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Uptake and perceptions of an e-learning package on blood transfusion by trainees in Wales

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ABSTRACT E-learning packages are increasingly promoted as an effective way of delivering training within the National Health Service in the UK. In response to a recommendation by the reporting body Serious Hazards of Transfusion (SHOT UK) we prospectively evaluated, over one year, the uptake among the 266 Foundation Year-1 (FYI) trainees in Wales of a blood transfusion package developed by the Scottish Blood Transfusion Service. The package consisted of two modules and was made available to FY1 trainees at hospital trust inductions. At the end of FY1 there was a 65% registration rate, with 54% of trainees completing at least one level and 42% completing both. Ninety-three trainees therefore failed to engage with the package. There was enormous disparity in uptake rates between NHS trusts, varying between 0% and 100%. Feedback to trusts in the form of benchmarking appeared to increase uptake. We conclude that this mode of delivery fails to engage a significant proportion of the intended audience and that there is extensive variation between organisations in their ability to deliver such training. Maximising the effectiveness of such packages will therefore require a more complex approach to delivery. Evidence suggests that blending e-learning with other methods could address these issues, and further evaluation of such an approach is recommended.

KEYWORDS Blood transfusion, e-learning, lifelong learning, medical education, online learning, self-directed learning

DECLARATION OF INTERESTS No conflict of interests declared.

INTRODUCTION

One of the greatest challenges to the National Health Service in the UK at present is the delivery of effective and up-to-date training to large numbers of staff.[1] It is necessary that this is done in a timely manner and in a way that is practicable to deliver in the workplace. E-learning packages potentially offer an appealing resource to meet this need and, indeed, a number of national organisations have invested in developing such materials, including the British Medical Association and the Joint Information Systems Committee (UK). Internationally there is also huge investment in such materials, with surveys showing, for example, that almost 80% of geriatric medical education programmes within the US use internet-based materials.[2] Currently, however, there is very little published literature on the uptake or effectiveness of e-learning packages within the NHS. This is the first observational study on the uptake of e-learning packages across a range of NHS employers for trainee doctors.

One particular area in which e-learning has been promoted is for blood transfusion training. In 2004, 439 voluntary reports were made by UK hospitals to the reporting body Serious Hazards of Transfusion (SHOT). Of these cases, there were four deaths related to transfusion and 19 cases of ABO blood group incompatible red cell transfusions. These results were published in the *SHOT Annual Report 2004*.[3]

The report's authors stated: 'The most important contribution that can be made now by Trust CEOs to improve patient safety in this area is to provide support and resource [sic] for training and education of staff. A framework for education has been developed in Scotland at http://www.learnbloodtransfusion.org.uk.' This website was subsequently recommended for the training of all newly qualified doctors throughout the UK.

In August 2005, this website was promoted to all 266 Foundation Year-1 (FY1) trainees in Wales as part of the induction into their NHS trusts. Organised by the local hospitals' postgraduate departments, inductions consist of an introduction to the national and local requirements of working as an FY1 doctor and an explanation of how local processes work. To assess the viability of the e-learning training tool, uptake rates were prospectively evaluated in different trusts, and factors that may have affected those rates were observed.

MATERIALS AND METHODS

The 'Learn Blood Transfusion' e-learning package

The 'Learn Blood Transfusion' e-learning package was developed by the Effective Use of Blood (EUB) group of the Scottish National Blood Transfusion Service (SNBTS). The EUB group consists of specialist clinicians, nurses and information technologists. Its e-learning
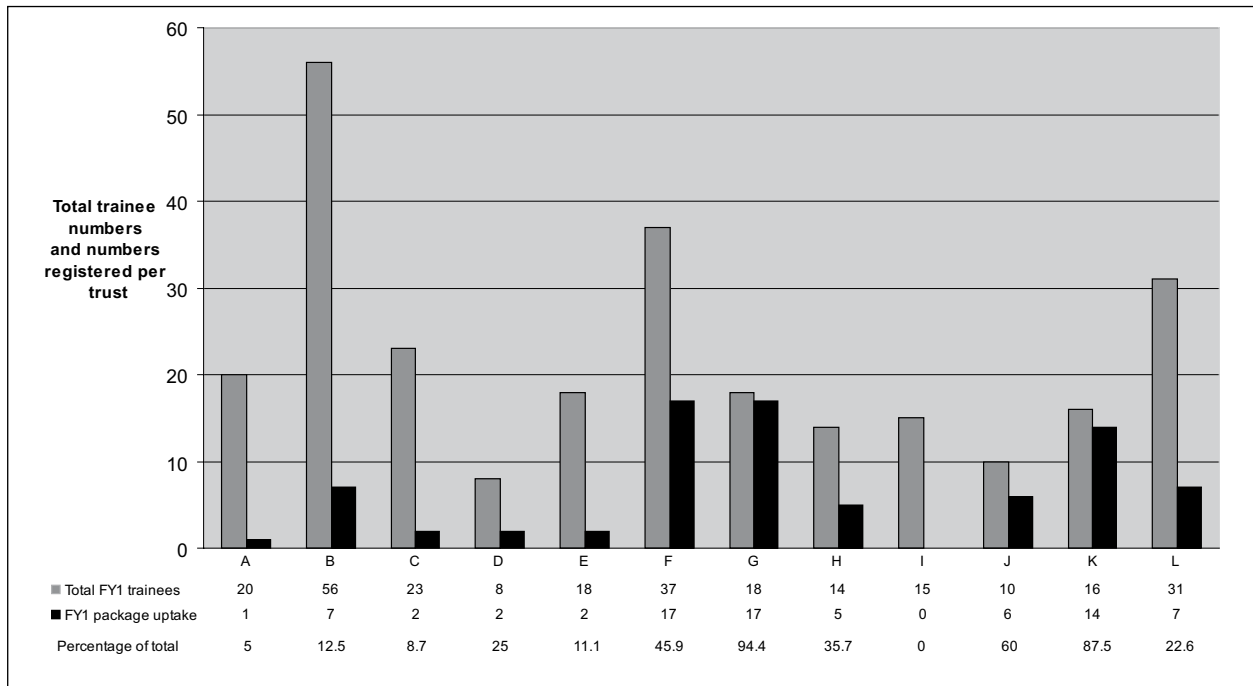
	A	B	C	D	E	F	G	H	I	J	K	L
■ Total FY1 trainees	20	56	23	8	18	37	18	14	15	10	16	31
■ FY1 package uptake	1	7	2	2	2	17	17	5	0	6	14	7
Percentage of total	5	12.5	8.7	25	11.1	45.9	94.4	35.7	0	60	87.5	22.6

FIGURE 1 Histogram showing registration rates at week 2 of the study.

package is a web-based system hosted on ORAS GOLD™ (MDC Learning Systems, Edinburgh, UK).

The interactive package consists of four modules and associated end-of-module assessments. Content is delivered in a variety of forms, including text, graphics and animations. Supporting information is provided in an online notebook, and references much standard information from external sources. The package is accessed via the internet and requires users to register in order to obtain a user ID and password. Each module has a description, including stated aims and learning outcomes. The navigation system allows learners to dip in and out as required, providing flexibility of access and use in busy work environments.

The modules contain a variety of interactive activities with feedback, which act as formative assessment. The end-of-module assessments consist of true/false and multiple choice questions, which are scored and have a pass mark of 80%. The successful completion of all modules allows the production of a certificate of achievement. During the study period, there were two levels of training available, 'safe transfusion practice' (level one) and 'blood component use' (level two).

Implementation

The study looked at the engagement of 266 FY1 trainees with this system in 12 Welsh health trusts. Prior to the start of the FY1 training year, trust librarians, postgraduate centre managers (PGCMs) and postgraduate organisers/clinical tutors (PGOs) in each trust were contacted by e-mail and informed specifically about the package, including guidance on how to register with the system and

technical requirements. Information was also circulated as part of general guidance on the requirements for FY1 induction. Trainees were required to register themselves and could access the system from any computer with an internet connection. They were explicitly informed that their participation would be monitored.

Uptake

Using administrator log-in rights, the number of FY1s registering with the e-learning package was monitored on a fortnightly basis. At approximately weeks 7 and 14, all PGOs were contacted by post with feedback on the uptake rate for their trusts and a comparison with other Welsh trusts. At week 21 the transfusion lead consultants in all trusts were contacted directly with information of the uptake rates within their trusts. At week 50, completion rates were observed for all trainees who had registered on the site.

Perceptions of postgraduate organisers/clinical tutors

Between weeks 7 and 14, PGOs were surveyed regarding their views on e-learning generally and this package specifically through a questionnaire. They were also asked for information on their methods of promoting the package, and to identify what they considered were barriers, if any, to uptake.

Perceptions of FY1 trainees

At week 21, 122 of the trainees who had undertaken the e-learning package were e-mailed for feedback on the package. They were asked to rate its relevance, presentation and content on a Likert-type scale of 1 to 6, where 1 corresponded to 'very poor' and 6 to 'excellent'. Respondents were also asked to evaluate the method compared with face-to-face and text-based learning.
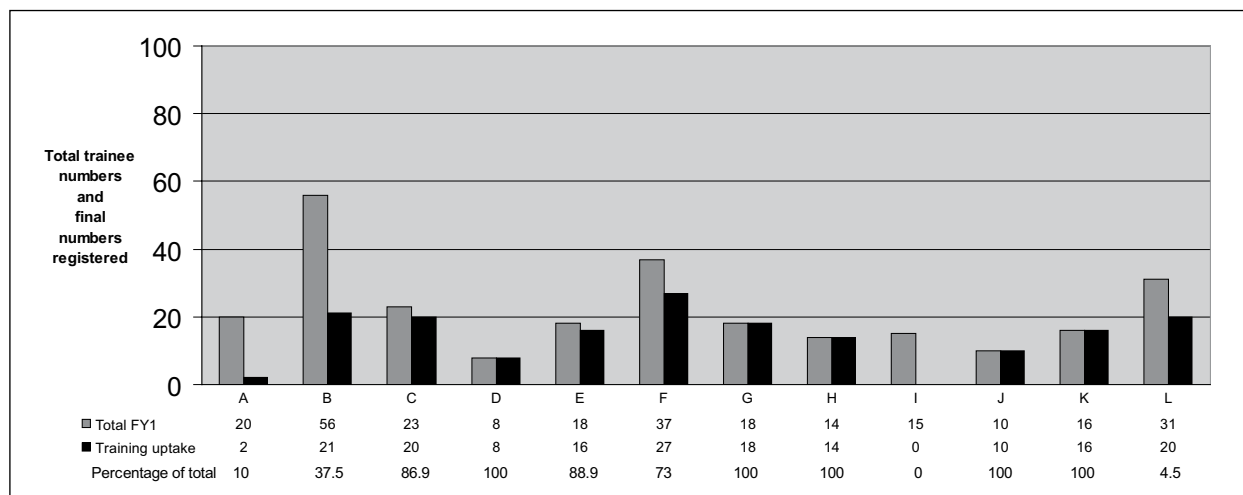
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	A	B	C	D	E	F	G	H	I	J	K	L
☐ Total FY1	20	56	23	8	18	37	18	14	15	10	16	31
■ Training uptake	2	21	20	8	16	27	18	14	0	10	16	20
Percentage of total	10	37.5	86.9	100	88.9	73	100	100	0	100	100	4.5

FIGURE 2 Histogram showing registration rates at week 50 of the study.

RESULTS

Uptake

Uptake rates were monitored for each of the health trusts, which have been identified by the letters A to L. Rates were first monitored at two weeks post induction. At this time, 80 of the potential 266 participants (30%) had registered with the site and completed either one or both levels of the package. Registration within individual trusts varied between zero and 95% (Figure 1). Only one trust (I) had a registration rate of zero. One trust (A) actively chose not to promote the e-learning package as it already had an established training tool.

There was a gradual improvement in uptake in most trusts over the next 48 weeks (Figure 2). Uptake rates dropped off quickly after week 4. Five trusts (B, C, E, F and L) then showed a small increase in uptake numbers between weeks 8 and 12. Four trusts (B, D, E and G) showed increased uptake in weeks 22 to 24.

At the end of the study (by week 50), 65% of trainees (172) had registered with the e-learning package. Both test levels were successfully completed by 42% of trainees (113), while 11% (28) completed only one test level. The remaining 13% (31) did not successfully complete a level. Five trusts had a final registration rate of 100%.

Perceptions of postgraduate organisers/clinical tutors

The survey of PGOs had a response rate of 94% (15 out of 16 possible replies). All respondents rated e-learning generally as either useful or very useful, irrespective of the performance of the trusts. No association was found between the method of informing trainees of the package, i.e. verbal or written information, and the uptake rate. Three hospitals involved other staff – consultant haematologists or nursing staff – to help disseminate information regarding the package, and again no correlation was seen with the uptake rates. Four PGOs from different trusts noted initial difficulties with

IT support that were subsequently corrected. In all cases this was because firewalls would not allow downloading of video software (Flash Player). Four respondents perceived that time constraints on trainees hindered further uptake. None of the respondents identified a lack of IT skills among trainees as a problem, and there were no major concerns expressed with regards to implementation.

Perceptions of FY1 trainees

The response rate from FYI trainees was 15%. Among those who replied the average scores for relevance, presentation and content were 4.46 (range 2–6), 4.93 (range 4–6) and 4.2 (range 1–6) respectively. The majority of trainees (87%) reported that the e-learning package was inferior to face-to-face learning, while 73% said they preferred it to text-based self-directed learning. The majority (67%) also agreed that it promoted reflective learning.

DISCUSSION

The most striking finding was the huge disparity in uptake rates between trusts, ranging from zero to 100%. In addition, the most successful trusts had higher uptake rates within the first two weeks, suggesting that within these organisations, barriers to e-learning were already low.[4] We would also suggest that the gradual increase in other trusts indicates that these barriers may be overcome with time.

An attempt was made to identify factors within trusts that affected uptake. Surprisingly, there was no association between the reporting of initial technical problems, the type of staff used to promote the package or whether verbal or written information was given. As the package was purchased by the Welsh Blood Service, there were no cost implications for individual trusts.

Despite no major overall concerns reported, there were clearly factors hindering uptake in some trusts. It has been suggested that 'marketing' or the lack of it could explain

such variation.[5,6] It was therefore postulated that there would be a correlation between the positive perceptions of those responsible for promoting the package, PGOs and the uptake rates within their trusts. However, all PGOs identified e-learning as a valuable method of training, and there was no difference in trusts with low uptake. No test was made to detect whether any correlation existed between reported attitude and behaviour.

One important observation was our ability to generate slow improvements in uptake over the next six months. This was attributed to the role of external auditing and benchmarking in overcoming resistance. An increase in uptake was shown following feedback at week 7. In addition there was a continued steady increase in uptake throughout the remainder of the study. Our presumption is that by involving staff with specific responsibility for transfusion training, namely the lead transfusion consultants, there was ongoing encouragement and support for trainees to access the package.

The stated principle within the Foundation Programme curriculum that 'doctors in the programme will take responsibility for their own learning'[7] relies on an embedded culture of self-directed learning. It is possible that this is not yet the case in the early years of training for those trainees evaluated in this cohort. Alternatively, one might speculate that engagement was hindered by the quality of the package. The e-mail survey had a low response rate of 15%, but overall feedback was positive.

However, there was a strong perception that e-learning is inferior to instruction delivered 'face to face'. This therefore suggests we need to look again at our delivery methodology. Indeed, Kiernan et al.[8] suggest that insufficient or inappropriate support for learners in an electronic environment leads to a lack of engagement with electronic packages. This is supported by a recent survey of web-based learning within medical education in the UK, which showed high levels of familiarity with web-based learning but also a lack of knowledge and skills.[9]

Using e-learning as part of a blended learning approach with other methods, such as workshops, tutorials and formative assessments, appears to be more effective.[10,11] None of the trusts in our series reported using blended learning techniques to promote the package. One might speculate, however, that this would overcome the perception of our trainees that e-learning alone is inferior and meet the perceived skills gap that others have identified.

CONCLUSIONS

We conclude from this prospective observational study that e-learning packages fail to engage a significant proportion of staff (35%), even when that group of staff is computer literate and has specifically facilitated IT access. In addition, there is enormous disparity between organisations, and some are clearly much more effective than others in ensuring the delivery of good uptake rates. Benchmarking, however, can influence the uptake rates favourably. Understanding this variability and how to overcome it is essential before increasing reliance can be put upon e-learning generally to meet our training needs.

There is evidence that such packages are more effective when they are used as part of a 'blended' approach, and clearly an important next step will be to incorporate this package within a broader training programme.

Investing resources in such programmes, however, will only be of value if they can be shown to facilitate the acquisition of required knowledge and skills and to have application to real-world scenarios. Further work is essential to evaluate not only the effectiveness of e-learning packages but also the delivery methodologies, ensuring that resources are directed appropriately to obtain maximum benefit.

E-learning packages are an attractive option for training large numbers of staff within the health service, but achieving maximum effectiveness remains a challenge.

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