

Child Dehydration Management: A Health Literacy-Focused Resource Analysis

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BACKGROUND

As children are at high dehydration risk, caregivers must have access to understandable and actionable educational resources. A significant proportion of dehydration-related hospitalizations are not only preventable, but also often attributable to inadequate parental education and/or prevention (i.e., not providing enough fluids at home).

PURPOSE

The overarching purpose of this study was to assess usability, accessibility, complexity and readability of educational materials for at-home childhood dehydration management. **This study addressed two research questions:** (1) What was the reading grade level, document complexity, language availability, dimensions and text point size of over-the-counter pediatric electrolyte replacement solution (PERS) labeling? (2) What was the scope of information included across over-the-counter PERS internet-based resources?

METHODS

Selection of over-the-counter pediatric electrolyte replacement solutions. In January 2021, we conducted comprehensive Internet searches to identify brand name and generic PERSs currently available for purchase in the US. Based on our Internet searches and visits to major retailers, five (n=5) brand and nine (n=9) generic PERSs were identified and purchased.

Assessment of reading grade level, document complexity, language availability, dimensions and text point size of over-the-counter pediatric electrolyte replacement solution labeling. PERS label content was organized in four separate sections (panels), including: (1) specific product details, (2) nutrition facts label, (3) usage and instructions, and (4) electrolyte replacement solution comparison chart/figure. We calculated usage and instruction reading grade level using the Flesch Reading Ease (FRE). We used the established PMOSE/IKIRSCH tool to evaluate nutrition facts label and electrolyte replacement solution comparison chart/figure document complexity. Length and width of PERS labels were recorded to the nearest millimeter (mm) using a standard ruler. Text point size was measured with a C-Thru Ruler.

Assessment of supplemental internet-based over-the-counter pediatric electrolyte replacement solution information. We reviewed pediatric electrolyte replacement solution container labels to assess whether a hyperlink and/or Quick Response (QR) code was included. If a hyperlink and/or QR code was provided, we reviewed the following website content features: (1) product overview, (2) use of photographs/graphics, (3) landing page features, (4) product information, (5) dehydration/rehydration information, (6) audiovisual resource(s) and (7) language availability.

Data and statistical analyses

Descriptive analyses (e.g., frequencies, means, standard deviations) were calculated using the IBM® Statistical Package for the Social Sciences,® Version 27.0 (SPSS+, Chicago, Illinois).

RESULTS

With text point size averages of 15.42±6.75 cm and 15.21±5.38 cm respectively, both manufacturer and electrolyte names were the most prominently displayed product-specific information. Nutrition facts labels had low document complexity (level 2) based on PMOSE/IKIRSCH scores. Thirteen PERSs included a usage and instruction section with text point size averaging 6.04±0.14 cm (range 6.0-7.0 cm). Usage and instruction sections (n=13) had average FRE scores of 65.70±15.33, indicating reading difficulty between 8th and 9th grade level. Thirteen products included an electrolyte replacement solution comparison chart/figure with all having either very low (n=12) or low (n=1) document complexity based on PMOSE/IKIRSCH scores. Just one PERS included English- and Spanish-language information on their label. All (n=5) brand name PERS provided a hyperlink and/or QR code where a caregiver could find additional product-related information.

Table. Assessment of supplemental internet-based pediatric electrolyte replacement solution information (n=5)

Pediatric Electrolyte Replacement Solution	Content Features
BerriLYTE®	The Berri Pro, Incorporated website provides product overviews and photographs in English. The top of the landing page includes (1) product list (including BerriLYTE®), (2) company mission, (3) store locator, (4) giving back, and (5) shop. The BerriLYTE® product section provides (1) icons (plant based, pediatrician approved, proven to hydrate, and tastes great), (2) description (e.g., packed with flavor), (3) ingredients, (4) nutrition facts label, and (5) electrolyte replacement solution comparison chart/figure. The website includes 20 Frequently Asked Questions (FAQs), but none specifically address pediatric dehydration. Customer reviews are included.
Earth's Best Organic®	The Earth's Best website provides product overviews and photographs in English. The top of the landing page includes (1) Why Earth's Best (e.g., Our Promise), (2) products, (3) resources, and (4) join our community. The Earth's Best Organic® section provides (1) key benefits, (2) nutrition facts label, and (3) ingredients. The <i>Just in Time for Cold & Flu: First Organic Electrolyte Solution for Kids</i> resource recommends using Earth's Best Organic® electrolyte solution to avoid toddler dehydration.
Kinderlyte®	The Kinderlyte® website provides product overviews and photographs in English. The top of the landing page includes (1) our story, (2) the problem, (3) IAT technology, (4) store locator, and (5) buy now. Kinderlyte® is described as a doctor-formulated, natural hydration source that is made with natural ingredients. Icons highlight Kinderlyte® as a natural, vegan, non-GMO, no fructose, and gluten free product. The Advanced Natural Hydration section provides (1) description, (2) ingredients, (3) usage, and (4) 8 FAQs related to product use/comparisons and hydration. An electrolyte replacement solution comparison chart/figure is also included. Social media use is encouraged (#choosekinder). Customer reviews are included.
Pedialyte®	The Pedialyte® website provides product overviews and photographs in English. The top of the landing page includes (1) products, (2) dehydration symptoms & causes, (3) why Pedialyte®, and (4) where to buy. The Dehydration Symptoms & Causes tab provides an overview of the following symptoms: (1) What is Dehydration, (2) Signs of Dehydration (using an infographic), (3) What are electrolytes (using an infographic), (4) What causes dehydration (with link to MedlinePlus resources), and (5) How to replace electrolytes. Five major dehydration causes are described using a mix of text and graphics: (1) stomach flu, (2) food poisoning, (3) travel, (4) heat, and (5) exercise. The Why Pedialyte® section provides (1) 11-second video of Pedialyte® products, (2) a comparison chart depicting differences between Pedialyte® and other sports drinks in regards to electrolyte sodium and sugar levels, (3) who can use Pedialyte® description. Contact information and social media buttons are displayed on the left-hand side of the screen. Customer reviews are included.
Suero®	The Suero® Oral website provides product overviews and photographs in English and Spanish. The top of the landing page includes (1) home/inicio, (2) benefits/beneficios, (3) products/productos, and (4) contact us/contactanos. The Benefits tab provides an overview of (1) what are electrolytes/la solución electrolito que apoya a su vida activa, (2) why electrolytes are important/que es un electrolito y su importancia, (3) electrolytes found in Suero Oral/que son los electrolitos en Suero Oral, and (4) how Suero® Oral can help children/como Suero® Oral puede ayudar a los niños. The Products tab provides photographs and listings of 500mL and 1L bottles. The landing page also includes a 1:37 minute English-language video highlighting benefits of using Suero® Oral to rehydrate.

CONCLUSIONS

Our review of PERS labeling revealed both positive aspects and identified features to improve upon as future iterations are considered. It was encouraging that both nutrition facts and electrolyte replacement solution comparison charts/figures had low document complexity indicating that a significant proportion of caregivers would be able to use and act on this information. However, reading demands and text point sizes of usage and instruction sections did not align with health literacy-related formatting guidelines.