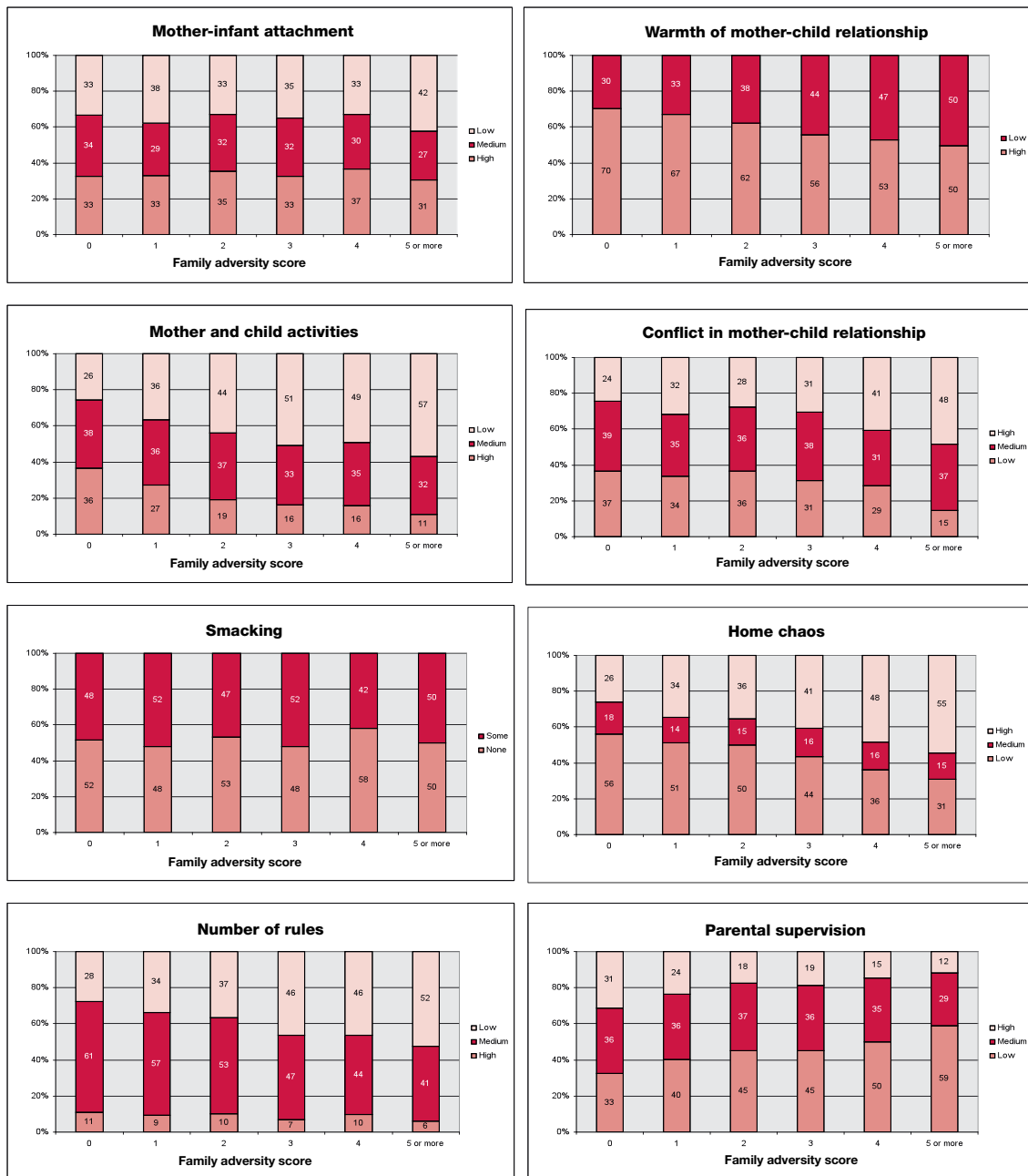
3.4 Associations between parenting measures

Most parenting measures were weakly or moderately, but statistically significantly, correlated (see Table 2.2 in the Technical Appendix). For instance, parents who had a warm relationship with their child were also likely to be parents who undertook many joint activities with their child, had more rules about behaviour, low levels of conflict and home chaos. The analysis undertaken here controls for these relationships between the different parenting measures.

3.5 Associations between different dimensions of parenting and family adversity

Figure 3-A indicates that most aspects of parenting were strongly patterned according to family adversity. Families with the highest adversity score had less optimal parenting practices, with lower connection, greater negativity and less control. Only mother-infant attachment and smacking did not show clear associations with family adversity (associations not statistically significant).

Figure 3-A Percentage of parents in each band of eight parenting measures, according to level of family adversity



n=3486 (unweighted)

Associations between family adversity and mother-infant attachment and smacking were both not significant. Associations between family adversity and other parenting measures were all significant $p < 0.001$.

3.6 Index of parenting skill

Although it is instructive to examine various different dimensions of parenting for associations with child health and health behaviours, it may also be useful to consider how a single composite measure of positive parenting is associated with health outcomes. This report follows a similar approach to the one taken by in the evaluation of the Sure Start programme (National Evaluation of Sure Start 2008).

Six dimensions of parenting were used to create the parenting index: Pianta warmth of mother child relationship, level of mother-child activities, Pianta conflict in mother-child relationship, supervision, rules, and home chaos. Smacking and mother-infant attachment were excluded from the index, as these measures were not clearly associated with family adversity (see above). Standardised scores for all measures were then summed and divided into three groups indicating low, average and high parenting skills. Within the limits of 'granularity' in the data (where it is impossible to split parents who have the same score), these groups were more or less equal in size. In the total sample there were 37% of parents in the low, 32% in the average and 30% in the high parenting skill bands.

3.7 Associations between index of parenting skill and family adversity

Section 3.5 showed that the parenting measures that were combined to form the parenting index were all individually associated with family adversity. Therefore it is not surprising that the three groups or bands of the parenting skill index were also strongly patterned according to family adversity (see Figure 3-B).

In the group with no family adversity (e.g. those with a family adversity score of zero), the majority (79%) of parents had high or average parenting skills. Amongst those with an adversity score of three or more (the three columns on the righthand side of Figure 3-B), more than half of parents fell into the low parenting skills group.

Figure 3-B Percentage of parents in each band of parenting index according to level of family adversity



n=3486 (unweighted)

chapter
IS PARENTING ASSOCIATED WITH CHILD
HEALTH AND HEALTH BEHAVIOURS?

4

4.1 Introduction

This chapter investigates whether parenting is associated with child health outcomes and health behaviours. In the first part of the chapter, each dimension of parenting is examined individually. The last section of the chapter examines associations between the composite parenting index (as described in Chapter 3) and health. In both cases, associations are investigated before and after controlling for other family factors that may influence health⁸.

4.2 Key findings

- The prevalence of children in poor health and with poor health behaviours increased as the level of parenting skill decreased. After taking account of the child's social background and family circumstances, low overall parenting skills were associated with poorer general health, greater longstanding illness, poorer mental health, worse dental health, lower physical activity, higher screen time, lower fruit and vegetable consumption, and more snacking amongst children.
- The association between low parenting skills and children's social, behavioural or emotional difficulties was particularly strong.
- There were no associations between overall parenting skills and number of health problems in the past year, or accidents and injuries over the first five years, after allowing for other family factors.
- A wide range of different parenting skills appeared to be important for health, although the following aspects of parenting appeared particularly relevant for specific outcomes:
 - High levels of parent-child conflict were strongly associated with behavioural and emotional difficulties.
 - Low parental supervision was associated with poorer general health, greater long-standing illness and social, behavioural and emotional difficulties.
 - Joint mother-child activities and parental rules appeared important for health behaviours.

4.3 Associations between individual dimensions of parenting and child health

Table 4.1 presents associations between each parenting measure and child health outcomes. This analysis does not take account of the fact that many parenting practices may be related, and also ignores other important family influences on health (subsequent analysis will control for these relationships and other influences).

⁸ A description of the analysis is included in the Technical Appendix.

The table indicates that many of the associations were statistically significant after controlling for several basic demographic factors (the child's gender, the child's age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep 5⁹) but not other parenting measures. In summary:

- All aspects of parenting were associated with having moderate or severe difficulties with most also associated with general health and dental health (only mother-infant attachment and smacking were not).
- Health problems and accident/injuries were the two outcomes least likely to be associated with parenting.
- Home chaos was associated with each health outcome.
- Parental supervision was associated with all health outcomes except having three or more accidents/injuries.
- Both warmth and conflict in the mother-child relationship were associated with most health outcomes but neither were significantly related with having accidents/injuries or health problems.

9 Each of these factors was significantly associated with one or more of the health or health behaviour outcomes. Boys were more likely than girls to have a limiting long-term illness, high number of accidents or injuries, show emotional or behavioural difficulties and watch more television/play with electronic games. Dental health and both dietary outcomes varied with birth order and family size. Screen time and snacking behaviour varied according to child's age at the sweep 5 interview. Full results available on request.

GROWING UP IN SCOTLAND:

Parenting and children's health

Table 4.1 Summary of child health behaviour outcome

Row percentages	General health fair, bad or very bad		Limiting long-standing illness		Total difficulties score moderate or severe		Three or more health problems last 12 months		Three or more accidents/injuries sweeps 1-5		Dental decay		Row bases	
	%		%		%		%		%		%		Weighted	Unweighted
All	5		4		12		17		11		16		3478	3486
Mother-infant attachment	6	NS	5	**	17	***	17	NS	11	NS	16	NS	1219	1238
	5		4		11		19		10		17		1098	1117
	4		3		9		17		11		17		1149	1121
Warmth of mother-child relationship	7	***	7	***	21	***	19	NS	12	NS	21	***	1253	1203
	4		2		7		17		10		14		2198	2261
Mother and child activities	6	*	4	NS	17	***	18	NS	13	NS	24	***	1299	1214
	5		4		11		16		10		14		1260	1271
	3		3		7		18		10		9		919	1001
Conflict in mother-child relationship	4	**	2	***	3	***	16	NS	9	NS	15	*	1126	1169
	4		3		6		18		12		16		1272	1283
	7		7		29		19		12		19		1052	1011
Smacking	5	NS	4	NS	10	***	16	NS	9	*	15	NS	1783	1778
	5		4		15		19		13		18		1695	1708
Parental supervision	6	*	6	***	14	***	21	***	10	NS	20	***	1419	1333
	5		2		13		16		12		16		1235	1252
	3		3		7		14		10		13		823	900
Number of rules	6	*	5	NS	18	***	19	NS	12	NS	24	***	1245	1187
	4		4		10		16		10		13		1897	1962
	3		3		5		17		12		9		336	337
Home chaos	3	**	2	***	6	***	16	**	9	***	13	***	1704	1764
	6		5		10		15		10		16		563	570
	7		6		22		20		14		21		1211	1152

Note: Significance levels: *p<0.05, **p<0.01, ***p<0.001, NS = not significant. Adjusting for child gender, age in months at sweep 5, birth order and number of children in household at sweep 5. Analyses do not adjust for relationships between parenting measures.

4.3.1 Associations after controlling for family influences and relationships between parenting measures

As discussed in section 3.4, the different parenting styles are related to each other. The analysis in the previous section does not control for these relationships. In this section, the first stage of analysis considers the association between parenting and health whilst controlling for the relationships between the parenting measures. At the second stage, the analysis further controlled for other family influences on health, namely: mother’s ethnic group, age at birth of the survey child, educational qualifications and mental health; and family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation. Full details of these analyses are provided in section 2.3 of the Technical Appendix. In this chapter, we focus on important features of the fully adjusted (stage 2) models.

Table 4.2 provides a summary of statistically significant associations between individual parenting measures and health outcomes after controlling for the relationships between the parenting measures and some family characteristics.

Table 4.2 Associations between individual parenting measures and child health after controlling for family influences and relationships between parenting measures

	Connection			Negativity		Control		
	Mother-infant attachment	Warmth of mother-child relationship	Mother and child activities	Conflict in mother-child relationship	Smacking	Parental supervision	Rules	Home chaos
General health fair, bad or very bad						✓		
Limiting long-standing illness	✓	✓		✓		✓		✓
Total difficulties score moderate or severe		✓		✓	✓	✓	✓	✓
Three or more health problems last 12 months								
Three or more accidents/injuries sweeps 1-5					✓			
Dental decay			✓				✓	

n=3343 (unweighted). Ticks indicate significant relationships between variables. Models controlled for child’s gender, age at sweep 5, birth order; number of children in household; mother’s ethnic group, age at birth of the survey child, educational qualifications and mental health; family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation; other parenting measures.

It can be seen that all parenting measures were associated with at least one health outcome, and that many different dimensions of parenting were associated with limiting longstanding illness or a high level of social, behavioural and emotional difficulties. However, no parenting measure was associated with having a high number of health problems in the last 12 months.

Detailed information about the magnitude of effects can be found in section 2.3 of the Technical Appendix. In summary, this information shows that:

- In the connection domain, the odds of children who experienced low levels of attachment, warmth or joint activities having poor health were 1.8 to 2.1 times higher than for children with more optimal parenting.
- In the negativity domain, the association between conflict and poor child mental health was particularly strong. The odds of children with a highly conflictual mother-child relationship having mild or severe social, emotional and behavioural difficulties were 7 times higher than for children experiencing low levels of conflict.
- For other health outcomes, associations were such that the odds of children experiencing highly negative parenting (conflict and smacking) having poor health were 1.3 to 2.2 times higher than those for children with low levels of negative parenting.
- In the control domain, the odds of children experiencing low levels of supervision, rules and control having poor health were 1.8 to 2.2 times higher than for children with less optimal parenting.

Note that whilst these associations are statistically significant, it is not possible to determine causal direction from the findings.

We compared the findings in this section with a recent study using data from the Millennium Cohort Study (MCS), referred to in Chapter 1 (Hobcraft and Kiernan 2010). The MCS, using the sample of children surveyed in England, examined associations between parenting behaviours at age 3 and two health outcomes also used in this report: general health (fair/poor/very poor) and total difficulties score (moderate/severe) at age 5.

Parenting behaviours in the MCS study covered similar 'domains' to GUS, with some similar or identical measures, although it did not include the parental supervision or home chaos measures used here. The MCS study included mother-reported Pianta measures of warmth and conflict (similar to GUS), interviewers' observations of positive and negative parenting, mother reports of reading with the child, disciplinary practices (frequency of smacking and shouting) and family organisation (regular bedtimes and mealtimes).

In multivariate analysis that took account of other family and maternal characteristics, the MCS study found that two measures of family organisation (regular bed and mealtimes) were the

only parenting behaviours predicting poor general health. Pianta warmth and conflict, shouting and irregular mealtimes predicted a moderate/severe total difficulties score.

In order to see whether parenting was associated with a *change* in health from age 3 to 5, a second stage of analysis in the MCS study added health outcomes at age 3 to the models. At this stage some of the parenting measures dropped out of the analysis, leaving only irregular mealtimes as a predictor of poor general health and Pianta conflict and irregular mealtimes as a predictor of total difficulties.

Both MCS and GUS results suggest that parenting is more strongly associated with social, behavioural and emotional difficulties than with general health, in terms of the greater number of significant associations between parenting measures and difficulties. The MCS findings for Pianta conflict and routines in relation to total difficulties echo the findings of this study. In the GUS data set, because conflict and difficulties were measured at the same interview, it is possible that some of the strong association is due to reverse causation, with difficult child behaviour leading to conflict in the mother-child relationship. The MCS study had the advantage that associations between parenting and health outcomes were longitudinal in nature, and this temporal relationship adds strength to the likelihood that findings reported for total difficulties in GUS could also reflect earlier negative parenting. After the completion of current and future data collection, such analysis will be possible using GUS data.

4.4 Associations between individual dimensions of parenting and child health behaviours

Table 4.3 presents associations between each parenting measure and child health behaviours. As in Table 4.1, this analysis does not take account of the fact that many parenting practices may be related, and also ignores other important family influences on health, although some basic demographic factors (the child's gender, the child's age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep 5 – see earlier footnote in this chapter) are controlled for.

As for the child health outcomes, many of the associations between individual parenting measures and health behaviours were statistically significant after taking account of basic demographic factors. In particular, this analysis showed that:

- Mother-child activities and rules were significantly associated with all health behaviours.
- Home chaos was associated with all but one (physical activity) of the health behaviours.
- Screen time and fruit and vegetable consumption were associated with most parenting measures.
- Early mother-infant attachment was not associated with any of the behaviours selected for this report.

GROWING UP IN SCOTLAND:

Parenting and children's health

Table 4.3 Associations between parenting and child health behaviours

		Physical activity - low		Screen time 2 hours plus on termtime weekday		Fruit and vegetable consumption - low		Sweets/ crisps/sugary soft drinks more than once daily		Row bases	
Row percentages		%		%		%		%		Weighted	Unweighted
All		38		40		69		35		3478	3486
Mother-infant attachment	Low	40	NS	40	NS	71	NS	35	NS	1219	1238
	Medium	39		37		68		33		1098	1117
	High	35		41		67		36		1149	1121
Warmth of mother-child relationship	Low	42	***	43	*	71	NS	39	***	1253	1203
	High	35		38		68		33		2198	2261
Mother and child activities	Low	45	***	47	***	79	***	43	***	1299	1214
	Medium	35		38		68		34		1260	1271
	High	31		32		56		26		919	1001
Conflict in mother-child relationship	Low	35	NS	34	***	65	***	33	NS	1126	1169
	Medium	38		40		68		34		1272	1283
	High	39		46		73		38		1052	1011
Smacking	None	38	NS	37	**	66	***	34	NS	1783	1778
	Some	37		42		72		36		1695	1708
Parental supervision	Low	39	NS	44	***	72	**	36	NS	1419	1333
	Medium	38		37		68		35		1235	1252
	High	36		36		65		33		823	900
Number of rules	Low	42	***	49	***	77	***	42	***	1245	1187
	Medium	36		35		65		32		1897	1962
	High	31		29		60		28		336	337
Home chaos	Low	37	NS	34	***	65	***	31	***	1704	1764
	Medium	36		40		72		33		563	570
	High	40		47		72		42		1211	1152

Note: Significance levels: *p<0.05, **p<0.01, ***p< 0.001, NS = not significant. Adjusting for child gender, age in months at sweep 5, birth order and number of children in household at sweep 5. Analyses do not adjust for relationships between parenting measures.

4.4.1 Associations after controlling for family influences and the relationship between parenting measures

Table 4.4 provides a summary of statistically significant associations between individual parenting measures and health behaviours after controlling for family influences and the relationship between parenting measures. Whilst some of the associations shown in Table 4.3 have dropped out, with the exception of early mother-infant attachment, all parenting measures were associated with at least one health behaviour. Joint activities and parental rules were both associated with three out of four health behaviours.

Table 4.4 Associations between individual parenting measures and child health behaviours after controlling for family influences and relationships between parenting measures

	Connection			Negativity		Control		
	Mother-infant attachment	Warmth of mother-child relationship	Mother and child activities	Conflict in mother-child relationship	Smacking	Parental supervision	Rules	Home chaos
Physical activity - not meeting guidelines		✓	✓					
Screen time 2 hours plus on term-time week day				✓	✓		✓	
Fruit and vegetable consumption - low			✓		✓	✓	✓	
Sweets/crisps/sugary soft drinks more than once daily			✓				✓	✓

n=3343 (unweighted). Ticks indicate significant associations between variables. Models controlled for child's gender, age at sweep 5, birth order; number of children in household; mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation; other parenting measures.

Detail on the magnitude of associations between parenting and health behaviours has been provided in section 2.4 of the Technical Appendix. Below we provide a summary of those data:

- In the connection domain, the odds of children experiencing low levels of warmth and joint activities with their mother having poor health behaviours were 1.6 to 2.6 times higher than those of children with high levels of connection.
- In the negativity domain, the odds of children experiencing high levels of conflict and smacking having poor health behaviours were 1.2 to 1.3 times higher than for children with low levels of negativity.
- In the control domain the odds of children experiencing low levels of supervision and rules or a high level of home chaos having poorer health behaviours were 1.2 to 2.0 higher than those of children with high parental control.

4.5 Which dimensions of parenting are most important?

As sections 4.3 and 4.4 show, each of the parenting domains (connection, negativity and control) contained parenting measures with significant associations with both child health and health behaviours. The magnitude of these significant associations did not differ greatly between child health and health behaviours, although high conflict was unique in its particularly strong association with social, emotional and behavioural difficulties. Within each 'domain', each dimension of parenting was associated with several health/health behaviour outcomes (the one exception being mother-infant attachment, which was only associated with limiting long-term illness).

These findings of a complex network of associations between all domains and dimensions of parenting suggest that a wide, rather than a narrow, range of parenting skills is important to benefit both children's health and their health behaviours. Although it is difficult to single out particular dimensions of parenting, it is worth noting that low parental supervision was associated with three out of six health outcomes, and bordered on statistical significance for a fourth outcome. For child health behaviours, joint mother-child activities and parental rules appeared more important, as each measure was associated with three out of the four health behaviours studied.

4.6 Associations between index of parenting skills and child health and health behaviours

In this section, we consider the association between classification on the index of parenting skills (low, average or high) and child health and health behaviours.

Figures 4-A and 4-B show the proportion of children in poor health and with poor health behaviours according to their grouping on the parenting skills index. The graphs show that the prevalence of children in poor health and with poor health behaviours increased as the level of parenting skill decreased. The difference between the low parenting skill group and the other two groups was most pronounced for social, behavioural and emotional difficulties.

Figure 4-A Percentage of children in poor health according to parenting skill index group

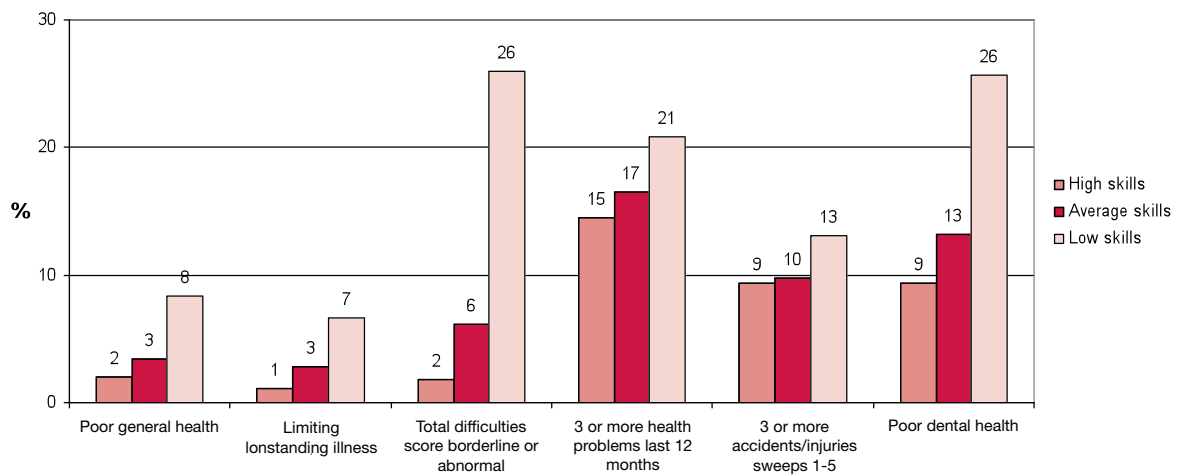
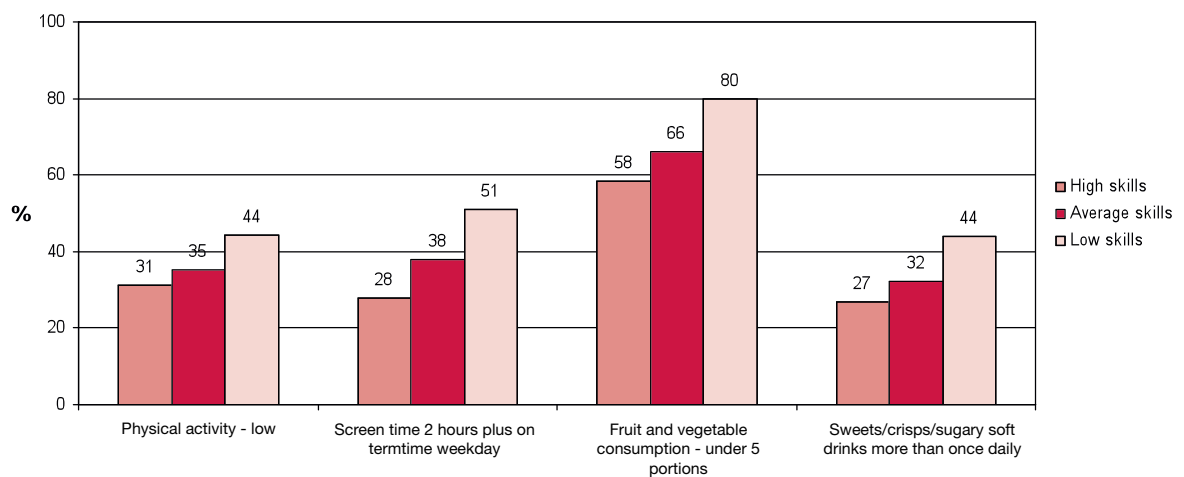


Figure 4-B Percentage of children with poor health behaviours according to parenting skill index group



4.6.1 Associations between parenting index and health and health behaviours after controlling for family influences

Two-stage analysis of associations between the parenting index and both health outcomes and health behaviours were performed in a similar fashion to that described for the previous sections. Full results are presented in section 2.5 of the Technical Appendix. Table 4.5 summarises statistically significant associations between the parenting index and health outcomes/health behaviours after controlling for family influences and the relationships between the parenting measures. There were significant associations between the parenting index and all health outcomes and health behaviours, with two exceptions: health problems and accidents/injuries.

Table 4.5 Associations between parenting index and child health and health behaviours after controlling for family influences

		Parenting index
Child health	General health fair, bad or very bad	✓
	Limiting long-standing illness	✓
	Total difficulties score borderline or abnormal	✓
	Three or more health problems last 12 months	
	Three or more accidents/injuries sweeps 1-5	
	Dental decay	✓
Child health behaviours	Physical activity - low	✓
	Screen time 2 hours plus on term-time week day	✓
	Fruit and vegetable consumption - under 5 portions	✓
	Sweets/crisps/sugary soft drinks more than once daily	✓

N=3343 (unweighted). Ticks indicate significant associations between variables. Models adjusted for child's gender, age at sweep 5, birth order; number of children in household; mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation.

Full details of the strength of the associations are included in the technical appendix. In summary, we found that, when children in the low parenting skills group were compared with those in the high parenting skills group:

- Low parenting skill showed the strongest association with social, behavioural and emotional difficulties. The odds of children of parents in the low skill group having mild or severe difficulties were more than eleven times higher than those of children with parents in the high skill group.

- For the other health outcomes, the odds of having poor health for children with low skill parents ranged from being two to over four times higher than for children with high skill parents.
- The odds of children of with low-skilled parents having poor health behaviours were 1.5 times to over 2 times higher than those for children with high skill parents.

For two health outcomes (limiting long-term illness and social, emotional and behavioural difficulties) and two health behaviours (screen time and fruit and vegetable consumption), children of parents with average skills were also more likely to have poor health and poor health behaviour than children in the high parenting skills group. Elsewhere, differences between the average and high skills groups were not statistically significant ($p < 0.05$).

This analysis further confirms that highly skilled parenting is associated with more positive health outcomes and health behaviours in children.

4.7 Summary

Parenting skills are associated with a range of child health outcomes and behaviours. Even after taking account of the child's social background and family circumstances, low overall parenting skills were associated with poorer general health, greater longstanding illness, poorer mental health, worse dental health, lower physical activity, higher screen time, lower fruit and vegetable consumption, and more snacking amongst children.

A wide range of different parenting skills were important for health, although certain aspects of parenting appeared particularly relevant for specific outcomes. For example, high levels of parent-child conflict were strongly associated with behavioural and emotional difficulties, whereas joint mother-child activities and parental rules appeared more important for health behaviours.

At an overall level, parenting skill was more strongly related to certain health outcomes and behaviours than others. The association between low parenting skills and children's social, behavioural or emotional difficulties was particularly strong. In contrast, there were no associations between overall parenting skills and number of health problems in the past year, or accidents and injuries over the first five years after allowing for other family factors.

chapter
DO DIFFERENCES IN PARENTING CONTRIBUTE TO
INEQUALITIES IN CHILD HEALTH AND
HEALTH BEHAVIOURS?

5

5.1 Introduction

Analysis in section 2.5 illustrated how child health outcomes varied by levels of family adversity. Then, in section 3.7, the analysis demonstrated how parenting skill also varied by family adversity. Given these relationships, this chapter explores whether differences in parenting may help to explain some of the association found between family adversity and children's health.

This topic was investigated using two stages of statistical modelling. Stage 1 examined the association between family adversity and each of the health outcomes or health behaviours after controlling for a set of basic demographic factors (the child's gender, the child's age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep 5).

At stage 2, all the individual parenting measures were then added to the models. If parenting is an important explanation for inequalities in health according to level of family adversity, we would expect the strength of the association between family adversity and health (observed in stage 1) to be reduced after controlling for parenting in this way.

5.2 Key findings

- Differences in parenting accounted for some, but not all, inequalities in child health and health behaviours that are linked to family adversity.
- Parenting differences were a stronger explanation for some health inequalities than others. High parenting skill reduced the association between adversity and health by between 33% and 44% for poor general health, limiting long-term illness, social, emotional and behavioural difficulties, and poor dental health.
- Parenting skill had a lesser effect on health problems (22%) and accidents and injuries (8%).
- Parenting skill accounted for between 32% and 54% of the association between adversity and screen time, fruit and vegetable consumption and snacking on crisps, sweets and sugary drinks.

5.3 Does parenting account for inequalities in child health?

The graphs in Figure 5-A display odds ratios with 95% confidence intervals before (stage 1) and after (stage 2) parenting variables are added to the model. When the dashed line falls below the solid line this indicates a reduction in the strength of association between family adversity and child health when parenting variables are added to the model suggesting that differences in parenting across families with different levels of adversity explain some of the inequalities in that health outcome.

As the graphs show, for the most part when parenting measures were added to the models, the strength of the relationships between family adversity and poor health were reduced. For many health outcomes, the effect of the adjustment for parenting appeared greatest with higher levels of family adversity. That is, parenting skills accounted for more inequalities in health for those families experiencing the highest levels of adversity (shown by the wider gaps between the two lines towards the right-hand side of the graphs).

In order to estimate how much of the relationship between family adversity and health behaviour inequalities is explained by differences in parenting, children who had no adversity were compared with children experiencing any level of adversity (more information is provided in section 2.6 of the Technical Appendix)¹⁰.

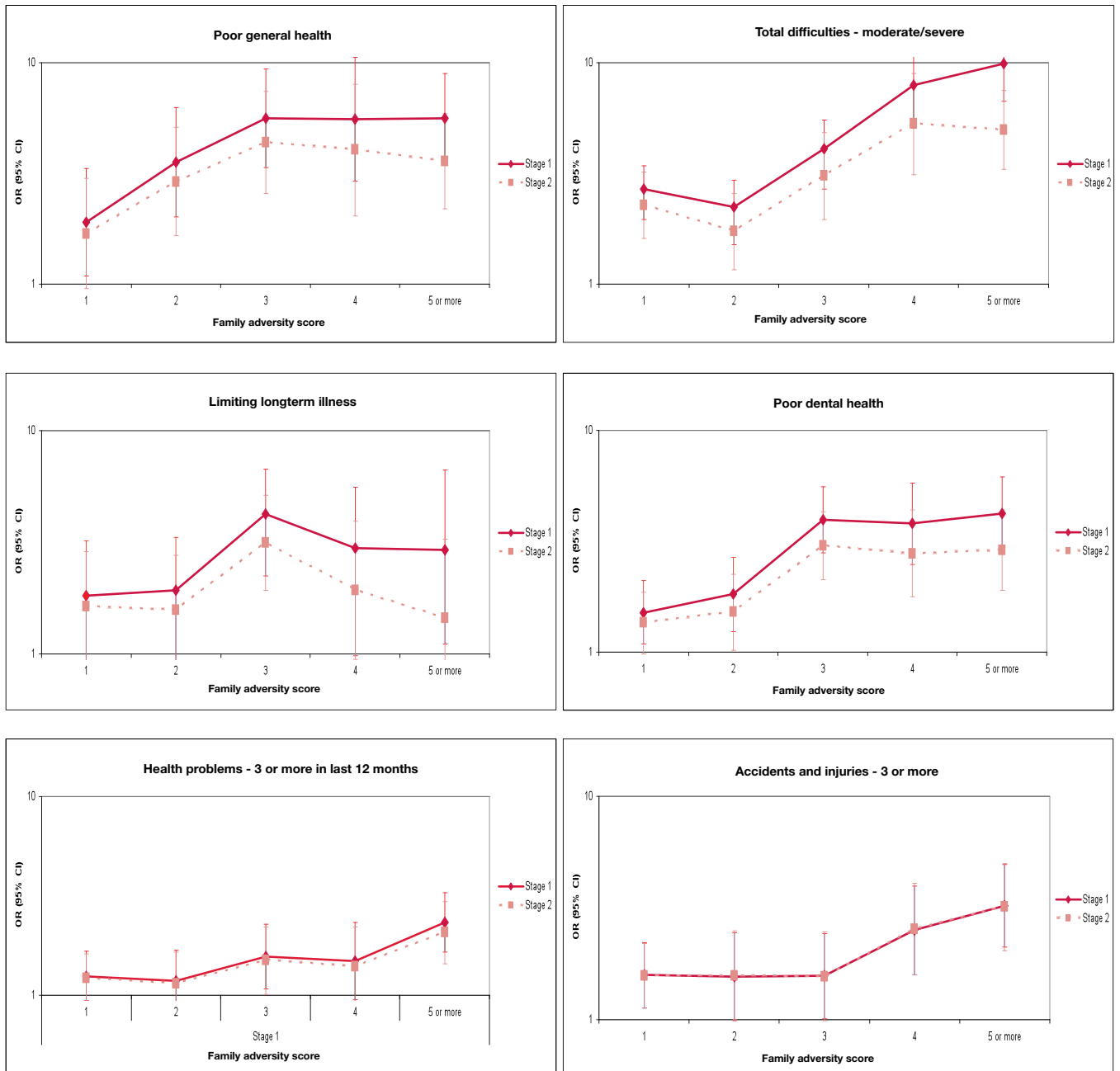
- The effect of parenting was strongest in the model of limiting long-term illness, reducing the odds associated with family adversity by 44%.
- For poor general health, social, emotional and behavioural difficulties and dental health, parenting accounted for 33%, 40% and 38% of the association between adversity and health.
- Smaller reductions were achieved in the models of health problems (22%) and accidents and injuries (8%).

For health problems and accidents and injuries, the effect of parenting was very small. These findings should not be taken to imply that parents cannot do much to reduce the incidence of health problems or accidents and injuries in their children. Both outcomes may relate more to other aspects of the family environment, or to parental behaviours that have not been studied here.

The results imply that parenting may help to explain some of the inequalities in child health linked to family adversity. However, in most cases, family adversity remained significantly associated with health inequalities even after taking account of differences in parenting. This suggests that parenting is only a partial explanation for inequalities in child health. Parenting may be more important for some health outcomes than others, and overall is likely to constitute only a partial explanation for inequalities in child health.

¹⁰ We combined all children who had an adversity score of one or more into a single group and compared them with children who had an adversity score of zero. Again two stages of modelling were used to compare the odds of poor health in children with some degree of family adversity before and after controlling for parenting.

Figure 5-A Associations between family adversity and poor health, before and after taking account of parenting



n=3343 (unweighted). The graphs display odds ratios with 95% confidence intervals before (stage 1) and after (stage 2) parenting variables are added to the model. When the dashed line falls below the solid line this indicates a reduction in the strength of association between family adversity and child health when parenting variables are added to the model suggesting that differences in parenting across families with different levels of adversity explain some of the inequalities in child health outcomes. Stage 1 adjusted for child gender, age in months at sweep 5, birth order and number of children in household at sweep 5. Stage 2 further adjusted for all parenting measures.

5.4 Does parenting account for inequalities in child health behaviours?

Figure 5-B shows associations between family adversity and child health behaviours, before (stage 1) and after (stage 2) adjusting for all parenting measures, as in the previous section. Physical activity has not been included in this table, as it did not show a clear trend according to the level of family adversity (see Chapter 2).

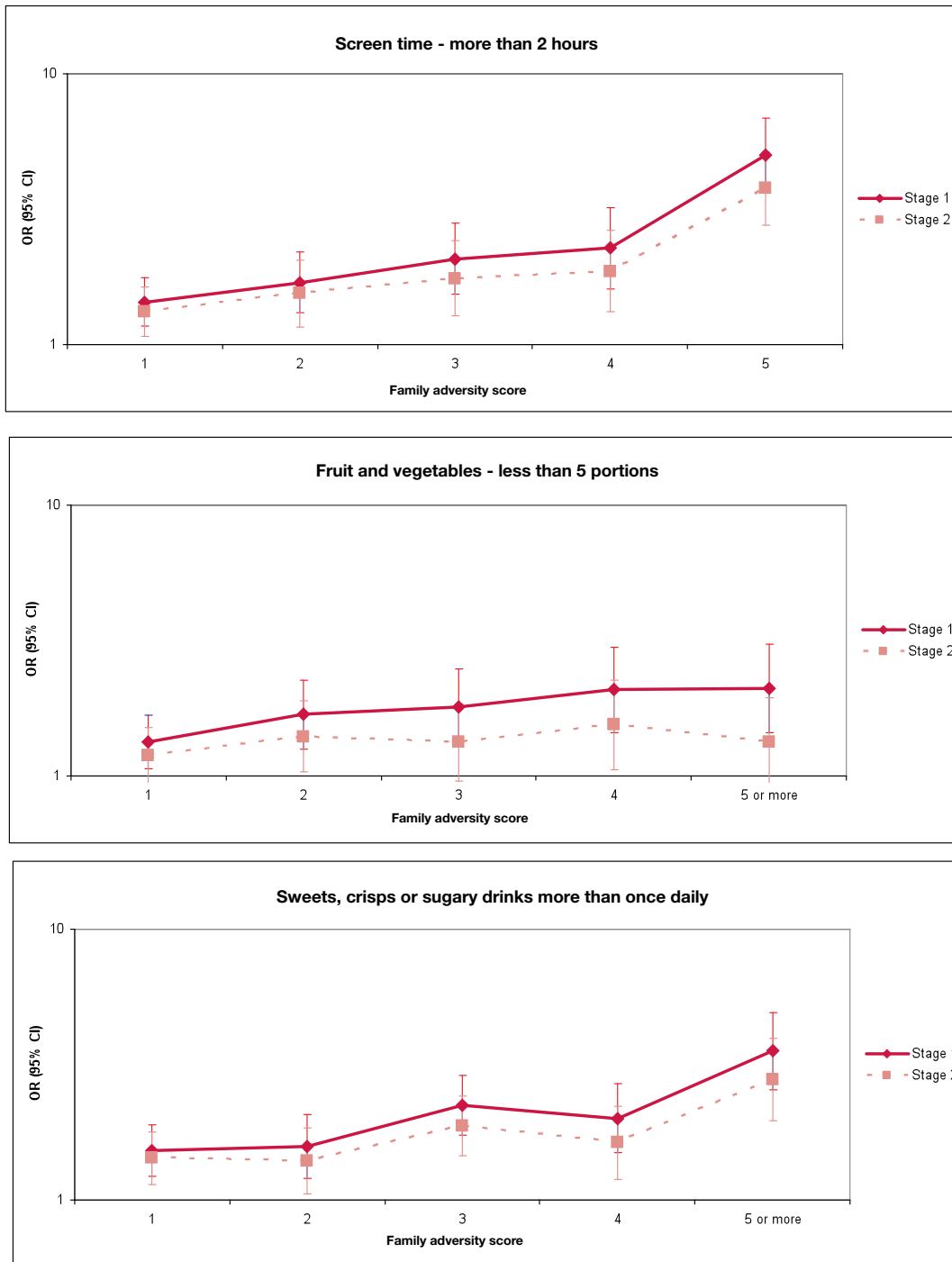
The graphs present a similar picture to the effect of parenting measures in the models of child health. There is a reduction in the strength of the association between family adversity and health behaviours at stage 2 when parenting is controlled for in the models. Again, the greatest reductions in the odds of poor health behaviours are seen at higher levels of family adversity. This implies that parenting may help to explain some of the inequalities in child health behaviours linked to family adversity, particularly among those families experiencing higher levels of adversity.

As in the previous section, to estimate how much of the relationship between family adversity and health behaviour inequalities is explained by differences in parenting, children with any level of family adversity greater than zero were compared with those who had no adversity. Parenting explained some, but not all of the effect of family adversity on health behaviour (see Technical Appendix for more information). The effect is estimated at:

- 33% for screen time;
- 54% for fruit and vegetable consumption; and
- 32% for unhealthy snacking.

To summarise, the findings suggest that parenting may explain some, but not all of the inequalities in child health behaviours that are linked to family adversity.

Figure 5-B Associations between family adversity and poor child health behaviours, before and after taking account of parenting



n=3343 (unweighted). Stage 1 adjusted for child gender, age in months at sweep 5, birth order and number of children in household at sweep 5. Stage 2 further adjusted for all parenting measures.

chapter
SUMMARY AND CONCLUSIONS

6

This chapter summarises the main findings, discusses some of the limitations of the study and reflects on implications for policy and practice.

The main aim of this report was to investigate two research questions:

- (1) Which aspects of day-to-day parenting are associated with children's health and health behaviours?
- (2) Do variations in parenting account for social inequalities in child health outcomes?

The study examined six child **health outcomes**:

- general health
- limiting long-standing illness
- social, emotional and behavioural difficulties
- dental health
- short-term health problems in the last year
- accidents and injuries

and four child **health behaviours**:

- physical activity
- 'screen time': watching television or using computers and games consoles
- fruit and vegetable consumption
- snacking on crisps, sweets and sugary drinks.

With the exception of accidents and injuries, which used data from all five sweeps, these outcomes were based on information reported by mothers at the fifth interview in 2009/10 when the study children were almost 5 years old (58 months).

6.1 Associations between parenting and health and health behaviours

Parenting behaviours covered three main 'domains' identified in other research (Belsky et al. 2007): connection, negativity and control. Connection included a measure of early mother-infant attachment, a later measure of the warmth of the mother-child relationship and activities undertaken together. Negativity covered a measure of conflict in the mother-child relationship and parent's use of smacking as a disciplinary tool. Control comprised parental supervision, rule setting and amount of household disorganisation or 'home chaos'. Some parenting measures were based on sweep 5 information (warmth and conflict, and home chaos). Other measures used information from earlier sweeps (mother-infant attachment used sweep 1 information, and supervision used sweep 4

information) while the remainder (joint activities and rule-setting) drew on information from more than one sweep. All parenting behaviours were reported by the mother at interview.

The report examined associations between these individual measures or 'dimensions' of parenting and health, as well as looking at associations between health outcomes and a composite measure or 'index' of parenting. This parenting index was similar to one devised for the evaluation of Sure Start (National Evaluation of Sure Start 2008), although GUS does not contain the observational measures used in the Sure Start evaluation. The parenting index combined scores across various dimensions. Parents who had high scores on warmth, number of joint activities, supervision and rule-setting, but low scores on conflict and 'home chaos', were considered to have the highest skill in this parenting index. The report used the index to divide parents into three equal groups of low, average and high parenting skills.

The analysis of associations between parenting and health outcomes controlled for other important family influences on poor health, including low income and maternal mental health that have been widely found in other research including other investigations using GUS data.

Low overall parenting skill, as measured by the parenting index, was associated with greater risk of several health outcomes including:

- poor general health;
- limiting long-term illness;
- social, emotional and behavioural difficulties; and
- poor dental health.

Low overall parenting skill was also associated with all four health behaviours – physical activity, screen time, fruit and vegetable consumption and snacking on crisps, sweets and sugary drinks.

The increased likelihood of social, emotional and behavioural difficulties for children whose mother had low parenting skills was particularly strong. There was evidence that average parenting skills were also disadvantageous compared to high skills for some of these outcomes. There were no associations between overall parenting skills and the number of health problems in the past year and accidents and injuries.

Overall, there were significant associations between all three domains of parenting and the outcomes studied. When the various dimensions of parenting were examined in detail, it appeared that both child health outcomes and health behaviours each had

slightly different patterns of association with parenting behaviours. Low parental supervision was associated with behavioural difficulties, limiting long-term illness and poor general health. For child health behaviours, joint mother-child activities and parental rules appeared more important. Lower scores on each of these measures were associated with lower physical activity, lower fruit and vegetable consumption and unhealthy snacking.

6.2 Does parenting help to explain social inequalities in child health?

To explore the second research question, an index of family adversity combined eight different indicators of health risk including low income and maternal depression, using an approach that was similar to a US study (Larson et al. 2008). Higher family adversity index scores were associated with higher prevalence of poor child health and health behaviours, with two exceptions. In the case of limiting long-term illness, there was no clear increase in prevalence with higher family adversity score, although any score above zero was associated with a greater risk of limiting long-term illness compared to children with no family adversity.

There was no clear association of physical activity with the family adversity score. Another study using Growing Up in Scotland data did find a relationship between physical activity and social background (Marryat et al. 2009). However, the two studies have taken different approaches to measuring activity and social background. Here we have separated out sedentary behaviour – watching TV and playing on computers and games consoles – from active behaviours, and we have looked at associations with an overall measure of adversity rather than the relationship between activity and the individual components of this measure. Our study did find a strong association between screen time and social background.

There was also strong patterning of parenting behaviour according to family adversity score. Parents in families with higher adversity scores were less likely to have a warm relationship with their child, to share joint activities, to have low conflict and avoid smacking and to exercise control over their child's behaviour. Variations in parenting amongst families with different levels of adversity offered some explanation for part of the association found between family adversity and several health outcomes. However, there was a negligible effect of variation in parenting on associations between family adversity and accidents and injuries. Furthermore, after allowing for parenting, there was still an association between family adversity and other poorer health outcomes. This implies that parenting is likely to offer only a partial explanation for inequalities in child health that are linked to social background.

It should be stressed that associations found between parenting and child health and health behaviours in this report are not in themselves evidence of causation. There are several limitations to the analysis that should be borne in mind when assessing any policy relevance.

The study relies on mother's own reports of both parenting and their child's health. While there is evidence that use of self-rated health measures is likely to be a reasonable measure of social inequalities found in direct measures of health (Subramanian and Ertel 2008; Subramanian and Ertel 2009), less is known about the validity of mother's reports of child health and self-reported parenting information. There may be bias, if for example a mother's report of parenting behaviour is influenced by social desirability, or if a mother's views of her relationship with her child and the child's health are influenced by the mother's own difficulties. Future use of observational data and linkage of GUS data to independent health service data may help overcome these issues.

In addition, many of the parenting behaviours were measured concurrently with health outcomes. It is possible that some of the associations found could be due in part to reverse causation: for example, social, emotional and behavioural difficulties or a long-standing health problem could lead to conflict in the mother-child relationship. It is also likely that there are unmeasured factors responsible for many of the associations found: in particular, it is impossible with this type of study to distinguish between genetic and environmental influences on health. Genetic predispositions could affect both a mother's parenting behaviour and the propensity of her child to suffer poor physical and mental health.

6.3 Implications for policy and practice

These limitations underline the necessity for more in-depth exploration of possible mechanisms underlying associations between parenting and health. This will be aided by longitudinal analysis of associations between parenting measures used in this study and child health outcomes added in future sweeps, including more objective measures such as BMI and hospital admissions.

Research on factors conducive to positive change in parenting behaviour, using parenting measures tracked at future sweeps of GUS would also be a useful addition to the evidence base for parenting policy. Existing research on the ALSPAC cohort suggests that improving parental support may be effective (Waylen and Stewart-Brown 2010), although there is a particular challenge in engaging with parents to deliver the appropriate support (Mabelis and Marryat, 2011). The list of parenting processes included here is not exhaustive, and future work could add parenting behaviour that is likely to be related closely to specific outcomes, such as parental modelling of health behaviours, as well as parents' confidence in their ability to look after their children well,

something that has been highlighted as important in other research (Lexmond and Reeves 2009). The study also has a limited focus on mothers' parenting of children up to the age of 5, and more work is required to establish wider applicability to the role of fathers or non-biological parent figures, or to the parenting of older children.

Despite the limitations of the study that have been highlighted above, the findings suggest that policy measures to strengthen parenting skills may benefit child physical and mental health and child health behaviours. It is beyond the remit of this report to suggest mechanisms for delivering parental support, and measures could range from direct (e.g. parenting advice and classes) to indirect (alleviating aspects of family adversity that may impede good parenting). In what follows, the term 'parenting programmes' is intended to cover a range of policy options.

Since greater parental connection, lower negativity and more control each contained dimensions of parenting associated with several health benefits, parenting programmes that support a wide range of skills are likely to achieve more wide-ranging health improvements than programmes with a narrower focus on only one or two aspects of parenting. With regard to health behaviours, parenting that encompasses many joint mother-child activities and has rules to guide a child's daily activities may be optimal. For health, a high degree of parental supervision appeared important although not predominantly so.

Many different aspects of parenting were associated with social, behavioural and emotional difficulties in children, so it is possible that parenting programmes would achieve the greatest health benefits here. Even if part of the association is due to reverse causation, with children's behaviour and emotional difficulties leading to difficulties in parenting, the findings underline the need to support parents of these children.

Other aspects of child health, such as health problems and accidents and injuries, appeared to be less strongly influenced by general parenting skills. Stronger associations with parenting may be found in future studies that are able to account for differences in the type or severity of health problems and injuries, or that examine their accumulation over a longer period. In addition, it is likely that other aspects of parenting such as ensuring that children's immunisation record is complete, a good diet and a warm and safe living environment are more closely related to these health outcomes than the general parenting skills examined in this report.

The strong patterning of parenting according to family adversity in itself suggests that parents in higher-risk groups may need additional help in addressing obstacles to more skilful parenting of their children. Families experiencing adversity may benefit from support in multiple areas of parenting to promote a higher degree of connection and

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control, and lower conflict with children. More skilful parenting is likely to have wider benefits on children's overall development apart from health.

Echoing other research pointing to multiple explanations for health inequalities in terms of stress, culture, knowledge and resources as well as parenting skills (Bradley and Corwyn 2002; Chen 2004; Conger and Donnellan 2007) the findings suggest that parenting is likely to be only part of the answer to removing social inequalities in health.

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ISBN 978-1-7559-78045-198-5 (web only)

APS Group Scotland
DPPAS11599 (06/11)

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