






Assessing the ethical and content quality of online parenting resources

Evaluación de la calidad ética y del contenido de los recursos online para padres

-  Arminda Suárez-Perdomo is Research Assistant in the Department Developmental Psychology and Education at the University of La Laguna (Spain) (asuper@ull.edu.es) (<http://orcid.org/0000-0002-6755-5284>)
-  Dr. Sonia Byrne is Doctor Assistant in the Department Developmental Psychology and Education at the University of La Laguna (Spain) (sbyrne@ull.edu.es) (<http://orcid.org/0000-0002-9267-3354>)
-  Dr. María-José Rodrigo is Professor in the Department Developmental Psychology and Education at the University of La Laguna (Spain) (mjrodri@ull.es) (<http://orcid.org/0000-0001-5504-886X>)

ABSTRACT

The quality of the online resources for parents offering access to open knowledge has hardly received attention despite their increasing number. This paper provides a framework to examine the ethical and content quality of parenting resources. The ethical criteria were based on "the Health on the Net" (HON) framework whereas the content criteria were based on the Positive Parenting framework and the effectiveness of the learning materials used. The criteria were applied to a survey of international websites (n=100) for Spanish-speaking parents. Chi-square analyses showed that websites from Spain, official companies sites and information sites, as compared to South American, parents' and interactive sites, scored higher in the ethical criteria of privacy, authority, justifiability and financial disclosure. Hierarchical cluster analysis applied to content criteria showed that the High quality websites, unlike the Low quality ones, valued gender equality, a positive parental role, modeled a variety of parenting practices, educational contents with multimedia formats, and made use of experiential, academic and technical information. Privacy, financial disclosure and justifiability were more likely to be found in the High and Medium quality content clusters. In conclusion, the study illustrates some of the challenges of open knowledge and sets out the priority areas for quality improvement for website designers and for professionals who want to help parents develop effective skills for searching for trustworthy sources.

RESUMEN

La calidad de los recursos online para padres que permiten acceder al conocimiento en abierto apenas ha recibido atención a pesar de su incremento. Este estudio analiza la calidad tanto ética como de contenido de dichos recursos. Los criterios éticos están basados en los de «Salud en la Red» (HON), mientras que los de contenido se basan en los principios de la Parentalidad Positiva y la efectividad de los materiales de aprendizaje usados. Los criterios se aplicaron a una muestra de webs internacionales (n=100) para padres y madres hispanohablantes. Los análisis de Chi-cuadrado mostraron que los sitios web españoles, de empresas oficiales e informativos obtuvieron una calificación más alta en los criterios éticos que los recursos de Sudamérica, de padres e interactivos, en privacidad, autoridad, justificabilidad e información financiera. El Análisis Jerárquico de Clúster aplicado a los criterios de contenido mostró que los sitios web de alta calidad, a diferencia de los de baja calidad, valoraban la igualdad de género, un rol parental positivo, modelaban una variedad de prácticas parentales, contenidos educativos con formatos multimedia y proporcionaban experiencias, información académica y técnicas. La privacidad, la información financiera, y la justificabilidad eran más característicos de los clúster con contenidos de Alta y Media calidad. En conclusión, el estudio ilustra algunos de los retos del conocimiento en abierto y define las áreas prioritarias para la mejora de la calidad para los diseñadores de webs y para los profesionales que quieren ayudar a los padres a desarrollar habilidades para buscar fuentes confiables.

KEYWORDS | PALABRAS CLAVE

Website quality, ethical criteria, content criteria, web-based support, cluster analysis, e-parenting, online resources, positive parenting.

Calidad websites, criterios éticos, criterios de contenido, apoyo web, análisis de clúster, parentalidad online, recursos online, parentalidad positiva.



1. Introduction

Nowadays, parents use the Internet as an important source of information to support their parenting and better promote their children's development and family wellbeing (Dworkin, Connell, & Doty, 2013; Niela-Vilén, Axelin, Salanterä, & Melender, 2014; Nieuwboer, Fukkink, & Hermanns, 2013a; 2013b). The use of the Internet and social media for parenting purposes allows parents to obtain information and counseling from experts but also to exchange experiences with other parents and create virtual communities around certain child-rearing topics (Madge & O'Connor, 2006; Myers-Walls & Dworkin, 2015; McDaniel & al., 2011; Muñetón, Suárez, & Rodrigo, 2015). The Internet offers a range of opportunities for e-empowerment, giving means through which parents can increase their competence at personal, social and citizenship levels, perceived self-efficacy and autonomous decision making about child-rearing issues (Amichai-Hamburger & al., 2008). In sum, parents are not only in the hands of experts, but they can produce and communicate information by themselves, heading towards open knowledge models where information is primarily produced in digital formats and consumed through online media (García-Peñalvo, García de Figuerola, & Merlo-Vega, 2010).

Parents' use of the Internet does not come without risks since they determine when, where, which and how to access information from some websites that may not rely on credible and reliable sources. The responsibility to access high-quality, reliable educational content that used to rest primarily on the expert/educator has been partly transferred to parents, who should be skillful enough to conduct efficient searches and properly evaluate the outcomes (Dworkin & al., 2013; Ebata & Curtiss, 2017; Rothbaum, Martland, & Janssen, 2008; Suárez, Rodrigo, & Muñetón, 2016). However, the extent to which online parenting resources provide effective support to parents also depends on the quality of the websites browsed. Website designers and online service providers should also take responsibility and offer websites that meet high-quality standards to provide consumers with credible information prepared for general audiences spanning the world.

Notably, quality standards of websites for the parenting domain have not yet been well established or tested on empirical grounds (Myers-Walls & Dworkin, 2016). The present study proposes a framework to evaluate the quality of online parenting resources based on ethical and content criteria, since the design, organization, and user-friendly quality standards of the parenting websites have received more attention in the online parenting literature (Hughes & al., 2012; Myers-Walls & Dworkin, 2015). The idea is to identify ethical and content standards and to empirically test their application to a sample of websites for Spanish-speaking parents. On the practical side, our study would help to reveal differences in the quality of websites offered to parents in the large community of Spanish-speaking Internet users. Spanish is the third-most-spoken language on the Internet and the second on the social networks.

In a recent review, Ebata and Curtiss (2017) listed some criteria that may be helpful in determining if a parenting website has a quality information (e.g., the website has a legitimate authority, the authorship is provided, the purpose of the information is declared, the information is justified on scientific evidence, and the information is current and accurate). However, there is a need to support the selection of the quality standards on a more theoretical basis. Cheung & al. (2008) have proposed a model for the WOM (word-of-mouth) communication defining two important factors for information adoption: source credibility and information quality. Sources credibility involves source expertise and source trustworthiness. Information quality involves relevance, timeliness, accuracy, and comprehensiveness. This model was used in the current study to test the pertinence and relative importance of both factors as quality criteria of parenting websites.

We selected criteria related to source credibility following the ethical standards defined by "Health on the Net" (HON, 2017) (<https://goo.gl/JNDPg9>) aimed at improving the ethical quality of medical and health information on the Internet. Ethical standards in the Internet context reflect the principles that websites should follow to respect the consumers' rights in agreement with fairness, accountability and trustworthy issues. The HON system certifies websites based on a code of conduct in widespread use: it covers over 35 languages and has been adapted to cultural differences and regulations around the world (Baujard & al., 2010). For this study, the following criteria were used: authority, privacy, attribution, justifiability, transparency, financial disclosure and advertising policy (see Method, Table 3 for a description).

As for the information content, we selected criteria that reflect aspects related to the adequacy of the information (relevance, timeless and accuracy) and its learnability (comprehensiveness) to provide effective support to parents. Adequacy of the information (a) was assessed following the Council of Europe's Recommendation 19/2006 (Council of Europe, 2006) on positive parenting, whereas learnability of information (b) was assessed following the

literature on the characteristics of parenting websites that may foster effective learning (Dworkin & al., 2013; Hughes & al., 2012; Myers-Walls & Dworkin, 2015; Rothbaum & al., 2008). According to (a), the Council of Europe's Recommendation provides a modern view of positive parenting, and what is needed for support in our societies. Furthermore, this evidence-based framework is widely accepted and applied in Spain (Rodrigo & al., 2016) and the rest of Europe (Rodrigo & al., 2016) and is gradually spreading to other Spanish-speaking countries (Rodrigo & al., 2015).

Under this framework, it is important to pay attention to several aspects: the sites' orientation on gender equality and family patterns; whether the view of the parental role was positive (stressing parental capabilities and skills) or negative (stressing difficulties and problems), and whether the website mentioned a variety of child-rearing practices rather than a single positive or negative instance (as simple recipes). According to (b), an important aspect of content quality is that the infor-

mation provided on the website may foster effective learning (Dworkin & al., 2013; Hughes & al., 2012; Myers-Walls & Dworkin, 2015; Rothbaum, Martland, & Janssen, 2008). We focused on the following aspects: whether it provides a variety of educational content, a variety of multimedia materials, such as pictures, video, text and animated simulations; a variety of communication tools to support interactive exchanges; and finally, whether it presents mixed information involving personal experiences, concepts, research findings and child-rearing techniques (see Method, Table 4 for a description).

The Internet has become a crucial information and support source for parents, which provides an interesting example of open knowledge management in an informal educational context. It is in the parenting domain where the danger of exposing consumers to evidence-based contents, biased values, poor e-learning environments and hidden commercial purposes is presumably greater than informal educational contexts. Regrettably, the assessment of the quality of online parenting support and education is still an emerging field.

This study addresses a systematic assessment of the ethical and content criteria, based on the model of the information adoption (Cheung & al., 2008), applicable to a sample of parenting websites in Spanish. Our first research question was to identify the website characteristics (type of website, origin, type of entity, purpose, and audience) associated with their ethical quality. We hypothesized that mainly the type of entity (e.g., public agencies) responsible for the website would be related to higher ethical standards to protect the consumers' rights. Type of entity is also a relevant feature for parents with more proficiency in using the Internet for parenting purposes (Muñetón, Suárez, & Rodrigo, 2015; Suárez, Rodrigo, & Muñetón, 2016). Country of origin could also be relevant due to the huge differences in Internet penetration rates in Spanish-speaking countries involving two continents (e.g., Spain and South-American countries; Live Internet Stats, 2016) that may have an impact on the quality of the websites for parents.

Our second research question was to examine the extent to which the websites' ethical quality was related to the quality of their content. Both ethical and content criteria could be expected to be relevant and probably mutually related for high-quality websites. Parents deserve that the information available followed ethical standards that guarantee its credibility, and they also deserve the proper informational message that guarantees a positive exercise of parenting.

A person-centered approach (Bergman & al., 2003) was used to identify different groups of websites with similar content criteria configurations, enhancing our knowledge about the potential combination of quality criteria there could be. In what follows, the methodology used to select the websites, the results obtained after the application of the quality criteria and their practical implications are described.

2. Material and methods

2.1. Sampling of websites

The search was carried out in May and June 2016 using Google and Yahoo as search engines, and the strategy involved conducting Boolean searches of various key words related to the parenting domain (Table 1). The criteria for including a resource in the sample were as follows: first, it should be a webpage or blog, as these are the main formats used to convey online parenting information; second, either direct or logged in access should be free; and third, the primary components of the resource should be educational or on family health-related issues. The exclusion criteria were as follows: first, the resource could not be a commercial website; second, the type of entity could not be inaccessible; third, the origin could not be inaccessible; and fourth, formats such as newsletters, magazines, eBooks, and curriculum guides were not included. As a result, 100 websites were selected out of 175 entries, with 48% from Google and 52% from Yahoo with no overlaps in the search results.

2.2. Evaluation checklist and reliability of coding scheme

The evaluation checklist consisted of two sets of criteria: seven ethical criteria (Table 3) and eight content criteria (Table 4).

Descriptions of each criterion and the coding scheme used are provided. All HON criteria were adapted to the parenting field, with the exception of complementarity (information should support, not replace, the doctor-patient

Table 1. Search terms, search engine used and outcome of the selection process

Search terms	Entries		Selected	
	Google	Yahoo	Google	Yahoo
"parenting 'AND' education 'OR' child-rearing"	8	10	3	5
"education 'AND' parents 'OR' children"	24	15	12	10
"parenthood 'OR' motherhood 'AND' education"	24	20	10	14
"parenting 'AND' positive 'OR' education"	19	17	8	11
"parenting 'AND' positive 'OR' child-rearing"	20	18	15	12
Total	95	80	48	52

Note: search terms in Spanish are: parentalidad / educación / crianza; educación / padres / niños; paternidad / maternidad / educación; Parentalidad / positiva / educación; parentalidad / positiva / crianza.

Table 2. Distribution of website characteristics in the simple (n=100)

Variable	%	Variable	%
Type of website		Purpose	
Webpage	53	Information	59
Blog	47	Interaction with experts and peers	41
Origin (Spanish-speaking zones)			
Spain	27	Audience (parents with children)	
North America (USA, Mexico)	35	0 to 11 years	32
South America (Chile, Colombia, Argentina)	38	Adolescent children	13
Type of entity		Children of any age	55
Public agency	13		
Company	22		
NGO	19		
Expert	29		
Parents	17		

Table 3. List of the ethical standards for parenting websites (HON, 2017)

Criterion	Description
1. Authority	Indicates the authorship: unknown authorship; experts in education and psychology; experts in other subjects; parents. (0) Absence; (1) Presence.
2. Privacy	Declares to respect the privacy and confidentiality of personal data submitted to the site by the visitor. (0) Absence; (1) Presence.
3. Attribution	Information supported by clear references to source data and, where possible, with specific HTML links to that data. (0) Absence; (1) Presence.
4. Justifiability	Makes clear claims about the benefits of any recommendation / expert advice and backs up these claims with scientific evidence. (0) Absence; (1) Partial (one element); (2) Full (both elements).
5. Transparency	Provides working email address or contact form, makes it easy to access from anywhere on the site, and provides prompt answer to website visitors' enquiries: (0) Absence; (1) Partial (one or two elements); (2) Full (all three elements).
6. Financial disclosure	Identifies website's funding sources and describes type of support. (0) Absence; (1) Partial (one element); (2) Full (both elements).
7. Advertising policy	Indicates that the site does not host or receive funding from advertising or from the display of commercial content. If the site displays advertisements it should clearly distinguish advertising from editorial content. (0) Absence; (1) Partial (one element); (2) Full (both elements).

relationship), which was excluded, given that it was not easily assessed and/or applied to the parenting domain.

The eight content criteria and respective coding systems were defined by consensus by a panel of four experts in the positive parenting framework and online parenting. Overall, the ethical criteria were evaluated using categorical variables,

whereas the content criteria used Likert-scale or cumulative (0-1) values. Two reviewers, other than the authors, independently evaluated the 100 websites. They were trained during 15 hours on how to apply the ethical and content quality criteria using ten websites that were not included in the analyses. Disagreements were resolved through discussion. After reaching a Kappa coefficient > 0.8 in the training period as a recommended value

Table 4. List of the content criteria for parenting websites (Council of Europe, 2006)

Criterion	Description
1. Gender equality	Language denotes an equal treatment of the parental task for women and men and/or differentially refers to boys and girls. Scale 0-2: (0) gender inequality (neither of these aspects); (1) intermediate (only one aspect); (2) gender equality (both aspects).
2. Family diversity	Refers to a diversity of family forms. Scale 0-2: (0) low diversity (not distinguishing any type of family); (1) medium diversity (mentions one or two types of family); (2) high diversity (mentions three or more types of family).
3. Parental role	Positive role: emphasizes parental capabilities and skills; showing love and acceptance; searching for social support; sees family conflicts as opportunities; considers the parenting task as a personal construction. Negative role: emphasizes difficulties and problems, values the use of criticisms and warnings, presents family conflicts as negative, states parents made wrong decisions, proposes an ideal model of parenting. Scale 0-4 in each role: (0) none of these elements; (1) mentioned one element; (2) mentioned two elements; (3) mentioned three or four elements; (4) mentioned five elements.
4. Parenting practices	Refers to a variety of practices: assertive communication; negotiating a solution; time out; taking away privileges; token economy; scolding; emphasizing empathy; corporal punishment. (0) Absence; (1) Presence. Cumulative score (0-8).
5. Educational content	Offers content on: school homework; educational games; developmental stages; behavioural problems; family health; innovative pedagogy; pregnancy and childbirth; family nutrition. (0) Absence; (1) Presence. Cumulative score (0-8).
6. Multimedia use	Offers: videos; online games; news; animated scenes. (0) Absence; (1) Presence. Cumulative score (0-4).
7. Communication tools	Email; chat-rooms; online forums; Facebook; Twitter. (0) Absence; (1) Presence. Cumulative score (0-5).
8. Type of information	Uses the three types of information: a) experiential information (e.g., events, opinions); b) academic information (concepts, research findings); c) technical information (e.g., strategies, practices). Scale 0-4, (0) not at all to (4) very much.

(Bangdiwala, 2017; Cohen, 1960), the two raters started the evaluation of the websites in the sample. Inter-rater reliability (Kappa 0-1) for the ethical criteria was adequate: Authority 0.93; Privacy 0.72; Attribution 0.84; Justifiability 0.91; Transparency 0.88; Financial disclosure 0.86; and Advertising policy 0.88. Inter-rater reliability for the content criteria was adequate: Gender equality 0.91; Family diversity 0.93; Parental role 0.94; Parenting practices 0.88; Educational content 0.87; Multimedia use 0.88; Communication tools 0.83; and Type of information 0.88.

3. Analysis and results

For the first research question, chi-square analyses were used, crossing the characteristics of the sampled websites with each ethical criterion. We used the corrected typified residuals (r_z) to further explore the statistically significant differences in the contingency tables (Haberman, 1973). This procedure allowed us to identify the particular cells in which the z scores were greater than $+1.96$ (above chance levels) or less than -1.96 (below chance levels). Cramer's v (Agresti, 1996) was used as an indicator of effect size (ES), and significant results with medium and high ES were reported.

For the second research question, a hierarchical cluster analysis was performed on the content criteria scores using Ward's (1963) method to examine whether it was possible to distinguish different profiles. All variables were standardized to z scores to prevent the different scales from influencing the results. One-way ANOVAs by cluster membership were performed with Scheffe post hoc comparisons to examine whether the profiles significantly differed in the content criteria. The statistic R^2 (Cohen, 1988) was used as an indicator of ES. Finally, chi-square analyses were used, crossing the characteristics of the sampled websites and the ethical criteria with the three clusters.

3.1. Characteristics of the online parenting resources modulating ethical quality

On average, Authority was unknown in 9.47% of the sites; experts in education and psychology were the authors in 46.32%, followed by experts in other subjects (22.11%) and parents (22.11%). Information on Privacy and Attribution was present in 68% and 42.11% of the sites, respectively. Information on Justifiability and Transparency was absent in 42.11% and 26.32% of the sites, partially present in 47.37% and 38.95%, and present in full in 10.53% and 34.74%, respectively. Financial disclosure and Advertising policy details were absent in 36.84% and 49.47% of the sites, partially present in 18.95% and 38.95%, and present in full in 44.21% and 11.58%, respectively.

The origin, type of entity, and purpose of the websites modulated most ethical criteria. Concerning origin, websites from Spain, and South America, respected privacy ($\chi^2(2)=9.26$, $p<0.001$), provided evidence to justify claims ($\chi^2(4)=12.68$, $p<0.001$), and provided financial disclosure ($\chi^2(4)=15.88$, $p<0.001$). Concerning type of entity and authority (as ethical criteria), public agencies were more likely to have experts in education as authors. Companies were more likely to have experts in other subjects authoring content, and parents' websites were more likely to have parents as authors ($\chi^2(12)=43.7$, $p<0.001$). Public agencies were more likely to respect privacy, and parents' websites were less likely to do so ($\chi^2(4)=11.22$, $p<0.001$). Companies were more likely to provide financial disclosure, and parents' websites were less likely to do so ($\chi^2(8)=29.42$, $p<0.001$). Finally, regarding purpose and authority, information sites had experts in education as authors whereas interactive sites had parents as authors ($\chi^2(3)=17.9$, $p<0.001$). Information sites provided attribution to source data while interactive sites were less likely to do so ($\chi^2(1)=9.71$, $p<0.001$); they partially provided evidence to justify claims while interactive sites provided no evidence ($\chi^2(2)=10.34$, $p<0.001$), and they provided financial disclosure while interactive sites were less likely to do so ($\chi^2(2)=12.57$, $p<0.001$).

3.2. Identifying content criteria profiles

For the second research question, cluster analyses showed an adequate three-cluster solution, since the clusters were theoretically meaningful, evident in the dendrogram (a tree-structured graph used to visualize the result of a hierarchical clustering calculation), and represented the best possible balance between cluster size and differentiation. The hierarchical three-cluster solution was replicated using the iterative partitioning method, k-means ($n=95$). Mean distances between centroids of clusters 1 and 2 were 2.405 and 3.528, respectively, whereas the main distance between clusters 2 and 3 was 2.435. The mean scores on the clustering variables are shown in Table 5. The clusters differed in all variables, except for communication tools.

Cluster 1, labeled High quality ($n=33$), was characterized by gender equality, the use of a positive parental role as opposed to

the negative role, a great variety of positive and negative parenting practices under analysis, a relatively high variety of educational content, and of multimedia use, and a balanced presentation of experiential, academic and

technical information. Cluster 2 was labeled Medium quality ($n=25$) and was characterized by medium levels of gender equality, relatively high levels of family diversity, medium use of the positive parental role, low use of the negative parental role, medium variety of parental practices and educational content, low multimedia use, low levels

	Quality clusters			F (2,92)	Effect size (ES)	Differences	
	1 High (n=33)	2 Medium (n=25)	3 Low (n=37)			Post hoc	
Gender equality	1.36	1.04	.46	12.57***	.21	1-3***	2-3*
Family diversity	.15	.80	.05	21.00***	.31	2-1***	2-3***
Positive parental role	2.82	1.96	.73	56.21***	.55	1-2*** 2-3***	1-3***
Negative parental role	1.21	1.40	2.14	6.34**	.12	3-1**	3-2*
Parenting practices	3.30	2.00	.73	34.01***	.42	1-2*** 2-3***	1-3***
Educational content	5.03	3.44	1.57	40.59***	.46	1-2*** 2-3***	1-3***
Multimedia use	1.79	.60	.81	21.58***	.31	1-2***	1-3***
Communication tools	2.48	2.20	2.11	.97	.02	---	---
Experiential information	.64	.08	.51	4.11*	.10	1-2*	
Academic information	2.48	2.80	1.54	12.35***	.21	1-3**	2-3***
Technical information	2.52	1.32	.97	17.71***	.27	1-2***	1-3***

of experiential information, high levels of academic information and medium levels of technical information. Cluster 3, Low quality (n=37), was characterized by a low level of gender equality, very low levels of family diversity, very low use of the positive parental role and high use of the negative parental role, a very low variety of parenting practices, very low levels of educational content, medium levels of multimedia use, high levels of experiential information, and low levels of academic and technical information.

3.3. Website characteristics and ethical criteria associated with cluster membership

Chi-square tests revealed that Origin was differentially distributed across the clusters ($\chi^2(2)=7.77$, $p<0.05$).

Websites from Spain were overrepresented in the High-quality cluster, whereas sites of South American origin were overrepresented in the Low-quality cluster. Type of entity differed by Cluster ($\chi^2(8)=20.07$, $p<0.01$). Companies were overrepresented in the High-quality cluster and parents' websites in the Low-quality cluster. Purpose differed by Cluster ($\chi^2(2)=8.83$, $p<0.01$). Information sites were overrepresented in Cluster 2 and interactive sites in Cluster 3. Finally, Figure 1 illustrates the relationship between ethical criteria and cluster distribution. Privacy, Justifiability and Financial disclosure significantly differed by Cluster ($\chi^2(2)=12.45$,

$p<0.01$; $\chi^2(4)=13.88$, $p<0.01$; $\chi^2(4)=20.77$, $p<0.001$, respectively). Websites scoring above chance in full Privacy and Financial disclosure were more likely to be found in the High and Medium quality clusters. Websites scoring above chance in full Justifiability were more likely to be found in the High-quality cluster. Websites scoring below chance in full Privacy, Justifiability and Financial disclosure were in the Low-quality cluster.

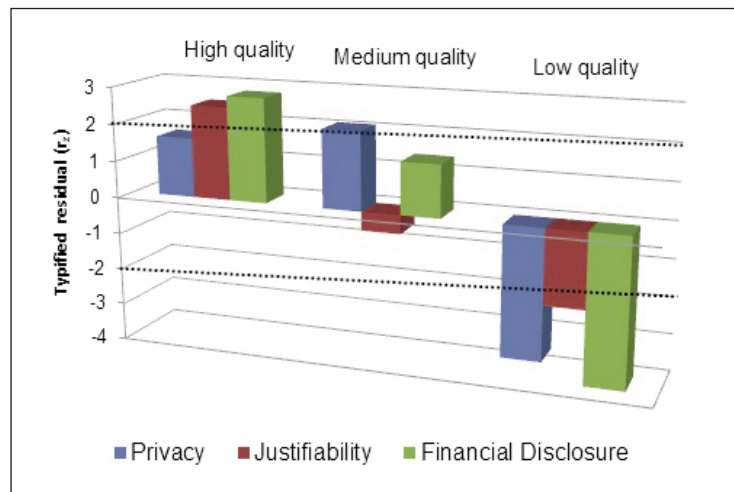


Figure 1. Significant corrected typified residuals (above and below the dotted line) for Privacy, Justifiability and Financial disclosure according to High, Medium and Low quality content profiles.

4. Discussion and conclusions

This study examined, for the first time, a set of ethical and content criteria based on the model of information adoption to be applied in the parenting domain. The results showed that the model used works well in guiding the selection of quality criteria for the evaluation purpose, which should be backed by further studies. Overall, the ethical quality varied according to the criteria. Authority, privacy, transparency and financial disclosure were more likely to be declared and practiced, whereas attribution to source data, justification of the claims based on scientific evidence and a clear advertising policy were practically absent in around half of the sites. The evidence-based movement in the parenting domain is not yet well established in Europe and is still in its infancy in many Spanish-speaking countries (Rodrigo & al., 2016). Therefore, parenting websites in Spanish face a major challenge to reflect this evaluation culture in the materials they offer. Likewise, commercial purposes are likely to be confounded with designers' genuine interest in supporting parents, which goes against a culture of respect for parents' rights as consumers.

As expected, the quality of ethical criteria also varied according to the origin, type of entity and purpose of websites. Higher quality was observed in websites from Spain as compared to those from South American countries, as measured by the privacy, justification and financial disclosure. Interestingly, lower Internet penetration rates in Colombia (56.9%), Argentina (69.2%) and Chile (77.8%) than in Spain (82.2%) seem to be accompanied by the designers' lower awareness of the importance of quality web-based parent support. Websites from North America had an intermediate position, probably because of they were clustered together for geographical proximity, but they show different penetration rates: USA (88.5%) and Mexico (45.1%). However, a more representative and ample

sample of websites from Spanish-speaking countries is needed before more solid conclusions can be reached.

The results for the type of entity and purpose also point to an ethical quality gap between public agencies and companies on the one side and parents' websites on the other. The use of experts, respect for privacy, attribution, justifiability and financial disclosure were typical of public agencies and companies and information sites, whereas parents' websites and interactive sites scored lower on all these ethical criteria. A possible explanation is that, in principle, parents are not expert designers and may not be aware of these ethical aspects. In fact, when doing their searches, parents seem to pay attention only to the authority and advertising policy, since they trust official websites and parental resources equally, whereas they give less credibility to commercial websites (Dworkin & al., 2013; Muñetón & al., 2015). Another potential explanation is that information carries value and credibility when it is delivered by friends or family in the context of a caring and trusting relationship or by those who share experiences and values similar to one's own (Ebata & Curtiss, 2017).

Using a person-centred approach, it was possible to distinguish three quality profiles for the websites, which differed meaningfully in two aspects: their view of families and the parenting task (Rodrigo & al., 2016), and the way they foster effective learning (Hughes & al., 2012; Myers-Walls & Dworkin, 2015). The High-quality websites valued gender equality, stressed a positive parental role, modeled a variety of parenting practices, included a variety of educational content and multimedia formats, and made use of experiential, academic and technical information. By contrast, the Low-quality websites provided a biased set of values (gender inequality and an undifferentiated view of the family), a focus on parental problems and single techniques, and a poor learning environment (little educational content, low multimedia use and an overreliance on parental experiences). Websites from Spain, sites run by companies and information sites were overrepresented in the High and Medium quality profiles, whereas sites from South America, parents' websites and interactive sites were mostly overrepresented in the Low-quality profile. These results showed that the benefits of using the Internet to exchange experiences with other parents and experts (Madge & d O'Connor, 2006; Niela-Vilén & al., 2014), might be put at risk by the comparatively lower ethical and content quality of these parenting resources.

Finally, as expected, we found a relationship between the ethical and content quality. It seems that protection of the visitor's rights to privacy and confidentiality, reliance on scientific evidence to back up claims or recommendations and fair disclosure of financial interests are important ethical qualities associated with a modern view of family and parenting, and efficient ways to foster the visitor's learning. This is especially true for the official/expert websites but not so much for the websites run by parents and interactive sites that tended to score lower on ethical criteria, as it is more difficult to ascertain the credibility of the source (like in eWOM communication, Cheung & al., 2008).

As a limitation, the selection of content criteria guided by the Council of Europe's Recommendation (19/2006) on positive parenting could not be universally accepted in other cultural contexts. The clustering of websites based on the geographical proximity should be refined in further studies using instead the penetration rates of the Internet in each country. Finally, the expert point of view taken in this study should be complemented with the professional and family perspectives to reach a complete consensus on the quality standards.

In conclusion, the Internet has become a crucial information and support source for parents, which provides an interesting example of open knowledge management in an informal educational context. It is in the parenting domain where the danger of exposing consumers to evidence-based contents, biased values, poor e-learning environments and hidden commercial purposes is presumably greater than informal educational contexts. Regrettably, the assessment of the quality of online parenting support and education is still an emerging field. Given the explosion of websites and blogs for parents, it is urgent to arrive at common definitions of ethical and content criteria for the assessment of online resources. Once reached a consensus, these criteria may provide guidelines for those designers who develop websites for parents. Our results showed that there is a large room for improvement both on the ethical and content aspects especially for interactive websites, those authored by parents and those with a South American origin. Professionals may also benefit by adopting quality standards since they also need to know which criteria to employ when judging the quality of Internet-based resources. In this way, professionals may decide on better grounds which websites and online materials should be used to support parents. They may also help parents to develop effective skills for browsing and search for trustworthy sources by themselves. The dissemination of the present results may also benefit parents as users of websites to autonomously scan information and decide whether it is credible, relevant or compelling enough to spend more time on it. To conclude, quality assurance of the websites should be at the forefront of the measures that should be taken for the effective use of informational technology in the parenting domain.

Funding agency

This work was supported by the Spanish Ministry of Economy and Competitiveness (MINECO), the European Regional Development Fund (FEDER) under the Grants PSI2015-69971-R and EDU2012-38588.

References

- Amichai-Hamburger, Y., McKenna, K.Y., & Tal, S.A. (2008). E-empowerment: Empowerment by the Internet. *Computers in Human Behavior*, 24(5), 1776-1789. <https://doi.org/10.1016/j.chb.2008.02.002>
- Bangdiwala, S.I. (2017). Graphical aids for visualizing and interpreting patterns in departures from agreement in ordinal categorical observer agreement data. *Journal of Biopharmaceutical Statistics*, 1-11. <https://doi.org/10.1080/10543406.2016.1273941>
- Baujard, V., Boyer, C., & Geissbühler, A. (2010). Evolution of Health Web certification, through the HONcode experience. *Swiss Medical Informatics*, 26(69), 53-55. (<https://goo.gl/RZp5Sg>).
- Bergman, L.R., Magnusson, D., & El-Khoury, B.M. (2003). *Studying individual development in an interindividual context: A person-oriented approach*. London: Psychology Press. (<https://goo.gl/qsXTD6>).
- Brady, E., & Guerin, S. (2010). Not the romantic, all happy, coochy coo experience: A qualitative analysis of interactions on an Irish parenting web site. *Family relations*, 59(1), 14-27. <https://doi.org/10.1111/j.1741-3729.2009.00582.x>
- Cheung, M.K., Lee, M.K.O., & Rabjohn, N. (2008). The impact of electronic word-of-mouth-The adoption of online opinions in online customer communities. *Internet Research*, 18(3), 229-247. <https://doi.org/10.1108/10662240810883290>
- Cohen, J. (1960). A coefficient for agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37-46. <https://doi.org/10.1177/001316446002000104>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Lawrence Erlbaum, Hillsdale. (<https://goo.gl/yeqvLg>).
- Council of Europe (2006). *19 Recommendation of the Committee of Ministers to member States on policy to support positive parenting*. Strasbourg. (<https://goo.gl/Sk2BQG>).
- Dworkin, J., Connell, J., & Doty, J. (2013). A literature review of parents' online behaviour. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 7(2), 1-12. <https://doi.org/10.5817/CP2013-2-2>
- Ebata, A., & Curtiss, S.L. (2017). Family life education on the technological frontier. In S.F. Duncan & H.S. Goddard (Eds.), *Family life education: Principles and practices for effective outreach* (pp. 236-626). Thousand Oaks, CA: Sage. (<https://goo.gl/5PtQq3>).
- García-Peñalvo, F. J., García-de-Figuerola, C., & Merlo-Vega, J.A. (2010). Open knowledge: Challenges and facts. *Online Information Review*, 34(4), 520-539. <https://doi.org/10.1108/14684521011072963>
- Haberman, S.J. (1973). The analysis of residuals in cross-classified tables. *Biometrics*, 29(1), 205-220. <https://doi.org/10.2307/2529686>
- Healthonnet.org (2017). Health on the Net (HON): *HonCode: Principios en español*. (<https://goo.gl/eP73wT>).
- Hughes, R., Bowers, J.R., Mitchell, E.T., Curtiss, S., & Ebata, A.T. (2012). Developing online family life prevention and education programs. *Family Relations*, 61(5), 711-727. <https://doi.org/10.1111/j.1741-3729.2012.00737.x>
- Internet Live Stats (2016). *Internet Users by country*. (<https://goo.gl/1xiZfR>).
- Madge, C., & O'Connor, H. (2006). Parenting gone wired: Empowerment of new mothers on the Internet? *Social & Cultural Geography*, 7(2), 199-220. <https://doi.org/10.1080/14649360600600528>
- McDaniel, B.T., Coyne, S.M., & Holmes, E.K. (2012). New mothers and media use: Associations between blogging, social networking, and maternal well-being. *Maternal and Child Health Journal*, 16(7), 1509-1517. <https://doi.org/10.1007/s10995-011-0918-2>
- Muñeton M., Suárez, A., & Rodrigo, M.J. (2015). El uso de recursos web como apoyo a la educación de los hijos en los padres colombianos. *Investigación & Desarrollo*, 23(1), 91-116. <https://doi.org/10.14482/indes.23.1.6496>
- Myers-Walls, J.A., & Dworkin, J. (2016). Parenting education without borders. Web-based outreach. In J.J. Ponzetti (Ed.), *Evidence-based Parenting Education. A global perspective* (pp. 123-139). New York: Routledge. (<https://goo.gl/HC2TXm>).
- Niela-Vilén, H., Axelín, A., Salanterä, S., & Melender, H.L. (2014). Internet-based peer support for parents: a systematic integrative review. *International Journal of Nursing Studies*, 51(11), 1524-1537. <https://doi.org/10.1016/j.ijnurstu.2014.06.009>
- Nieuwboer, C.C., Fukkink, R.G., & Hermans, J.M. (2013a). Peer and professional parenting support on the Internet: a systematic review. *Cyberpsychology, Behavioral and Social Networks*, 16(7), 518-528. <https://doi.org/10.1089/cyber.2012.0547>
- Nieuwboer, C.C., Fukkink, R.G., & Hermans, J.M. (2013b). Online programs as tools to improve parenting: a meta-analytic review. *Children and Youth Services Review*, 35(11), 1823-1829. <https://doi.org/10.1016/j.chilyouth.2013.08.008>
- Rodrigo, M.J., Máiquez, M.L., Martín, J.C., & Rodríguez, B. (2015). La parentalidad positiva desde la prevención y la promoción. In M.J. Rodrigo, M.L. Máiquez, J.C. Martín, S. Byrne, & B. Rodríguez (Eds.), *Manual práctico en parentalidad positiva* (pp. 25-44). Madrid: Síntesis. (<https://goo.gl/RpHwpB>).
- Rodrigo, M.J., Almeida, A., & Reichle, B. (2016). Evidence-based parent education programs: A European perspective. In J. Ponzetti (Ed.), *Evidence-based parenting education: A global perspective* (pp. 85-104). New York: Routledge. (<https://goo.gl/HC2TXm>).
- Rodrigo, M.J., Byrne, S., & Álvarez, M., (2016). Interventions to promote positive parenting in Spain. In M. Israelashvili, & J.L. Romano (Eds.), *Cambridge handbook of international prevention science* (pp. 929-956). Cambridge, UK: Cambridge University Press. (<https://goo.gl/nrYhEk>).
- Rothbaum, F., Martland, N., & Janssen, J.B. (2008). Parents' reliance on the web to find information about children and families: Socio-economic differences in use, skills and satisfaction. *Journal of Applied Developmental Psychology*, 29(2), 118-128. <https://doi.org/10.1016/j.appdev.2007.12.002>
- Sarkadi, A., & Bremberg, S. (2005). Socially unbiased parenting support on the Internet: a cross sectional study of users of a large Swedish parenting website. *Child: Care, Health and Development*, 31(1), 43-52. <https://doi.org/10.1111/j.1365-2214.2005.00475.x>
- Suárez, A., Rodrigo, M.J., & Muñeton, M. (2016). Parental activities seeking online parenting support: Is there a digital skill divide? *Revista de Cercetare si Interventie Sociala*, 54, 36-54. (<https://goo.gl/H5yCxb>).