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Original investigation

Stable prevalence of workplace bullying among Norwegian doctors: A study based on national samples in 1993, 2004 and 2014-15

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Abstract:

Objectives: To examine the trend in 12 months prevalence of subjection to bullying at work for doctors in different job categories and medical disciplines from 1993 to 2014-15, to describe the impact of personality dimensions on reporting bullying in 2004 and 2014-15 and to find work and health-related factors associated with being subjected to workplace bullying for doctors in 2014-15.

Design: Cross-sectional survey in 1993 and unbalanced cohort surveys in 2004 and 2014-15 based on postal questionnaires.

Setting: Norway.

Participants: National samples of 2,628 doctors (72.8%) in 1993, 1,004 (67%) doctors in 2004 and 1,261 doctors (78.2%) in 2014-15.

Outcome measure: Being subjected to bullying at work from colleagues or superiors within the last year.

Results: The samples in 1993 (5.7%, 95% CI 4.8 to 6.6), in 2004 (7.3%, 5.4 to 9.2) and in 2014-15 (7.0%, 4.5 to 8.5) showed no significant changes in being subjected to bullying at work. Neither were there any significant changes over time within different job positions or medical disciplines. Bullied doctors scored higher on the personality trait neuroticism, both in 2004 (4.1, 3.3 to 5.0 vs. 3.0, 2.7 to 3.2) and in 2014-15 (4.4, 3.4 to 5.5 vs. 3.0, 2.8 to 3.2). In 2014-15, being bullied at work was significantly associated with female gender (OR 2.0, 95% CI 1.2 to 3.5), lower levels of job satisfaction (0.9, 0.9-0.9) and lower levels of self-rated health (very good 1, average or poor 2.3, 1.2 to 4.3; good 3.5, 1.5 to 8.3), controlled for age and sickness absence days.

Conclusions: The fraction of doctors who experienced being bullied was stable over a 20-year period. Neuroticism may increase this experience. A detrimental effect of workplace bullying on doctors` self-reported health and job satisfaction was confirmed. Our findings call for increased awareness on bullying among doctors.

Strengths and limitations of this study

- The prevalence of being subjected to bullying at work for doctors in different job categories and medical disciplines was stable from 1993 to 2014-15.
- The representative data allow for generalisation to the whole doctors population in Norway.
- Analyses were based on self-reported data that is not easy to judge whether the respondents overestimate or underestimate their experiences.

INTRODUCTION

The negative effects of workplace bullying on both the individual and the organisational level are well documented. It is often associated with suboptimal health and poor job satisfaction, as well as frequent job change and increased absenteeism.[1-3] It is also shown that poor health and low job satisfaction of doctors may affect patient safety and treatment outcomes.[4] Despite these negative effects, work place bullying among doctors has not been well studied in Norway.

International variations in levels of workplace bullying are large. On average, 5 % of the respondents in the 6th European Working Condition Survey 2015 comprising all the EU-28 countries reported being subjected to bullying or harassment during the last 12 months.[5] According to Statistics Norway, 3.3 % of Norwegian employees had been bullied at work at least once a month, with no significant differences in age or gender. Between occupational groups, service-related occupations (waiters, craftspersons, military, police, health- and social care) experience bullying more than average.[6 7]

A cross-sectional study based on 2004-05 data from university hospitals showed that 10.5 % of doctors in Trondheim (Norway), 12.7 % in Reykjavik (Island), 13.8 % in Stockholm (Sweden) and 20.2 % in Padova (Italy) reported degrading experiences including bullying at workplace harassment during the previous six months.[8] Other cross-sectional studies in European countries,[9-13] USA[14-16] and Australia[17] suggest similar high levels of experienced bullying at work for diverse groups of doctors, ranging from 16 % to 76 % depending on definitions and methods of assessment.

The perception of being bullied is linked to personality traits. Victims tend to be more neurotic and less agreeable, conscientious and extravert than non-victims (Glasø et al. 2007).[1 18] People who score high on neuroticism were found to be more reactive to stress and more likely to interpret ordinary situations as threatening. [19]

In Norway, many studies have addressed bullying in the workplace, including hospital staff[20] and nurses,[2] but none have examined the experience of doctors based on nationwide representative dataset over a 20-years period.

Since 1993 the Institute for Studies of the Medical Profession (LEFO) has regularly surveyed a representative sample of active doctors in Norway (legeforsk.org). The surveys in 1993, 2004 and 2014-15 included identical item on being subjected to workplace bullying. It is therefore possible to reliably describe changes during this period.

In this article we mainly focus on the possible changes in the prevalence of being subjected to workplace bullying for Norwegian doctors in various types of job and for hospital doctors practising in different medical disciplines in 1993, 2004 and 2014-15. We also describe the impact of two major dimensions of personality introversion-extraversion and neuroticism on reporting bullying experience in 2004 and 2014. In 2014-15 we investigate whether being bullied is associated with work- and health related factors.

MATERIAL AND METHODS

Design and participants

In Norway, doctors' health and working conditions have been studied in an extensive research program by Institute for Studies of the Medical Profession starting in 1992.

In 1993, a random sample of 9,266 active doctors in Norway was invited to take part in a cross-sectional postal survey of doctors` health, working conditions and quality of life. Each doctor received four from a pool of 16 different questionnaires; one basic questionnaire was sent to all, and the three others were randomly distributed according to a weighted system. The intention was to achieve a random pattern of missing responses in the total database. See Aasland et al[21] for a detailed description of this overlapping questionnaire design. The data used in this article are from a

representative subsample of 3,608 doctors who received a questionnaire about organisation of work and work environment including items on experienced bullying in the workplace.

A randomly selected group of 2,000 doctors were invited to be included in a longitudinal study instead of in the cross-sectional, and 1,272 agreed to participate.[21] Since 1994, this group has been followed through biannual postal questionnaires, and retired doctors have gradually been replaced by younger ones. [22 23] Both in 2004 (n=1,499) and 2014-15 (n=1,612) the questionnaires contained items on bullying at the workplace.

Variables

Response variable

Being subjected to workplace bullying was assessed with the same question in 1993, 2004 and 2014-15: "Have you been subjected to bullying or uncomfortable teasing (mobbing) from colleagues or superiors during the last year?" There were five response categories: (1) no, (2) yes, up to a few times a month, (3) yes, about once a week, (4) yes, a few times a week, and (5) yes, daily or almost daily.

Effect variables

Numerous associations with workplace bullying have been reported, for example poor mental or physical health and poor working conditions. The present study includes the following items:

Nine job categories:

1: doctors in hospital management positions (medical superintendent, head of department, chief senior consultant, head of unit, senior consultant, head of section)

2: senior hospital consultants

3: specialty registrars

4: general practitioners

5: specialists working in private practice

6: community medical officers (district medical officer, senior district medical, officer, nursing home medical officer, visiting medical officer, doctor at infant welfare clinic, community general practitioner)

7: doctors in academia (professor, associate professor, research fellow, and researcher)

8: doctors in administrative positions (county medical officer, medical advisor, chief medical officer)

9: other key job categories

There are 45 approved *medical disciplines* in Norway. For the purpose of this study, the disciplines are collapsed into five categories:

1: general (internal) medicine disciplines (general practice, paediatrics, haematology, endocrinology, gastroenterology, physical medicine and rehabilitation, geriatrics, cardiology, dermatology, internal medicine, communicable diseases, respiratory medicine, neurology, oncology, nephrology, rheumatology)

2: surgical disciplines (anaesthesiology, paediatric surgery, cardiothoracic and endocrine surgery, obstetrics and gynaecology, gastroenterological surgery, general surgery, vascular surgery, maxillofacial surgery, neurosurgery, orthopaedic surgery, plastic surgery, thoracic surgery, urology, otorhinolaryngology, ophthalmology)

3: laboratory disciplines (immunology and transfusion medicine, clinical pharmacology, clinical neurophysiology, medical biochemistry, medical genetics, medical microbiology, nuclear medicine, pathology, radiology)

4: psychiatry (psychiatry, child and adolescent psychiatry, substance abuse and addiction medicine, community medicine)

5: other

Self-rated health was measured in 2014-15 by the question “In general, would you say your health is: very good, good, average, poor”.

Sickness absence was measured in 2014-15 with a single question: "How many days of sickness absence have you taken during the past 12 months?" The reported numbers of sickness absence days were split into four levels: 0 day, 1 to 3 days, 4 to 99 days, and 100 or more days.[24]

Job satisfaction was measured with the "Job Satisfaction Scale" of Warr, Cook and Wall.[25] It includes ten items that scored on a Likert scale from 1 (very dissatisfied) to 7 (very satisfied). The items were added together into a composite mean job satisfaction scale with possible values from 10 to 70.

Two personality dimensions, *extraversion – introversion* and *neuroticism*, were measured with the "Eysenck Personality Inventory". Each dimension is based on ten yes or no questions, giving a range from 0 to 10.[26] A subset of the original members of the Panel had completed the inventory in 2002.

Item on working within one of four *regional health authorities* (North, Central, West and South-East) was included in 2014-15 (helseforetak.no). *Other background variables* were gender and age.

Analysis

In this study, we look at the prevalence of being subjected to workplace bullying within last year among doctors in 1993, 2004 and 2014-15, based on self-reports. Statistically significant group differences are indicated by non-overlapping 95 % confidence intervals. Simultaneous effects are shown in multivariate logistic regression models. Units with missing data were excluded. Predictive Analytics Software Statistics 23 was used for the analyses.

RESULTS

Respondents

The samples of the cross-sectional survey in 1993 and the cohort data from 2004 and 2014-15 were nearly representative of the total doctor work force in terms of age, gender and main job categories (as described in previous studies).[21-23]

The response rates were 72.8 % (2,628/3,608) in 1993, 67 % (1,004/1,499) in 2004 and 78.2 % (1,261/1,612) in 2014-15. The numbers of respondents with data on all variables (being subjected to bullying, gender, age, and job category) were 2,439 in 1993, 730 in 2004 and 1,079 in 2014-15. 485 doctors responded both in 2004 and 2014-15.

Subsamples of the Panel members had completed the Eysenck Personality Inventory: 660 of 730 in 2004, 563 of 1,079 in 2014-15 and 443 of the 485 cohort members in 2004 and 2014-15.

The proportion of females in our samples increased from 27.9 % (n=680) in 1993 to 31.5 % (n=230) in 2004 and further to 43.1 % (n=465) in 2014-15. The mean age was 42.2 years (95 % CI 41.8-42.6) in 1993, 54.3 years (95% CI 53.7-54.9) in 2004 and 48.5 years (95 % CI 47.9-49.2) in 2014-15, when younger doctors had been included in the sample. The majority of respondents worked in the hospital sector (data not shown).

Among the 485 doctors who responded both in 2004 and 2014-15, 31.8 % (n=154) were females and 68.2 % (n=331) were males. The mean age was 46.6 years (95 % CI 45.9 to 47.3) in 2004 and 56.8 years (95 % CI 56.1 to 57.5) in 2014-15. In 2004 and 2014-15, about every second doctor worked in hospital and every fourth doctors worked as GP and every fourth hold another job position.

Prevalence of bullying at work in 1993, 2004 and 2014-15

Table 1 shows that the last 12 months prevalence of being subjected to bullying from colleagues or superiors among all doctors stayed stable over the 20 year period. Being subjected to bullying at work monthly or more was 5.7 % (95 % CI 4.8 to 6.6) in 1993, 7.3 % (5.4 to 9.2) in 2004 and 7.0 % (4.5 to 8.5) in 2014-15.

Group differences

Table 2 shows the last 12 months prevalence of bullying at work from colleagues or superiors over time by gender, age and main job positions among all doctors, and by medical disciplines among hospital doctors.

At all three points in time the prevalence of becoming bullied was higher for senior hospital consultants and for doctors in hospital management position than for specialty registrars, GPs and specialist in private practice.

The highest prevalence of being subjected to bullying at work was found among doctors in the surgery and laboratory medicine categories in 1993 and 2004, and in surgery and psychiatry in 2014-15. Among hospital doctors in 2014-15, no significant differences in bullying at work were found across the four regional health authorities (data not shown).

Males compared to females, and GPs compared with specialty registrars and senior hospital doctors reported significantly lower prevalence of experienced bullying in 1993. No significant differences were found in data from 2004 and 2014-15.

Changes in responses in the cohort from 2004 to 2014-15

Figure 1 illustrates how the responses on being subjected to bullying at work changed from 2004 to 2014-15 among the 485 doctors who answered at both points in time. There was a non-significant decrease in the prevalence of being subjected to bullying monthly or more from 7.2 % (95 % CI 5.2 to 9.9) in 2004 to 5.6 % (95 % CI 3.9 to 8.0) in 2014-15. At both points in time, 11 doctors (2.3 %) reported that they had been bullied at work monthly or more in the last year.

Reporting bullying and personality dimensions

Table 3 describes the mean scores with 95 % confidence intervals of two personality dimensions among Norwegian doctors with and without having experienced workplace bullying, adjusted for

gender and age. The introversion-extraversion dimension had no effect on reporting bullying at work, while the scores for the neuroticism dimension was significantly higher in doctors who reported being bullied at work.

To further explore the effects of personality, age, and gender on experienced bullying, we performed multivariate logistic regression analyses for each time point. Neuroticism was a significant predictor in all models, in the cross-sectional samples from 2004 (OR 1.28, 95 % CI 1.13-1.44) and 2014-15 (1.24, 1.07-1.45), and in the cohort samples from 2004 (1.21, 1.05-1.40) and 2014-15 (1.30, 1.09-1.56). Introversion-extraversion, age and gender showed no effect in these models (data not shown).

Predictors of being subjected to bullying at work in 2014-15

Table 4 describes the distribution of possible effect variables, and summarizes the univariate and multivariate analyses of the chosen variables on being subjected to bullying at work from colleagues or superiors monthly or more within the last year among all doctors. Being female, having lower job satisfaction and lower levels of self-rated health were significant univariate and multivariate predictors.

DISCUSSION

Main findings

Being subjected to workplace bullying remained stable for doctors in Norway over a 20-year period. Neuroticism was positively associated with being bullied. Negative effects of workplace bullying on doctors` self-reported health and job satisfaction were confirmed.

Comparison with other studies

Differences in methodology limit direct cross-national comparisons. The selected studies in Table 4, however, suggests less workplace bullying in our sample of Norwegian doctors. The prevalence of being bullied was 6.5 % among our specialty registrars versus 48 % in residents/fellows in US and 13-16 % in junior doctors in Germany, 11.3 % in our doctors in academia positions versus 42-58 % in

doctor-researchers in the UK, 9.3 % among our surgeons versus 47 % in surgery trainees and consultants in Australia, 4 % among our GPs versus 30 % in GPs in Lithuania and 79 % in GPs in Canada.

Having experienced bullying for Norwegian specialty registrars at all three time points was slightly lower than for senior hospital consultants and doctors in hospital management position. The opposite was observed among surgery trainees versus consultant surgeons in Australia, and among doctors in postgraduate position 1 versus levels 2-8 in hospital setting in the US, while no such differences were found in the UK.[13 14 17] While we found a higher prevalence of experienced bullying among Norwegian female doctors, and a fairly even distribution across age groups, other studies did not report such patterns.[8 10 12-14] However, the higher prevalence for doctors in surgery and academic positions is more consistent.[9 13 17 27]

Our findings add to other Norwegian studies suggesting that workers in the health and social sectors are more at risk for reporting experienced bullying at work.[6 7] In our survey from 2014-15, 7 % of doctors experienced workplace bullying from colleagues or superiors a few times a months within the last 12 months, compared with 3 % in the general working population, and 6 % of nurses and 5 % of other workers in health care in 2013.[6] Doctors working in public sector hospitals reported more frequently workplace bullying than doctors working as GPs or as private practice specialist. This finding is consistent with a national survey suggesting a higher prevalence of work conflicts in public rather than private settings.[28] Previous Norwegian studies have also found that hospital doctors experienced more psychosocial work stress and are less satisfied with several aspects of job conditions than are GPs and private practice specialists.[24 29]

In our cross-sectional and panel data, neuroticism was positively associated with reporting bullying experience, which is also found in several other studies.[18]

In our multivariate model, being subjected to bullying was associated with both lower level of self-reported health and job satisfaction, but no with sickness absence. These results are in agreement with recent meta-analyses on health- and job-related outcomes of bullying at work.[1 30]

Explanation of results

The work environmental hypothesis emphasise the importance of psychosocial work environment factors on workplace bullying. It implies that poor psychosocial working environment characterized by dissatisfaction, stress and unpredictable tasks can lead to conflicts, which in turn may develop into bullying.[31] Workplaces with high levels of conflicts between workers were found to also have increased risk for bullying.[28] Furthermore, victims of bullying are more dissatisfied with several psychosocial factors in the work environment compared with other workers.[32]

Thus, variations in the psychosocial working conditions for doctors between countries and across occupational groups in Norway may account for variations in the prevalence of bullying.

In the OECD study across 38 countries from 2016 on Better Life Index, the average level of life satisfaction was highest in Norway, suggesting strong social cohesion.[33] In the Eurofund study across 28 countries from 2015 on working environment, there is a more positive picture of psychosocial and organizational working conditions in Norway, for example the scores for being "very satisfied or satisfied" with working conditions in the main job and being "always or almost the time" treated fairly at the workplace were higher in Norway (93 %; 94 %), compared with for example Germany (89 %; 90 %), Sweden (85 %; 87 %), Italy (83 %; 84 %), UK (90 %; 85 %) and Lithuania (83 %; 76 %).[5] In other studies, doctors in Norway report lower stress levels, [34] better work-home balance, lower working time[22 35] and a higher level of job satisfaction,[34 36-38] suggesting a better work atmosphere in Norway, with lower physical burden, better collegial environment, more professional autonomy, more control over clinical work and shorter work hours.

The present study documents no significant changes in the level of experienced bullying from 1993 to 2014-15 suggesting stable psychosocial working conditions for Norwegian doctors. Data from the last decades show that also the weekly working time and the satisfaction with various aspects of working conditions of doctors in Norway remained relative stable.[22 23 39 40]

Our results suggest higher prevalence of workplace bullying for doctors than in other occupations in Norway, which may partly be explained by the differences in cultural and psychosocial factors. A study points out the importance of cultural factors such as the traditional hierarchical structures and teaching methods in the medical profession that might influence the development of bullying.[41] In the Living Condition Survey among Norwegian working population from 2013, doctors belonged to the group of occupations that scored highest on the scales of psychosocial risk factors at work including work-home unbalance, long working weeks, night works, frequent re-organizations at workplace and high effort at work.[6] In a previous nation-wide survey, the medical and biological occupations scored second highest at the scale of conflicts at work. About six of ten doctors reported conflicts both between leader and employees and between employees.[28] Current studies underline the higher workload and lower work-home balance in doctor work force compared with several occupations in Norway.[22 23]

Bullying is a subjective experience and can take many forms. Different tolerance levels against more negative or clearer language are documented. In our sample, neuroticism was significant predictor of reporting bullying experiences at work from colleagues or supervisors. It suggests that personality traits, at least neuroticism, may have an impact on the subjective experience of workplace bullying.

Strengths and limitation

The main strength of our study lies first and foremost in the near representative dataset, making the results generalizable to the entire population of doctors in Norway.[21-23] Similarities in survey methods and comparable items on being subjected to bullying at work are also strengths. The response rate was between 67 % and 78 %, which is higher than for other surveys of the medical profession.[22] There is of

course the possibility that the doctors who did and did not respond are different in their characteristics. A methodological problem is that we only have self-reported and therefore subjective data, which however is considered a plausible methodology.[6 7] Other specific elements in workplace bullying like how it occurred (verbal or written by e-post or social media), who the perpetrators were (superiors, doctor colleagues, other personal, patients, relatives or friends of patients) or how long the bullying lasted might be also useful information, but was not obtainable in the present study.

Policy implications

Specific attention should be paid to doctors in hospital management position, senior hospital consultants and doctors in academic position, who run an increased risk of being bullied. More awareness about bullying in medical school and specialist training is clearly needed.

DECLARATIONS

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Contributors JR and OGA designed the study. JR undertook the literature review, did the statistical analysis and wrote the first draft. OGA made critical revisions. Both authors had full access to all of the data (including statistical reports and tables) and are jointly responsible for the integrity of the data and the accuracy of the data analysis.

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Competing interest None declared.

Ethics approval According to the Regional Committee for Medical Research Ethics, the study based on "Norwegian Physician Survey - A bi-annual prospective questionnaire survey to a representative sample of Norwegian physicians" is exempt from review in Norway, cf. §§ 4 of The Act. The project can be implemented without the approval by the Regional Committee for Medical Research Ethics (IRB 0000 1870). Additionally, approval for data protection of the bi-annual prospective survey among Norwegian doctors was obtained from the Norwegian Social Science Data Service (Reference 19521).

Data sharing statement The authors may be able to provide aggregated data on which the analysis is based, on request. No additional data available.

Table 1. The 12 months prevalence of being subjected to workplace bullying from colleagues or superiors for Norwegian doctors in 1993, 2004 and 2014-15

	1993 % (n)	2004 % (n)	2014-15 % (n)
No	94.3 (2,300)	92.7 (677)	93.0 (1,004)
Yes, until a few times a month	4.5 (109)	5.2 (38)	5.5 (59)
Yes, about ones a week	0.6 (15)	1.0 (7)	0.6 (7)
Yes, about few times a week	0.3 (8)	0.8 (6)	0.6 (7)
Yes, daily or almost daily	0.3 (7)	0.3 (2)	0.3 (3)

Table 2. Group differences in the 12 months prevalence of being subjected to workplace bullying from colleagues or superiors a few times a month or more for Norwegian doctors in 1993, 2004 and 2014-15

	1993		2004		2014-15	
	n	% (95 % CI)	n	% (95 % CI)	n	% (95 % CI)
ALL DOCTORS	2,439		730		1,080	
Gender						
Females	57	8.3 (6.5-10.7)	11	4.8 (3.0-8.4)	43	9.2 (6.6-11.8)
Males	82	4.7 (3.8-5.8)	42	8.4 (6.3-11.2)	33	5.4 (3.6-7.2)
Age by years						
25 to 35	31	5.6 (3.9-7.8)	0	0.0 (-)	11	6.7 (3.8-11.6)
36 to 45	56	5.8 (4.5-7.5)	11	10.9 (6.2-18.5)	25	8.5 (5.8-12.3)
46 to 55	38	6.0 (4.4-8.2)	16	7.7 (4.8-12.1)	20	8.1 (5.3-12.1)
56 to 65	13	5.3 (3.1-8.9)	20	5.8 (3.8-8.9)	19	6.1 (4.0-9.4)
66 to 69	1	2.1 (0.4-11.1)	6	10.2 (4.7-20.5)	1	1.6 (0.3-8.3)
Job positions						
Specialty registrars	67	7.2 (5.7-9.1)	6	5.2 (2.4-10.9)	11	6.5 (2.8-10.2)
Senior hospital consultants	11	14.3 (8.2-23.8)	19	10.2 (6.6-15.4)	34	9.7 (6.6-12.8)
Doctors in hospital management positions	1	11.1 (2.0-43.5)	9	9.6 (5.1-17.2)	10	9.7 (4.0-15.4)
Community medical officers	27	5.7 (4.0-8.2)	2	6.5 (1.8-20.7)	0	0.0 (-)
General practitioners	6	2.4 (1.1-5.2)	8	4.3 (2.2-8.3)	9	4.0 (1.5-6.6)
Specialists in private practice	1	9.1 (1.6-37.7)	2	4.3 (1.2-14.2)	0	0.0 (-)
Doctors in academia positions	7	7.3 (3.6-14.3)	3	11.5 (4.0-29.0)	7	11.3 (3.4-19.2)
Doctors in administrative positions	1	16.7 (3.0-56.4)	1	11.1 (2.0-43.5)	2	7.1 (-2.4-16.6)
Other	18	3.0 (1.9-4.8)	3	7.9 (2.7-20.8)	3	8.8 (-0.7-18.3)
HOSPITAL DOCTORS[(a)]	1,014		395		618	
Internal medicine	15	4.9 (3.0-8.0)	11	7.5 (4.2-12.9)	18	6.9 (4.4-10.7)
Laboratory medicine	5	7.9 (3.4-17.3)	5	8.9 (3.9-19.3)	6	8.5 (3.9-17.2)
Surgery	25	11.1 (7.6-15.9)	13	11.7 (7.0-19.0)	15	9.3 (5.7-14.8)
Psychiatry	6	5.2 (2.4-10.8)	4	5.4 (2.1-13.1)	12	10.3 (6.0-17.2)
Other	28	9.2 (6.5-13.0)	1	14.3 (2.6-51.3)	3	30.0 (10.8-60.3)
Total	79	7.8 (6.3-9.6)	34	8.6 (6.2-11.8)	51	8.4 (6.4-10.8)

(a) The group of hospital doctors includes specialty registrars, senior hospital consultants and doctors in hospital management positions.

Table 3. General linear model of mean scores of personality dimensions with 95 % confidence intervals among Norwegian doctors with and without experienced workplace bullying from colleagues or superiors a few times a month or more (adjusted for gender and age)

	Being subjected to bullying at work			
	no		yes	
	n	mean (95 % CI)	n	mean (95 % CI)
Cross-sectional data 2004				
Extroversion – introversion	614	6.27 (6.08-6.47)	46	6.41 (5.69-7.14)
Neuroticism	614	2.96 (2.76-3.15)	46	4.40 (3.69-5.12)
Cross-sectional data 2014-15				
Extroversion – introversion	532	6.46 (6.25-6.66)	31	7.00 (6.13-7.86)
Neuroticism	532	2.97 (2.77-3.17)	31	4.05 (3.19-4.90)
Cohort data 2004				
Extroversion – introversion	421	6.40 (6.16-6.37)	22	6.30 (5.54-7.14)
Neuroticism	421	2.97 (2.73-3.21)	22	4.14 (3.29-5.00)
Cohort data 2014-15				
Extroversion – introversion	421	6.37 (6.13-6.60)	22	6.88 (5.86-7.91)
Neuroticism	421	2.99 (2.75-3.22)	22	4.42 (3.38-5.45)

Table 3. Univariate analyses and logistic regression model on being subjected to bullying at work from colleagues or superiors at least a few times a month as response variable among all doctors in 2014-15 (n=1,053)

	All	Univariate analyses on			Logistic regression model		
	% (n)	No % (n)	Yes % (n)	P-value	Exp(B)	95 % C.I. for ExpB	P-value
Gender							
Male	57.6 (607)	94.9 (576)	5.1 (31)	0.009	1		
Female	42.4 (446)	90.6 (404)	9.4 (42)		2.02	1.18-3.47	0.010
Age by years (mean)	49.0 (1.053)	49.2 (980)	47.0 (73)	0.112	0.99	0.97-1.02	0.625
Job satisfaction (mean, range from 10 to 70)	53.0 (1.053)	53.6 (980)	44.9 (73)	<0.000	0.92	0.90-0.94	<0.000
Self-rated health							
Very good	44.3 (467)	96.6 (451)	3.4 (16)	<0.000	1	-	0.010
Good	45.9 (483)	91.7 (443)	8.3 (40)		3.50	1.49-8.25	0.004
Average or poor[(a)]	9.8 (103)	83.5 (86)	16.5 (17)		2.29	1.21-4.33	0.011
Sickness absence							
0 day	46.6 (491)	95.1(467)	4.9 (24)	0.053	1	-	0.967
1 to 3 days	28.2 (297)	92.6 (275)	7.4 (22)		1.17	0.62-2.22	0.629
4 to 99 days	23.5 (247)	89.9 (222)	10.1 (25)		1.12	0.57-2.18	0.744
100 days or more	1.7 (18)	88.9 (16)	11.1 (2)		0.98	0.18-5.28	0.977

(a) Categories of self-rated health "average" and "poor" collapsed into "average or poor", because of very low response of "poor" (n=1).

Table 4. Prevalence of being subjected to bullying or mobbing at work among doctors in selected countries

Country	Survey year	Sample size	Sample	Terminology	% of outcome
Norway (Trondheim) Island (Reykjavik) Sweden (Stockholm) Italy (Padova)[8]	2004-05	377 of 689 254 of 531 1,075 of 1,827 372 of 900	Doctors from university hospitals	Presenting definition on degrading experiences including bullying, followed by a single item regarding subjection to degrading experiences or harassment at the workplace during the last six months with response alternatives: yes, no.	10.5 12.7 13.8 20.2
UK[13]	-	594 of 1,000	Junior doctors	(a) Presenting definition on bullying, followed by a single item regarding subjection to bullying in the past year with response alternatives: yes, no. (b) Scale with 21 items on bullying behaviors from peers, senior staff or managers in the past 12 months. One of more bullying behaviors:	37.0 84.0
UK[9]	-	259	Doctors undertaken research	Items regarding experiencing of four categories of bullying behavior: -treat to professional status: -threat to personal standing: -isolation: -enforced overwork:	 43.0 41.7 74.9 57.9
Germany[12]	2004 2005 2007	507 of 1,000	Junior hospital doctors in 2rd and 3rd year of residency	Presenting definition on bullying, followed by a single item regarding subjection to bullying in the past year with response alternatives: yes, no.	12.9 14.9 15.9
Bosnia and Herzegovina[10]	2004-05	534 of 700	Contracted doctors in hospital and health centers	Items regarding fife major categories of mobbing behavior in the past 12 months: treat to professional status, treat to personal integrity, isolation, overwork, destabilization. One of more types of mobbing behaviors:	76.0
Lithuania[11]	-	324 of 362	Family physicians	Single item regarding the frequency of experienced bullying during the last 6 months with response alternatives: no, occasional, severe (weekly and more frequent).	30.3
Canada[16]	2008-09	774 of 3,802	Family physicians	Items regarding 14 different types of abusive encounters in the past year with response alternatives: from never to very often on 5-point Likert scale. Bullying at least ones:	 78.9
US[14]	2015	1,791 of 2,158	Residents and fellows	(a) 20 items on bullying behavior with frequency scale in the past year. (b) Presenting definition on bullying, followed by a single item regarding subjection to bullying in the past 12 months from peers, attendings, nurses, ancillary, staff or patients with response alternatives: yes, no.	3.0-44.0 48.0
Australia[17]	2012	370 of 1,084	General surgery trainees and consultant surgeons	Presenting definition on bullying, followed by a single item regarding the frequency of experienced bullying in the past 12 months with response alternatives: never, now and then, monthly, weekly, daily.	47.0

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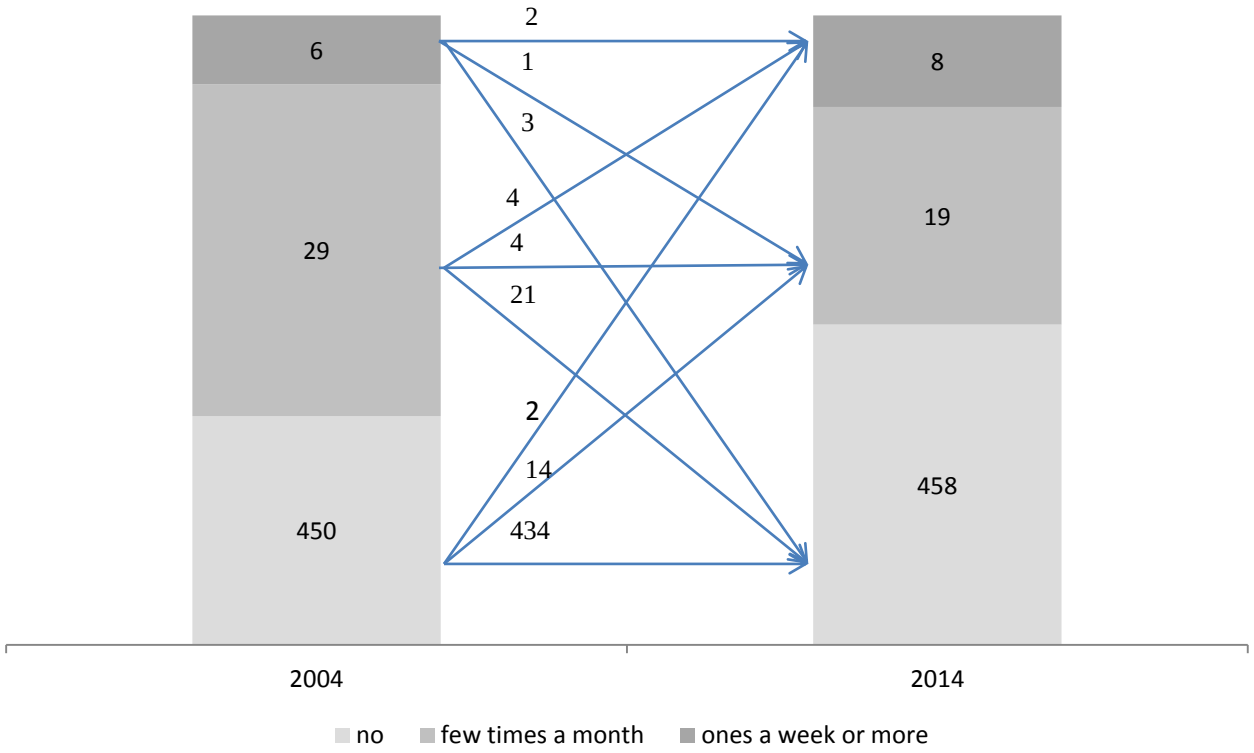
Figure 1. Change in responses for being subjected to bullying at work from 2004 to 2014-15 (n=485).



STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any pre-specified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	-
		(*c*) Explain how missing data were addressed	8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed	-

		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8-9
		(b) Give reasons for non-participation at each stage	8-9
		(c) Consider use of a flow diagram	8-9
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-9
		(b) Indicate number of participants with missing data for each variable of interest	8-9
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	9-10
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	9-10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-11
		(*b*) Report category boundaries when continuous variables were categorized	-
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14-15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	11-13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.
Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Perceived bullying among Norwegian doctors in 1993, 2004 and 2014-15: A study based on cross-sectional and repeated surveys

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Original investigation

Perceived bullying among Norwegian doctors in 1993, 2004 and 2014-15: A study based on cross-sectional and repeated surveys

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Abstract:

Objectives: To examine 12-month prevalence of perceived bullying at work for doctors in different job categories and medical disciplines in 1993, 2004 and 2014-15, and personality traits, work and health-related factors associated with perceived workplace bullying.

Design: Cross-sectional questionnaire surveys in 1993, 2004 and 2014-15 where the 2004 and the 2012-15 samples are partly overlapping.

Setting: Norway.

Participants: Response rates were 72.8 % (2,628/3,608) in 1993, 67 % (1,004/1,499) in 2004 and 78.2 % (1,261/1,612) in 2014-15. 485 doctors responded both in 2004 and 2014-15.

Outcome measure: Perceived bullying at work from colleagues or superiors at least a few times a month during the last year.

Results: Between the samples from 1993, 2004 and 2014-15 there were no significant differences in the prevalence of perceived bullying at work. More senior hospital doctors and surgeons reported being bullied. Doctors with higher scores on the personality trait neuroticism were more likely to perceive bullying, as were female doctors, doctors with poor job satisfaction and poor self-rated health.

Conclusions: The fraction of doctors who experienced bullying at work was stable over a 20-year period. Psychological, psychosocial and cultural factors are predictors of perceived bullying.

Strengths and limitations of the study

- The study describes the prevalence of perceived bullying at work among doctors over a 20-year period.
- The data allow for generalisation to the whole doctor population in Norway.
- Analyses are based on self-reported questionnaire data with the possibility of both over- and underestimation.

INTRODUCTION

The negative effects of workplace bullying on both the individual and the organisational level are well documented. Bullying is often associated with suboptimal health and poor job satisfaction, as well as frequent job change and increased absenteeism.[1-3] It is also shown that poor health and low job satisfaction of doctors may affect patient safety and treatment outcomes.[4] Despite these negative effects, work place bullying among doctors has not been well studied in Norway.

International variations in the prevalence of workplace bullying are large. On average, 5 % of the respondents in the 6th European Working Condition Survey 2015 comprising all the EU-28 countries reported being subjected to bullying or harassment during the last 12 months.[5] Norway was below the EU average.[6] In national studies in Norway, 2-3 % of employees had been bullied at work at least once a month, with no significant differences within age or gender. Between occupational groups, service-related occupations (waiters, craftspersons, military, police, health- and social care) experience bullying more than average.[7 8]

In cross-sectional studies from Europe,[9-13] USA[14-16] and Australia,[17] the prevalence of experienced bullying at work for diverse groups of doctors range from 16 % to 76 % depending on study design and method of assessment. A cross-national comparison between four European university hospitals in 2004-2005 showed lower prevalence of degrading experiences including bullying at the workplace during the previous six months for doctors in Trondheim /Norway (10.5 %), than in Reykjavik/Iceland (12.7 %), in Stockholm/Sweden (13.8 %) and in Padova/Italy (20.2 %).[18]

According to the work environmental hypothesis, poor psychosocial conditions like dissatisfaction, stress, or high levels of conflict play important roles in generating workplace bullying.[19] Associations between individual personality traits and workplace bullying are also documented, but a cause-and-effect relationship is complex.[20]

In Norway, many studies, including hospital staff[21] and nurses,[2] have addressed bullying at the workplace, but none have examined the experience of doctors based on a nationwide representative dataset over a 20-years period.

Since 1993 the Institute for Studies of the Medical Profession (LEFO) has regularly surveyed a representative sample of active doctors in Norway (legeforsk.org). The surveys in 1993, 2004 and 2014-15 included identical questions on perceived bullying at work. It is therefore possible to reliably describe changes during this period.

In this article we focus on the prevalence of perceived bullying at work for Norwegian doctors in various types of job and for hospital doctors practising in different medical disciplines in 1993, 2004 and 2014-15. We also investigate to what extent being bullied is associated with other work- and health related factors. In addition we explore the possible association between perceived bullying and two major personality traits: introversion-extraversion and neuroticism.

MATERIAL AND METHODS

Design and participants

In Norway, doctors' health and working conditions have been followed since 1992 by the Institute for Studies of the Medical Profession through a comprehensive research program.

In 1993, a random sample of 9,266 active doctors in Norway were invited to take part in a postal survey on doctors` health, working conditions and quality of life, and 6,672 (72 %) agreed. From a pool of 16 different questionnaires, each doctor received four, one basic to all, and the three others with different themes, randomly distributed according to a weighted system. The intention was to achieve better statistical power through a random pattern of missing responses in the total database.[22] See Aasland et al[23] for a detailed description of this overlapping questionnaire design. The data used in

this article are from a representative subsample of 3,608 doctors who received a questionnaire about organisation of work and work environment including item on perceived bullying at work.

An additional randomly selected group of 2,000 doctors were invited to participate in a longitudinal study, and 1,272 (64%) agreed.[22 23] Since 1994, this sample has been followed through biannual postal questionnaires, while retired doctors were successively replaced by younger colleagues. These data constitute a set of unbalanced panel data,[24] with variation in the number of observations for each respondent.[25 26] The 2004 questionnaire (n=1,499) and the 2014-15 questionnaire (n=1,612) both contained the same question on perceived bullying at work as in the 1993 questionnaire.

Informed consent was obtained from all participants in the three surveys, as well as an exemption from specific review of the individual surveys from the Regional Committee for Medical Research Ethics.

Variables

Response variable

Perceived bullying at work was assessed with the question: "Have you during the last year been subjected to vexation or uncomfortable teasing (bullying) from colleagues or superiors?" Response categories were: no, yes - a few times a month, yes - about once a week, yes - a few times a week, and yes - daily or almost daily. For most of the statistical analyses in this article the categories were collapsed into “no” and “yes” (i.e. from a few times a month to daily or almost daily). This item corresponds to similar questions used in other surveys on psychosocial working conditions in the Norwegian working population,[7 22] where it also pertains to last year, and with the additional explanation that "vexation or uncomfortable teasing" means bullying.[27]

Effect variables

Numerous associations with workplace bullying have been reported, for example poor mental or physical health, personality traits and poor working conditions. The present study includes the following items:

Self-rated health was measured in 2014-15 by the question "In general, would you say your health is: very good, good, average, poor".

Sickness absence was measured in 2014-15 with a single question: "How many days of sickness absence have you taken during the past 12 months?" The reported number of sickness absence days was recoded into four levels: 0 days, 1 to 3 days, 4 to 99 days, and 100 days or more.[28]

Job satisfaction was measured with the "Job Satisfaction Scale" of Warr, Cook and Wall.[29] It includes ten items that scored on a Likert scale from 1 (very dissatisfied) to 7 (very satisfied). The items were added together into a composite mean job satisfaction scale with possible values from 10 to 70.

Two personality dimensions, *extraversion – introversion* and *neuroticism*, were measured with the "Eysenck Personality Inventory". Each dimension is based on ten yes or no questions, giving a range from 0 to 10.[30] A subset of the members of the repeated surveys had completed the inventory in 2002.

Group variables

Job categories:

1: doctors in hospital management positions (medical superintendent, head of department, chief senior consultant, head of unit, senior consultant, head of section)

2: senior hospital consultants

3: specialty registrars

4: general practitioners

5: specialists working in private practice

6: community medical officers (district medical officer, senior district medical, officer, nursing home medical officer, visiting medical officer, doctor at infant welfare clinic, community general practitioner)

7: doctors in academia (professor, associate professor, research fellow, and researcher)

8: doctors in administrative positions (county medical officer, medical advisor, chief medical officer)

9: other key job categories

Medical disciplines

For the purpose of this study, the 45 different disciplines are collapsed into five categories:

1: general (internal) medicine disciplines (general practice, paediatrics, haematology, endocrinology, gastroenterology, physical medicine and rehabilitation, geriatrics, cardiology, dermatology, internal medicine, communicable diseases, respiratory medicine, neurology, oncology, nephrology, rheumatology)

2: surgical disciplines (anaesthesiology, paediatric surgery, cardiothoracic and endocrine surgery, obstetrics and gynaecology, gastroenterological surgery, general surgery, vascular surgery, maxillofacial surgery, neurosurgery, orthopaedic surgery, plastic surgery, thoracic surgery, urology, otorhinolaryngology, ophthalmology)

3: laboratory disciplines (immunology and transfusion medicine, clinical pharmacology, clinical neurophysiology, medical biochemistry, medical genetics, medical microbiology, nuclear medicine, pathology, radiology)

4: psychiatry (psychiatry, child and adolescent psychiatry, substance abuse and addiction medicine, community medicine)

5: other

Other variables were *Regional Health Authority* (North, Central, West and South-East), *age* and *gender*.

Analysis

Using proportions with 95% confidence intervals we explored possible changes over time in the prevalence of perceived bullying by comparing the three cross-sectional datasets from 1993, 2004 and 2014-15 respectively. We also looked at potential changes among the 485 who responded both in 2004 and 2014-15. General linear models with age and gender as covariates were used to describe the associations between perceived bullying and personality traits in the cross-sectional data. Based on cross-sectional data from 2014-15, a logistic regression model was used to assess the simultaneous effect of gender, age, job satisfaction, self-rated health and sickness absence on perceived bullying. Units with missing data were excluded. Predictive Analytics Software Statistics 23 was used for the analyses.

RESULTS

Respondents

Representativity and response rates

Both the respondents of the cross-sectional survey in 1993 and the longitudinal surveys in 2004 and 2014-15 were nearly representative of the total doctor work force in terms of age, gender and main job categories (as described in previous studies).[23 25 26]

The response rates were 72.8 % (2,628/3,608) in 1993, 67 % (1,004/1,499) in 2004 and 78.2 % (1,261/1,612) in 2014-15. The numbers of respondents with data on all variables (perceived bullying, gender, age, and job category) were 2,439 in 1993, 730 in 2004 and 1,080 in 2014-15. 485 doctors responded both in 2004 and 2014-15.

Subsamples of the longitudinal surveys had completed the Eysenck Personality Inventory in 2002: 614 of 730 respondents in 2004 and 532 of 1,080 in 2014-15. Since personality is regarded a trait, we combined data from 2002 with 2004 and 2014-15.

Gender, age and job characteristics of doctors in the cross-sectional data from 1993, 2004 and 2014-15

The proportion of females in our samples increased from 27.9 % (n=680) in 1993 to 31.5 % (n=230) in 2004 and further to 43.1 % (n=465) in 2014-15. The mean age was 42.2 years (95 % CI 41.8-42.6) in 1993, 54.3 years (95% CI 53.7-54.9) in 2004 and 48.5 years (95 % CI 47.9-49.2) in 2014-15, when younger doctors had been included in the sample. The majority of respondents worked full time in hospitals (data not shown).

Gender, age and job characteristics of doctors in the repeated data from 2004 and 2014-15

Among the 485 doctors who responded both in 2004 and 2014-15, 31.8 % (n=154) were females and 68.2 % (n=331) were males. The mean age was 46.6 years (95 % CI 45.9 to 47.3) in 2004 and 56.8 years (95 % CI 56.1 to 57.5) in 2014-15. In 2004 and 2014-15, about every second doctor worked in hospitals. The rest were either general practitioners or had other jobs like administration or private specialist practice (data not shown).

Prevalence of perceived bullying at work in the cross-sectional data from 1993, 2004 and 2014-15

Table 1 shows consistent levels of perceived bullying from colleagues or superiors among all doctors over the 20-year period.

Group differences in the prevalence of perceived bullying at work in the cross-sectional data from 1993, 2004 and 2014-15

Table 2 shows the prevalence of perceived bullying at work from colleagues or superiors at least a few times a month within the last 12 months by gender, age groups and main job positions among all doctors, and by medical disciplines among hospital doctors in 1993, 2004 and 2014-15.

There were no significant changes over time among all doctors or within different job positions, medical disciplines, age groups or females. A significant increase was for males in 2004.

Regarding job positions, the prevalence of perceived bullying at work was higher for senior hospital consultants and for doctors in hospital management positions than for specialty registrars, GPs and specialist in private practice. In 1993, GPs reported significantly lower prevalence of perceived bullying than specialty registrars and senior hospital doctors.

Across medical disciplines in hospital, the highest prevalence of perceived bullying at work was found among doctors in surgery and laboratory disciplines in 1993 and 2004, and in surgery and psychiatry in 2014-15.

Among hospital doctors in 2014-15, no significant differences in perceived bullying were found across the four Regional Health Authorities (data not shown).

Changes in perceived bullying at work in the repeated measures from 2004 and 2014-15

Figure 1 illustrates how the prevalence of perceived bullying at work changed from 2004 to 2014-15 among the 485 doctors who answered at both points in time. There was a non-significant decrease in perceived bullying at work at least few times a months from 7.2 % (95 % CI 5.2 to 9.9; n=35) in 2004 to 5.6 % (95 % CI 3.9 to 8.0; n=27) in 2014-15.

Perceived bullying at work and personality traits in the cross-sectional data

To explore the associations between perceived bullying and personality traits we performed multivariate logistic regression analyses for the cross-sectional samples in 2004 (n=614) and 2014-15 (n=532). Controlled for gender and age, neuroticism was a significant predictor in the cross-sectional samples from 2004 (OR 1.28, 95 % CI 1.13-1.44) and 2014-15 (1.24, 1.07-1.45). Introversion-extraversion showed no effect (data not shown).

Associations between perceived bullying at work and possible effect variables in the cross-sectional data from 2014-15

Table 3 lists the included effect variables, and summarizes the univariate and multivariate analyses of the variables on perceived bullying at work from colleagues or superiors at least a few times a month within the last year for all doctors. Being female, having lower job satisfaction and lower levels of self-rated health were significant univariate and multivariate predictors.

DISCUSSION

Main findings

The prevalence of perceived bullying at work did not change significantly neither in the cross-sectional samples from 1993 to 2004 and 2014-15, nor in the repeated measures in 2004 and 2014-15. More senior hospital doctors and doctors in surgery reported being bullied over the study period. Association of perceived bullying at work with self-reported health, job satisfaction and neuroticism was confirmed.

Comparison with other studies

Differences in methodology regarding data collection, sample characteristics and measurements limit direct cross-national comparisons. The perception of having experienced bullying at work, however, seems to be lower in our sample in Norway (Table 2) compared with residents/fellows in US (48 %),[14] junior doctors in Germany (13-16 %),[12] doctor-researchers in the UK (42-75 %),[9] surgery trainees and consultants in Australia (47 %),[17] GPs in Lithuania (30 %)[11] and Canada (79 %).[16]

Perceived bullying at work for Norwegian specialty registrars at all three time points was slightly lower than for senior hospital consultants and doctors in hospital management position. The opposite was observed among surgery trainees versus consultant surgeons in Australia, and among doctors in postgraduate positions 1 versus levels 2-8 in hospital settings in the US, while no such differences were found in the UK.[13 14 17] The higher prevalence for doctors in surgery and academic positions is more consistent.[9 13 17 31]

A study from Germany describes the 12-month prevalence for experienced bullying over time. As opposed to our findings, this study reports a slightly increasing prevalence among junior hospital doctors in Germany, from 12.9 % at baseline in 2004 to 14.9 % one year after baseline, and further to 15.9 % three years after baseline.[12]

Our findings add to other Norwegian studies suggesting that workers in the health and social sectors are more at risk for reporting experienced bullying at work.[7 8] In our survey from 1993, 2004 and 2014-15, about 6-7 % of doctors reported perceived bullying at work from colleagues or superiors at least a few times a month within the last 12 months, compared with 2-3 % in the general working population in the period 1989-2013.[7 27]

In our cross-sectional data, neuroticism was positively associated with reporting perceived bullying experiences, which is also found in several other studies.[20 32]

In our multivariate model, perceived bullying at work at least few times a month within the last year was associated with both lower level of self-reported health and poorer job satisfaction, but not with sickness absence. These results are in agreement with recent meta-analyses on health- and job-related outcomes of bullying at work.[1 33]

Explanation of results

The work environmental hypothesis emphasises the importance of psychosocial work factors on workplace bullying. It implies that poor psychosocial working conditions characterized by dissatisfaction, stress and unpredictable tasks can lead to conflicts, which in turn may develop into bullying.[19] Workplaces with high levels of conflict between workers were found to have increased risk of bullying.[27] Victims of bullying were also showed to be more dissatisfied with several other psychosocial factors in the work environment.[34] On the other hand, personality traits like neuroticism was associated with the perception of being bullied. Doctors who scored high on neuroticism were also more reactive to stress[35] and more likely to interpret situations as threatening.[20]

Thus, the lower prevalence of perceived workplace bullying at the population level, and explicitly in the Norwegian medical profession compared with some other countries, can partly be explained by variations in psychosocial working conditions.

Good working environment is part of a work culture in Norway.[36] In the OECD study across 38 countries from 2016 on Better Life Index, the average level of life satisfaction was highest in Norway, suggesting strong social cohesion.[37] In the Eurofund study across 28 countries from 2015 on working environment, there was a more positive picture of psychosocial and organizational working conditions in Norway, for example the scores for being "very satisfied or satisfied" in the main job, and being "always or almost all the time" treated fairly at the workplace, were higher in Norway (93 %; 94 %) compared with for example Germany (89 %; 90 %), Sweden (85 %; 87 %), Italy (83 %; 84 %), UK (90 %; 85 %) and Lithuania (83 %; 76 %).[5] In the 2005 European working conditions survey, Norway showed the second highest level of satisfaction.[38] In studies of the medical profession, doctors in Norway, compared with some other countries reported lower stress levels,[39] better work-home balance, lower working time,[26 40] a higher level of job satisfaction[39 41-43] and lower prevalence for self-reports of perceived bullying at work,[18] suggesting a better work atmosphere in Norway.

Differences in cultural and psychosocial environmental factors across occupational groups in Norway may account for variations in perception of experienced bullying. In the 2013 Living Condition Survey of the Norwegian working population, doctors were the occupational group that scored highest on the scales of psychosocial risk factors at work including work-home unbalance, long working weeks, night works, frequent re-organizations at workplace and high effort at work.[7] In a previous nation-wide survey, the medical occupations scored second highest on a scale of conflicts at work. About six of ten doctors reported conflicts both between leader and employees and between employees.[27] Current studies underline the higher workload and lower work-home balance in the doctor work force compared with several occupations in Norway.[25 26] In addition, studies points to the importance of cultural factors such as the traditional hierarchical structures and teaching methods in the medical profession that might influence the development of bullying.[44 45]

Doctors are not a homogenous group. We found that doctors working in public sector hospitals reported workplace bullying more frequently than doctors working as GPs or as private practice specialist. This finding is consistent with a national survey suggesting a higher prevalence of work conflicts in public as opposed to private settings.[27] Previous Norwegian studies have also shown that hospital doctors experience more psychosocial work stress and are less satisfied with several aspects of the job conditions than are GPs and private practice specialists.[28 46]

The present study documents no significant changes in the perceived bullying at work from 1993 to 2004 and further to 2014-15 based on cross-sectional data or the repeated data from 2004 and 2014-15, suggesting stable psychosocial working conditions for Norwegian doctors. Four major health reforms have been implemented over the last 15 years – the GP list patient scheme in 2001, the free choice of hospital in 2001, the hospital ownership reform in 2002 and the primary/secondary health care coordination reform in 2012. These reforms have of course influenced the organisation of doctors' day-to-day practice. One study shows that the perception of professional freedom of speech and professional autonomy among doctors declined from 2000 to 2004.[47] Another study based on data from 2010 shows that 70 % of doctors experience stress in association with perpetual reorganisations of the national health care system, particularly for hospital doctors.[48] These reforms in the health care organisations seem not to be reflected in perceived bullying at work for doctors. Neither do several national anti-bullying initiatives from 2005, nor does the new Working Environment Act from 2006,[49] which also includes specific measures against harassment or other improper conduct at work, seem to have influenced the perception of workplace bullying among doctors. This suggests that the amount of perceived bullying is not particularly sensitive to organisational change or protective legislation. Cultural values and traditions in medicine are probably more important. However, a relatively high prevalence of bullying at work in medicine is documented.[7 8] An interesting study shows that surgeons view intimidation and harassment in the learning environment as both dysfunctional and functional.[45]

Some important environmental factors that directly or indirectly may generate stress in the health care setting did not change during the last two decades. For most doctors in Norway total weekly working hours remained unchanged in the period 1994-2014.[25 26] The satisfaction with various aspects of working conditions, including the amount of responsibility, variation of work, colleagues and fellow workers, opportunities to use own skills, overall job situation, freedom to choose own methods of working, physical work conditions, recognition for good achievements, rate of pay and work hours as measured with the Job Satisfaction Scale[29] remained relatively stable and high among doctors in Norway.[50 51]

A major personality trait like neuroticism is considered stable in adult life. Subjects scoring high on neuroticism are more likely to perceive situations as threatening. Studies indicate an association between neuroticism and perceiving bullying, although the relationship is complex.[20 32] In our sample, neuroticism was significantly associated with perceived bullying from colleagues or supervisors, suggesting that personality traits, at least neuroticism, may have an impact on the subjective experience of workplace bullying.

Strengths and limitations

The main strength of our study lies first and foremost in the near representative dataset, making the results generalizable to the entire population of doctors in Norway.[23 25 26] Further in the fact that we have data from three different points in time over a period of more than 20 years, including some repeated measures. Similarities in survey methods and comparable items on being subjected to bullying at work are also strengths. The response rates are between 67 % and 78 %, which are higher than for most other surveys of the medical profession.[26] A limitation is that we only have self-reported data, although this is considered a plausible methodology.[7 8] A further limitation is that the prevalence of perceived bullying at work is based on a single item, and does not meet the gold standard of measuring bullying with a global, check-list based measure.[52] However, this practice started after the data collection in 1993 and 2004, and would have been difficult to have incorporated into the survey design in 2014-15. Other specific elements of workplace bullying like how it occurred (verbal or

written by e-post or social media), who the perpetrators were (superiors, doctor colleagues, other personal, patients, relatives or friends of patients) or how long the bullying lasted might be also useful information, but were not obtainable in the present study.

Policy implications

Reducing workplace bullying among doctors is important. It can have a positive effect on the doctors` health, the quality of patient care and the work organisation.[1 3] Specific attention should be paid to doctors in hospital management position, senior hospital consultants and doctors in academic position, who reported higher prevalence of perceived bullying at work in 2014-15. Good leadership, social support and improved work environment combined with active workplace interventions are crucial to prevent bullying.[19 32 53] Because intimidation and harassment were found to be a part of medical education, changes in the attitudes towards these negative behaviours are also important.[45] More recognition and awareness about bullying in medical school and specialist training are instrumental for improving communication and relationship between colleagues.

DECLARATIONS

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Contributors JR and OGA designed the study. JR undertook the literature review, did the statistical analysis and wrote the first draft. OGA made critical revisions. Both authors had full access to all of the data (including statistical reports and tables) and are jointly responsible for the integrity of the data and the accuracy of the data analysis.

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Competing interest None declared.

Ethics approval According to the Regional Committee for Medical Research Ethics, the study based on "Norwegian Physician Survey - A bi-annual prospective questionnaire survey to a representative sample of Norwegian physicians" is exempt from review in Norway, cf. §§ 4 of The Act. The project can be implemented without the approval by the Regional Committee for Medical Research Ethics (IRB 0000 1870). Additionally, approval for data protection of the bi-annual prospective survey among Norwegian doctors was obtained from the Norwegian Social Science Data Service (Reference 19521).

Data sharing statement The authors may be able to provide aggregated data on which the analysis is based, on request. No additional data available.

Table 1. The 12-month prevalence of perceived bullying at work from colleagues or superiors for Norwegian doctors in the cross-sectional data from 1993, 2004 and 2014-15

	1993 % (n)	2004 % (n)	2014-15 % (n)
No	94.3 (2,300)	92.7 (677)	93.0 (1,004)
Yes, a few times a month	4.5 (109)	5.2 (38)	5.5 (59)
Yes, about ones a week	0.6 (15)	1.0 (7)	0.6 (7)
Yes, a few times a week	0.3 (8)	0.8 (6)	0.6 (7)
Yes, daily or almost daily	0.3 (7)	0.3 (2)	0.3 (3)

Table 2. Group differences in 12-month prevalence of perceived bullying at work from colleagues or superiors at least few times a month for Norwegian doctors in the cross-sectional data from 1993, 2004 and 2014-15

	1993 (n=2,439)		2004 (n=730)		2014-15 (n=1,080)	
	n	% (95 % CI)	n	% (95 % CI)	n	% (95 % CI)
ALL DOCTORS	139	5.7 (4.8 to 6.6)	53	7.3 (5.4 to 9.2)	76	7.0 (4.5 to 8.5)
Gender						
Females	57	8.3 (6.5-10.7)	11	4.8 (3.0-8.4)	43	9.2 (6.6-11.8)
Males	82	4.7 (3.8-5.8)	42	8.4 (6.3-11.2)	33	5.4 (3.6-7.2)
Age by years						
25 to 35	31	5.6 (3.9-7.8)	0	0.0 (-)	11	6.7 (3.8-11.6)
36 to 45	56	5.8 (4.5-7.5)	11	10.9 (6.2-18.5)	25	8.5 (5.8-12.3)
46 to 55	38	6.0 (4.4-8.2)	16	7.7 (4.8-12.1)	20	8.1 (5.3-12.1)
56 to 65	13	5.3 (3.1-8.9)	20	5.8 (3.8-8.9)	19	6.1 (4.0-9.4)
66 to 69	1	2.1 (0.4-11.1)	6	10.2 (4.7-20.5)	1	1.6 (0.3-8.3)
Job positions						
Hospital doctors						
Specialty registrars	67	7.2 (5.7-9.1)	6	5.2 (2.4-10.9)	11	6.5 (2.8-10.2)
Senior hospital consultants	11	14.3 (8.2-23.8)	19	10.2 (6.6-15.4)	34	9.7 (6.6-12.8)
Doctors in hospital management positions	1	11.1 (2.0-43.5)	9	9.6 (5.1-17.2)	10	9.7 (4.0-15.4)
Community medical officers	27	5.7 (4.0-8.2)	2	6.5 (1.8-20.7)	0	0.0 (-)
General practitioners	6	2.4 (1.1-5.2)	8	4.3 (2.2-8.3)	9	4.0 (1.5-6.6)
Specialists in private practice	1	9.1 (1.6-37.7)	2	4.3 (1.2-14.2)	0	0.0 (-)
Doctors in academia positions	7	7.3 (3.6-14.3)	3	11.5 (4.0-29.0)	7	11.3 (3.4-19.2)
Doctors in administrative positions	1	16.7 (3.0-56.4)	1	11.1 (2.0-43.5)	2	7.1 (-2.4-16.6)
Other	18	3.0 (1.9-4.8)	3	7.9 (2.7-20.8)	3	8.8 (-0.7-18.3)
	1993 (n=1,014)		**2004** (n=395)		**2004-15** (n=618)	
	n	% (95 % CI)	n	% (95 % CI)	n	% (95 % CI)
ALL HOSPITAL DOCTORS[(a)]	79	7.8 (6.3-9.6)	34	8.6 (6.2-11.8)	54	8.7 (6.4-10.8)
Internal medicine	15	4.9 (3.0-8.0)	11	7.5 (4.2-12.9)	18	6.9 (4.4-10.7)
Laboratory medicine	5	7.9 (3.4-17.3)	5	8.9 (3.9-19.3)	6	8.5 (3.9-17.2)
Surgery	25	11.1 (7.6-15.9)	13	11.7 (7.0-19.0)	15	9.3 (5.7-14.8)
Psychiatry	6	5.2 (2.4-10.8)	4	5.4 (2.1-13.1)	12	10.3 (6.0-17.2)
Other	28	9.2 (6.5-13.0)	1	14.3 (2.6-51.3)	3	30.0 (10.8-60.3)

(a) Missings for medical disciplines in datasets: n=11 in 1993, n=46 in 2004, n=10 in 2014-15.

Table 3. List of effect variables, univariate and multivariate analyses of the variables on perceived bullying at work from colleagues or superiors at least a few times a month for all doctors in the cross-sectional data from 2014-15 (n=1,053)

	All	Univariate analyses			Logistic regression model		
	% (n)	No % (n)	Yes % (n)	P-value	OR	95 % C.I. for OR	P-value
Gender							
Male	57.6 (607)	94.9 (576)	5.1 (31)	0.009	1		
Female	42.4 (446)	90.6 (404)	9.4 (42)		2.02	1.18-3.47	0.010
Age by years (mean)	49.0 (1.053)	49.2 (980)	47.0 (73)	0.112	0.99	0.97-1.02	0.625
Job satisfaction (mean, range from 10 to 70)	53.0 (1.053)	53.6 (980)	44.9 (73)	<0.000	0.92	0.90-0.94	<0.000
Self-rated health							
Very good	44.3 (467)	96.6 (451)	3.4 (16)	<0.000	1	-	0.010
Good	45.9 (483)	91.7 (443)	8.3 (40)		3.50	1.49-8.25	0.004
Average or poor[(a)]	9.8 (103)	83.5 (86)	16.5 (17)		2.29	1.21-4.33	0.011
Sickness absence							
0 day	46.6 (491)	95.1(467)	4.9 (24)	0.053	1	-	0.967
1 to 3 days	28.2 (297)	92.6 (275)	7.4 (22)		1.17	0.62-2.22	0.629
4 to 99 days	23.5 (247)	89.9 (222)	10.1 (25)		1.12	0.57-2.18	0.744
100 days or more	1.7 (18)	88.9 (16)	11.1 (2)		0.98	0.18-5.28	0.977

(a) Categories of self-rated health "average" and "poor" collapsed into "average or poor", because of very low response of "poor" (n=1).

Figure legend

Figure 1. Changes in perceived bullying at work in the repeated measures from 2004 and 2014-15 (n=485).

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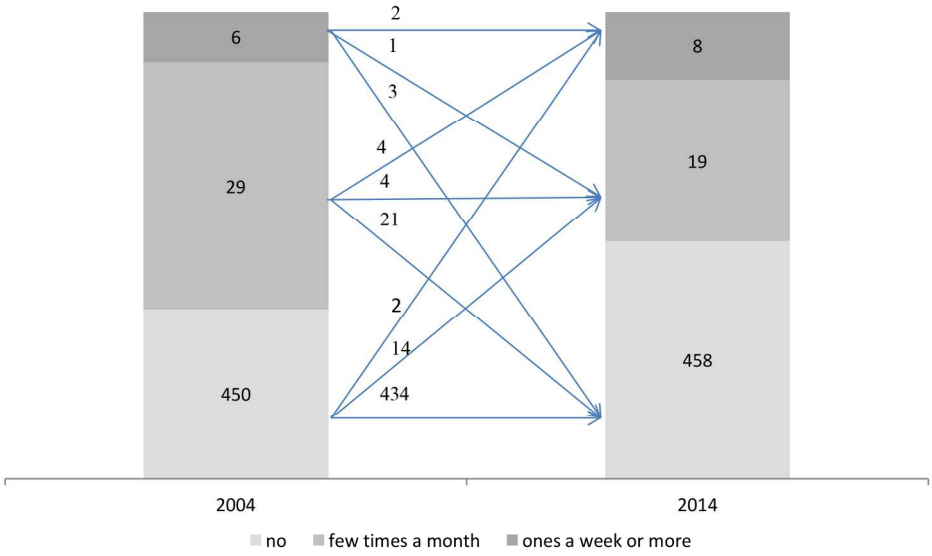

Figure 1. Changes in perceived bullying at work in the repeated measures from 2004 and 2014-15 (n=485)

178x122mm (300 x 300 DPI)

STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any pre-specified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9
		(*b*) Describe any methods used to examine subgroups and interactions	-
		(*c*) Explain how missing data were addressed	9
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed	-

		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	9
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	9
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	9
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	12
		(*b*) Report category boundaries when continuous variables were categorized	-
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	16-17
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13-16
Generalisability	21	Discuss the generalisability (external validity) of the study results	12-13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.
Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.