IN BRIEF

- Patient information leaflets can be used to support oral health promotion, treatment choice and decision making in dental settings.
- Judged against standardised criteria the commercially produced patient information leaflets investigated in this study were readable and well produced, but failed to involve the patient in decision making, tended not to present the option of having no treatment and failed to reveal information sources.
- General dental practitioners and the dental team should consider the limitations of commercially produced leaflets and ensure that their communications with patients rectify the shortcomings of the leaflets.

An evaluation of the quality of commercially produced patient information leaflets

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Aim A descriptive study was undertaken to assess the quality of a range of patient information leaflets produced by the British Dental Association.

Method Twenty-nine leaflets were assessed with regard to presentation, readability and quality. The topic areas covered included: treatment, self-care and disease related information. Presentation was evaluated with regard to layout, font size, typeface, use of illustrations, paper type and print colour. Readability was assessed using the Flesch reading grade and the SMOG reading grade. Quality was assessed using the DISCERN tool.

Findings All leaflets scored quite well for readability, with the average SMOG Reading Grade Level being 9.10 (SD 0.80) and the average Flesch reading Grade Level being 6.18 (SD 0.83). There were, however, some areas of presentation that could be improved, specifically font size, illustration use and paper finish, which did not comply with the RNIB guidelines. Quality ratings using the DISCERN tool were low. In particular most leaflets scored poorly in setting out clear aims in the opening paragraph, in identifying sources and dates of information provided, and other sources of advice and support available. Few leaflets discussed the option of no treatment or how the treatment would affect overall quality of life. The role of shared decision making was rarely mentioned.

Conclusion Patient information leaflets produced commercially are of high production quality and good readability but tend not to be patient centred.

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Written patient information is frequently used for the benefit of dental patients to complement communication with the dentist. In order to achieve this it should be of good quality, evidence based and appropriate for the user. While there have been many studies describing the readability of medical literature, using various assessment tools, both in the United Kingdom and the United States of America,[1-3] there has been considerably less research related to dental topics.

Blinkhorn and Verity[4] expolored the readability of information leaflets concerning oral healthcare for children. One hundred and forty schoolchildren, aged 14, were asked to pronounce and explain 25 commonly used dental terms. Some groups of words associated with oral hygiene appeared to be less well understood. The readability of the leaflets was assessed using the FOG index; most were above a reading age of 12 years, one leaflet having a reading age of 17.4 years.

Readability was also assessed by Backdash and Odman[5] in a study of 20 items of periodontal health education literature. They used the MNIRAP programme, which combines a number of readability tests to provide a mean value for reading skill. Only 15% of the leaflets were set at a grade level of 6 or below (equivalent to a reading age of about 11 years). Backdash and Odman[5] estimated that a 10th grade reader (reading age 15) would understand only 35% of the literature they surveyed, while a 12th grader (reading age 17) would understand 85%.

Similarly Alexander[6] assessed the reading level of 24 dental patient information leaflets using the Flesch-Kincaid formula. Over 40% of leaflets were written at a reading level greater than the recommended 7th to 9th grade.

Newton[7] assessed a number of dental practice leaflets using the Flesch formula and found most were above the level suited to the average reader. The information they contained conformed to the minimum required by the NHS regulations, but many omitted possibly useful information such as disabled access and availability of extra services, such as a hygienist.

Finally, Chung & Horrwitz[8] used the SMOG tool to assess the readability of 19 oral cancer leaflets and found the reading level of the majority fell in the range 6th to 9th grade. They also commented on the lack of leaflets that deal specifically with oral cancer.

Recommendations concerning the design of patient

information leaflets have been made by a number of organisations and researchers. The Royal National Institute for the Blind (RNIB) provides guidance on areas that can improve accessibility to information for people with sight problems (www.rnib.org.uk/seeitright). Specifically the RNIB outline principles to aid typographical legibility of the text including factors such as print size, font type, colour, contrast, alignment, spacing, paper type and layout. The Centre for Health Information Quality (CHIQ, www.hfht.org/chiq) aims to promote the production of good quality information and provides training for producers of information and has developed criteria to assess and help develop quality information. It also raises awareness amongst consumers on how to assess quality. The triangle mark can be awarded to information that has been shown to be evidence based, clearly presented and has involved consumers throughout its production. The Plain English Campaign (www.plainenglish.co.uk) promotes the use of short sentences, words and paragraphs and the use of active verbs and personal references. It can award the Crystal Mark to documents that have been tested in 35 areas by a panel consisting of a lawyer and members of the general public. The Department of Health has produced a Toolkit for Producing Patient Information (available at www.doh.gov.uk/nhsidentity). This toolkit provides advice and guidance as well as a number of templates that can be downloaded to help standardise the quality and presentation of NHS information. Guidance and resources for producing patient information are provided by Entwistle and O'Donnell[9] and Duman.[10]

While most dental research in this area has focused on readability, the DISCERN tool was developed by Charnock *et al.*[11] to assess a broad range of aspects of the quality of information. The tool consists of 15 questions and is available at www.discern.org.uk. It incorporates many of the recommendations outlined above.

METHODS

Twenty-nine patient education and information leaflets produced by the British Dental Association were selected. The leaflets cover a range of treatments, advice and oral diseases and are designed to be displayed on a rack in the waiting room or given to patients to support chairside advice/discussion.

Each leaflet was read and assigned to one of three categories:

- Treatment – this group mainly dealt with information about different treatments provided by dentists, what this would involve, why it was necessary and what were the benefits/risks involved.
- Oral self-care – this group dealt mainly with advice to the reader about what activities they could carry out or choices they could make to maintain or improve oral health.
- Disease related information – this group dealt mainly with providing information about oral diseases.

Assessment of leaflet presentation, layout/format

Each leaflet was scanned using a Lexmark X74 all-in-one scanner/copier/printer. The following settings were selected: 100% scan size, best quality, mixed text and figures, output as rich text format. The leaflets were measured in millimetres, using a standard rule and compared to a table of standard paper sizes (http://www.prepressure.com/library/papersizes.htm).

The paper type was assessed by visual inspection, with attention being paid to weight and finish. The font size was compared to a printout of font sizes and checked on the scanned image, using the Microsoft Word programme, Windows XP Edition. The font type was determined in a similar manner. Justification and spacing were assessed visually and confirmed within Microsoft Word. Contrast, paper colour and print colour were noted visually.

The use of illustrations was assessed with regard to position, type, labelling and appropriateness, the latter being a subjective evaluation. The use of bullet points was noted and paragraph and sentence length also recorded.

Assessment of readability

Readability was assessed using two methods:

- The SMOG Readability Assessment.[12] The SMOG Grade level for each leaflet was recorded and the average Reading Grade Level for the range of leaflets was calculated.
- Flesch Readability Assessment.[13] The Flesch Reading Ease score has a range of 0 to 100, where zero represents a very difficult passage to read and 100 a very simple one.

Assessment of quality using the DISCERN Instrument

The DISCERN instrument[11] was used to assess the quality of the leaflets. It comprises 15 questions plus a final overall rating question, which were assessed for each leaflet. For each of the 15 questions a rating is made on a five point scale with higher scores indicating greater quality. A final summed score is made by totalling the number of responses falling within the five categories; this provides a guide on the overall quality of the leaflet as rated by the DISCERN instrument. If the scoring is mainly in the 1 and 2 range the overall rating for the quality of that leaflet is 'low'; if the scoring is mainly of 3 or equal numbers of 1,2 ,4 and 5 scores the leaflet is rated as being of 'Moderate' quality. For leaflets that score '5' on most items the rating of quality is 'High'.[11]

FINDINGS

A total of 29 leaflets were appraised with regard to presentation, readability and content (as assessed using the DISCERN tool). The leaflets topics were categorised into three types: treatment (22 leaflets), oral self-care (seven leaflets) and disease related information (seven leaflets). Seven leaflets fell into more than one category.

Assessment of leaflet presentation, layout/format

All the leaflets were the same size, measuring approximately 164 mm x 100 mm. This equates most nearly to ISO A6 but appears not to be a standard ISO size. A gloss finish was used with a medium weight paper. Printing on the reverse side was faintly visible under white areas. The main body of text in all leaflets was judged to be 9 point. All sub-titles were judged to be 12.5 points. Titles varied in size between 19 and 22.5 points, depending to some extent on the length of the title. The font used was Arial normal for the main body of the text, sub-titles and titles. The text for all leaflets was left justified throughout.

White paper was used for all leaflets. Black print was used for the main body of text. The sub-headings were dark blue and the titles were reversed, being white letters on a dark blue background.

Each leaflet had an accompanying illustration. They were all situated beneath the title, some full width (six in all), the remainder positioned to the right hand side of the page (23 in all). Twenty-five were photographs and all but one were coloured, four were diagrams. One diagram had writing over the illustration. None of the illustrations were directly labelled.

White space was used well, with a clear margin around the text. The line spacing was exact.

Bullet points were used on all except two leaflets. Short paragraphs were generally used, the average number of sentences per paragraph was 1.65 (SD 1.82) and the average number of words per sentence was 12.45 (SD 0.21).

Assessment of readability

The average Flesch-Kincaid reading Grade for the 29 leaflets was 6.18 (SD 0.83), and the average Flesch Reading Ease level 72.19 (SD 4.75). In contrast the average SMOG reading grade level was 9.10 (SD 0.83) for all 29 leaflets.

Assessment of quality using the DISCERN Instrument

Table 1 summarises the assessment of the 29 leaflets against the DISCERN criteria. All 29 items were given an overall rating of 'low' on the basis of the ratings made of the DISCERN items.

DISCUSSION

Twenty-nine leaflets produced by the British Dental Association for sale to general dental practitioners were reviewed for quality and readability. The size of all leaflets was small, but would be convenient for carrying. The paper type used had a shiny finish, RNIB guidelines recommend the use of uncoated paper, since the glare produced by the reflection of light can make it difficult to read and also causes more eye fatigue. The paper was reasonably thick, with text from the other side only just being visible in a strong light. The text size in the body of the leaflet was judged to be nine points, with titles varying in size from 19 to 22.5 points. The RNIB recommend a minimum of 12 point text in order to enable some partially sighted people to read the leaflet, increasing it to 14 point will encompass more people with sight difficulties. The NHS *Toolkit for producing patient information* also recommends a minimum font size of no less than 12 points. In this area, changing the font size could increase the accessibility of the text. The growing number of older people in the population might mean an increased proportion of patients with sight difficulties. The font type used was Arial normal. The plainer typefaces are easier to read and generally should be selected and for the same reason Italics should be avoided. The leaflets conform to these recommendations. Both guides recommend that text is left justified only as it easier for the partially sighted to follow writing and in addition keeping the spaces between words even, helps reading. Again the leaflets conform to this standard.

All the leaflets were printed on white paper with black print for the main body of the text. This provides the optimum degree of contrast. The sub-headings were dark blue and the titles reversed, being white letters on a blue background. This is acceptable, according to the NHS Toolkit, for small areas of the text, if there is good contrast between the colours. Ideally, no more than two colours should be used for the text and again the leaflet meets this recommendation. White spacing around the text was used well, with a clear margin around the text and exact line spacing. These are factors that aid scanning of the text.

All the leaflets used illustrations, four used diagrams and the remainder used photographs. All illustrations were situated beneath the title and none of them were labelled. The NHS Toolkit endorses the use of illustrations and diagrams but advises that they should be clearly labelled and not overwritten. This is an area that could easily be improved by the addition of labelling. Most of the illustrations relate to the topics but some of them could be regarded as inappropriate or ageist. The leaflets relating to extraction and post-extraction both depicted an older person. The leaflet about mouth cancer showed an older woman looking distressed and with her head in her hands. In contrast, the leaflet discussing gum disease showed two smiling people with healthy looking mouths. It might have been more effective to show the appearance of teeth and gums affected by the disease.

All the leaflets showed good levels of readability. This SMOG test gave higher estimates of the reading age than the Flesch-Kincaid reading level. Although both tests use sentence length and complexity of words to predict reading level, the level of comprehension required to validate the test is higher for the SMOG formula and so the reading level is normally higher by comparison with the Flesch test. However results from both tests are close to the range of Grade level 7-9 which has been suggested as suitable.[14,15] However at least one author has suggested that a reading grade level of 5 would increase comprehension and increase access to information for those with poorer literacy levels.[16] The readability formulae are estimates of the reading level required to understand

Table 1 Summary of ratings made of 29 leaflets against DISCERN items

Items	Ratings of 1&2 (not met or mostly not met) N (%)	Ratings of 3 (partially met) N (%)	Ratings of 4&5 (met or almost met) N (%)
1. Are the aims clear?	28 (97%)	0	1 (3%)
2. Does the leaflet achieve its aims?[1]			1 (3%)
3. Is it relevant?	0	10 (35%)	19 (65%)
4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	29 (100%)	0	0
5. Is it clear when the information used or reported in the publication was produced?	29 (100%)	0	0
6. Is it balanced and unbiased?	21 (72%)	8 (28%)	0
7. Does it provide details of additional sources of support and information?	29 (100%)	0	0
8. Does it refer to areas of uncertainty?	22 (76%)	7 (22%)	0
9. Does it describe how each treatment works?	2 (7%)	8 (28%)	19 (66%)
10. Does it describe the benefits of each treatment?	4 (14%)	6 (21%)	19 (66%)
11. Does it describe the risks of each treatment?	16 (55%)	9 (28%)	4 (14%)
12. Does it describe what would happen if no treatment is used?	21 (72%)	6 (21%)	2 (7%)
13. Does it describe how the treatment choices would affect overall quality of life?	25 (86%)	4 (14%)	0
14. Is it clear that there may be more than one possible treatment choice?	9 (31%)	18 (62%)	2 (7%)
15. Does it provide support for shared decision making?	25 (86%)	4 (14%)	0

1. This item was not applicable for 28 of the leaflets

the text, but should only be used as a guide. This study suggests that, compared to many other samples of health information literature, the patient information leaflets produced by the BDA are set at a reasonable level. It is more important to match the reading material to the reader. Dentists may need to assess their patients and decide whether the material is suitable or if an alternative should be used. Practitioners working in areas where English is a second language for many of their patients, may need to source material set at a lower reading level or in a different language.

The DISCERN instrument has three sections; questions 1-8 assess the reliability of the publication, questions 9-15 assess the quality of information on treatment choices and question 16 is the third section, an overall rating of the quality of the material.

Overall, the leaflets scored badly in certain areas when assessed with the DISCERN instrument. Only one leaflet set clear aims for the material in the opening paragraph explaining who the leaflet was aimed at and what topics would be covered. The leaflets were rated more highly for relevance. No references to sources of information or date of production were present in any leaflet. Only one leaflet made reference to alternative sources of information. Overall the reliability of the leaflets as assessed in Section 1 was graded as low.

The middle section of the DISCERN instrument asks if the publication describes the effectiveness and benefit of treatments. This area was one that the leaflets addressed quite well, especially information on the benefits and clinical outcome of treatment. However, the leaflets provided little information about the risks of treatment or the effect of choosing not to have treatment. The effect of treatment on the overall quality of life and provision of support for shared decision-making were not areas that were addressed well in the leaflets.

Overall all the leaflets were given a rating of low for the DISCERN instrument. On the basis of guidance given by the developers of the instrument this indicates that the leaflets have serious or extensive shortcomings. General dental practitioners considering the use of these leaflets should consider how they could supplement the use of these leaflets in order to overcome the limitations identified. While the leaflets are good at describing the nature of the treatments, they are poor at identifying risks and helping the patient to discuss the decision whether or not to have treatment. These are important aspects of dentist-patient communication and practitioners using the leaflets surveyed here should emphasise those aspects in their discussions with patients. Alternatively general dental practitioners may wish to design their own patient information materials, including leaflets and web pages. Practitioners should consider using the DISCERN guidelines to aid the design of these materials. From the data described here such design should include consideration of the size of font used (for patients with visual impairments, should reflect the patient population of the practice and include more information on risks.

Accurate and accessible information is vital in order to equip patients to make informed decisions about treatment choices, prevention and self-care. Such information should be an adjunct to face-to-face discussion and appropriate for that individual patient. The findings of this study suggest that while commercially produced leaflets have succeeded in addressing the readability of the information they have been less successful in providing patient centred information. The DISCERN instrument provides a useful guide for those developing patient based information sources.

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