Evaluation of a computer-assisted learning programme on the oro-facial signs of child physical abuse (non-accidental injury) by general dental practitioners

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A computer-assisted learning programme with tutorials and self assessment multiple choice questions has been developed. One hundred and two general dental practitioners were asked to evaluate the programme. Over 80% of respondents felt that the programme was easy to use, contained an appropriate level of supporting information, and had improved their knowledge of non-accidental injury. All users of the programme felt that it was a better way of learning than video, audio tapes, and journals or books on the subject. It is concluded that CAL programmes are worthwhile for providing continuing professional education for general dental practitioners.

Child physical abuse or non-accidental injury (NAI) is a problem that all dental practitioners should be alert to. Dental literature addressing NAI is the primary vehicle through which practicing dental professionals are expected to broaden their knowledge base. There are no requirements to include this subject in the undergraduate dental school curriculum, and postgraduate exposure will depend not only upon the availability of local lectures and courses, but also whether a practitioner chooses to attend.

Dental practitioners are in a unique position amongst health professionals for recognising the oro-facial signs of child physical abuse. General dental practitioners (GDPs) examine children on a 4–6 monthly basis and the Community Dental Service has a statutory requirement to examine all children three times before they leave school.

The Dental School in the University of Newcastle upon Tyne, in collaboration with funding from the Department of Health has developed a number of computer-assisted learning (CAL) programmes. They are an adjunct to continuing professional education (CPE) and have been reported to be popular with general dental practitioners.[1–3]

Computers have been used to teach dental subjects for a number of years, and the recent increase in the power of personal computers has facilitated the use of powerful teaching programmes that could replace conventional teaching in medicine and dentistry. Current CAL programmes allow extensive interactivity between the user and the software, resulting in the 'student' being able to 'explore' the subject at his or her own pace. The aim of this CAL programme was to improve the teaching, understanding and recognition of the signs of child physical abuse.

In brief
- CAL is user friendly
- CAL has made a valuable contribution to postgraduate dentistry
- The dental practitioner can make a valuable contribution to child protection

To evaluate the usefulness of the programme, a random sample of GDPs was sent copies of this package and asked to comment upon certain aspects of the programme by completing a questionnaire. The questionnaire format was similar to that used for other Department of Health funded programmes in the school of Dentistry, University of Newcastle upon Tyne.

Material and methods

The programme 'The Oro-Facial signs of Non-Accidental Injury' was developed to run on a PC with a minimum specification of windows 3.1 or higher, 386 processor (486 recommended), 4MB of RAM, a colour monitor and a mouse or similar pointing device. As with previous CAL packages it was developed using Multimedia Textbook.[4]

The programme was designed in tutorials (chapters). Each tutorial is accessed via buttons on the bottom of the screen. Subsequent pages of each tutorial are accessed via tabs along the top of the screen (Fig. 1). At the end of each tutorial there is a series of multiple choice questions on that tutorial. Feedback is given following each answer and a running score is kept to give the user an indication of their knowledge (Fig. 2). Importantly, the role of the dentist is indicated, together with a list of the actions they should undertake if they suspect abuse. The programme was supplied on three floppy discs containing all the information

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required for installing, running, and de-installing the programme.

The test panel of GDPs was recruited through the Regional Postgraduate Institute for Medicine and Dentistry. A total of 102 practitioners were sent the programme, which included a two-part assessment questionnaire. The first part was an evaluation of the programme. It requested details of the time spent using the programme and type of computer used. A series of questions then asked how easy the programme was to use and how useful it was. Practitioners were asked to rate their experience/knowledge of NAI after using the programme and also their overall impression of the programme.

These questions were completed using a five-point ranking scale from 'bad' to 'excellent'. The next series of questions was 'open', requesting the user to explain which parts of the programme were most and least useful as well as what they felt they had learned as a result of using the programme. They were asked to rate the programme in relation to other teaching media and finally were asked to complete a series of statements on the good and bad aspects of the programme. They were also asked to give details of any problems encountered when using the programme. The second section asked the practitioners about themselves; their experience of computing, their gender, current status in practice, ie principal, associate, assistant, their age, and finally their professional experience.

Results

Forty out of 102 practitioners returned their completed evaluations (39%). The majority of responders were male (80%) with an average age of 40.3 years (sd 7.7, range 25–56 years). Practice principals (63%) were the largest responders with associates and assistants equally represented. The mean time in practice was 12.3 years (sd 9.0, range 0–34 years) and the majority of them (80%) rated themselves average or better than average in their computer skills and literacy.

None of the responders felt that their computer skills were very low. The mean time spent using the programme was 37 minutes (range 10 to 90 minutes) and the majority used the programme at home (60%) and worked with a Pentium processor with 16 or 32 MB of RAM.

The majority of responders found programme tasks comprehensible and easy to follow (92.5%), and felt that the programme content was presented at the correct level of difficulty (95%). Supporting and help information within the programme was rated above average by 82.5% and all responders thought the programme took an appropriate time to complete. Eighty per cent reported that the programme had improved their knowledge of

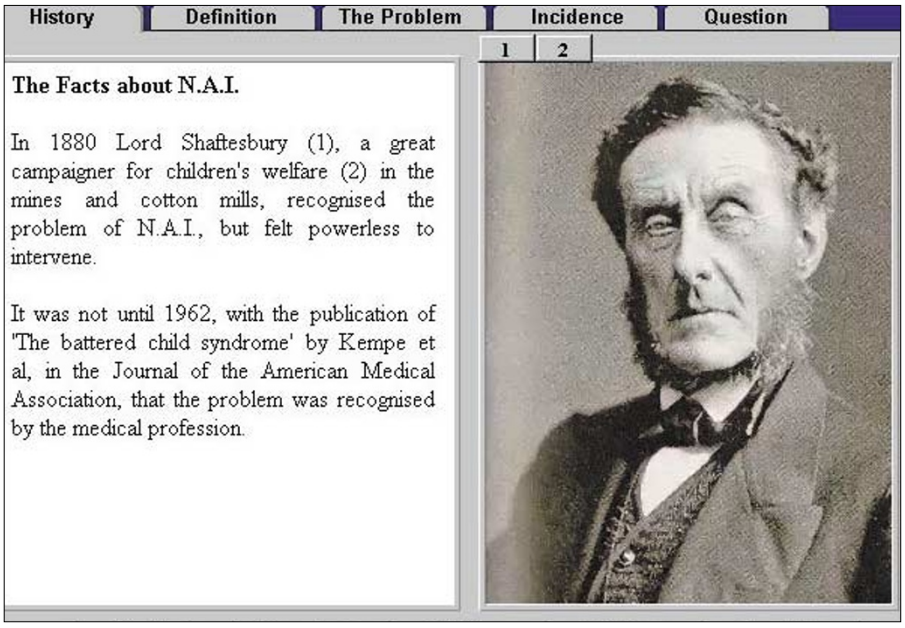

Fig. 1 The picture shows Lord Shaftesbury, a great reformer for children's rights in the nineteenth century. The tutorials or chapters are accessed via the buttons on at the bottom of the screen. The pages of each tutorial are accessed via the tabs at the top of the screen.

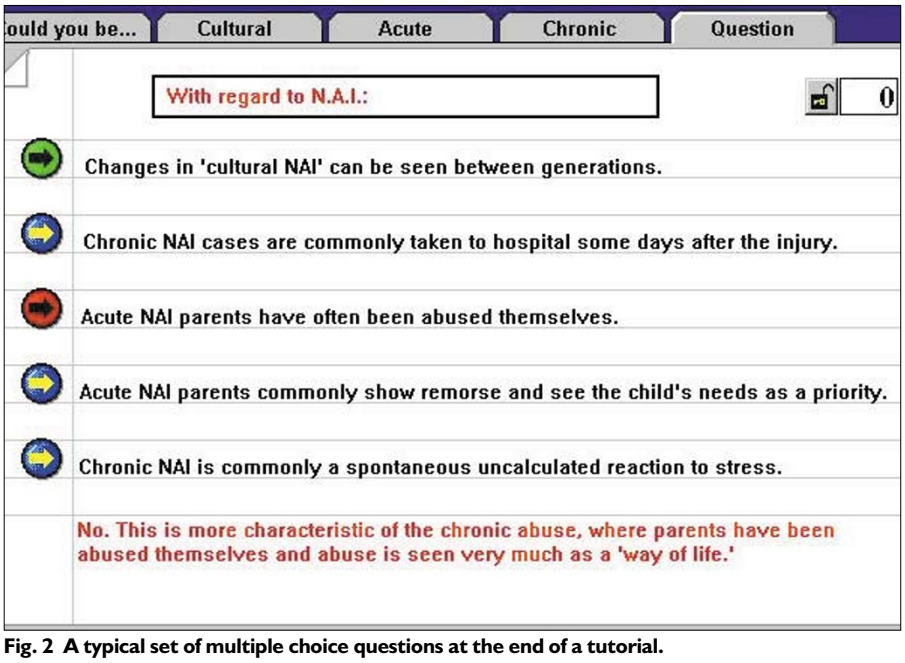

Fig. 2 A typical set of multiple choice questions at the end of a tutorial.

NAI and 67.5% felt that their clinical awareness and recognition of oro-facial signs of NAI had improved after using the programme.

Prior to using the programme, 10% of users rated their knowledge of NAI as above average, and 40% as below average. After the programme 95% of users considered that their knowledge of NAI was now above average. Only two users (5%) felt their knowledge was still average.

Overall 92.5% of responders were very happy with the programme. Responders were asked to rate the CAL programme in comparison with other teaching media. Sixty per cent felt that CAL was better than video, 95% felt it was better than audio tapes, 85% felt it was better than reading journals and 80% felt it was better than reading a book on the subject. Finally, the responders were asked how much they would be prepared to pay for the CAL programme. The average user was prepared to pay £12 with a range from £10–£40!

Discussion

The results of this study must be viewed with caution because of the low response rate. Any interpretation of the attitudes of the respondents may not necessarily reflect the attitudes of the general population of GDPs. Although the programme was warmly received by the panel of responding GDPs, it is possible that they may have a greater interest in continuing education and professional development than non-responders. A more critical appraisal might be achieved from a broader dental population.

In general the vast majority of responders rated the programme very highly in its style of presentation, its content, and its usefulness as a learning tool.

Responders indicated that they liked the style of tutorial presentation, which enabled the user to navigate through the material at their own pace. They also liked the interactive self-assessment multiple choice questions at the end of each tutorial topic and felt that these reinforced the lessons learnt in the tutorial. Adverse comments were directed at image quality, but, often this was the fault of the original photographs, which may have been taken under difficult circumstances.

This CAL programme was rated higher than any other form of teaching media for NAI by the responding GDPs. This has been found in other CAL programmes[1,5–9] and is probably due to the interactive nature of the programmes. The low financial value attached to the programme by the respondents was very surprising.

The average value of £12 was substantially less than the commercial price of most educational software packages and also less than the average book price of most educational texts. This may reflect the relative inexperience of the responders in purchasing software as individual items or the fact that previous CAL programmes have been provided free of charge by the Department of Health to interested practitioners.

Conclusion

CAL continues to develop as a method of self-learning that seems to be both acceptable and attainable for the busy general dental practitioner.

We are grateful to the general dental practitioners who took the time to work through this programme and to return the evaluation questionnaire, and to the Department of Health who funded this development.

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