What will happen to the quality of care with fewer junior doctors?

A Delphi study of consultant physicians' views

ABSTRACT—*Hospital medical staffing: achieving a balance* proposed a reduction in the number of junior doctors and an expansion in the number of consultant posts. This change was to be subject to the 'safety net'—that the number of staff should not fall below a minimum safe level for 24-hour emergency cover. However, no operational definition of 'safe' was offered. Consultant physicians in one NHS region were interviewed to find out how they thought safety would be affected by a reduction in junior doctor numbers. It emerged that consultants' concerns over reductions in staff covered a wider range of issues than just the clinical effectiveness of care. The interpretation of safety extended to cover general adverse effects on care. A survey, using the Delphi method, revealed that consultant physicians were most concerned over reductions in the humanity of care if numbers of junior staff were reduced. This included such factors as the time spent by patients waiting in outpatient and A&E departments, and the time doctors spend talking to patients. Consultants were less concerned over the effect of reduced staff numbers on the technical efficiency of provision, and least of all on the effectiveness of care. This last point was seen to be a reflection of consultant physicians' confidence in the basic medical knowledge and skill of their junior staff.

Current medical manpower policy, based on *Hospital medical staffing: achieving a balance*, envisages a reduction in the number of junior doctors and an expansion in the number of consultant posts. However, such changes, and especially the reductions in junior doctor staffing levels, are subject to the proviso that [1]:

> . . . the number of intermediate-level staff to support consultants in the major acute specialties should not fall below a minimum safe level for 24-hour emergency cover.

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No operational definition of 'safe' was offered, either in this document or in its successor [2].

The *Concise Oxford Dictionary* defines safe as 'affording security or not involved in danger'. Since danger is further defined as 'exposure to harm, risk, peril (of one's life)' this seems adequately to reflect the concern of the authors of *Achieving a balance*—that reductions in staffing levels should not affect a hospital's ability to maintain emergency cover, jeopardising the health of patients. Such a definition might be seen to relate most closely to levels of inpatient mortality and how they might be minimised.

Forty consultant physicians in district general hospitals and teaching hospitals in North West Thames region were interviewed to find out what they thought would be the consequences if the number of junior doctors in their hospital were reduced below a 'safe' level. A wide range of suggestions was made. It soon became clear that the concerns being raised went beyond a narrow interpretation of safety to embrace general adverse effects of reducing junior doctor numbers. In all, 109 separate adverse effects were suggested, which could be condensed to 20 principal issues (Table 1).

These issues reflected two major concerns: a reduction in the effectiveness of care, and a reduction in the humanity of care. A third concern, raised less often but strongly emphasised by those who did raise it, was that consultants would have less time for non-clinical duties, whether they be teaching or general administrative tasks.

Having conducted the interviews it became necessary to assess how comprehensive and representative were the views expressed by clinicians in NW Thames region. To do this it was necessary to obtain the opinions of a large group of consultant physicians from different parts of the country, in different types of hospitals, and in different medical specialties. Their opinions could then be assessed by the Delphi method.

The Delphi method is a means of determining the extent to which a consensus exists amongst a group of people [3, 4]. This takes place in a series of 'rounds'. The first round involves obtaining the opinions of selected experts about a particular issue. In subsequent rounds the same experts are asked to rate the

extent of their agreement or disagreement with a series of statements describing the opinions expressed in the first round. Responses are analysed for the degree of consensus achieved. While a number of experts are used in this method, in order to gain a wide range of opinions and avoid missing obvious points, no group meetings are arranged, with experts being approached individually.

In the health field the uses of the Delphi method have covered a wide range of topics [5–11]. The method has three features: anonymity, controlled feedback and statistical group response [12]. Anonymity is important as a means of avoiding dominance, and will usually be secured by using a questionnaire. The controlled feedback of information occurs in the series of rounds in which the questionnaire is returned to respondents showing the responses made in the previous round. This provides an opportunity for individuals to change their views if they so wish. Statistical group response, seen by Dalkey [3] as the most important feature of the method, ensures that each opinion is represented in the final response.

The advantages of Delphi, for the researcher, are that it enables a large group of experts to be addressed cheaply, most commonly by mail using a self-administered questionnaire, with few geographical limitations on those included in the sample [4]. It allows each member to hold a view while collecting data on the group as a whole, and it avoids dominance, since equal weight is accorded to each response. Finally, the results give an indication of the extent of agreement among the participants.

Method

The adverse consequences of reducing the number of junior doctors suggested in the interviews (Table 1) were included in a questionnaire sent to 110 consultant physicians in SW Thames and Trent health regions. The physicians represented half the consultant workforce in general medicine and its associated specialties and were chosen randomly. Respondents were asked to indicate their level of agreement with each statement on a scale from 0 to 9 (0 indicating total disagreement and 9 indicating total agreement). They were also invited to suggest any further possible consequences of a reduction in junior doctor staffing levels.

The median and the mean score for each statement was calculated to provide an indication of the level of agreement amongst respondents. Standard deviation was used to provide a measure of dispersion and as such gives an indication of the degree of consensus.

A second questionnaire was sent to the consultants

Table 1. Adverse effects of *Achieving a balance* on the safety of medical care suggested by consultants

A. Reduced effectiveness of care
Increase in:
case fatality rates (incl. fewer successful resuscitations)
complications
premature discharge and readmissions
missed diagnoses
incorrect treatment
failure to follow up abnormal test results
refused admissions
delays in responding to urgent out-of-hours calls
Decrease in:
basic investigations performed
time spent reviewing new admissions
patient compliance with treatment advice
B. Reduced humanity of care
Increase in:
patients' complaints/litigation
waiting time to be seen in outpatient clinics
waiting time to be seen in A&E departments
refused admissions
Decrease in:
medical and nursing staff morale
time spent attending to patients (particularly non-acute cases)
patient satisfaction
C. Reduced time for consultants' non-clinical tasks
Reduced time for:
teaching
basic administrative tasks (incl. committee work)

who had responded to the previous round. This second questionnaire was similar to the first but it showed the initial responses of all the participants. In addition, the individual's rating for each statement in the previous round was shown. The purpose of this was to offer an opportunity for respondents to amend their ratings in view of the expressed attitudes of their colleagues. Once again mean score, standard deviation and median were calculated for each of the statements.

Results

In the first round replies were received from 79 physicians (a response rate of 72%). The response rate was similar for the two regions (SW Thames 68%; Trent 73%) and for the type of hospital (district general 73%; teaching 64%).

A second questionnaire was sent to the 79 consultants who had responded to the first round. Replies were received from 57 (70%) physicians (52% overall). The response from SW Thames (53%) was poorer than from Trent (76%). The response by type of hospital was similar to that obtained in the first round: 75% from district general hospitals and 63% from teaching hospitals. The results of the second questionnaire are shown in Table 2.

Only slight changes occurred between the two questionnaire rounds of the Delphi study. The indicators that achieved greatest agreement (highest mean score) increased in the level of agreement and of consensus (as measured by standard deviation), while the level of disagreement increased for the indicators scoring lowest in the first questionnaire. Given the lack of change in response it was decided not to conduct any further rounds.

The results of the second round of the questionnaire revealed four categories of adverse effects, characterised by the type of concerns being raised and the level of agreement or disagreement between respondents:

1. *Delays and insufficient time to provide a humane service* (overall mean score for the group of 7.94). Not all the adverse effects may seem to affect safety directly

Table 2. Responses to questionnaire on adverse effects of reducing number of junior medical staff in general medicine and associated specialties: second round ($n = 57$)

Adverse effects	Mean	Median	Standard deviation
Delays and insufficient time to provide a humane service	**7.94**		
Less time spent with patient	8.42	9.0	0.96
Increased wait in A & E	8.16	9.0	1.30
Less time to talk with relatives	8.00	8.0	1.51
Increased wait in outpatients	7.69	9.0	2.11
Increased time taken to answer urgent out-of-hours calls	7.44	8.0	1.79
Reduced satisfaction both for patients and staff	**7.07**		
Decreased morale of nursing staff	7.20	8.0	1.96
Decreased patient satisfaction	7.19	7.0	1.98
Increased patient complaints	6.82	7.0	2.03
Inefficient use of resources	**6.75**		
Increase in average length of stay	6.76	7.0	2.16
Discharge delayed	6.76	7.0	2.10
Increased failure to follow up abnormal test results	6.72	7.0	2.51
Poor medical outcomes	**5.82**		
Reduced rate of successful resuscitation after cardiac arrest	6.63	7.0	2.61
Increased complication rate	6.13	6.0	2.16
Increased missed/mistaken diagnosis	6.00	6.0	2.34
Increased mortality rates	5.70	6.0	2.42
Increased fatality rates for IHD admissions	5.65	6.0	2.53
Increased incorrect treatment rate	5.28	5.0	2.45
Increased readmission	5.35	6.0	2.64
Reduced number of basic investigations	**4.17**	**5.0**	**2.61**
Premature discharge	**3.20**	**2.0**	**2.51**

(except the issue of delays in attending urgent out-of-hours calls) but, as stated earlier, they raise issues regarding the quality of care. Issues such as delays in patients being seen and insufficient time available to talk to patients and to relatives were clearly the matters of greatest concern to physicians.

2. *Patient and staff satisfaction* (overall mean score 7.07). Reductions in junior doctor staffing levels were expected to produce a general reduction in patient satisfaction and an increase in complaints over the quality of care. At the same time, the morale of hospital nursing staff was expected to be adversely affected.

3. *Administration and management of cases in the hospital.* This category may be considered as concerning adverse effects on the efficiency of patient care and was termed inefficient use of resources (mean score 6.75), including increased length of stay, delayed discharge and also a failure to follow up abnormal test results (which may have a direct impact on the safety of hospital care).

4. *Respondents were ambivalent as to whether reductions in junior staff would have adverse effects on medical outcomes* (overall mean score 5.82). Physicians were uncertain as to whether or not a consequence of fewer junior staff would be an increase in missed or mistaken diagnoses, more frequent incorrect treatment or a rise in case fatality rates.

Finally, there was very little support for two other suggested adverse effects—that the number of basic investigations would fall and that patients would be discharged prematurely.

Discussion

Before undertaking the Delphi study the most commonly suggested indicator of the safety of hospital care raised was inpatient mortality. However, it became apparent at an early stage that consultants' concerns went beyond a narrow clinical interpretation of safety to embrace issues surrounding the humanity of care. This was borne out by the responses to the questionnaires.

The concerns of physicians about the consequences of a reduction in the number of junior doctors were most closely related to the ability of the system to provide timely and humane care, to a lesser extent to the technical efficiency of provision, and least of all to the effectiveness of care, reflecting their confidence in the competence and commitment of their junior staff. There was considerable agreement in the views expressed by the consultants, regardless of differences in the geographical location and type of hospital in which they were working.

These results should not be seen as suggesting that consultant physicians consider reduced effectiveness as unimportant, but that they felt it was unlikely to be adversely affected by a reduction in junior doctor staffing levels.

How much weight can be put on these findings? There are several critical issues to be considered: the sample size to be used; whom to include as participants; how to feed back the information after each round; how many rounds to undertake; and how to measure the accuracy of the answer obtained from the group.

It seems clear that the results will be sensitive to the number and selection of participants [6]. In this study, half of all potential respondents were invited to take part. Since we were interested in analysing the responses by subgroups (by region and by hospital type) it was important to make sure that the final sample for each of these was of an acceptable size.

Consultant physicians in teaching hospitals and in DGHs in the two regions in this study were chosen on a random basis. The response rates did not vary significantly by region or by type of hospital, therefore selection bias should be negligible. The selection of experts presents a number of conceptual problems in defining who has an interest in the issue under investigation, and who can provide an informed and relevant opinion on the matter. Consultant physicians were chosen as being the most accessible and identifiable experts on the potential impact of a reduction in junior doctor numbers on the safety of hospital care.

A wide variety of methods is available for reporting back the results of questionnaire rounds, using statistical and graphical representations of the data; these include arithmetic means, medians, ranges, histograms, and pie charts. For each of the statements on the questionnaire, the percentage of respondents scoring at each point was shown below the 0 to 9 scale. This gave a clear indication of the distribution of the group's response.

The decision over the number of rounds that should be carried out in a Delphi study is largely a pragmatic one. The possible advantages of allowing respondents to consider their responses further needs to be balanced against the level of non-response at each round. For this survey three rounds were carried out (one interview and two questionnaire rounds). As there were no significant changes in levels of agreement and consensus between the group's responses to the two questionnaires, it was felt that conducting further rounds would be counter-productive.

It is difficult to assess the accuracy of the results of a survey in a case such as this where no concrete measurable evidence is available. Some of the respondents to this survey were well aware of the lack of objective evidence to support their views. Pill [12] suggested using a revealed preference method to validate the responses to a Delphi survey. This would require using the potential measures of safety included in the questionnaire and examining their relationship to junior

doctor staffing levels, to see if they behave in the ways suggested.

It is clear that those factors that are seen as being most likely to be affected by reductions in junior doctor staffing levels are those for which it is most difficult to collect complete and reliable data. However, a method testing the relationship between junior doctor staffing levels and the safety of care that relied only on the most quantifiable measures (such as mortality rates) would ignore factors related to the humanity of care; these factors are clearly of major concern to consultant physicians.

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