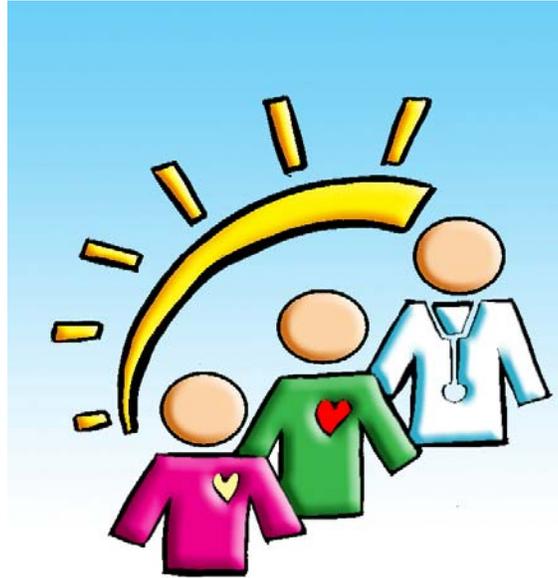


Hormone Disorders Leaflet Series



Methodology

Professor Gary Butler (Paediatrics) & Fernando Vera MSc
Institute of Health Sciences, University of Reading, 2006.

Introduction

The aim of this paper is to describe the methodology employed in the construction of the **Hormone Disorders Leaflet Series (HDLS)** produced by Fernando Vera MSc and Professor Gary Butler (Paediatrics) at the Institute of Health Sciences, University of Reading, Reading, UK in August of 2006. The funding for the production of this series was provided through an educational grant by Serono Ltd, Bedfont Cross, Stanwell Road, Feltham, Middlesex TW14 8NX, UK. Added support was kindly granted by the Child Growth Foundation, 2 Mayfield Avenue Chiswick, London W4 1PW - UK.

Aim

The aim of the HDLS is to deliver information on 14 hormone disorders (see Appendix 1 for full list) affecting children, adolescents and adults in two readability formats: Easy and Average. The HDLS also constitutes part of a larger series of information booklets on child growth and hormone disorders published by the Child Growth Foundation.

Background Research

The first step in the construction of the HDLS was to conduct a systematic literature review in three databases (Medline, Psycinfo and PubMed) to identify the range of human and environmental factors associated with the comprehension and retention of leaflet information in children and adults. One surprising finding of this review was the lack of published research aimed children and the absence of guidelines for the production of age-appropriate written material.

There were, however, studies with adult participants that identified the following as factors which influence the degree to which individuals understand and recall written information: literacy (Harris and Hodge, 1995), text readability (Tooth, et al. 2000), content (Merril, 1991), format and layout (Paul et al., 1997, Boyd, 1997), language

(Kitching, 1990), illustrations (Vahabi et al., 1995) and methods of delivery (Lukoschek et al., 2003). Altogether these factors served as guidelines in the development of the content and design of the HDLS. Nevertheless, it was necessary to omit or modify certain recommendations as needed due to the inexistence of specified criteria for the production of child leaflets.

HDLS Target Audience

The second step in the development of this series was to determine the target audience. We conceived the HDLS as an information agent for individuals of diverse literacy skill, including children and adults. Although it is generally assumed that literacy improves with age, this is not always the case as indicated by a national survey in England which revealed that up to 24% of the adult population is functional illiterate (Basic Skills Agency, 2000). Considering this finding, it was decided to categorise the HDLS into an *Easy* and an *Average Readability* format. The principal advantage of creating a double format is that the first can be used with children or low-literate adults, whilst the second can be employed with older individuals of average reading ability or advanced young readers.

HDLS Design

The third and final step in the development of this project was the leaflet design. This design includes five features that will be fully described in this section: text format, content, layout, language and illustrations.

1. Text format

As previously described the HDLS was developed in two readability formats (easy and average). Although these formats present differences in readability, content length and illustrations, they share common features in other aspects such as in text presentation and content organisation.

Regarding the text presentation, this was designed to be perceived as direct and personal by setting the tone to a conversational style active voice. Furthermore, the text was organised in a question-answer format to promote interest and motivation in the reader (Vahabi & Ferris, 1995, Sanson-Fisher, 1997, Boyd 1987).

Easy Readability

The easy readability format was created to provide the reader (child or adult with below than average literacy) basic information on a specific condition including its diagnosis, treatment and possible side effects. The readability for this format was set at fifth-grade level (+1/-1 variance) with the use of the Flesh-Kinkaid formula. This readability formula calculates in an extract of text, the average sentence length in syllables or words, the proportion of common words used, and the proportion of words that are monosyllabic or that contain three or more syllables (Ley & Florio, 1996).

The total word count for this format was set at 600 (+100/-100 variance), whilst the average number of characters per sentence was maintained below 50 to avoid exceeding the recommended value of 70 (Boyd, 1987). The text was written in upper and lower case letters to enhance the shape and contour of letters, which in turn improves legibility. The typeface used was black Arial 13 and black Arial 14 for headings as this font delivers highly visible letters, particularly when printed on a light contrast background (Boyd, 1987).

Average Readability

The average readability format was designed for average reading adults or advanced young readers. This format conveys more information than the former version but with the added characteristic of a succinct theoretical approach. As a result, this version facilitates the reader's transition from an easy readability or introductory format to a more advanced format.

The readability for this version was set at eight-grade level (+1/-1 variance) with the use of the Flesh-Kinkaid formula, whilst the total word count was fixed at 1000 (+100/-100). The average number of characters per sentence was maintained below 50 and the font was black Arial 12 and black Arial bold 13 for all subtitles. All other specifications remained identical to those in the easy readability format.

2. Content

In addition to the text format, the effectiveness of written material will also be determined by the content and how this is displayed to the reader. For both readability formats the content was designed to be of some benefit to the reader by presenting the facts in a balanced, objective and focused manner as suggested by several authors (Frank-Stromborg & Cohen, 1991). Furthermore, the content aimed to discuss “what, why and when’ of the content as recommended by Boyd (1987). This last characteristic is highly relevant as it allows information to be structured in an organised and natural sequence from the more general to the specific.

3. Layout

For the layout, Doak et al (1995) recommends that sentences should remain succinct and attempt to explain a single idea as this facilitates the integration and storage of information in short-term memory. This characteristic is also relevant in the light of cognitive load theory (Chandler et al., 1991). According to this theory, redundant forms of information may require longer processing and possibly prevent a reader from learning. For the above reasons we strived to maintain the minimum amount of words possible.

The paragraphs were also organised to first discuss the most relevant facts prior to the introduction of new information and to end in a summary of the section. This arrangement has been noted to facilitate assimilation and reinforce learning (Bernier, 1993, Manning 1981)

4. Language

It is widely accepted that language influences the easiness of understanding written information. Following Kitching's (1990) and Boyd's (1987) suggestions, we made a clear attempt to avoid the use of jargon, and when technical terms were required, these were always followed by a clear and simple explanation.

5. Illustrations

It has been proposed that illustrations enable individuals to follow the text whilst improving motivation (AAP, 2000). Although, the mnemonic function of illustrations may depend on certain interpersonal variables such as age and reading skill, there is partial evidence to suggest that illustrations may improve reading motivation in children of low, average and high literacy (Vera, 2006).

The illustrations for the HDLS were designed to appear easily recognizable to the reader and to only convey a single idea. These two characteristics are frequently highlighted as important when designing illustrations (Vahabi & Ferris, 1995, Kitching, 1990). There were, however, graphical differences between the illustrations used at each readability format.

Easy Readability

For this format the illustrations were sketched using a cartoon style design in order to appeal to a younger audience. This style featured animated characters (e.g. human heart with limbs in motion) in a storyboard continuum that closely paralleled the theoretical content. Moreover, all depicted objects and characters were clearly labeled when needed to avoid confusion or distraction in the reader.

Average Readability

The illustrations sketched for this format were designed for an older audience in that they attempt to resemble textbook art but without the complex details that may overload a reader's attention and capacity for memory. These illustrations were also fewer in number and less frequent throughout the text than those included in the previous format.

Conclusion

The HDLS was conceived as an effective tool in educating children and adults about a variety of hormone disorders. We strongly believe that this was achieved. This success responds to two central factors. The first being the vast experience in clinical paediatrics possessed by one of the authors which helped shape the overall content and its accuracy, and the second, the exhaustive literature review used to develop the technical aspect of this leaflet series.

Although the overall effectiveness of the HDLS was not fully assessed by the users themselves, there is partial evidence of its success as reported in a study by Vera (2006). In this study, a sample of children from three age groups (9, 10 and 11) and distinct literacy skill (low and high) were asked to read one of the leaflets in the series. Moreover, participants were randomly assigned to either an illustrated or non-illustrated form of the leaflet. Shortly after, they completed a questionnaire to assess their recall of the material read. The results indicated that regardless of the literacy background and the type of leaflet read, all children obtained a similar high score in the recall questionnaire (on average five correct questions out of seven). The verbal feedback given by participants was congruent with this result in that the majority found the leaflet easy to read and those who received the illustrated leaflet felt more motivated to complete their reading.

This result suggests that this material was not only easily understood by participants but that it also was perceived as child-friendly. We feel that similar success would be enjoyed by the other leaflets in this series because of the standard methodology employed

across the HDLS. Nevertheless, future research would be needed to explore the effectiveness of this material over traditional leaflets.

It is hoped that the HDLS project will contribute to the field of health education by demonstrating the importance of developing age and level appropriate material under the scrutiny of a standardized guidelines.

Finally, we would like to thank all those individuals who kindly collaborated in this project by providing insightful feedback, as well as Serono-Merck Ltd for providing the necessary financial support.

For feedback, suggestions and comments please contact Professor Gary Butler
g.e.butler@reading.ac.uk

Appendix 1.

- Series N 2.** Growth Hormone Deficiency
- Series N 3.** Puberty and the Growth Hormone Deficient Child.
- Series N 4.** Precocious Puberty
- Series N 5.** Emergency Information for Children with Cortisol and GH Deficiencies and those Experiencing Recurrent Hypoglycaemia.

- Series N 6.** Congenital Adrenal Hyperplasia
- Series N 7.** Growth Hormone Deficiency in Young Adults.
- Series N 10.** Constitutional delay of growth and puberty
- Series N 11.** Multiple Pituitary Hormone Deficiency
- Series N 12.** Diabetes Insipidus
- Series N 13.** Craniopharyngioma
- Series N 14.** Intrauterine Growth Retardation or Small Gestational Age
- Series N 15.a.** Hyperthyroidism
- Series N 15.b.** Hypothyroidism
- Series N. 16.** Type 2 Diabetes and Obesity

References

American Academy of Pediatrics (2002) <http://www.medem.com/search/article>

Bernier, M. J. (1993). Developing and evaluating printed education materials: A prescriptive model for quality. *Orthopedic Nursing*, 12, 39–46

Boyd, M. D. (1987). A guide to writing effective patient education materials. *Nursing Management*, 18, 56–57.

Doak, C., Doak, L. & Root, J. H. (1995). *Teaching patients with low literacy skills* (2nd ed.). Philadelphia: J B Lippincott

Frank-Stromborg, M. & Cohen, R. (1991). Evaluating written patient education materials. *Seminars in Oncology Nursing*, 7, 125–134

Harris, T.L. & Hodges, R.E (1995). *The literacy dictionary: The vocabulary of reading and writing*. Newark, DE: International Reading association.

Kitching, J. B. (1990). Patient information leaflets — the state of the art. *Journal of the Royal Society of Medicine*, 83, 298–300

Ley, P. & Florio, T. (1996). The use of readability formulas in health care. *Psychology, Health and Medicine*, 1, 7–28

Lukoschek, P, Fazzari, M., Marantz, P. (2003). Patient and physician factors predict patients' comprehension of health information. *Patient Education and Counseling*. Vol 50(2) Jun. 201-210

Manning, D. (1981). Writing readable health messages. *Public Health*, 96, 464–465.

Merrill, M. D. (1991). Constructivism and instructional design. *Educational Technology*, 31, 45–52.

Paul, C. L., Redman, S. & Sanson-Fisher, R. W. (1997). The development of a checklist of content and design characteristics for printed health education materials. *Health Promotion Journal of Australia*, 7, 153–159.

Tooth, L., Clark, M. & McKenna, K. (2000). Poor functional health literacy: The silent disability for older people. *Australasian Journal on Ageing*, 19, 14–22.

Vahabi, M. & Ferris, L. (1995). Improving written patient education material: A review of the evidence. *Health Education Journal*, 54, 99–106

Vera, F. (2006) *The effectiveness of illustrations in child information leaflets*. MSc Dissertation. School of Psychology, University of Reading, UK.