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Use of services and associated costs for young adults with childhood hyperactivity/conduct problems: 20-year follow-up

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Background

- Children who have received a clinical diagnosis of ADHD are likely to use more services and incur greater public costs than children without ADHD (findings from USA)
- With regards to UK, a study has quantified that child psychiatric disorders totalled £1.47bn in 2008 (Snell et al., 2013).
- Supplementary evidence suggests that the economic impact of ADHD is about three times greater in relation to affected adults than children and adolescents.

Background

- The size of costs in the adulthood for problems related to ADHD is critical, as avoiding that the disease persist after infancy would potentially save considerable resources.
- Furthermore, ADHD is a risk factor for the development of additional problems including:
  - ❑ other psychiatric disorders
  - ❑ substance misuse
  - ❑ educational underachievement
  - ❑ difficulties with employment and/or with relationship
  - ❑ criminal activities

Aims of the study

- In relation to young adults who had hyperactivity and/or conduct problems during childhood, the aim of the study is:
  - ❑ To describe the use of services and calculate recent (past 6 months) and early adulthood (since the age of 18 years) public expenditure costs incurred by.
  - ❑ To investigate clinical and socioeconomic predictors of early adulthood costs of illness as well as employment outcomes.

Baseline data (original study)

- The sample used in this study is the second follow-up of a cohort of 3,215 six to seven years old boys resident in Newham (London), attending mainstream schools.
- The baseline study took place in 1981-1983.
- Hyperactivity and conduct disorders in the boys was assessed using parent-rated Rutter A(2) and teacher-rated B(2) scores.
- The threshold scores represented severity of the behavioural problems rather than the exact diagnostic criteria. Boys with additional emotional problems have been excluded because of a different aetiology.

Group allocation

- **Hyperactivity only: boys who scored high on hyperactivity on both parents' and teachers' questionnaires but below the conduct problems threshold.**
- **Conduct problems only: boys who scored high on either parents' or teachers'-rated questionnaires, but did not have pervasive hyperactivity.**
- **Mixed problems: boys who scored high for both hyperactivity and conduct problems.**
- **Control group: boys who didn't score for neither of the behavioural problems.**

Illnesses' characteristics

Hyperactivity:

- Attention deficit
- Impulsive behaviour
- Problems with executive functions

Conduct disorder:

- Anti-social behaviour
- Violation of social norms
- Violence toward animals, peers, etc.

Follow-up data (our study)

- Of the 120 boys from the original sample, 83 (69%) were successfully followed up and grouped by baseline "diagnosis":

❑ 24 participants with hyperactivity only (63% of the original group).

❑ 18 with conduct problems only (75% of the original group).

❑ 16 with mixed problems (64% of the original group).

❑ 25 controls (76% of the original group).

- No meaningful differences were found between those who were and those who were not followed up.

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Summary statistics at baseline

Variable	Control group (n=25)		Hyperactive group (n=24)		Conduct problems (n=18)		Mixed group (n=16)		P-value
Rutter A2 score	4.16	(3.33)	12.29	(7.42)	11.61	(2.57)	15.38	(5.9)	0.00
Rutter B2 score	9.48	(5.24)	15	(6.92)	10.11	(4.61)	16.06	(4.12)	0.00
Number of rooms	4.92	(0.76)	4.71	(0.95)	4.89	(0.76)	4.81	(0.91)	0.83
Number of people in the hhold	4.44	(1.36)	4.13	(1.33)	4.39	(1.04)	5.5	(1.63)	0.02
Number of children (<17 years)	2.28	(1.37)	2.67	(1.27)	2.44	(0.92)	3.13	(1.45)	0.21
Father unemployed (>3 months)	3/22	(14%)	1/19	(5%)	0/17	(0%)	4/15	(27%)	0.10
Fathers' occupational SES (semi-skilled & unskilled)	5/24	(21%)	8/20	(40%)	5/17	(29%)	4/15	(27%)	0.57
Housing problems	3	(12)	6	(25)	1	(6)	4	(25)	0.27
Housing: poor state of repair	6	(24)	8	(33)	6	(33)	6	(37)	0.81

Summary statistics at follow-up

Variable	Control group (n=25)		Hyperactive group (n=24)		Conduct problems (n=18)		Mixed group (n=16)		P-value
Age, years: mean (s.d.)	27.36	(1.47)	27.71	(1.27)	27.61	(1.04)	27.69	(0.70)	0.74
GP (past 6 months)	15	(60%)	12/22	(55%)	7	(39%)	13	(81%)	0.09
General hospital out-patient or A&E (past 6 months)	4	(16%)	4/23	(17%)	1	(6%)	5	(31%)	0.26
A&E	12	(48%)	15	(63%)	12	(67%)	10/15	(67%)	0.54
General hospital out-patient	16/22	(73%)	17/23	(74%)	11	(61%)	12	(75%)	0.78
General hospital admission	5	(20%)	10	(42%)	7	(39%)	7/15	(47%)	0.27
Psychiatric out-patient	5	(20%)	4	(17%)	1	(6%)	0	(0%)	0.18
Psychiatric hospital admission	1	(4%)	2	(8%)	0	(0%)	0	(0%)	0.66
Received medication for anxiety/depression	4	(16%)	3	(13%)	2	(11%)	1	(6%)	0.83
Any police contact	15	(60%)	13	(54%)	10	(56%)	11	(69%)	0.81
Employed	22	(88%)	19	(79%)	15	(83%)	13	(81%)	0.87
No/rare absenteeism	11/23	(48%)	15/21	(71%)	4/17	(24%)	7/14	(50%)	0.03

Unit costs

- Health care-related unit costs for hospital services were obtained from National Health Service (NHS) reference costs for 2009/10.
- Unit costs for GP visits, nurse consultations, counselling and social care support were taken from the PSSRU volume for 2010.
- Values for DLA, JSA and housing benefits (to assist with costs of accommodation rent) were obtained using averages obtainable from public sources (www.direct.gov.uk).
- Unit costs for court appearances and prison stays were also obtained from Ministry of Justice reports.

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Costs' descriptive statistics

Variable	Control group (n=25)		Hyperactive group (n=24)		Conduct problems (n=18)		Mixed group (n=16)	
Past 6 months:								
Total benefits	**68**	(341)	**160**	(547)	**519**	(1457)	**611**	(2443)
	[-73	*209]*	*[-71*	*391]*	*[-206*	*1243]*	*[-691*	*1912]*
Health and social care	**694**	(1829)	**442**	(765)	**413**	(945)	**689**	(1160)
	[-61	*1449]*	*[111*	*773]*	*[-57*	*883]*	*[-71*	*1307]*
Total	**762**	(1849)	**609**	(1053)	**932**	(1822)	**1299**	(2994)
	[-1.17	*1525]*	*[154*	*1064]*	*[26*	*1838]*	*[-296*	*2895]*
Since age of 18 years:								
Criminal justice	**1294**	(4448)	**1001**	(3801)	**3561**	(9511)	**539**	(953)
	[-542	*3130]*	*[-604*	*2606]*	*[-1169*	*8290]*	*[31*	*1047]*
Health and social care	**1563**	(2797)	**2099**	(2662)	**2670**	(5758)	**2010**	(2016)
	[408	*2717]*	*[975*	*3222]*	*[-193*	*5533]*	*[935*	*3084]*
Total	**2856**	(6945)	**3099**	(4950)	**6231**	(14985)	**2549**	(2244)
	[-10	*5723]*	*[1009*	*5189]*	*[-1221*	*13682]*	*[1353*	*3744]*

Childhood predictors of early adulthood costs

Variable	Model A (95% CI)	Model B (95% CI)	Model C (95% CI)
Hyperactive	1.09 (0.36-3.32)	1.70 (0.76-3.79)	1.74 (0.83-3.63)
Conduct problems	2.15 (0.52-8.97)	3.25* (1.05-10.0)	2.63 (0.98-7.03)
Hyperactive x conduct problems	0.40 (0.08-2.03)	0.23 (0.05-1.01)	0.26* (0.07-0.94)
Age	-	0.81 (0.62-1.07)	0.78 (0.57-1.06)
IQ	-	0.98* (0.96-0.99)	0.98 (0.96-1.00)
Household size (factor 1)	-	-	1.20 (0.88-1.64)
Housing problems (factor 2)	-	-	0.92 (0.71-1.19)
Father's work status (factor 3)	-	-	1.20 (0.89-1.62)
Observations	83	83	83

Main conclusions

- High levels of childhood conduct problems -> about 3 times increase in early adulthood costs, mainly driven by criminal justice contacts.
- Mixed problems group presented highest recent costs in terms of receipt of benefits and health and social care, but they had the lowest criminal justice lifetime cost.
- The “real-life” character of the sample may make it a powerful tool.
- However, possible misallocations and small numbers may be a limitation.

Thank you.

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