The impact of shift patterns on junior doctors' perceptions of fatigue, training, work/life balance and the role of social support

M Brown,[1] P Tucker,[1] F Rapport,[2] H Hutchings,[2] A Dahlgren,[3] G Davies,[4] P Ebden[4]

[1]Department of Psychology, Swansea University, Swansea, UK
[2]School of Medicine, Swansea University, Swansea, UK
[3]Department of Shipping and Marine Technology, Chalmers University, Gothenburg, Sweden
[4]Singleton Hospital, Swansea, UK

Correspondence to
Philip Tucker, Department of Psychology, Swansea University, Swansea SA2 8PP, UK; p.t.tucker@swan.ac.uk

Accepted 11 November 2009

ABSTRACT

Background The organisation of junior doctors' work hours has been radically altered following the partial implementation of the European Working Time Directive. Poorly designed shift schedules cause excessive disruption to shift workers' circadian rhythms.

Method Interviews and focus groups were used to explore perceptions among junior doctors and hospital managers regarding the impact of the European Working Time Directive on patient care and doctors' well-being.

Results Four main themes were identified. Under "Doctors shift rotas", doctors deliberated the merits and demerits of working seven nights in row. They also discussed the impact on fatigue of long sequences of day shifts. "Education and training" focused on concerns about reduced on-the-job learning opportunities under the new working time arrangements and also about the difficulties of finding time and energy to study. "Work/life balance" reflected the conflict between the positive aspects of working on-call or at night and the impact on life outside work. "Social support structures" focused on the role of morale and team spirit. Good support structures in the work place counteracted and compensated for the effects of negative role stressors, and arduous and unsocial work schedules.

Conclusions The impact of junior doctors' work schedules is influenced by the nature of specific shift sequences, educational considerations, issues of work/life balance and by social support systems. Poorly designed shift rotas can have negative impacts on junior doctors' professional performance and educational training, with implications for clinical practice, patient care and the welfare of junior doctors.

The European Working Time Directive (EWTD) stipulates that junior doctors should not spend more than 13 h at their place of work.[1 2] Consequently, most junior doctors in the UK now work rotating shifts. Such schedules may include several consecutive night shifts. In some cases, junior doctors are required to work as many as seven consecutive night shifts.[3] This equates to 91 h of night shift in 1 week (permissible under the EWTD, which stipulates limits based on the average weekly hours worked over 17 weeks). Sleep that is taken during the day between night shifts is generally shorter and of poorer quality than night-time sleep, as it is taken at an inappropriate circadian phase. When several night shifts are worked in a row, sleep between shifts continues to be disrupted, as the night workers' circadian rhythms show little adjustment to the nocturnal routine.[4] This leads to accumulations of sleepiness, fatigue and reduced motivation, any or all of which can lead to reduced productivity and increased accident risk.[5]

The majority of previous studies concerning doctors' work hours have been conducted in countries where doctors' work and training practices differ from those in the UK. Relatively little qualitative research has examined the impact on junior doctors of EWTD compliant rotating shift systems. Few studies, if any, have compared the relative effects of the different types of shift systems that have been implemented in the wake of the EWTD. Thus, the current study seeks to examine junior doctors' perceptions of their professional performance and well-being, following the (partial) implementation of the EWTD.

METHODS

Recruitment

Presentations outlining the study were delivered at 11 NHS Trusts across Wales to junior doctors in Foundation Years One and Two, Specialist Training grades and Specialist Registrars.

Data collection

Participants took part in either an in-depth interview or focus group discussion. All interviews were performed by one investigator (MB), were audio recorded and then transcribed for analysis. In-depth interviews provide a confidential setting in which to disclose sensitive information and explore key issues in detail.[6] Interviews are complemented by focus group discussions, in which data is enriched through the processes of group interaction.[7]

Data analysis

An Inductive Thematic Analysis framework was applied to the data, in which each transcript is related to the other transcripts to distil the core concepts. When this is achieved, a "thick description" is built around the data findings supported by verbatim quotation.[8 9] Initial interpretation was conducted by each researcher, working independently, followed by group analysis sessions (MB, PT, FR, HH and AD). Team members had access to each other's workings from the individual codification process and discussed within the group how best to reduce, assess and present that data. This iterative process involved moving back and forth between individual transcripts and the group of transcripts as a whole, exploring group understandings based on patterns and incongruities in the data. The process of cross-comparison and validation continued until consensus was achieved around the meanings, both underlying and

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apparent, that participants gave to their experiences. Further analysis was then conducted (FR and MB) to refine the final thematic outputs, with transcripts being reread several times, to appreciate the entirety of the interviews and ensure no major issues had been overlooked or misrepresented.

RESULTS

Ten junior doctors were interviewed (mean age 24 years, SD 6, range 24–30 years; 50% were female). The mean interview duration was 29 min (range 22–35 min). Five of the participants were in Foundation Year One, three were in Foundation Year Two and two were Specialist Training grades. Each interview was conducted on hospital premises.

Twenty-four individuals participated in one of four focus groups. Seventeen (70%) were female, 11 (46%) were in Foundation Year One, five (21%) in Foundation Year Two, one (4%) was Specialist Training grade, one (4%) was a Specialist Registrar and one (4%) was a Staff grade doctor. Five (21%) were NHS managers/administrators.

Four inter-related themes emerged, as follows:

Doctors' shift rotas

This theme focused on the different ways in which shift rotas can be organised. Participants identified certain features of their own rota as being especially disruptive of their life outside work and/or fatiguing. Some doctors believed that particular shift sequences impaired their ability to maintain adequate patient care.

Night shifts were of particular concern. Excessive fatigue towards the end of seven consecutive night shifts negatively affected patient care, training opportunities and safety. Doctors who commuted long distances also raised concerns about fatigue while driving home, citing examples of minor accidents and traffic offences committed on the way home when working seven nights in a row. Split nights (three or four consecutive shifts) were commonly regarded as more manageable and less fatiguing, with improvements in sustained attention and concentration being associated with fewer errors (box 1). However, split nights were not favoured by some who felt that they were more disruptive of life outside work. Split nights also meant having to make the difficult transition between a diurnal and a nocturnal routine more often (box 2).

Long shift sequences (ie, 12 consecutive day shifts) were associated with increased fatigue, decreased alertness and concentration, increased errors, reduced work speed, and impaired information processing and reduced motivation (box 3).

Education and training

Participants expressed concerns that the working time arrangements might prevent junior doctors from becoming competent consultants of the future, as a result of the reduced working hours and training opportunities that followed the partial implementation of the EWTD (see box 4).

Junior doctors also discussed the ways in which high workload and difficult work schedules impinged on their protected teaching time and opportunities for private study. They also noted that motivation to learn could suffer as a result of excessive fatigue, particularly during exams (see box 5).

Work/life balance

Doctors experienced difficulty maintaining a balance between the desire for a successful medical career and their home-life commitments. Personal needs were frequently pushed aside in favour of professional commitments. Sacrifices in all life domains were discussed; many interviewees openly discussed the consequences of their decisions, indicating that at times a high price had been paid (box 6).

However, some of the most positive work experiences were associated with shifts that were most disruptive of life outside work. It was felt that regular exposure to on-call shifts and night shifts enhanced career development by providing extensive hands-on experience in clinical situations that demanded critical personal judgements and confident decision-making skills (box 7).

Social support

Good morale among colleagues and a sense of "team spirit" helped junior doctors cope with their work schedule. Being part of a supportive team acted as a buffer against the effects of arduous schedules and intense work loads, allowing junior doctors to feel more secure. Team spirit enhanced opportunities for learning from colleagues through observation of procedural techniques and management skills. Conversely, poor communication and limited social support from coworkers led to the erosion of morale among colleagues, which in turn was associated with lack of enjoyment and an inability to cope (box 8).

Box 1 Working seven consecutive night shift exacerbate fatigue

"Seven days in a row, it really chips away and by about the fifth night I was missing important things in the results and not spotting things in *x* rays. I just wasn't fully awake…if you're absolutely exhausted your judgement of what's actually urgent is probably a bit clouded." (Male F1)

"Doing seven 12 or 13 h shifts in a row I think is quite dangerous, really. I don't think you're competent at the end of it." (Female ST2)

"In (hospital) we just had to do three or four (nights) which was manageable. At the end of the surgical nights (seven in a row) I think I was quite dangerous really just because I was so tired, certainly driving home there was one incident." (Male F2)

Box 2 Shorter spans of nights shifts disrupt life outside work

"Personally I like to do things, everything in one go, in some hospitals they have split the nights, three and four. I would rather get it over and done with so I have done my nights and I don't have to worry about it." (Male F1)

"I quite like doing the week of nights because tiring as it may be you get it over and done with which is quite nice … Its changing the sleep pattern which is the difficult thing." (Male F2)

"I'm still quite young and I'd rather just get them over and done with…I feel that if I had to continually change my body clock I think it would be worse in the long run." (Male F1)

Box 3 Working twelve consecutive day shifts exacerbates fatigue

"I think working 12 days in a row borders on unsafe and is certainly horrible to do… You work the Monday to Friday, whole week then the weekend, late Friday, Saturday and Sunday then carry on the whole week." (Female ST2)

"Little things like prescribing fluids for someone who's slightly dry, analgesia for someone who's in a bit of pain, things like that I have missed (during 12 consecutive shifts)." (Female F1)

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Box 4 Training and development may be compromised

"A doctor is an apprentice, the only way to learn how to do things, is if you do things. If you're a plumber or an electrician, it's by doing it and it just so happens, that cardiac surgery and lots of types of surgery are lengthy." (Male, SpR)
"There is a strong movement in surgery against the EWTD because it's not going to be good for the training of doctors of the future. They will not be able to gain enough hours of experience" (Female, F2)

DISCUSSION

In common with night workers in other occupational settings, participants in the current study experienced conflict between the demands of their work schedule and their lives outside work. However, unlike many shift workers, junior doctors' night shifts feature a degree of job enrichment that is absent from the day shift—for example, learning to have confidence when put in a position of responsibility. Junior doctors are therefore perhaps uniquely appreciative of the opportunity to work night shifts. However, many participants felt that the potential benefits of working night shifts were being offset by the effects of excessive fatigue. In particular, the latter stages of a block of seven consecutive night shifts were characterised by considerable fatigue with obvious implications for patient well-being and safety and impaired learning process. Conversely, some participants expressed a preference for longer blocks of nights, which they felt were less disruptive of life outside work. The majority of previous research has shown that sleep and on-shift alertness is superior when blocks of night shifts are relatively short (*eg*, two or three consecutive shifts).[10–12] Thus, the choice of the optimum number of consecutive nights depends on the relative importance attached to safety and social problems in any given workplace.[13] Given the nature of junior doctors' work, this suggests that rotas of seven consecutive nights should be discouraged in all but exceptional cases in which fatigue-related safety is not considered to be a significant issue.

Fatigue also accumulates over successive days when shifts are worked without a break, as reflected in the current participants' concerns about working 12 consecutive day shifts. Rest days are important for the maintenance of work performance. They also provide opportunities for the dissipation of work-related stress and are thus important for the maintenance of well-being.[14] This suggests that sequences of 12 consecutive day shifts should be avoided whenever possible—for example, by scheduling at least one rest day following a weekend on-call.

Demanding work schedules impinged on junior doctors' opportunity and motivation to study during their free time. It was also argued that the EWTD's imposition of reduced work hours limits junior doctors' opportunity for gaining valuable on-the-job experience. This echoes the findings of previous research.[15 16] However, as yet there appears to be no research that has attempted to examine this question using objective measures of performance. Such research is needed to establish whether the positive effects of the new work-hour restrictions on fatigue and well-being are outweighed by their deleterious impact on training outcomes.

Box 5 Finding time and motivation to study

"I don't think we have enough time to learn…I think our theoretical knowledge is quite poor as we don't have time to study". (Female ST2)
"I don't know anyone who doesn't struggle, mentally struggling and physically, people get very stressed during exams at the moment on top of a busy job" (Female, F2)

Box 6 The impact on work/life balance

"I don't think its very family friendly, so if you have a child, as a woman I don't think its very easy, not just the schedule but also the other commitments that you have after 5 o'clock to do. I think that all combined is difficult… my child is brought up almost completely by his grandparents and that way I can get on with my career." (Female ST3)
"It's the antisocial aspect which is probably tiring … you go home at 10 pm but its not 10 pm because by the time you have done your post take ward round you might be there until 10:30, 11 pm sometimes, and then you go home, sleep and you're back in again." (Male, F2)

The fact that many participants struggled to maintain a satisfactory balance between work and personal life is not surprising and accords with previous findings.[17] Junior doctors commonly work long unsocial hours, but they are highly motivated to work such hours to maximise their training opportunities. Nevertheless, while a degree of work/life conflict may be inevitable for doctors, if it is allowed to become too much of a problem it can be harmful to psychological health, with doctors becoming disengaged, distracted and alienated. The degree of conflict experienced by an individual will depend on the degree to which their work hours meet their own needs and those of their partner and any dependents they may have.[18 19] Hence, the design of appropriate rotas is especially important for junior doctors with families, to help them maintain their health and their motivation to remain in training.

Participants' comments about team working are in accordance with previous findings that workplace social support can protect individuals from the harmful effects of stressors, such as work overload.[20 21] However, it is also interesting to note that such beneficial effects may be undermined if there is lack of continuity within the membership of work teams. This highlights the importance of a second set of organising principles that should govern the design of rotas. They should seek to minimise the accumulation of fatigue in the individual and promote continuity of team membership—for example, by having teams comprising matched partners at each level, sharing the coverage of day and night duties, so that at any one time at least half the team remains intact.[22]

Strengths and limitations of the study

The current study provides an in-depth exploration of the impact of rotas designed to be compliant with the second stage

Box 7 The positive side of working unsocial hours

"When you're on call you get to do a bit of real medicine, make some real decisions and I think its good experience, especially nights as well when there's not as many people around, you have to think a lot more." (Male F2)

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Box 8 The importance of social support at work

"I think as it's such a supportive department there is good interaction with colleagues, if it was not supportive I think it would be horrendous." (Female F2)
"The department on the whole are (sic) very supportive…the registrar and consultants are very approachable and will help out." (Male F1)
"I do think we miss out on team spirit and morale… the consultants' change every few weeks… there's also the SHO and they always change as well. So every couple of weeks you expect to see a new HO, SHO oh and obviously the registrars change too … so there's a great lack of continuity." (Male F2)
"In my last job, because of the rota, I came out in Eczema…It was doing so many on-calls and I was trying to sort out my rota and I wasn't getting much help from the Trust or medical personnel." (Female ST1)

of the EWTD's implementation. It facilitated discussion of specific shift features, by those who regularly work them, in a range of hospitals throughout Wales. However, not all hospitals in Wales were represented in the sample. Work commitments meant it was difficult for junior doctors to find time in their schedule to commit to an interview. As only a small number of junior doctors took part in the interviews, care should be exercised when generalising from their views.

CONCLUSIONS

High work demands are part and parcel of junior doctors' working life. However, the negative impact of these demands is exacerbated by poorly designed rotas that do not offer sufficient opportunity for rest and recovery. This may be addressed, in part, by appropriate sequencing of shifts. In addition, work schedule design should, whenever possible, seek to maintain continuity of team structure and take into account the needs of those with caring responsibilities. Appropriately designed rotas will be beneficial to the well-being and performance of junior doctors and, indirectly, their patients. Moreover, they will help to maintain and promote junior doctors' enthusiasm and commitment to their chosen profession.

Funding The study was funded by a grant from the Wales Office of Research and Development for Health and Social Care, part of the Wales Assembly Government (reference: ReF06/2/ 220). All researchers involved in this study were independent of the funding organisation. The funding organisation had no involvement in the conduct or reporting of this research.

Competing interests None.

Ethics approval The study was granted ethical approval by Multi-Centre Research Ethics Committee for Wales (MREC) on 8 March 2007 (reference: 07/MREC09/18).

Contributors PT and MB coauthored the paper. MB collected the data. PT conceived the study, led the funding application that supported its conduct, managed the project and is the guarantor of the papers' content. FR supervised the data analysis. MB and FR undertook the bulk of the data analysis, in collaboration with all of the other authors. HH, AD, GD and PE contributed to the design of the study, as well to the analysis of the data. All authors have contributed to the design of the study and the preparation of the manuscript.

Provenance and peer review Not commissioned; externally peer reviewed.

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