

responsibility for the study design, the supervision of the study, the discussion of the results, and the revision and approval of the final version of the paper. Members of the research coordinating centre contributed to the final version of protocols, coordinated all phases of the study, participated in data collection, carried out the analysis and interpretation of data, and revised and approved the final version of the paper. Members of the editorial committee wrote the paper and act as guarantors.

*Dr G Di Bella, the son of Dr L Di Bella, participated at only the first two meetings of the Steering Committee. On many occasions, he strongly disagreed with the performance and results of the trials. No part of the present article has been discussed or agreed with Dr G Di Bella.

Funding: The study was specifically funded through an act of the Italian parliament.

Competing interests: None declared.

1 Support for a pragmatic health minister [editorial]. *Nature* 1998;392:421.

- 2 Pellegrini R. Di Bella's method of curing cancer is becoming popular in Italy. *BMJ* 1998;317:352.
- 3 Italia. *DL n. 23 del 17 febbraio 1998. Disposizioni urgenti in materia di sperimentazioni cliniche in campo oncologico e altre misure in materia sanitaria*. G.U. n. 39 del 17 febbraio 1998.
- 4 Gruppo di Coordinamento Centrale per la Sperimentazione del Multitratamento Di Bella. *Risultati della sperimentazione del multitratamento Di Bella (MDB): protocolli 4, 6, 8, 10*. Roma: Istituto Superiore di Sanità, Servizio per le Attività Editoriali, 1998. (Rapporti ISTISAN; 98/17.)
- 5 Gruppo di Coordinamento Centrale per la Sperimentazione del Multitratamento Di Bella. *Risultati della sperimentazione del multitratamento Di Bella (MDB): protocolli 1, 3, 5, 7, 9*. Roma: Istituto Superiore di Sanità, Servizio per le Attività Editoriali, 1998. (Rapporti ISTISAN; 98/24.)
- 6 Simon R. Optimal two-stage designs for phase II clinical trials. *Control Clin Trials* 1989;10:1-10.
- 7 Miller AB, Hoogstraten B, Staquet M, Winkler A. Reporting results of cancer treatment. *Cancer* 1981;47:207-14.
- 8 De Vita VT Jr, Hellman S, Rosenberg S. *Cancer: principles and practice of oncology*. 5th ed. Philadelphia: Lippincott-Raven, 1997.

(Accepted 7 January 1999)

Workplace bullying in NHS community trust: staff questionnaire survey

Lyn Quine

Centre for Research in Health Behaviour, Department of Psychology, University of Kent at Canterbury, Canterbury CT2 7NP
Lyn Quine, reader in health psychology
L.Quine@ukc.ac.uk

BMJ 1999;318:228-32

Abstract

Objectives To determine the prevalence of workplace bullying in an NHS community trust; to examine the association between bullying and occupational health outcomes; and to investigate the relation between support at work and bullying.

Design Questionnaire survey.

Setting NHS community trust in the south east of England.

Subjects Trust employees.

Main outcome measures Measures included a 20 item inventory of bullying behaviours designed for the study, the job induced stress scale, the hospital anxiety and depression scale, the overall job satisfaction scale, the support at work scale, and the propensity to leave scale.

Results 1100 employees returned questionnaires—a response rate of 70%. 421 (38%) employees reported experiencing one or more types of bullying in the previous year. 460 (42%) had witnessed the bullying of others. When bullying occurred it was most likely to be by a manager. Two thirds of the victims of bullying had tried to take action when the bullying occurred, but most were dissatisfied with the outcome. Staff who had been bullied had significantly lower levels of job satisfaction (mean 10.5 (SD 2.7) *v* 12.2 (2.3), $P < 0.001$) and higher levels of job induced stress (mean 22.5 (SD 6.1) *v* 16.9 (5.8), $P < 0.001$), depression (8% (33) *v* 1% (7), $P < 0.001$), anxiety (30% (125) *v* 9% (60), $P < 0.001$), and intention to leave the job (8.5 (2.9) *v* 7.0 (2.7), $P < 0.001$). Support at work seemed to protect people from some of the damaging effects of bullying.

Conclusions Bullying is a serious problem. Setting up systems for supporting staff and for dealing with interpersonal conflict may have benefits for both employers and staff.

Introduction

Bullying in the workplace has been recognised as an important issue by trade unions in Britain for about five years. Several reports have graphically illustrated the pain, mental distress, physical illness, and career damage suffered by victims of bullying,¹⁻⁴ but academic study began only recently.⁵⁻⁷ The most developed research comes from Scandinavia,⁸⁻¹² where there is strong public awareness, government funded research, and established anti-bullying legislation.

Bullying presents considerable methodological problems for researchers. A central difficulty is that of definition as no clear consensus exists on what constitutes adult bullying. Although physical bullying is rarely reported, the workplace presents opportunities for a wide range of intimidating tactics. Rayner and Hoel provide five categories of bullying behaviour.⁷ These are threat to professional status (for example, belittling opinion, public professional humiliation, accusation of lack of effort); threat to personal standing (for example, name calling, insults, teasing); isolation (for example, preventing access to opportunities such as training, withholding information); overwork (for example, undue pressure to produce work, impossible deadlines, unnecessary disruptions); and destabilisation (for example, failure to give credit when due, meaningless tasks, removal of responsibility, shifting of goal posts).

Most definitions of workplace bullying share three elements that are influenced by case law definitions in the related areas of racial and sexual harassment. Firstly, bullying is defined in terms of its effect on the recipient not the intention of the bully. Thus it is subject to variations in personal perceptions. Secondly, there must be a negative effect on the victim.^{7, 8} Lyons and colleagues use the following definition: “persistent, offensive, abusive, intimidating, malicious or insulting behaviour, abuse of power or unfair penal sanctions, which makes the recipient feel upset, threatened, humiliated or vulnerable,

which undermines their self-confidence and which may cause them to suffer stress.¹³ Thirdly, the bullying behaviour must be persistent.¹²

There have been three main approaches to research into workplace bullying. The first has been qualitative and individualistic in perspective, identifying a role for the individual in terms of vulnerability to bullying or a propensity to bully^{5 14 15} and elucidating the dynamics of bully-victim relationships. The second approach is descriptive and epidemiological and is usually based on self report.^{6 9 10} These studies document the prevalence of workplace bullying, the types experienced, age and sex differences, who is told, what action is taken, etc. The third approach is influenced by theories and constructs in organisational psychology and has focused on the interaction between the individual and the organisation and how aspects of the organisational structure and climate of the workplace may encourage the development of a bullying culture.^{11 12}

This study is a survey of workplace bullying in an NHS community trust. The objectives were to determine the prevalence of workplace bullying in the trust; to examine the association between bullying and occupational health outcomes; and to investigate the relation between support at work and bullying.

Subjects and methods

In 1996, as part of a larger survey of working life, a community NHS trust in south east England commissioned an examination of the prevalence of workplace bullying. The trust provides a range of mental health, learning disability, primary care, and child health services comprising residential care, multidisciplinary community and day service teams, health promotion, health visiting, school and community nursing services, occupational therapy, physiotherapy, speech and language therapy, and child and family psychiatry services.

We sent a questionnaire to all 1580 trust employees, together with a covering letter explaining the purpose of the research and a prepaid envelope. The questionnaire was anonymous to encourage participation. A reminder was sent after three weeks, a second questionnaire after a further three weeks, and then a final reminder. The data were then entered on to computer and analysed with SPSS for Unix.

Questionnaire

The first section of the questionnaire collected information about the participant's job, qualifications, professional group, hours worked, and supervisory responsibilities. The second contained several widely used scales to measure occupational health outcomes: job induced stress,¹⁶ job satisfaction,¹⁷ propensity to leave,¹⁸ anxiety and depression,¹⁹ and a scale to measure support at work.²⁰ The job induced stress scale contains seven items intended to measure the existence of tensions and pressures growing out of job requirements. The job satisfaction scale uses five items to tap a worker's general affective reaction to the job.¹⁷ The propensity to leave scale provides a three item index of employees' intention to leave their job.¹⁸ The hospital anxiety and depression scale has 14 items, seven of which measure anxiety and seven depression.¹⁹ Cut off points are provided to give the best separation

between non-cases (0-7), doubtful cases (8-10), and cases (≥ 11) of clinical anxiety and depression.

Support at work was measured by a scale adapted from Payne.²⁰ Workers were asked to rate on a five point scale various resources in the work environment, including feedback and support from peers and managers, access to community resources, level of workplace morale, positive working practices, and physical work environment.

The third section of the questionnaire contained questions about staff experience of bullying in the trust and examined its consequences. To avoid some of the methodological problems inherent in previous definitions of bullying we separated out the experience of bullying behaviours from their effects. Twenty types of bullying behaviour were taken from the literature,^{21 22} representing each of the categories defined by Rayner and Hoel.⁷ Staff were asked to indicate by a yes/no response whether they had been persistently subjected to any of these behaviours in the past 12 months. The final section of the questionnaire asked for socio-demographic information—age, sex, educational level—and contained questions concerning smoking and drinking habits.

Statistical analysis

A supportive work environment has been suggested to act as a coping strategy or moderator, buffering the individual from the damaging effects of work stressors such as bullying.²⁰ The moderator effect is typically shown as an interaction term in analysis of variance.²³ To test whether support at work could act as a moderator, five two-way analyses of variance were conducted. The dependent variables were job satisfaction, propensity to leave, job induced stress, and anxiety and depression. The independent variables were scores on the support at work scale, which was split at the mid point to give two groups, staff with poor support and staff with good support and scores on the bullying variable, which was divided into reported bullying and no reported bullying.

Table 1 Characteristics of study participants

	No (%) of respondents
Occupational group (n=1100)	
Nurses*	396 (36)
Therapists†	111 (10)
Administrative staff	132 (12)
Doctors	49 (5)
Clinical psychologists	11 (1)
Other professionals‡	101 (9)
Unqualified staff¶	300 (27)
Sex (n=1091)	
Male	176 (16)
Female	915 (84)
Hours of work (n=1097)	
Full time	560 (51)
Part time	537 (49)

*For example, registered general nurses, registered mental health nurses, registered learning disabilities nurses, health visitors.

†For example, occupational therapists, speech and language therapists, chiropodists, physiotherapists.

‡For example, social work, residential care, health promotion.

¶For example, unqualified residential care staff, secretarial staff, porters, catering, cleaning, and maintenance staff.

Numbers do not add up to 1100 because some participants did not answer all questions.

Table 2 Respondents reporting each type and category of bullying

	No (%) (n=1100)
Threat to professional status	185 (17)*
Persistent attempts to belittle and undermine your work	124 (11)
Persistent and unjustified criticism and monitoring of your work	109 (10)
Persistent attempts to humiliate you in front of colleagues	90 (8)
Intimidatory use of discipline or competence procedures	57 (5)
Threat to personal standing	217 (20)*
Undermining your personal integrity	124 (11)
Destructive innuendo and sarcasm	123 (11)
Verbal and non-verbal threats	63 (6)
Making inappropriate jokes about you	49 (5)
Persistent teasing	32 (3)
Physical violence	18 (2)
Violence to property	16 (2)
Isolation	255 (23)*
Withholding necessary information from you	178 (16)
Freezing out, ignoring, or excluding	143 (13)
Unreasonable refusal of applications for leave, training, or promotion	78 (7)
Overwork	166 (15)*
Undue pressure to produce work	139 (13)
Setting of impossible deadlines	89 (8)
Destabilisation	294 (27)*
Shifting of goal posts without telling you	204 (19)
Constant undervaluing of your efforts	126 (12)
Persistent attempts to demoralise you	114 (11)
Removal of areas of responsibility without consultation	84 (8)

*Some respondents reported more than one type of bullying in each category.

Table 3 Characteristics of the victims of bullying

Variable	No (%) bullied	No (%) not bullied	χ^2 , P value
Occupational group			21.8, <0.003
Nurses	174 (44)	222 (56)	
Therapists	41 (37)	70 (63)	
Administrative staff	49 (37)	83 (63)	
Doctors	15 (31)	34 (69)	
Psychologists	4 (36)	7 (64)	
Other professionals	36 (36)	65 (64)	
Unqualified residential care staff	48 (48)	52 (52)	
Ancillary staff	54 (27)	146 (73)	
Sex			NS
Male	75 (43)	101 (57)	
Female	343 (37)	572 (63)	
Age (years)			17.1, <0.0006
18-30	91 (51)	87 (49)	
31-40	135 (40)	203 (60)	
41-50	108 (34)	214 (66)	
>51	79 (35)	150 (65)	
Hours of work			34.2, <0.0001
Full time	262 (47)	298 (53)	
Part time	159 (30)	378 (70)	

Results

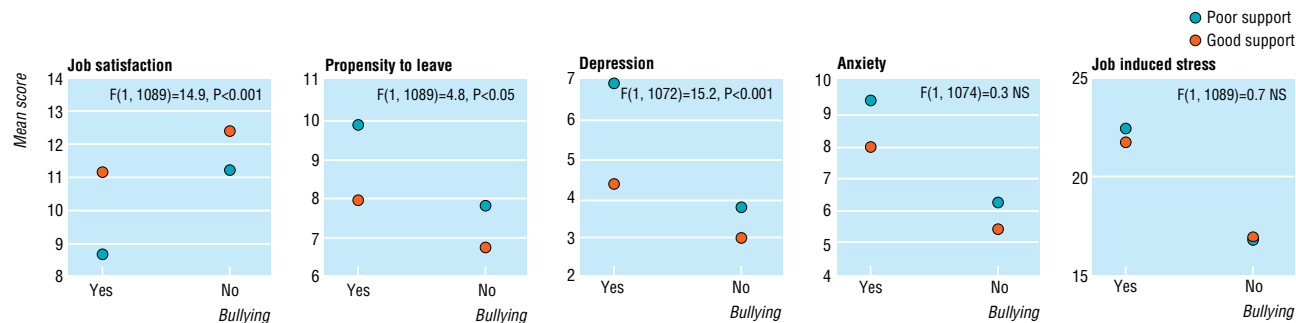
We received 1100 completed questionnaires, which represented a response rate of 70%. Table 1 shows the profile of the participants. Checks made with the personnel department indicated that the sample accurately reflected the profile of the trust in terms of age, sex, and occupational groups.

Table 2 shows the proportion of staff reporting each type and category of bullying. Overall, 421 (38%) people reported experiencing one or more types of bullying and 241 (22%) described an incident in the past three months; 460 (42%) had witnessed the bullying of others.

Table 3 shows the differences in occupational group, sex, age, and hours between those who reported bullying and those who did not, and table 4 shows the percentage of staff in each occupational group reporting each category of bullying. Of those reporting an incident in the past three months, 161 (67%) had tried to take action about the bullying when it occurred, but most (119 (74%)) were not satisfied with the outcome. Only 14/241 (6%) people had used the staff stress counselling service, which was comparatively new.

The most common bully was a senior manager or line manager (128/239 (54%)), although in 80 (34%) cases it was someone of the same level of seniority as the victim and in 31 (12%) it was someone less senior. In 137 (57%) cases the bully was the same sex as the victim, and in 54 (8%) cases it was someone of the opposite sex. In 59 (27%) cases the bully was male and in 144 (65%) female; both sexes were involved in the remaining cases. Of the 205 cases for which information was given on age, in 100 (49%) the bully was older than the victim, in 57 (28%) both parties were of similar age, and in 48 (23%) the bully was younger.

Relations between bullying and occupational health outcomes were examined by *t* test or χ^2 test where appropriate. Staff who had experienced bullying in the past year reported significantly lower levels of job satisfaction than other workers (mean 10.5 (SD 2.7) *v* 12.2 (2.3), *t* (1, 1098) = 10.7, *P* < 0.001). Additionally they had significantly higher levels of job induced stress (22.5 (6.1) *v* 16.9 (5.8), *t* (1, 1098) = 14.4, *P* < 0.001) and higher scores on the propensity to leave scale (8.5 (2.9) *v* 7.0 (2.7), *t* (1, 1098) = 8.72, *P* < 0.001) than those who had not been bullied. They were significantly more likely to suffer clinical levels of anxiety (30% (125) *v* 9% (60), *df* = 1, χ^2 = 79.3, *P* < 0.001) and depression (8% (33) *v* 1% (7), *df* = 1, χ^2 = 32.5,



Effect of support at work on occupational health outcomes

Table 4 Number (percentage) of staff reporting each category of bullying

	Threat to professional status	Threat to personal standing	Isolation	Overwork	Destabilisation
Nurses (n=396)	76 (19)	88 (22)	107 (27)	74 (19)	132 (33)
Therapists (n=111)	20 (18)	23 (21)	24 (22)	22 (20)	28 (25)
Administrative staff (n=132)	16 (12)	20 (15)	24 (18)	29 (22)	34 (26)
Doctors (n=49)	7 (14)	9 (18)	10 (20)	10 (20)	9 (18)
Psychologists (n=11)	2 (18)	2 (18)	0 (0)	1 (9)	3 (27)
Other professionals (n=101)	12 (12)	16 (16)	22 (22)	5 (5)	21 (21)
Unqualified residential care staff (n=100)	26 (26)	27 (27)	36 (36)	12 (12)	36 (36)
Ancillary staff (n=200)	26 (13)	32 (16)	32 (16)	13 (7)	31 (16)

$P < 0.001$). Sixty one people who had experienced bullying reported that their health had been affected and 20 had taken time off work. Altogether 335 days were reported lost. Forty four per cent (56/122) of smokers who had experienced bullying reported an increase in their smoking in the previous year, and 20% (70/373) of drinkers reported an increase in their alcohol consumption.

For the analyses of variance to test whether support at work could moderate the effects of bullying 209 (19%) staff were classified as having poor support and 884 (81%) good support from the support at work variable. The figure shows that there were main effects of support for each outcome variable except job induced stress, and interaction (moderating) effects for three of the five outcome variables.

Discussion

In this study more than a third of staff (38%) reported experiencing one or more types of bullying in the past year, which should be a cause for concern. This prevalence compares with 1 in 8 reporting being bullied in the past five years in a recent study of 1000 workers by the Institute of Personnel and Development,²⁴ about 1 in 5 found in a recent Unison survey,⁴ 1 in 3 in a Royal College of Nursing Survey,²⁵ and 1 in 2 of 1137 mature students at one English university reporting being bullied "at some time during their working life."²⁶ Comparisons should be treated with caution because of differences in definition and time. The most frequently reported bullying behaviours were shifting the goal posts, withholding necessary information, undue pressure to produce work, and freezing out, ignoring, or excluding. If these four bullying behaviours only were included, the prevalence would be 32% (346). Unqualified residential care staff were most likely to report experiencing each of the five categories of bullying except enforced overwork.

Staff who had experienced bullying reported lower levels of job satisfaction and higher levels of job induced stress. They were more likely to be clinically anxious and depressed and were more likely to report wanting to leave. Three explanations could account for these associations. Firstly, being bullied leads to psychological ill health and reduced job satisfaction. Secondly, certain staff may be more likely to report being bullied than others. These may be people who are more pessimistic in outlook. Such people might also report higher levels of job dissatisfaction, propensity to leave, etc than other workers. Thirdly, being depressed, stressed, or anxious may cause a person to be bullied by unscrupulous workers who choose

weaker people as their victims. Anxiety and depression may also weaken a person's ability to cope with stressors such as bullying or make them more likely to perceive other people's behaviour as hostile and critical. Longitudinal data are required to try to disentangle these effects.

Despite these difficulties, the finding that 42% of staff had witnessed the bullying of others, including many who did not report being bullied themselves, confirms that it is not purely a subjective phenomenon. Similarly, the finding that higher proportions of unqualified residential care staff and younger staff report being bullied suggests a role for aspects of the organisational climate.

Support at work

The results are consistent with the hypothesis that a supportive work environment can protect people from some of the harmful effects of bullying. Support at work may function as a buffer against stress by providing resources to enable them to cope with stressful.²⁶ Other factors may also be able to perform this protective role, among them high levels of job control and personal dispositions such as hardiness, optimism, or sense of personal control (self efficacy). These merit further research interest.

The survey achieved a 70% response rate, which is highly satisfactory for studies of this kind.²⁷ Checks indicated that the sample matched the profile of the trust adequately, minimising potential bias resulting from non-response. The Health and Safety Executive acknowledge in their guide *Stress at Work*²⁸ that bullying is a workplace risk and advise that employers should have effective systems for dealing with interpersonal conflict, bullying, and racial and sexual harassment,

Key messages

- 38% of staff in a community NHS trust reported being subjected to bullying behaviours in the workplace in the previous year and 42% had witnessed the bullying of others
- Staff who had been bullied had lower levels of job satisfaction and higher levels of job induced stress, depression, anxiety, and intention to leave
- Support at work may be able to protect people from some of the damaging effects of bullying
- Employers should have policies and procedures that comprehensively address the issue of workplace bullying

including agreed grievance procedures and proper investigation of complaints. The results of this study indicate that providing a positive work environment with appropriate attention to staff support structures may be an additional way to protect people's health and welfare.

Contributors: LQ is the sole contributor.

Funding: The study was supported by a grant from the NHS trust that commissioned the research.

Conflict of interest: None.

- 1 Manufacturing, Science and Finance. *How big is the problem of bullying at work? Report of a survey of MSF workplace representatives on their experiences and impressions of bullying at work.* London: MSF, 1995.
- 2 National Association of Schoolmasters and Union of Women Teachers. *Workplace bullying: report of NASUWT survey of members 1995.* Birmingham: NASUWT, 1995.
- 3 National Association of Schoolmasters and Union of Women Teachers. *No place to hide: confronting workplace bullies.* Birmingham: NASUWT, 1996.
- 4 Unison. *Violence at work: health service staff study.* London: Unison, 1995.
- 5 Crawford I. Bullying at work: a psychoanalytic perspective. *J Comm Appl Soc Psychol* 1997;7:219-25.
- 6 Rayner C. The incidence of workplace bullying. *J Comm Appl Soc Psychol* 1997;7:199-208.
- 7 Rayner C, Hoel H. A summary review of literature relating to workplace bullying. *J Comm Appl Soc Psychol* 1997;7:181-91.
- 8 Nield K. Mobbing and well-being: economic and personnel development implications. *Eur J Work Organizational Psychol* 1996;5:239-49.
- 9 Bjorkqvist K, Osterman K, Hjelt-Back M. Aggression among university employees. *Aggressive Behaviour* 1994;20:173-84.
- 10 Einarssen S, Skogstad A. Bullying at work: epidemiological findings in public and private organizations. *Eur J Work Organizational Psychol* 1996;5:185-201.
- 11 Einarssen S, Raknes BI, Mathiesen SB. Bullying and its relationship to

- work and environment quality: an exploratory study. *Eur J Work Organizational Psychol* 1994;4:381-401.
- 12 Vartia M. The sources of bullying: psychological work environment and organisational climate. *Eur J Work Organizational Psychol* 1996;5:203-14.
 - 13 Lyons R, Tivey H, Ball C. *Bullying at work: how to tackle it. A guide for MSF representatives and members.* London: MSF, 1995.
 - 14 Lockhart K. Experience from a staff support service. *J Comm Appl Soc Psychol* 1997;7:193-8.
 - 15 Randall P. *Adult bullying: perpetrators and victims.* London: Routledge, 1997.
 - 16 House RJ, Rizzo J. Role conflict and ambiguity as critical variables in a model of organisational behaviour. *Organisational Behaviour and Human Performance* 1972;7:467-505.
 - 17 Quinn RP, Staines GL. *The 1977 quality of employment survey.* Ann Arbor: Institute for Social Research, University of Michigan, 1979.
 - 18 Cammann C, Fichmann M, Jenkins D, Klesh J. *The Michigan organisational assessment questionnaire.* Ann Arbor: University of Michigan, 1979.
 - 19 Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983;67:361-70.
 - 20 Payne R. Demands, supports, constraints and psychological health. In: Mackay C, Cox T. editors. *Response to stress: occupational aspects.* London: IPC Business Press, 1979.
 - 21 Adams A. *Bullying at work: how to confront and overcome it.* London: Virago, 1992.
 - 22 Bassman E. *Abuse in the workplace.* New York: Quorum Books, 1992.
 - 23 Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Personality Soc Psychol* 1986;51:1173-82.
 - 24 Institute of Personnel and Development. *News release.* London: IPD House, 1996.
 - 25 Alderman C. Bullying in the workplace. *Nursing Standard* 1997;11(35):22-6.
 - 26 Cohen S, Hoberman H. Positive events and social support as buffers of life change stress. *J Appl Soc Psychol* 1983;13:99-125.
 - 27 Nachmias C, Nachmias D. *Research methods in the social sciences.* New York: St Martin's Press, 1981.
 - 28 Health and Safety Executive. *Stress at work: a guide for employees.* London: HMSO, 1995.

(Accepted 28 October 1998)

Observational study of defibrillation in theatre

Jonathan M Fielden, Neil S Bradbury

Royal United Hospital NHS Trust, Bath BA1 3NG

Jonathan M Fielden, specialist registrar anaesthetist

Neil S Bradbury, resuscitation training officer

Correspondence to: Dr J M Fielden, Royal Berkshire Hospital, Reading RG1 5AN
jonathan@jfielden.demon.co.uk

BMJ 1999;318:232-3

Prompt, safe defibrillation is the treatment most likely to improve survival after ventricular fibrillation.¹ Anaesthetists and surgeons need adequate skills to treat cardiac arrest.² This observational study, set in the operating department of an acute hospital, tested whether surgeons and anaesthetists could manage ventricular fibrillation in accordance with advanced life support protocols.³

Subjects, methods, and results

Over two separate days 23 surgeons and 25 anaesthetists were asked, without warning or apparent prior knowledge, to manage simulated ventricular fibrillation (Laerdal skill master, Laerdal Heartstim 2000, and Laerdal monitor interface, Laerdal Medical, Orpington, Kent). Candidates were randomised (by tossing a coin) to either the S&W defibrillator (Simonson and Weald DMS 930, Vickers Medical, Sidcup, Kent) or the Lifepack 9 (Physio Control Corporation, Redmond, WA, USA). Nineteen consultants, four staff grades, and 25 trainees (12 senior house officers and 13 registrars, senior registrars, and specialist registrars) were studied from initial assessment to the third defibrillation. Results were analysed with Mann-Whitney U test and Fisher's exact tests (Analyse-it for Microsoft Excel).

Of all the candidates, 83% (40/48) failed to defibrillate according to advanced life support protocols (table). The Lifepack 9 was easier to turn on

(median (range) 61 (11-113) seconds *v* 82 (14-196) seconds for the S&W; $P=0.03$; $n=44$), and the first shock was delivered more rapidly (72 (16-123) seconds *v* 102 (40-201) seconds; $P=0.006$; $n=44$). This was not significant, however, after three shocks (129 (33-218) seconds *v* 152.5 (85-278) seconds; $P=0.15$; $n=43$). Forty candidates failed to deliver the first shock within 60 seconds, 24 by 90 seconds (range 11-201; $n=44$). Four candidates failed to turn on the defibrillator, five candidates failed to deliver three shocks, and only four candidates delivered three shocks within 90 seconds; seven took over 180 seconds (range 33-278). Median (range) times to confirm arrest and call the arrest team were 10 (0-87) seconds and 10.5 (0-120) seconds, respectively.

All candidates were content with the method of testing and were happy to be tested in this manner in future.

Anaesthetists fared better than surgeons, although because of the small sample this was not significant (7/25 *v* 1/23; $P=0.06$). There was no difference between trainees and consultants (3/25 *v* 3/19; $P=0.71$).

Comment

Defibrillation skills are poor across a cross section of grades of anaesthetists and surgeons, the main reasons being lack of safety procedures and lack of knowledge.