

ORIGINAL ARTICLE

Impact of feeling responsible for adverse events on doctors' personal and professional lives: the importance of being open to criticism from colleagues

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Objective: To investigate the impact of adverse events that had caused patient injury and for which the doctor felt responsible, and the experience of acceptance of criticism among colleagues.

Design: Self-reports based on postal questionnaires to 1616 doctors.

Setting: Norway.

Participants: A representative sample of 1318 active doctors.

Results: 368/1294 (28%) reported that they had experienced at least one adverse event with serious patient injury. Being male and working within a surgical discipline (including anaesthesiology, obstetrics and gynaecology) significantly increased the probability of such reports. 38% of the events had been reported to official authorities and, for 17% of doctors, the incident had a negative impact on their private life; 6% had needed professional help. 50% and 54%, respectively, found it difficult to criticise colleagues for their ethically or professionally unacceptable conduct. Doctors who found it easy to criticise colleagues also reported having received more support from their colleagues after a serious patient injury.

Conclusion: Male surgeons report the highest prevalence of adverse events. Criticism for professionally and ethically unacceptable conduct is difficult to express among doctors. More acceptance of criticism of professional conduct may not only prevent patient harm, but may also give more support to colleagues who have experienced serious patient injury.

While it has been shown that errors, complaints, and litigations have negative effects on medical practice,^{1–4} less attention has been given to how an unintended patient injury is experienced and tackled by the doctor. Although patient injury does not necessarily imply negligence, to cause suffering for a patient is probably a devastating experience for many doctors, and little or no support from colleagues after an accident has happened may add weight to the burden.^{5–7}

A trait of the medical culture is low acceptance of criticism among colleagues.⁸ The medical culture may be characterised as defensive and authoritarian.^{9–11} This may lead to serious ethical and medical problems being silenced, and colleagues who express doubt towards the quality of the solutions chosen may be regarded as enemies of the system and punished.^{8, 12} The Bristol cases serves as an example of vital criticism being ignored or disbelieved by the medical community with devastating consequences for children.^{10, 12, 13}

In Norway an ongoing prospective study on doctors' experiences, attitudes, and behaviour (box 1) made it possible to ask a cohort of doctors about their views on openness about errors, professional performance, and difficult ethical issues.

The objectives of the present study were (1) to determine how many and what kind of doctors have experienced adverse events that led to serious patient injury, (2) to study how such events have influenced the doctors' professional and private lives, (3) to assess the extent to which Norwegian doctors accept criticism of professional and ethical misconduct in their workplace, and (4) to explore whether such acceptance is related to the way incidents of serious patient injury are experienced. Our hypotheses are that the risk of having caused serious patient injury is highest among surgeons and other procedure intensive specialties, and that acceptance of criticism among colleagues reduces the negative impact of adverse events on the part of the doctor.

METHODS

A description of the sample is shown in box 1. The demographic data are taken from the main study.

Specialist categories

There are 43 medical specialties and subspecialties in Norway, some with few active members. With a sample of 1600 it was necessary to combine the specialties into larger

Box 1 Norwegian doctor surveys

The Norwegian Medical Association, organising more than 90% of all doctors practising in Norway, has sponsored its own research institute with the main objective to study the health and behaviour of doctors. See <http://www.legeforeningen.no/index.db2?id=4699> for an overview of the more than 150 publications so far.

In 1993 The Research Institute invited 2000 active doctors to participate in a prospective study about career changes and various ethical and political aspects of the practice of medicine. 1272 agreed and this group, minus 21 who have since died or withdrawn, has during the subsequent years received several questionnaires. In January 2000 another 795 doctors who had received their license after 1993 were invited to join the panel, of which 365 agreed. Accordingly, the number of participating doctors in 2000 was 1616. There were questions about the following topics (with already existing publications indicated): use of Internet to stay professionally updated,^{14, 15} the gatekeeper role,¹⁶ difficult end-of-life decisions,¹⁷ suicidal ideation and attempts (forthcoming), use of tobacco and alcohol,¹⁸ and doctors' perception of the expression "numbers needed to treat".¹⁹

entities with similar work conditions, so the respondents were divided into the following seven categories: no specialty, family medicine/general practice, laboratory medicine (radiology, pathology, biochemistry), internal medicine (including neurology and oncology), surgical medicine (including anaesthesiology and obstetrics and gynaecology), psychiatry, and community medicine/public health. Specialists in training were categorised according to their future specialty.

Questionnaire

In March 2000 a postal questionnaire was sent by mail to the 1616 doctors who had previously agreed to take part in the research projects. The questions were on six broad topics (box 1). This paper is based on the response to questions on adverse events and their consequences, and participants' views on reactions to these events by colleagues, patients, and health authorities.

We asked: "Have you experienced serious patient injury in connection with medical treatment you have given?" followed by nine questions about potential consequences on the part of the doctor (listed in table 3).

Two statements about acceptance of criticism were presented:

- It is difficult to criticise my colleagues for their ethically unacceptable conduct.
- It is difficult to criticise my colleagues for their professionally unacceptable conduct.

The statements were scored on a 4-point scale according to how well they described the respondent's relationship with his or her colleagues at the present work site: a good description, a fair description, a poor description, and a wrong description.

Analysis of data

We first estimated the prevalence of being responsible for serious patient injury and differences with respect to sex, age, and specialty. We also looked at possible differences between those who had experienced this "a few times" and those who reported "several times". We then analysed the professional and personal consequences for those who had experienced serious patient injury. Finally, we looked at acceptance of criticism among colleagues, and whether doctors working in a setting with a high level of such acceptance who had experienced serious patient injury were more likely to have received good support from their colleagues.

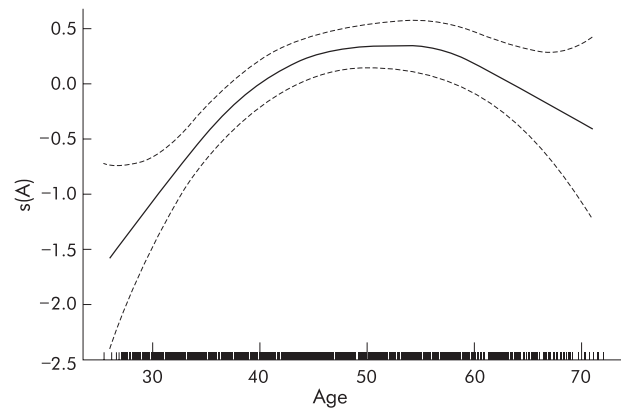


Figure 1 Estimated partial effect of age on the logit of the probability of having experienced serious patient injury, controlled for sex and specialty, with 95% confidence interval.

The results are presented as proportions with 95% confidence intervals or cross-tabulated categories with the gamma test for association between ordinal variables. Logistic regressions are used to show simultaneous effects. The statistical programs SPSS 11.0 and SPlus 2000 were used.

RESULTS

After one reminder 1318/1616 (82%) completed forms were returned. Of these, 484 (37%) were categorised as non-specialists, 250 (19%) as primary health care specialists, 68 (5%) as laboratory medicine specialists, 231 (18%) as internal medicine specialist, 157 (12%) as surgical medicine specialists, 96 (7%) as psychiatry or child psychiatry specialists, and 32 (2%) as public health or occupational medicine specialists. Table 1 compares the respondents with the population of active Norwegian doctors in April 2000. General practitioners and older doctors are slightly overrepresented, while the age group 35–44 years is somewhat underrepresented.

Prevalence of serious patient injury

1294 doctors responded to the question "Have you ever experienced a patient who was seriously injured due to the treatment you gave?" Response options were "never", "a few times", and "several times". 926 (72%) had never had this experience, 354 (27%) answered "a few times", and 14 (1%) answered "several times". In the subsequent analyses the two latter groups were combined. Figure 1 illustrates this

Table 1 Comparison between respondents and total Norwegian doctor population in 2000

	Respondents (% (n = 1318))	(95% CI)	All active doctors (% (N = 14 400))	p values
Sex				
Females	31.4	(28.9 to 34.0)	30.4	0.45
Males	68.6	(66.0 to 71.1)	69.6	
Age (years)				
<35	18.1	(16.1 to 20.3)	16.9	0.26
35–44	26.4	(24.1 to 28.9)	30.8	<0.005
45–54	31.2	(28.7 to 33.8)	32.0	0.54
55+	23.4	(21.2 to 25.8)	20.3	<0.005
Type of practitioner				
Senior consultants	27.2	(24.8 to 29.7)	29.1	0.14
Junior registrars	19.5	(17.4 to 21.8)	19.7	0.86
General practitioners	20.7	(18.6 to 23.0)	15.9	<0.005
Private practice specialists	5.3	(4.2 to 6.7)	5.6	0.67
Others	27.3	(25.9 to 29.8)	29.7	.07

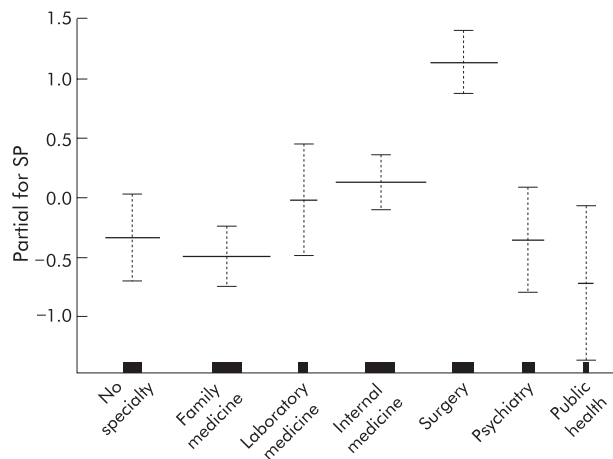


Figure 2 Estimated partial effects of specialities on the logit of the probability of having experienced serious patient injury, controlled for sex and age, with 95% confidence intervals.

response as a partial function of age controlled for sex and specialty group in a generalised additive model on a logistic scale.²⁰ The smoothed age function is close to quadratic, and the peak of the curve is calculated at age 52.1 when age is assumed to have a quadratic effect (the model below). In fig 2 the same model is used to show differences between specialty groups relative to the grand mean and controlled for age and sex. A similar analysis showed that male doctors were significantly more likely to have experienced serious patient injury; this was also the case when age and speciality were controlled for (results not shown).

Figure 2 also suggests an ordering of specialty groups according to risk which agrees with prior expectations. To test this ordering we used Helmert contrasts in a logistic regression model with “having experienced serious patient injury” as the response variable, specialty group and sex as categorical covariates, and linear and quadratic terms for age. The Helmert contrast allows us to test whether a specialty group differs significantly from the average for specialties lower in the ordering. The results of this modelling are shown in table 2. The odds ratios for specialty groups compares one group with the pool of specialties lower in the chosen order. A similar model in which the interaction between sex and age was included did not give a better fit.

Of the 368 respondents who reported having had patients who were seriously injured due to treatment, 14 had experienced this several times. A similar logistic regression as that shown above on this subset of data showed a significant difference between specialist groups ($p = 0.02$). However, none of the Helmert contrasts was individually significant, and no ordering is therefore significant among specialist groups with respect to the propensity of experiencing serious injury given at least one such experience, when controlling for age and sex.

Consequences for the doctor of serious patient injury

The respondents who reported having experienced at least one adverse event with serious injury were asked nine follow up questions about various consequences of the event. The response alternatives were “yes”, “no”, or “not sure”. Table 3 shows the responses to these nine questions, ranked according to prevalence. For each question only those who responded to the particular question are included. 22/365 (6%) had needed professional help, 40/366 (11%) found that the event had made it harder to work as a doctor, and 62/362 (17%) indicated a negative impact on their private life. In

Table 2 Logistic regression showing the adjusted effects of sex, age, and speciality on the probability of having experienced an adverse event with serious patient injury

	B	OR	95% CI
Age	0.036		0.02 to 0.05
Age ²	-0.003		-0.005 to -0.001
Males	0.677	1.97	1.43 to 2.90
Public health	0	1	
Family medicine	0.107	1.11	0.78 to 1.60
Psychiatry	0.084	1.09	0.89 to 1.32
No specialty	0.046	1.05	0.92 to 1.19
Laboratory medicine	0.091	1.10	0.99 to 1.22
Internal medicine	0.085	1.09	1.03 to 1.15
Surgery	0.206	1.23	1.17 to 1.30
Intercept	-2.253	0.365	

Helmert contrasts for specialty group, with ordering as given and public health specialty as reference. 95% confidence intervals for linear coefficients (B) or odds ratios (OR) for contrasts of categorical covariates.

133/360 (37%) of the cases the event had been reported to the County medical officer or the State board of health. 117/366 (32%) had been blamed by the patient or the patient’s family after the event, and 79/357 (22%) had not received good support from colleagues after the incident. General practitioners and laboratory doctors reported the best support. 231/339 (68%) reported that they had spoken with the patient or the patient’s family about the event.

Acceptance of criticism among colleagues

1292 doctors responded to the statement on difficulties in criticising their colleagues’ unethical conduct. 213 doctors (17%) considered this statement to be a good description of their present working situation, 432 (33%) considered it a fair description, 286 (22%) felt that the statement fit poorly, and 217 (17%) considered that the description did not fit at all. The remaining 144 (11%) indicated “not applicable”, probably because they did not work in a medical setting or were alone at work. Of the 1290 doctors who responded to the statement on difficulties in criticising professionally unacceptable conduct, 229 (18%) felt that the statement was a good fit, 469 (36%) a fair fit, 304 (24%) a poor fit, and 148 (12%) felt that the statement did not fit at all; 140 (11%) indicated “not applicable”.

To explore possible differences between groups, we dichotomised the response of the two statements into good or fair = 0 and poor or not at all = 1 (“not applicable” was omitted) and used this as the response variable in two logistic regression models with age, sex, and specialist category as effect variables. The only significant effect in these two models was that surgeons (including gynaecologists and anaesthesiologists) were slightly less likely to experience acceptance of criticism of ethically unacceptable conduct (OR 0.53, 95% CI 0.28 to 0.99 compared with public health specialists).

Relationship between consequences for the doctor of serious patient injury and acceptance of criticism

The statement on colleague support after a serious patient injury (table 3, second statement) was cross-tabulated against the two statements about acceptance of criticism of ethical or professional misconduct at the workplace. The statement about colleague support was coded “no” = 0, “not sure” = 1, and “yes” = 2. The statements about lack of acceptance of criticism at the workplace were coded as follows: “good description” = 1, “fair description” = 2, “poor description” = 3, and “wrong description” = 4 (“not applicable” responses were omitted). Thus, a higher value indicates a higher level of acceptance. Of the 357 doctors who responded to the statement about colleague support after

Table 3 Consequences of events with serious patient injury ranked according to prevalence

	Yes (%)	(95% CI)	No (%)	(95% CI)	N
The incident was discussed at the workplace	83	(79 to 87)	15	(12 to 20)	365
I received good support from colleagues	69	(64 to 74)	22	(18 to 27)	357
The incident was reported to the Board of Health	37	(32 to 42)	52	(47 to 57)	360
I was blamed by the patient or the patient's family	32	(27 to 37)	63	(58 to 68)	366
I have spoken with the patient or the patient's family about the incident	68	(63 to 73)	28	(23 to 33)	339
The incident had a negative impact on my private life	17	(14 to 22)	76	(71 to 80)	362
The incident was reported in the media	12	(9 to 16)	87	(83 to 90)	359
The incident has made it harder to work as a physician	11	(8 to 15)	83	(79 to 87)	366
I have needed professional help	6	(4 to 9)	92	(89 to 95)	365

The response alternative "not sure" was omitted.

serious patient injury, 335 and 331 respectively also responded to the statements about acceptance of criticism of ethical and professional misconduct at the workplace. In both cases (colleague support *v* acceptance of criticism of ethical misconduct and colleague support *v* acceptance of criticism of professional misconduct) there was a statistically significant trend for higher levels of acceptance to be associated with better colleague support: gamma = 0.272 ($p = 0.002$) and gamma = 0.292 ($p = 0.001$), respectively.

DISCUSSION

The study shows that one in three doctors have at least once been responsible for serious patient injury, and that this experience is particularly prevalent among doctors working in surgical disciplines. For some doctors such an adverse event had a negative impact on both their professional and private life. However, to be able to criticise colleagues for unethical or unprofessional conduct is only natural for half the doctors. This means that the intraprofessional mechanisms to deal with and learn from adverse events are not used to their full potential.

Since adverse events are not always recognised as such by individual doctors, the figures we present are minimum figures. Further, we have left it to the individual doctor to define "serious patient injury". Although this definition may vary from one doctor to another, our main focus is how this event was experienced and tackled by the doctor. We therefore feel that this individualistic definition is acceptable. That doctors working in surgical specialties most frequently report patient injury as a result of their treatment is not surprising, as the mishaps within this domain may be more "technical" and more readily identifiable. The curvilinear relationship with age may be explained by at least two different mechanisms: (1) that the oldest doctors have forgotten or suppressed their experiences with serious patient injury, or (2) that such incidents were considered more "normal" in earlier times.

In Norway serious patient injury as a rule should be reported to the County Medical Officer or the Board of Health. Although some of the incidents in this study took place before such reports became obligatory, it is remarkable that more than half the events were not reported. This indicates that external control systems only play a secondary role in quality improvement. On the other hand, 47% of Norwegian doctors have experienced complaints, although not necessarily in connection with serious patient injury.⁴

It was found that most doctors say that, in a hypothetical situation, they would disclose errors to patients out of moral reasons and in order to maintain trust.²¹ However, Wu *et al*²² retrospectively asked doctors whether they had talked with patients or families after mistakes had been made and found that only 24% had done so. In our study 68% had talked with patients or relatives after the incident. One explanation for

this difference may be that we studied the consequences of serious patient injury while Wu *et al* studied the consequences of medical mistakes in general. To meet with patients or family may be regarded as more necessary both medically and morally when the injury is serious. "Silencing" the event frequently increases the victims' perception of offence and injury.²³ To meet the patient and the family is probably one important way of reducing the negative impact of the event for the doctor,²² the other being able to speak openly about it with colleagues.

A questionnaire survey is not the best way of learning about serious incidents and strong emotional reactions; in-depth interviews would clearly have given additional information. However, this was not possible due to the anonymous design of the survey. Also, many of the reported events may have taken place when the respondents were in positions other than their present one, so the basis for testing our hypothesis about a possible association between good colleague support and less strain when incidents happen is not very strong.

Our data suggest that acceptance of criticism and discussion of ethical and professional matters among colleagues is not necessarily a sign of a colder and less human atmosphere, as this was positively related to increased perceived support from colleagues after the event. Discussion among colleagues after a serious event has taken place is vital to understanding what went wrong and is thus an important factor in quality improvement. The doctors who had the best routines for dealing with such situations also reported the highest level of colleague support.

It may be seen as worrisome (but not unexpected) that half the doctors found it difficult to criticise a colleague's unethical or unprofessional conduct. This characteristic of the medical culture may be seen as counterproductive to quality improvement. A previous Norwegian study also showed that criticism of colleagues and exposure of uncertainty is not necessarily easy for doctors.²⁴ It is interesting

Key messages

- Adverse events that caused patient injury and for which the doctor felt responsible are most likely to have been experienced by middle aged male doctors in intervention intensive areas of medicine like surgery.
- For many doctors, having experienced serious patient injury had a negative impact on their professional and private life.
- This impact may be lighter if the acceptance for mutual criticism and constructive feedback at the workplace is high.

that doctors working in technical specialties had the greatest difficulties in giving criticism to a colleague for unacceptable ethical conduct. However, the differences were not very great and should be interpreted with caution.

CONCLUSIONS

It is conceivable that the ability of doctors to confront and live with incidents of serious patient injury might be increased by increasing acceptance of criticism in their day to day practice. This cultural change should start in medical school. If it is accepted that criticism of "near miss" incidents is a welcome way of improving and adjusting practice,¹¹ it may also lead to greater acceptance of the fact that to err is human and not necessarily a sign of professional impairment. "We have to change the culture of medicine so early discussion is seen as the right and responsible thing to do".¹⁰

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