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RESEARCH


PAUL RAPSON/SPL

THIS WEEK'S RESEARCH QUESTIONS

Risk factors in medical students for subsequent professional misconduct

Janet Yates and David James' case-control study found that male sex, lower estimated social class, and poor early performance at medical school were independent risk factors for subsequent professional misconduct (p 1073).

There is plenty of evidence that male doctors are over-represented in cases of professional misconduct (*JAMA* 1998;279:1889-93), and previous studies in the United States have indicated a link between poor academic record and being disciplined by a medical board (*N Engl J Med* 2005;353:2673-82). Perhaps the most interesting result of Yates and James' research is the link between lower social class and future misconduct.

Others have picked up on this finding and its implications. Writing in a Rapid Response on bmj.com, Andrew D Beggs, a surgery research fellow in London, says "Concluding that medical students with lower socioeconomic status are more likely to face future General Medical Council disciplinary action . . . could theoretically be used to discriminate against these students at an undergraduate level" (http://www.bmj.com/cgi/eletters/340/apr27_1/c2040#235056). However, editorialist Alison Reid points out that "Yates and James are rightly cautious in attributing meaning to their findings in relation to social class" (p 1041).

Recurrence of hyperemesis gravidarum across generations

Hyperemesis gravidarum—the severe form of "morning sickness"—is thought to have a genetic component: if a woman experienced hyperemesis in her first pregnancy, the risk in a second pregnancy is about 15% (*BJOG* 2005;112:1641-5).

Åse Vikanes and colleagues have now found further evidence for a genetic element to the condition in a cohort study of nearly a million mother and child pairs in Norway (p 1071). Women who were born after a pregnancy complicated by hyperemesis had a 3% risk of having hyperemesis in their own pregnancy, whereas women who were born after an unaffected pregnancy had a risk of 1.1%. More intriguingly, female partners of sons who were born after pregnancies complicated by hyperemesis had a risk of 1.2%.

Removing financial incentives from clinical quality indicators

In April 2011, eight of the current 134 indicators for which general practices in the United Kingdom gain performance related pay will be removed from the Quality and Outcomes Framework (QoF). These eight indicators cover routine processes such as taking blood pressure or measuring serum cholesterol, rather than clinical outcomes.

David Reeves and colleagues pointed out recently that there is not much evidence on what happens to performance when an indicator is removed or replaced (*BMJ* 2010;340:c1717). Now some of the same authors, led by Helen Lester, have studied four of 20 indicators—diabetic retinopathy screening, cervical screening, glycaemic control, and hypertension control—used in the large Kaiser Permanente health maintenance organisation in northern California (p 1072). Between 1999 and 2007, financial incentives were removed from two of the indicators.

Regression analyses using routinely collected patient data showed that removal of incentives was associated with a decline in screening for diabetic retinopathy of about 3% per year and a drop in screening for cervical cancer of about 2% per year. Extrapolating these findings to the QoF is tricky, the authors admit, because payments attached to indicators within Kaiser Permanente are directed to large medical care facilities rather than to individual doctors.

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Community falls prevention for people who call an emergency ambulance after a fall: randomised controlled trial

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STUDY QUESTION

Can a rehabilitation service to prevent falls in the community reduce the rate of falls in people who fall and call an emergency ambulance but are not taken to hospital?

SUMMARY ANSWER

A community based falls prevention service significantly reduced the rate of falls.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Many people who call an ambulance after a fall are not taken to hospital. A community based falls prevention service reduced the rate of falls in these people and led to increased levels of activity and reduced fear of falling.

Design

We carried out a randomised controlled trial to compare an intervention to prevent falls in the community with standard medical and social care. Participants were allocated to their group using stratified randomisation and those in the control group were advised to use health and social services as usual. A multidisciplinary falls prevention service delivered the intervention: participants had reviews of drugs and blood pressure and were referred when appropriate; at home they were offered training in strength and balance, removal of potential hazards, and provision of aids; and in community centres they were offered sessions on falls prevention.

Participants and setting

Eligible adults were those aged over 60 who lived at home or in residential care and had called an emergency ambulance after a fall but had not been taken to hospital.

Primary outcome

The primary outcome measure was the rate of falls over 12 months, ascertained using telephone prompted, self completed monthly falls diaries.

Main results and the role of chance

Two hundred and four people were recruited, 102 in each group. Overall, 956 falls were reported during follow-up, of which 649 were in the control group (84.5 person years) and 307 in the intervention group (88.6 person years). The incidence of falls per year was 3.46 in the intervention group and 7.68 in the control group (incidence rate ratio 0.45, 95% confidence interval 0.35 to 0.58, P<0.001).

Harms

No adverse consequences were observed. On the contrary, several secondary outcomes were in favour of the intervention. In the intervention group a smaller proportion of participants called an emergency ambulance during follow-up; activity levels were greater, as measured by the Barthel index and Nottingham extended activities of daily living scale; and fear of falling was reduced, as measured by the falls efficacy scale.

Bias, confounding, and other reasons for caution

As this was an open and single centred study using an outcome measure that could not be objectively verified, a risk of bias exists.

Generalisability to other populations

These findings are likely to apply to other settings where ambulance services are used by people who fall and where many are not taken to hospital, and also where this high risk group does not routinely receive interventions for falls prevention.

Study funding/potential competing interests

This study was funded by a postdoctoral training scholarship awarded to PAL from the UK NHS National Institute of Health Research. We have no competing interests.

Trial registration number

Current Controlled Trials ISRCTN67535605.

OUTCOMES IN PARTICIPANTS ALLOCATED TO FALLS PREVENTION INTERVENTION OR STANDARD CARE

Outcome measures	Control group (n=102)	Intervention group (n=102)	Comparison* (95% CI)	P value
Primary outcome:				
Rate of falls/year	7.68	3.46	Incidence rate ratio 0.45 (0.35 to 0.58)	<0.001
Secondary outcomes:				
No (%) admitted to hospital with ≥1 fractures	6 (6)	3 (3)	Risk ratio 0.51 (0.13 to 2.06)	0.35
No (%) who died by 12 month assessment	16 (16)	14 (14)	Risk ratio 0.89 (0.43 to 1.82)	0.74
Total No of emergency ambulance attendances at home for fall	365	245	Incidence rate ratio 0.60 (0.40 to 0.92)	0.018
Barthel activities of daily living index (0-20)	15 (12-17)	15 (12-18)	Odds ratio (split at median, 15) 2.91 (1.18 to 7.20)	0.021
Nottingham extended activities of daily living scale (0-22)	6 (1-10)	8 (4-13)	Linear regression coefficient (mean difference) 3.47 (2.13 to 4.81)	<0.001
Falls efficacy scale (0-100)	76 (53-91)	57 (41-75)	Linear regression coefficient (mean difference) −16.5 (−23.2 to −9.8)	<0.001

Values are median (interquartile ranges) unless stated otherwise.
*Estimates adjusted for stratum (primary care trust). Comparisons for Barthel index score, Nottingham extended activities of daily living score, and falls efficacy score also adjusted for respective baseline values.

Recurrence of hyperemesis gravidarum across generations: population based cohort study

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EDITORIAL by Nelson-Piercy

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STUDY QUESTION

Do women and female partners of men born after pregnancies complicated by hyperemesis gravidarum (hyperemesis) have an increased risk of hyperemesis?

SUMMARY ANSWER

There was threefold increase in the risk of hyperemesis among daughters if their mother had had hyperemesis, whereas the female partners of men whose mothers had had hyperemesis did not have an increased risk of the condition.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Women who had hyperemesis in their first pregnancy have a high risk of recurrence. The observed pattern of familial clustering across generations suggests that maternal genes are more important than fetal genes in the aetiology of hyperemesis. Environmental influences along the maternal line, however, cannot be excluded as contributing factors.

Participants and setting

The data sample comprised 544 087 units of mother and childbearing daughter and 399 777 units of mother and child producing son. The medical birth registry of Norway, comprising 2.3 million births, provided linked generational data.

Design, size, and duration

Population based cohort study with data from 1967 to 2006. The relative risks of hyperemesis were estimated by odds ratios, calculated with logistic regression in three groups: mother-daughter recurrence; mother-son recurrence; and mother-daughters recurrence.

Main results and the role of chance

Daughters who were born after a pregnancy complicated by hyperemesis had a 3% risk of having hyperemesis in their own pregnancy, while women who were born after an unaffected pregnancy had a risk of 1.1% (unadjusted odds ratio 2.9, 95% confidence interval 2.4 to 3.6). Female partners of sons born after pregnancies complicated by hyperemesis had a risk of 1.2% (1.0, 0.7 to 1.6). Daughters born after a pregnancy not complicated by hyperemesis had an increased risk of the condition if the mother had had hyperemesis in a previous or subsequent pregnancy (3.2 (1.6 to 6.4) if hyperemesis had occurred in one of the mother's previous pregnancies and 3.7 (1.5 to 9.1) if it had occurred in a later pregnancy). Adjustment for maternal age at childbirth, period of birth, and parity did not change the risk estimates.

Bias, confounding, and other reasons for caution

Our population based cohort is based on mandatory reporting of a standardised dataset over a period of 40 years. Selection bias is not an issue in this situation. The validity of the data on hyperemesis in the registry is acceptable, as has been discussed in earlier publications. Unfortunately, variables such as body mass index, smoking habits, educational attainment, and ethnic background were not available. However, we do not expect residual confounding to influence our main results on exposure-outcome associations.

Generalisability to other populations

To the extent that the pattern of familial clustering across generations reflects biological mechanisms, the findings are relevant for all populations.

Study funding/potential competing interests

ÅV is funded by the Research Council of Norway. The authors are independent from funders. There are no conflicts of interests.

RISK OF HYPEREMESIS ACROSS GENERATIONS AND UNADJUSTED ODDS RATIOS

Hyperemesis in mother	No of pregnancies	No of daughters or son's partners with hyperemesis	Risk of hyperemesis (%)	OR* (95% CI)
All mother-childbearing daughter units				
Yes	3704	111	3.00	2.90 (2.35 to 3.57)
No	540 383	5680	1.05	Reference
Total	544 087	5791	1.06	—
All mother-child producing son units				
Yes	2290	27	1.18	1.04 (0.68 to 1.58)
No	397 487	4499	1.13	Reference
Total	399 777	4526	1.13	—

*Based on robust clustering accounting for dependencies within data. Of first generation mothers in mother-childbearing daughter units, 58% contributed more than one family record. Of first generation mothers in mother-child producing son units, 54% contributed more than one family record.

The impact of removing financial incentives from clinical quality indicators: longitudinal analysis of four Kaiser Permanente indicators

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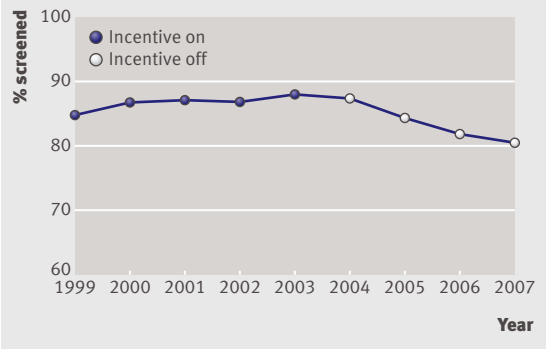
STUDY QUESTION What happens to performance levels when facility directed financial incentives are removed from clinical quality indicators in a primary care setting?

SUMMARY ANSWER Removing facility directed financial incentives from clinical indicators might result in a decline in performance levels.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Many healthcare systems now attach financial incentives to clinical indicators. Removal of financial incentives for two quality indicators has been associated with small falls in performance levels. Policy makers and clinicians need to be aware that removing financial incentives from clinical indicators might result in recorded performance levels, and consequently patient care, declining over time.

PERCENTAGE OF ADULTS AGED ≥31 SCREENED FOR DIABETIC RETINOPATHY IN RELATION TO FINANCIAL INCENTIVES



Participants and setting

The study population consisted of adult members of Kaiser Permanente Northern California, an integrated healthcare system providing medical care to about 3.1 million members. We included members whose primary source of care was one of 35 outpatient facilities owned by Kaiser Permanente Northern California.

Design, size, and duration

We examined four of 20 prespecified indicators, choosing those common to both the UK primary care "pay for performance" system, the Quality and Outcomes Framework, and the Kaiser Permanente Northern California, where incentives are directed to medical facilities, such as screening for cervical cancer, hypertension control (systolic blood pressure <140 mm Hg), glycaemic control (HbA_{1c} <8%), and screening for diabetic retinopathy. From 1999 to 2007, financial incentives were removed from both types of screening. We combined the automated data at patient level to produce quality indicators for each of the 35 facilities.

Main results and the role of chance

Hypertension control was incentivised through the period of interest. The proportion of hypertensive adults whose systolic blood pressure was below 140 mm Hg rose from 58.3% in 2002 to 78.2% in 2007. Glycaemic control was not incentivised during 1999 and 2000 and levels of achievement were 44.2% and 46.8%, respectively. Performance continued to improve after the introduction of incentives in 2001, with levels of achievement increasing most years and reaching 69.8% in 2007. During the five consecutive years when financial incentives were attached to screening for diabetic retinopathy (1999-2003), the proportion screened rose from 84.9% to 88.1%. During the four years without incentives, the proportion screened fell to 80.5%. When financial incentives were applied to cervical cancer screening (1999-2000), screening rates rose slightly from 77.4% to 78.0%. During the next five years when financial incentives were removed, rates fell to 74.3%. Incentives were then reapplied for two years during 2006 and 2007 and screening rates increased again. Regression analyses show that, after incentives were removed, screening for diabetic retinopathy fell by about 3% per year and screening for cervical cancer by about 2% per year.

Bias, confounding, and other reasons for caution

Within Kaiser Permanente Northern California the payment attached to each indicator is directed to its large medical care facilities rather than to individual doctors, and doctors' income is not affected by the incentives. Separating the impact of financial incentives from that of other regional efforts directed towards the same quality measures is also difficult. Although the data for each indicator suggest a general upward trend over time for incentivised indicators, no data are available for comparison from practices that are not incentivised that would allow distinction of effects, because of underlying trends and secular influences, such as publicity.

Generalisability to other populations

In the UK payment is directed to primary care practices and directly affects doctors' income, which limits the generalisability of the findings to other pay for performance systems such as the Quality and Outcomes Framework.

Study funding/potential competing interests

HL and SC are contracted to the National Institute for Health and Clinical Excellence (NICE) to provide advice on indicators for the Quality and Outcomes Framework. The authors' views do not necessarily represent those of NICE or its independent Quality and Outcomes Framework advisory committee.

Risk factors at medical school for subsequent professional misconduct: multicentre retrospective case-control study

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EDITORIAL by Reid
HEAD TO HEAD, p 1064

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STUDY QUESTION

Are there risk factors in a doctor's time at medical school that are associated with subsequent professional misconduct?

SUMMARY ANSWER

In this small limited study, male sex, examination failures early in the medical course, and lower social class background were independent risk factors for later professional misconduct.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Male doctors are known to have more complaints made against them. Studies in America suggest that professional misconduct could be linked to poor performance or unprofessional behaviour at medical school. Our study provides the first comparable evidence from the United Kingdom. Larger studies are needed to explore our findings in greater depth.

Participants and setting

The study involved doctors who had graduated from eight UK medical schools between 1958 and 1997.

Design, size, and duration

Cases were doctors who had been called before the UK's General Medical Council (GMC) in 1999-2004 and found to have shown professional misconduct. Four controls per case were selected from matching graduation cohorts. The doctors' medical school records were fully anonymised at source before we used them to extract sociodemographic and course progress data.

Primary outcomes, risks, exposures

The primary outcome was that of being a "case." Potential risk factors were sociodemographic factors (sex, age at course entry, and social class estimated from the father's stated occupation) and problems on the course (failed examinations, overall poor performance, delay in course completion, and adverse comments made in the medical school record).

Main results and the role of chance

Multivariable conditional linear regression showed that male sex, poor performance in the early course, and lower estimated social class at course entry were risk factors for subsequent professional misconduct (table). After statistical imputation to account for 30% missing data in the above model, the risk factors remained the same. The odds ratios were 5.57 (95% confidence interval 2.03 to 15.25, P=0.001) for male sex; 3.19 (1.29 to 7.87, P=0.012) for lower estimated social class; and 3.21 (1.43 to 7.23, P=0.005) for failed exams in early/preclinical course.

Bias, confounding, and other reasons for caution

The data should be interpreted with caution as they are derived from a small sample and only eight medical schools. Data quality and completeness were variable because of the long time span involved. The cases were identified over a short period of five years and excluded doctors with health problems or who chose voluntary erasure from the medical register. We could not study the potential effects of the medical schools themselves nor of career specialties or different types of misconduct. The odds ratios represent relative risk, and the absolute risk in a doctor from any background remains small.

Generalisability to other populations

Although we have no reason to expect our sample to be non-representative, we cannot say that it is generalisable to the wider population of doctors. The study was preliminary and needs to be repeated on a larger sample.

Study funding/potential competing interests

The study was completed with the full approval and cooperation of the UK GMC, who identified the cases and controls, liaised confidentially with the medical schools, and provided funding for the clerical work involved in copying and anonymising student files before they were sent to us for data entry. They had no further role in the collection or analysis of the data but approved the writing of this paper. JY is funded by the Service Increment for Teaching (SIFT).

MULTIVARIABLE CONDITIONAL LOGISTIC REGRESSION OF EXPLANATORY VARIABLES AGAINST OUTCOME OF BEING "CASE"

Factor	Adjusted odds ratio* (95% CI)	P value*
Male sex	9.80 (2.43 to 39.44)	0.001
Lower estimated social class	4.28 (1.52 to 12.09)	0.006
Failed exams in early or preclinical course	5.47 (2.17 to 13.79)	<0.001

*Adjusted for all variables entered into first model.

Responses on bmj.com

"The best thing for further planning would be to search for the problem in the current medical curriculum. 'What's missing from this class?' is a simple but important question."
Viroj Wiwanitkit, physician, Bangkok, Thailand

"Concluding that medical students with a lower socioeconomic status are more likely to face future disciplinary action from the General Medical Council ... could theoretically be used in the future to discriminate against such students at the undergraduate level."
Andrew D Beggs, research fellow surgery, London, UK

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