

Exploring the association between social disadvantage in early childhood with onset of limiting long term illness/disability (LLTI/D) in later childhood

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Background

- There is a known association of childhood LLTI/D with low household income and relative social disadvantage (Blackburn et al 2010; Berntsson and Kohler 2001)
- Gordon et al (2000) suggested that social disadvantage may be on the causal pathway to childhood disability as well as being a consequence of caring for a child with a disability
- The World Report on Disability (2011) states:
- “ *longitudinal data sets to establish the causal relation between disability and poverty are seldom available, even in developed countries*” (page 39)
- Despite an extensive literature search, we have been unable to find published studies exploring the social situation of families prior to the onset of childhood LLTI/D

This paper

- Examines whether there is an association of social disadvantage in earlier childhood with onset of LLTI/disability in later childhood
- Discusses the limitations of these findings and additional work needed to further explore causal pathways to childhood LLTI/D

Study design and methods

- Research questions:
 - i) Is there an association of social disadvantage in earlier childhood with onset of LLTI/disability in later childhood?
 - ii) If so, is the association graded by degree of disadvantage?

Study design and methods

- Secondary analysis of the UK Office for National Statistics Longitudinal Study (ONS-LS)
- 1% representative sample from 1971 Population Census for England and Wales and additional births on identified longitudinal study days;
- Sample tracked through subsequent censuses
- Data from census forms and linked information from vital registration systems (births, cancer registrations, deaths)
- ONS-LS also has data on other people identified as living in the same household e.g. parents
- Census has a single question that identifies adults and children reported as having a limiting long-term illness, health problems or disability:
Do you have any long-term illness, health problem or disability that limits your daily activities or the work you can do?

Our extracted sample

- 61,603 children between 1981 and 1991 became ONS-LS members and were tracked in 1991 and 2001 population censuses.
- Data extracted from ONS-LS member files and non-member files (those in same household)
- Index group: children not reported to have LLTI/disability in 1991 but reported to have LLTI/disability in 2001 (2049 with complete data)
- Comparison group: children not reported to have LLTI/disability in 1991 or 2001 (50790 with complete data)

Data analysis

- Cross tabulations to generate descriptive data
- Social disadvantage index: aggregate index constructed from 3 dichotomised variables:
 - Housing tenure: owner occupied v rented/other
 - Social class of household: high (1-3) v low (4-5)
 - Car/van ownership: 1 or more cars/vans v 0 cars/vans
- Scored on each variable: 0 indicates no disadvantage, score of 1 indicates disadvantage. Scores summed to give an aggregate score of 0-3, where 0 = not disadvantaged on any and 3 = disadvantage on all 3 factors
- Logistic regression models
 - Controlled for potential confounders: child's age, child's sex, child's ethnicity, family status

Data analysis

- Logistic regression models fitted on index/ comparison :
 - Model 1: Social disadvantage index entered alone
 - Model 2: Social disadvantage index plus child's age & sex
 - Model 3: above plus child's ethnicity
 - Model 4: above plus family status

Results

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Characteristics	Index group (no LLTI '91/LLTI '01) n = 2049	Comparison group (no LLTI in '91 or '01) n = 50790	p value
Sex: Boys Girls	1131(55.2%) 918 (44.8%)	25794(50.8%) 24996(49.2%)	<0.001
Mean age ('01)	14.67	14.56	<0.01
Ethnicity: White Black Indian Pakistani/B'desh Other	1878(91.7%) 117(5.2%) 11(0.5%) 27(1.3%) 16(0.8%)	46926(92.4%) 2616(5.2%) 241(0.5%) 769(1.5%) 236(0.5%)	0.24 (linear trend)
Family status in '91: Lone parent household	328(16%)	5718(11.3%)	<0.001
Social disadvantage index in '91: Disadvantaged in 3 Disadvantages in 2 Disadvantaged in 1 Not disadvantaged	169(8.2%) 258(12.6%) 504(24.6%) 1118(54.6%)	2337(4.6%) 4114(8.1%) 10405(20.5%) 33934(66.8%)	<0.001 (linear trend)

Logistic regression models fitted on index group (no LLTI '91 – LLTI '01)

Independent variables	Model 1 OR (95%CI)	Model 2 OR (95% CI)	Model 3 OR (95%CI)	Model 4 OR (95%CI)
Social disadvantage index (no disadvantage as ref):				
Disadvantage in 3	2.20(1.86,2.59)	2.21(1.87,2.62)	2.20(1.87,2.62)	2.11(1.76,2.53)
Disadvantage in 2	1.49(1.25,1.79)	1.50(1.26,1.80)	1.51(1.26,1.81)	1.45(1.20,1.75)
Disadvantage in 1	1.15(0.94,1.41)	1.15(0.94,1.41)	1.16(0.95,1.41)	1.14(0.93,1.39)
Sex (girls as ref)	-	1.20(1.10,1.31)	1.20(1.10,1.31)	1.20(1.10,1.31)
Age (<1 as ref)	-	1.02(1.01,1.03)	1.02(1.01,1.03)	1.02(1.01,1.03)
Ethnicity (white as ref)	-	-	0.99(0.92,1.08)	0.99(0.92,1.08)
Family status (couple as ref)	-	-	-	1.11(0.97,1.27)

Discussion

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Strengths and limitations of the study

- Strengths:
 - large, representative sample with sufficient power to account for potential confounding by age, sex, gender, family structure, social disadvantage
 - Longitudinal design thus able to examine temporal ordering
 - High response rate (98%) due to legal requirement to complete census form
- Limitations
 - Non-participation, loss at follow up, missing data are possible threats to validity
 - Participation in UK census is socially patterned, with lower response from socially disadvantaged areas – findings likely underestimate the impact of social disadvantage on the relationships considered
 - 1991 and 2001 censuses used a single, generic question to identify report LLTI/D

Discussion

- To our knowledge, this is the first study to explore the temporal direction of the relationship between social disadvantage and childhood LLTI/disability
- Our findings are similar to those of Jenkins & Rigg (2003) in adults
- The association of later onset of LLTI/disability with social disadvantage in earlier childhood is unaffected by ethnicity and only slightly attenuated by lone parenthood
- There is a clear gradient with odds of onset of LLTI/disability in later childhood increasing with increasing social disadvantage

Discussion

- Our findings support, but do not prove, a role for social disadvantage in the causal pathway to childhood LLTI/disability
- The graded relationship with earlier social disadvantage is supportive evidence of a causal role
- Further work is needed to explore this relationship preferably in longitudinal data sets with more detailed social and biological data

Discussion

- Further evidence of a role for social disadvantage in the causal pathway will require:
 - Large prospective data sets with sufficient power to test the associations identified here & adjust for confounders
 - Data on social circumstances before the onset of LLTI/D
 - Data on type and severity of LLTI/D
 - Replication of our findings especially ‘dose-response’ relationship
 - Evidence for biologically plausible mechanisms by which social disadvantage might be part of the causal pathway to specific types (conditions) of LLTI/D

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- Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland.
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