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Communicating Medical Information Online

The Case of Adolescent Health Websites

Abstract

In recent times, our understanding and practice of public health has been increasingly guided by technological advances generally based on governmental decisions (Green et al. 2009). Not only does the growth of a public system for protecting health hinge upon scientific discovery and dissemination of medical knowledge, but also the World Wide Web has considerably changed the health communication environment.

This paper considers the online health information addressed to adolescents. Given that young people have difficulty accessing traditional health services, in theory, the Internet might offer them a more confidential and convenient access to an unprecedented level of information about a diverse range of subjects (Hansen et al. 2003). In this context, the analysis concentrates on 'adolescent health,' and compares and contrasts the discourse of three websites: Healthdirect, a free service supported by the Government of Australia, SAHM managed by a multidisciplinary society based in the USA, Canada and the UK, and TeenMentalHealth.Org managed by the WHO (World Health Organization) Collaborating Centre in Mental Health Policy and Training. The study is designed to highlight both the specificities of communication of 'adolescent health' (Harvey 2014; Gotti, Maci and Sala 2015; Garzone and Ilie 2014), and the linguistic / discoursal and visual strategies adopted over the dedicated online platforms. Given the communicative immediacy of the new medium and the specificities of the target audience, it becomes crucial to see how the selected websites both linguistically and visually communicate medical information to adolescent web-users (LeVine and Scollon 2004; Kolucki and Lemish 2011).

Keywords: *multimodality, discourse analysis, online communication, medical information, adolescents*

Over the last decades, extensive research has been conducted on health communication and the World Wilde Web (Candlin and Candlin 2002; Sarangi and Clarke 2002; Gülich 2003; Calsamiglia and van Dijk 2004; Adolphs et al. 2004; Roberts and Sarangi 2005; Gotti and Salager-Meyer 2006; Garzone and Sarangi 2007; Candlin and Sarangi 2011; Hamilton and Chou

2014; Gotti, Maci and Sala 2015). In an environment of increasingly available electronic health resources, important questions arise as to whether public access to health and medical information contributes to the changing dimensions of the doctor-patient relationship and the traditional healthcare setting in general (McMullan 2006).

It has been recently demonstrated that different populations have varying opinions as to what content is appropriate to share on publicly available websites (Chretien and Kind 2013), and most healthcare organizations and institutions have their own Internet use policies that provide different regulations for physicians to accept and comply with (Hawkins et al. 2016). Online communication is not an easy task because not only are the addressees an unknown and undefined public from different social, economic and cultural backgrounds (Caballero 2008), but also because the information addressed, which needs to be constantly updated, involves and enlists the participation or involvement of the recipients of health advice (Adolphs et al. 2004). This raises two main issues: literacy, which entails people's knowledge and competence to properly assess and apply health information, and the capacity of health websites to provide the content (both linguistically and textually) to suit the target audience (Chou et al. 2013; Prestin and Chou 2014; Rubin 2014; Gotti, Maci and Sala 2015).[1] Furthermore, the Internet is one of a range of health information sources available to adolescents. Adolescence is the developmental stage when health-risk behaviour may be initiated (i.e., smoking, drug use, physical inactivity, high-risk sexual behaviour, eating disorders, etc.), and when youths move from parental control to establishing their own separate relationships with health professionals (Hansen et al. 2003). Adolescent health care is challenging compared to that of children and adults, due to their rapidly evolving physical, intellectual, and emotional development. Likewise, health practitioners face several challenges with adolescents as they require specialized skills for consultation, interpersonal communication, and interdisciplinary care.[2]

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[1] It must be mentioned that given the wide range of online health information from different organizations and individuals, it is important to understand how information seekers select and evaluate the web sources and, in particular, how they assess their credibility and trustworthiness. According to Sbaffi and Rowles (2017), "there is considerable scope for further research. This includes increased clarity of the interaction between the variables associated with health information seeking, increased consistency on the measurement of trust and credibility, a greater focus on specific WHI [World Health Information] sources, and enhanced understanding of the impact of demographic variables on trust and credibility judgments" (www.jmir.org/2017/6/e218/).

[2] *Programming for adolescent health and development: Report of a WHO/UNFPA/UNICEF study group.* World Health Organization, Saillon, Switzerland, 1999.

Evidence from high-income countries as well as low- and middle-income countries suggests that services targeting adolescents are highly fragmented, poorly coordinated, and inconsistent in quality.[3]

Many young people report that they would not involve parents or consult their family doctors for concerns about substance use, sexual conditions, personal feelings and emotional problems (Anderson and Lowen 2010). In this regard, the "Children in a digital world" report published by UNICEF in 2017 states that young people (aged 15–24) are the most connected age group. Worldwide, 71% are online compared with 48% of the total population. In particular, 40% of adolescents and young adults (ages 13-24) from 24 countries choose the Internet to learn about things regarding school and health. Then, a study conducted by Gray et al. (2004) on UK and US adolescents' perceptions and experiences of using the Internet to find information about health and medicines, in the context of the other health information sources that are available to them, confirms that the Internet represents their primary general information source.

Based on the known fact that young people have difficulty accessing traditional health services (Hansen et al. 2003; Gray et al. 2004; Freeman et. al 2018), in theory, the Internet might offer them a more confidential and convenient access to an unprecedented level of information about a diverse range of subjects (Skinner et al. 2003). As Harvey observes:

> The demand for health provision tailored to the need of adolescents has resulted in the rise of wealth websites designed for young people […]. These sites typically provide interactive advice and information in accessible, no-technical language, affording young people the opportunity of freely expressing their health questions to professionals, as well as sharing their concerns with fellow teenagers. Consequently, the internet has become a popular provider of health advice and information for adolescents, with the electronic gateway offering confidential advice and information that might be otherwise hard or compromising to obtain from more traditional health services. (2014, 4)

Exploring web-mediated adolescent health communication poses the question of the centrality of language and communication within the medical field. The first thing to consider is how to communicate with adolescents in ways that are age-appropriate, culturally sensitive, inclusive, positive, and, most importantly, interesting and engaging. According to a study conducted by Kolucki and Lemish (2011) on the communication with children and teenagers, the nature of adolescence is very much culturally constructed and growing into adulthood takes different forms in different societies. As they observe, "cultural differences play a very significant role in

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[3] *Global standards for quality healthcare services for adolescents: A guide to implement a standards-driven approach to improve the quality of health services for adolescents. Volume 1: Standards and Criteria.* World Health Organization, Geneva, 2015.

constructing what it means to be a child and an adolescent at different stages of development and requires that communication be culturally specific" (2011, 22). At the same time, Kolucki and Lemish's (2011) study demonstrates that what is clearly shared by all cultures is the fact that adolescents, while growing up, still need "loving and empathic adults who provide guidance, serve as positive role models, set clear boundaries and expectations and guide them to make the best choices" (2011, 22).

Despite a general growing awareness of how adolescents use technology for health information (Bilal and Kirby 2002; Hansen et al. 2003; Freeman et al. 2018), the amount of multimodal analytic work carried out by discourse scholars on adolescent's health websites is currently minor. To the best of my knowledge, only a few studies yield valuable insight into health care interaction pathways (Harvey et al. 2007; Koluchi and Lemish 2011; Hunt and Harvey 2015; Hawkins et al. 2016) or provide language analyses of adolescent health care (Adolphs et al. 2004; Harvey et al. 2008; Harvey, Locher and Mullany 2013; Harvey 2014). This study attempts to address this gap looking at the linguistic/discoursal and visual resources used across web-mediated texts to inform about and encourage young adults in their health.

1. Data observed

This study compares and contrasts the discourse of the following three web-based platforms:

1. *Healthdirect* (www.healthdirect.gov.au/teenagers-health)
2. *Society for Adolescent Health and Medicine* (*SAHM*) (www.adolescenthealth.org/Resources/Clinical-Care-Resources/Mental-Health/Mental-Health-Resources-For-Adolesc.aspx#Friendly)
3. *TeenMentalHealth.Org* (www.who.int/topics/adolescent_health/en/).

The three websites represent three organizations managed by the government of Australia (*Healthdirect*), the USA, Canada and the UK (*SAHM*), and the World Health Organization (*TeenMentalHealth.Org*) respectively, and provide health information to adolescents and young adults, along with guidance on priority setting and programming, online resources, support groups, peer networks, helplines, treatment locators, and advocacy opportunities.[4] *SAHM* and *TeenMentalHealth.Org* also supply additional information in order to find comprehensive ways

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[4] *Healthdirect*, *SAHM* and *TeenMentalHealth.Org* have been chosen by the author because of the authority and credibility of their managing organizations. Furthermore, these websites are the most frequent hits returned by a Google search for 'adolescent health' string restricted to one country domain.

to share information, resources and tools with parents, friends, health professionals, educators and those interested in learning more and caring for young people.

Healthdirect is a website specifically devoted to adolescents within the General Health Direct website. *Healthdirect* is a free service supported by the government of Australia. *HealthDirect* Australia was established in August 2006 as the National Health Call Centre Network, under a Council of Australian Governments (COAG) agreement to improve access to consistent health information for the people of Australia.[5] The intended outcomes of the service are the following:

- the Australian public has better access and equity of access to the most appropriate health information and advice;
- Australians have greater confidence and capacity to manage their own health;
- the health status of Australians is improved;
- demand for health services is managed more efficiently and effectively.[6]

The list of outcomes shown above represents the principles upon which the *Healthdirect* website has been designed and constantly updated.

The *Society for Adolescent Health and Medicine* (*SAHM*) website is managed by a multidisciplinary society based in the USA, Canada, and the UK. On April 28, 1968, representatives of adolescent clinics throughout the United States and Canada met and agreed to the formation of a Society for Adolescent Medicine. The goals of the Society are:

- to improve the quality of medical care for adolescents;
- to encourage the investigation of normal growth and development during adolescence and of those diseases and medical conditions that affect adolescents;
- to stimulate the creation of medical services for adolescents;
- to foster and improve the quality of training of those individuals providing medical care to adolescents.[7]

Then, *TeenMentalHealth.Org* is managed by the World Health Organization (WHO) whose primary role is to direct and coordinate international health within the United Nations' system. Working through offices in more than 150 countries, the WHO supports countries as they

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[5] The list of shareholders includes the Commonwealth, Australian Capital Territory, New South Wales, Northern Territory, South Australia, Tasmania and Western Australia governments.
[6] about.healthdirect.gov.au/we-are-healthdirect-australia.
[7] www.adolescenthealth.org/About-SAHM/Mission.aspx.

coordinate the efforts through multiple sectors of the government and partners to attain their health objectives and support their national health policies and strategies. Being listed among the WHO Health Topics, *TeenMentalHealth.Org* is a website specifically devoted to the adolescents within the general World Health Organization website.[8]

Prevention and early treatment of health problems are recognized as essential for youth to achieve their full potential, as it is stated in the three websites' Programmes /Mission page:

- to share information for children and their parents about living a healthy lifestyle (Programmes – *Healthdirect*);
- the Society for Adolescent Health and Medicine promotes positive youth development, illness prevention, achievement of individual potential and a sense of physical, mental, and social well-being (Mission - *SAHM*);
- What is clear, is that improving adolescent health at all of these levels is a very necessary investment in the future of our societies (Programmes - *TeenMentalHealth.Org*).

Among the topics covered on the selected websites, there is information about puberty, sexually transmitted diseases, the health effects of smoking, depression, eating disorders, etc. High quality of health information is designed and compiled by medical and healthcare academics and professionals ("Who we are" page in *Healthdirect*; "About SAHM" page in *SAHM*; "About us" page in *TeenMentalHealth.Org*), being consistent with Eastin's (2006) criteria on the effects of source expertise and knowledge on the credibility of online health information and authorships. As reliable informational websites, *Healthdirect, SAHM* and *TeenMentalHealth.Org* emphasize the providers' and users' role in the health communication, warning users not to use the information on the site as 'a substitute for professional health care,' thus representing themselves as an information source rather than medical-advice source for provider-user interaction. This is overtly addressed in a "healthdirect Symptom Checker" page in *Healthdirect*, "Clinical Care Resource" page in *SAHM,* and an "About us" page in *TeenMentalHealth.Org*, explaining how to take advantage of the information and online services for teenagers' health conditions.

In the present study, a selection of the webpages was made to include those parts of the *Healthdirect*, *SAHM*, and *TeenMentalHealth.Org* strictly dealing with health education and

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[8] www.who.int/.

tailored preventive information for adolescents (Table 1). Accessed in the timespan of January-December 2018, the selected webpages are more or less common to the three websites.

TeenMentalHealth.Org 21,276 tokens	SAHM 23,375 tokens	Healthdirect 19,834 tokens
About us	Youth Friendly Ment. Health On. Res.	Home
Health Topics	Health Talk/Mindfulness for Teens	Health topics A-Z
Quick Facts on Ad. Health	Mental Health Resources Institutes	Medicines
News on Ad. Health	Mental Health Medication Guides	Symptom checker
	Advocacy	

Tab. 1: Webpages included in the corpus

Healthdirect, *SAHM*, and *TeenMentalHealth.Org* show a high connectedness and low dominance, with links evenly distributed across system components allowing users to move from one system component to any other, at any time.[9] The selected webpages represent internal links that take the user to another document within the same website (e.g., *Healthdirect*, *SAHM*, and *TeenMentalHealth.Org*).[10] Links are used in a traditional indexing fashion even though with minor differences among the sites. Whereas, *SAHM* and *TeenMentalHealth.Org* use links to approximate an associative experience for the user, *Healthdirect* uses them to encourage linear progression through the material with lesser links in comparison with *SAHM* and *TeenMentalHealth.Org*.

The pages on legal, economic and more technical issues on health care, such as 'Countries,' 'Emergencies,' 'Collaborations and Partnerships,' 'Director General' in *TeenMentalHealth.Org*, 'Membership,' 'Meetings,' 'Training and CME,' 'Awards and Grants,' 'Donate to SAHM' in *SAHM*, and 'Service Finder' in *Healthdirect* have been omitted because they are not covered in all three websites. Texts in webpages are expository, accompanied at times by diagrams and videos. They usually show technical experts and clinical advisors giving information and

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[9] In this regard, Jackson (2006) believes that "this is the ideal structure to support associative movement as represented in original hypertext visions. It also requires the designer to abdicate any control over user exploration and movement throughout the site. While the user's paths may not be controlled, the use of such a structure still may serve strategic ends, such as encouraging users to 'get lost' within a site, meandering and exploring and, therefore, increasing their contact with the site's content" (onlinelibrary.wiley.com/doi/full/10.1111/j.1083-6101.1997.tb00063.x).

[10] In terms of the hierarchical relations, the *Healthdirect*'s and the *TeenMentalHealth.Org*'s selected webpages are prominent links in the primary navigation. In *SAHM*, "Youth Friendly Ment.Health On. Res.," "Mental Health Resources Institutes," "Mental Health Medication Guides," and "Advocacy" are prominent links in the primary navigation as well; "Health Talk" and "Mindfulness for Teens" are two of the helpful items included in the "App and Tech Services" prominent link.

sharing their knowledge about health treatment. Likewise, each website hosts an online discussion forum in which the readers can post their queries, comments and suggestions. For the purpose of the present study, forum discussions and threads were not considered.

2. Methodological framework

The main reason for conducting the analysis of health websites for adolescents is that it has become crucial to understand the intended format of specialized knowledge communication that require alternative ways of conveying and disseminating medical information to a specific audience. This new format involves a simplification that remodels both the content and the language to suit the adolescents, so that it becomes close to general discourse and everyday experiences and is cognitively accessible to them. To examine the selected linguistic data, I drew upon the *Critical Discourse Analysis* (*CDA*) approach to *discourse* (Fairclough 2001, 2013), analyzing micro-textual elements on specific patterns of use, such as those from the area of semantics (Davidson and Harman 2012; Facchinetti, Palmer and Krug 2012), or appraisal (Hunston and Thompson 2003).

Then, elements such as visual materials, in general, must be taken into consideration in online communication. The universality of the World Wide Web has made the public more influenced by what Sartori calls "the authority of image" (1997, 13), a condition that Kress and van Leeuwen describe as follows:

> What matters is the site as much as the kind of surface on which the text is received. Now, unlike in previous periods, the surface of reception is no longer necessarily at all the same as the one on which the text was/is produced. Transcodings/transpositions of a wide variety may take place [...]. The fact that the internet is crammed full with images is in large part a matter of available technology; and it has profound semiotic consequences. At another level what matters most is the production medium in which images are produced, and the distribution medium in which they are received [...], to be more precise, we would say that the mode of transmission is relevant only in relation to the potentials which it offers for reception as (re-)production. (2006, 219-220)

Both reception and (re-)production play an important role when dealing with communication through websites (Askehave and Ellerup Nielsen 2006). The way in which the world is represented, and the experience encoded visually, becomes crucial particularly when the addressees of the visual representation and the subject of communicative (re-)production are adolescents. Relying on Kress and van Leeuwen's (2001) four domains of practice (*discourse*, *design*, *production*, *distribution*) they propose for analyzing multimodal discourse, the selected visuals will be analysed in order to identify how the knowledge of reality is socially constructed

(*discourse*), the semiotic resource deployed to realize discourse(s) (*design*), the medium used to create messages (*proces*s), and how the semiotic process is shared with the intended audience (*distribution*). The focus of this analysis is to reveal the inherent properties and the characteristics of the adolescent e-health communication over the selected websites, such as hypertextuality (Ott and Walter 2009), non-linearity and multimodality (Kress 2009). The disclosure of such a range of semiotic modes (linguistic and visual representation) and the specificities of target audience, makes this web-mediated communication an interesting subject for research in terms of multimodal discourse analysis (Hyland 2005; Kress and van Leeuwen 2001; 2006; Iedema 2003; LeVine and Scollon 2004) and the social practice of meaning-making (Garzone and Sarangi 2007; Kress 2009).

As for the organisation of the following sections, after a description of the empirical material and the research method deployed, the key findings of empirical data will be explored and discussed (Section 3). First, each selected website will be analysed in terms of content design; then, the research findings will be narrowed to the most salient linguistic aspects common to all three websites (i.e., pronouns, imperatives, questions, active/passive voice structure, modal auxiliary verbs) and complemented in the multimodal analysis of the visual mode of communication deployed (Subsections 3.1, 3.2 and 3.3). Eventually, some tentative conclusions will be drawn from the data and the contextualized material observed (Section 4).

3. Results and discussion

3.1 Healthdirect

Prior to analyzing the linguistic and visual modes of communication, it may be useful to briefly look at the website design and content of the Home Page of *Healthdirect*. The website navigation is clear and simple, with the information distributed in image maps, fonts, colors, primary navigation menus ("Home," "Health topics A-Z," "Medicines," "Symptoms checker," "Service finder," "Search our site"), as well as short and simple texts distributed in a grid banner displaying boxes with a set of vertically aligned hyperlinks for the user, as shown in the screenshot reported in Figure 1 below.

Fig. 1: *Healthdirect* Home Page

When surfing through the website the amount of texts and visuals used to structure the content is equally balanced.[11] Overall, care and precision are taken regarding the choice of textual material (Askehave and Ellerup Nielsen 2006). Blocks of texts are generally introduced by headings and subheadings and the information is distributed into bulleted lists. The language used is ordinary and clear with simple words belonging to the medical domain (symptoms, antibiotics, gastroenteritis, etc.), with explanatory sentences or a glossary for specialist terms. As teenagers need to feel the information and advice being given are relevant to them, some linguistic strategies are used to attract their attention. In this regard, the use of the personal

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[11] In terms of the relationship between images and text, the type considered here aligns with Bateman's (2014) idea of 'visual presence,' where image and text need to have been presented together as joint contributions to a single and (possibly) more complex, message. Text and image meanings multiply each other in a way that can be described, categorised, and evaluated in terms of impact or effectiveness in their 'building on what it will be discovered' by virtue of their co-presence.

pronoun *you* (2,825 occurrences) and the possessive adjective *your* (957 occurrences) is a strategic technique to create an equal and sympathetic relationship with the target readers (Fairclough 2001), namely teenagers. The frequent use of *you*, even when the addresses are not specifically being told to do something, is believed to be a feature of persuasive discourse (Halmari and Virtanen 2005), as shown in the following excerpt:

(1)   If *you* are going to get acne, *you* will get it no matter how much *you* clean *your* skin. Too much cleaning can make the condition worse by removing the protective oils in *your* skin. (My italics)

The pronoun *you* represents the key discoursal technique used to create what Fairclough (2001) defines a 'synthetic personalization,' referring to the manipulation of interpersonal meanings and forms for intentional and strategic purposes. This strategy helps to locate a teenager's identity as patients in the online interactive discourse and encourages them to take an active role in their self-care options.

(2)   If *you* are still concerned about *your* acne, why not use healthdirect's online Symptom Checker to get advice on when to seek medical attention.

Interestingly enough, the analysis reveals no occurrences of *we/our/us*. This may be due, most probably, to the intention of the discourse producers to avoid any reference to the organizations themselves or to human beings in general.

Questions are often used in paragraph headings to organize information and draw the reader into the topic: "*What causes acne?,*" "*Need more information?,*" "*What symptom is bothering you most?,*" whereas, imperatives are used to instruct readers in some kind of procedural activity by providing them with reasons for action, and making interaction direct and immediate: "*Try not to pick or squeeze spots* as this can cause inflammation and lead to scarring;" "If you cannot find what you need, or your symptoms are hard to describe, *call healthdirect on* 1800 022 222."

Active voice is the norm ("Research *shows* that…," "Antidepressants *affect*…," "Many people *need* more than one medicine to bring their high blood pressure under control"), with very few instances of passive voice ("The symptoms of contact dermatitis *are* effectively *managed* with treatment"). Where web producers aim for the behavior of the adolescent to take place, active voice serves to discoursally construct a set of responsibilities for readers as active participants, who are presented with possible health scenarios and actions to think about and act upon individually:

(3)   If you are at more risk of complications or may get very sick, then your doctor may give you antibiotics. Talk to your doctor to see if antibiotics are right for you.

(4)   It's important to keep the doctor informed about any side effects that may occur. It may be possible to reduce side effects by changing the dose or the time of day the medicine is taken.

The discoursal strategy of foregrounding adolescents as patients in the representation of action and events conveys information about the social relevance of those participants. Without 'superior authority' (Fairclough 2001; 2013), adolescents become the responsible agent of their health in the interactional structure of discourse.

Modals (*can* 42 occurrences, *may* 12 occurrences, *should* 11 occurrences, *might* 9 occurrences) are rarely used, and mostly serve an 'advisive role' (Tsui 1994) suggesting a course of action, a sort of politeness markers to introduce optionality and soften the imposition of giving advice:

(5)   You *can* eat small amounts of unsaturated oils and spreads. These *may* be from olives, soybeans, corn, canola, sunflower, safflower, sesame or grapeseeds.

(6)   It's best to see your doctor or a genetic counsellor if you're thinking about having a test. That way, you *can* talk through the implications of having the test. And if you go ahead with it, you *can* get some good advice about what the results mean.

This last example is indicative of the communication activity via the informational website which intervenes between adolescents and medical practitioners. In fact, adolescents may accept getting face-to-face medical care by practitioners when their health problems have become more complicated and cannot be easily kept in check.

In terms of the visual mode of communication, the Home Page (Figure 1) of *Healthdirect* opens with a slogan "Free Australian health advice you can count on," followed by a picture showing teenagers of different sex and race. In addition to the logo at the top-left of the page, which upon a mouse left-click redirects the web users to the General Health Care website, the strategic fit of a specific audience through adolescent images is consistent with the site's rationale of placing young patients first. The Home Page, as well as the other browsable pages, displays at the top of the right-aligned box the two buttons Print and Share, the latter for Twitter, Facebook, Google and email users respectively. The first box on the left of the page has the title "Teenagers' health," and the content is organized around five vertically aligned browsable pages labelled as Acne, Glandular Fever, Boys and puberty, Girls and puberty, Teen aggression and arguments. Large-sized images are simple and realistic, while color coherence promotes an overall textual

cohesion. Images are marked as clickable when hovered over by a mouse and direct the web users to informational material related to them. Likewise, the button "Read more" in each browsable page guides the users through the topic, providing a large image of the issue being addressed and information in terms of meaning, implications, causes, and even myths and misconceptions that have been developed around the topic itself (Figure 1). To illustrate briefly, the Acne page shows a grid banner displaying boxes with a set of vertically aligned hyperlinks for the user as displayed in the Home Page (Figure 2).

Fig. 2: *Healthdirect* "Acne"

The left-aligned box displays a big picture showing a chin (presumably a teenager's chin) with a white spot on the skin and, interestingly enough, the indication of the time required to read the page ("3-minute read"). Scrolling down the page, there is an unquestionably simple description of the meaning of "Acne," followed by "What causes acne?" and "Myths about Acne" describing what acne is, its origins, several legends about what causes acne, and recommended professional advice from experts (doctors or pharmacists) in the case of any relapsing health condition (Figure 3). In order to provide specific information, more data resources are added to

such pages by a number of hyperlinks to relevant healthcare websites (in this case, the Autralasian Centre website).

Myths about acne

Several myths about what causes acne are described below.

Food

Research shows that eating low GI foods and cutting down on processed foods can help acne. But remember changing what you eat can only do so much. Medical treatments are still the main way to improve severe acne.

If you notice your acne is worse after you eat certain foods, cut these out for a while and see what happens.

Bad hygiene

Some people believe that acne is caused by bad personal hygiene, but this is not true. If you are going to get acne, you will get it no matter how much you clean your skin. Too much cleaning can make the condition worse by removing the protective oils in your skin.

Make-up

There is also a myth that wearing make-up can cause spots, but there is no evidence that this is the case. The less you touch your skin, the fewer bacteria will be spread to your skin. If you wear make-up, wash your hands before putting your make-up on and always remove it before going to bed.

If acne is severe, your doctor can refer you to a dermatologist who may prescribe medication.

Not sure what to do next?

If you are still concerned about your acne, why not use healthdirect's online **Symptom Checker** to get advice on when to seek medical attention.

The Symptom Checker guides you to the next appropriate healthcare steps, whether it's self care, talking to a health professional, going to a hospital or calling triple zero (000).

Figure 3: *Healthdirect* "Myths about Acne"

The content of the box on the right is organized around two vertically aligned pages labelled Symptom checker that help web users to check their health conditions from a Search Symptom List. The Symptom Checker page (Figure 4) opens with a warning message:

When to call triple zero (000)

If you or the patient have any of these symptoms:

- central or crushing chest pain
- unconsciousness or suffering a seizure (fit)
- difficulty breathing or turning blue
- badly bleeding
- victim of a severe accident.

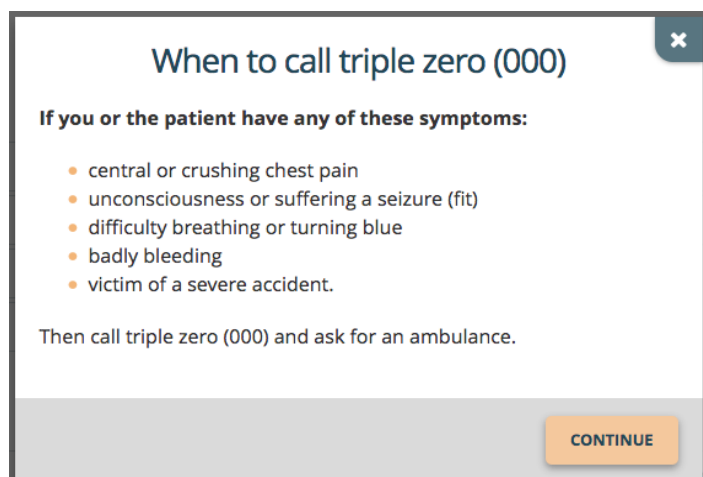Then call triple zero (000) and ask for an ambulance.

CONTINUE

Fig. 4: *Healthdirect* "Symptom Checker"

Then, Find a Health Service page provides web users with immediate help from any General Practice, Pharmacy, Emergency Departments, or Hospitals that are close to the location that will be indicated by the web user in "Enter a location." Although, at first sight, profiling such a range of simple and clear information may stray towards counselling communication, the predominant use of the website for immediate assistance is apparent in these pages, where the focus of producers is on managing health services for teenagers as efficiently and effectively as possible.

With the exception of the Teen aggression and argument page showing a picture of a male teenager aggressively arguing with a woman (presumably, his mother), no representation is made of the elderly in those human images most probably because discourse producers were aiming to appeal to adolescents more directly. In this regard, both the size frame and color of images help to define the compositional meaning,[12] which is in line with the kind of people discourse producers thought might be using the website.

Quoting Kress and van Leeuwen's words (2006, 30), the visual resources reveal the interest of *Healthdirect* web-makers "to choose an aspect or bundle of aspects of the object to be represented as being criterial, at that moment, for representing what they want to represent." In other words, web-makers place the focus on young patients first, reporting their personal and culturally-based perspective on information and advice or self-reflection, and then they choose the most acceptable and suitable form for its representation while covering a number of adolescent health conditions.

3.2 Society for Adolescent Health and Medicine (SAHM)

The navigation of the *SAHM* website is reasonably clear and simple, with the information distributed into a large amount of sections and subsections, primary navigation menus ("Membership," "Meetings," "Training and CME," "Resources," "Advocacy," "Awards and Grants," "about SAHM," "50 for 50 campaign") which is specifically addressed to those who want to have more information about and get involved into the SAHM Society, and secondary navigation menus (Home, Resources, Clinical Care Resources, Mental Health, Mental Health Resources For Adolescents and Young Adults) which is specifically provided for the teenagers (Figure 5).

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[12] Focusing on the structures or 'grammar' of visual design, such as color, perspective, framing and composition – Kress and van Leeuwen (2006) provide a useful 'tool-kit' for reading images. By compositional meaning, they (2006, 30) intend the major compositional structures which have become established as conventions in the course of the history of Western visual semiotics, and to analyze how they are used to produce meaning by contemporary image-makers.
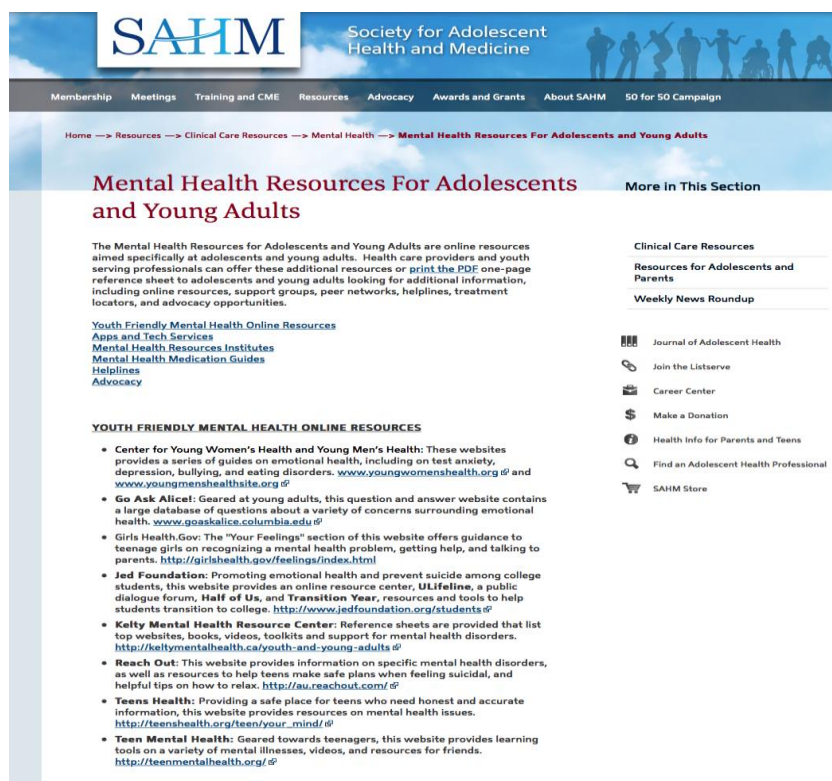
Fig. 5: *SAHM* Home Page

Great care and precision are taken in the choice of textual material. Blocks of texts are generally introduced by headings and subheadings and the information is distributed into bulleted lists. *You* personal pronoun (1,850 occurrences) and *your* possessive adjective (532 occurrences) are strategically used to secure young readers' involvement (Adolphs et al. 2004):

(7)   Do *you* have some super-strong feelings? Maybe *you* change from happy and confident one minute to sad and confused the next. *You* are not alone! If *you* are a teen (or *you*'re becoming one), *you* may feel like *you*'re on an emotional roller coaster. That's because so much is changing around *you* and inside *you*. Even *your* brain is changing. But *you* can learn how to cope with all kinds of feelings.

As this extract shows, addressing teenagers directly with the pronoun *you* not only individualizes readers as patients in their role of individuals and, specifically, adolescents, but also simulates a relationship of equality, solidarity and intimacy (Fairclough 2001). The 'synthetic you,' as shown in the example quoted above, induces them to read attentively and with a positive attitude. In some cases, the use of inclusive *we* (129 occurrences), *our* (57 occurrences) and *us* (25 occurrences) pronouns helps to discursively construct an intimate tone (between web-text producers and adolescents (Wales 2008; Fairclough 2013), and similarly the

adolescents to feel part of a universal community (Hunston and Thompson 2003; Ott and Walter 2009).

(8)   Caring about and maintaining *our* mental health is as important as *our* physical health. *We* only have one brain and one body, so it's *our* job to keep it running in the best way *we* can by paying attention to and working to improve *our* mental and physical health.

(9)   *We* seem to know more about *our* bodies than *we* do *our* minds. This website is designed to share information about mental health and provide *you* with resources that can help *you* understand *your* mental health and assist those *you* care about.

Furthermore, the use of *your* as attributive adjective makes the relational value of this type of discourse stronger by offering adolescents with more 'sympathetic' and 'personalized' care options (Turnbull 2015). In this regard, the imperative mode, when used, works concertedly with the synthetic *you/your* (Fairclough 2001) to reveal that the relational value of imperatives serves again to develop solidarity and intimacy in the discourse participants' relations by lowering the pressure on the adolescent to comply with some action.

(10)   *Don't try* to lower your stress in unhealthy ways. Things like taking drugs, drinking, cutting back on your sleep, or eating a lot or very little will only cause more problems. *Treat yourself* with the respect you deserve.

This would seem, as in the example shown above, to provide imperatives in the *SAHM* selected webpages with an exhortative rather than a command function. Questions are often used in paragraph headings to organize the information and draw the reader into the topic, first with a general question and then with a more personal reference:

- What is therapy?
- Why do teens go for therapy?
- What should I do to get started with therapy?
- What are some kinds of therapy?
- What about online support groups?

As in the case of *Healthdirect*, the greater use of active verb forms serves to discoursally construct a set of responsibilities for adolescents as patients and present them possible health scenarios and actions to think about:

(11) If you notice any of the symptoms you should to talk about them with your primary care provider (PCP). He/she will check you for possible medical causes of your symptoms, such as a problem with your thyroid.

(12) Anxiety can be treated in many ways. It's good to talk about treatment with your primary care provider to figure out what can help you. Some people with high levels of anxiety or moments of anxiety are able to cope well by practicing self-care. Self-care means "taking care of YOU." Doing activities, you enjoy will help you to relax and improve your mood. Some ideas are to take a walk, listen to peaceful music, exercise, or practice yoga.

The passive voice, when used, creates a distance from the action presenting a logical explanation and making the statements less threatening

(13) It's important to remember that any food can cause a severe allergic reaction. A person can have a food allergy to one or more kinds of food. Traces of food can also be found in non-food items such as certain medicines and vaccines.

Here, modals accommodate general epistemic statements about the 'possibility' or 'probability' of a variety of symptoms and causes across long-term conditions or the availability of possible/probable treatments in the relevant circumstances. The extract reported below, which gives a sign of the high frequency of *can* (1,021 occurrences) in comparison with *may* (320 occurrences) throughout the selected webpages, is indicative of text producers' intention to provide different information to influence teenagers' decision or action.

(14) OPTIONS OTHER THAN MEDICATION
Sometimes there are treatments that can be used instead of or in addition to medication.
- Counseling/therapy. It's always good to have trusted friends and family to talk with about your problems. Sometimes that's not enough. In those cases, you *may* want to talk with a trained therapist who *can* listen and offer guidance. The therapist can help you learn useful ways to deal with your feelings. An adult on your planning team *can* help you find a therapist.
- Meditation. Meditation is a type of mental exercise in which you learn to relax your body and calm your mind. Meditation is known to reduce stress and *can* help improve concentration. It *can* bring inner peace by helping you control your thoughts and become more aware. Meditation is a skill that requires learning and practice. A workshop or class *can* help get you started.
- Exercise. Exercise releases endorphins, or "feel-good" chemicals, in your brain. These chemicals make you feel less sad or anxious. Being active *can* take your mind off your problems and improve your ability to deal with things. You *can* exercise alone, join a

team, or organize some friends. Look for physical activities that you enjoy—hiking, dance, basketball, or other— and make exercise fun.

- Diet. What you eat *may* affect your moods and energy levels. You *may* feel better eating less "bad carbs," including foods with lots of sugar or white flour (muffins, white bread, bagels). Research tells us to eat foods rich in healthy omega-3 fats, which *can* be found in nuts and certain fish (tuna, salmon). Vitamins and minerals also *can* help your brain and body work better. Before taking vitamin supplements or making changes in your diet, talk with your doctor.

According to the issue being addressed, each of the browsable websites generally follows different approaches in its personalization. Empathy is often shown by presenting the topic in terms of how teenagers feel about their condition:

(15)   Being a teen can be really stressful! Mindfulness is a powerful way to handle stress, and live life more fully. Mindfulness is all about living fully in the present moment, without judgment, and with an attitude of kindness and curiosity. It's about breathing, noticing what's happening right here and now, sending a gentle smile to whatever you're experiencing in this moment (whether it's easy or difficult), and then letting it go. You can be mindful anytime, anywhere, no matter what you're doing. It sounds simple, but it's not always easy to do, especially when you are stressed! This website provides information, tools, and resources to help you get started. Hear what other teens have to say about mindfulness in the Kelty Centre's 3-minute video, "Mindfulness: Youth Voices."

In some sections, expressions of empathy are given by a personal perspective on information and advice or self-reflection, acting as powerful exemplars for other teenagers (Figure 6).
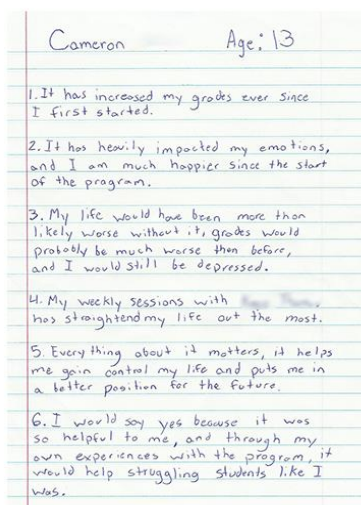

Fig. 6: *SAHM* "My Story"

The same effect is obtained when emotions are clearly expressed in videos of teenagers performing actions or telling a story related to a specific issue and health condition (depression, bullying, anorexia, etc.), as in the case of the subsection "Mental Health Medication Guide My Story – Taking Propanol for Anxiety: Katy's Story," where teenagers are invited and encouraged to leave comments.

Although great empathy with teenagers is always shown in all the browsable sections and subsections, depersonalization is strategically used to warn about risks, as shown in this extract taken from the 'Mindfulness for Teens' *SAHM* Home Page section

(16) What is anorexia nervosa?
      Anorexia Nervosa is an eating disorder and mental health condition where the person will severely limit or 'restrict' the amount of food they have, for long periods of time. It can be different from person to person but people with anorexia nervosa may:
      - Skip meals
      - Eat a lot less overall
      - Stop eating certain types of foods
      - Do unhealthy amounts of exercise
      - Vomit or use laxatives to 'purge' or remove food they have eaten from their body quickly.

The analysis of the extracts demonstrates that reader-friendly strategies are enacted to increase the adolescents' understanding of the health conditions and encourage the use of the therapies and treatments being recommended. As in the case of *Healthdirect* website, the language used is ordinary and clear by including simple words belonging to the medical domain (*symptoms, diet, pain, eating disorders*, etc.), with explanatory sentences or a glossary for specialist terms or expressions.

In terms of the visual mode of communication, the *SAHM* Home Page (Figure 5) displays neither pictures nor images of adolescents or young adults. Some human figures are displayed on the top right-hand corner of the page, depicting men and women performing different actions. An image of the sky with a few clouds stands out visibly from a pale shaded background and constitutes the frame of the page; white is the color used as the background for textual materials that is distributed on the left-hand side and right-hand side of the page through which users can interact with the website. The right-aligned box opens with a brief description of the website's objectives which is manifestly addressed to teenagers:

(17) The Mental Health Resources for Adolescents and Young Adults are online resources aimed specifically at adolescents and young adults. Health care providers and youth

serving professionals can offer these additional resources or print the PDF one-page reference sheet to adolescents and young adults looking for additional information, including online resources, support groups, peer networks, helplines, treatment locators, and advocacy opportunities.

On the right-hand side of the *SAHM* Home Page (Figure 5), short and simple texts are employed in a set of vertically aligned hyperlinks for the surfing public ("Clinical Care Resources," "Resources for Adolescents and Parents," "Weekly News Roundup"), downloadable documents, fill-in-forms for contact and email, donation and store ("Journal of Adolescent Store," "Join the Listserve," "Career Centre," "Make a Donation," "Health Info for Parents and Teens," "Find an Adolescent Health Professional," "SAHM Store"). Scrolling down the Home Page on the left-hand side, there are six browsable sections: "Youth Friendly Mental Health Online Resources," "Apps and Tech Services," "Mental Health Resources Institutes," "Mental Health Medication Guides," "Helplines," "Advocacy." Each of them provides a link to other websites.

When surfing through the browsable pages, there is an aesthetically diversified layout, though the amount of texts and visuals used to structure the content is equally balanced. To illustrate briefly, the Youth Friendly Mental Health Online Resources (which is the first in the list of the six browsable sections on left-hand side of the Home Page) provides links to eight different websites of specific adolescents' health resources, reporting the name and rationale for each of them: "Center for Young Women's Health and Young Men's Health: These websites provide a series of guidelines on emotional health, including on test anxiety, depression, bullying, and eating disorders. www.youngwomenshealth.org and www.youngmenshealthsite.org" (Figure 5). Each website is easily accessible, thus making navigation smooth and straightforward.

The layout, font colors, pictures and images of all sections are varied, and mid-frame images and videos run alongside meaningful texts with young (female and male) people expressing different moods and feelings indicating the intent of the message conveyed. Overall, the quality of expertise and responsibility, which is culturally and ideologically ascribed to doctors and specialists, is depicted in female healthcare professional images and passed on to young patients wishing to recover from their health conditions (Figure 7).

Fig. 7: *SAHM* "Going to Therapy"

Clarity in the language used and the usability of the various technological tools (links and hyperlinks, downloadable documents, fill-in-form documents, etc.) seem to be the most significant features in the various pages of the *SAHM* website. Overall, the *SAHM* images "demands that the cultural specificities of semiotic, social, epistemological and rhetorical effects of visual communication must be understood everywhere, since semiotic entities from anywhere now appear and are 'consumed' everywhere" (Kress and van Leeuwen 2006, 31), in an attempt to give the website a culturally-neutral organization and a broad representation of any conceivable adolescent health condition.

3.3 TeenMentalHealth.Org

The website layout and navigation, and the choice of textual material are perfectly in line with the international character of the organization and its main goals. In terms of the web design, the Home Page of *TeenMentalHealth.Org* opens with the logo of the World Health Organization and primary navigation menus (About us, Health topics, News, Countries, Emergencies, About WHO), all redirecting the readers to the general World Health Organization website (Figure 8). As far as accessibility is concerned, the six official languages of the United Nations (Arabic, Chinese, English, French, Russian, and Spanish) are provided for the website navigation.
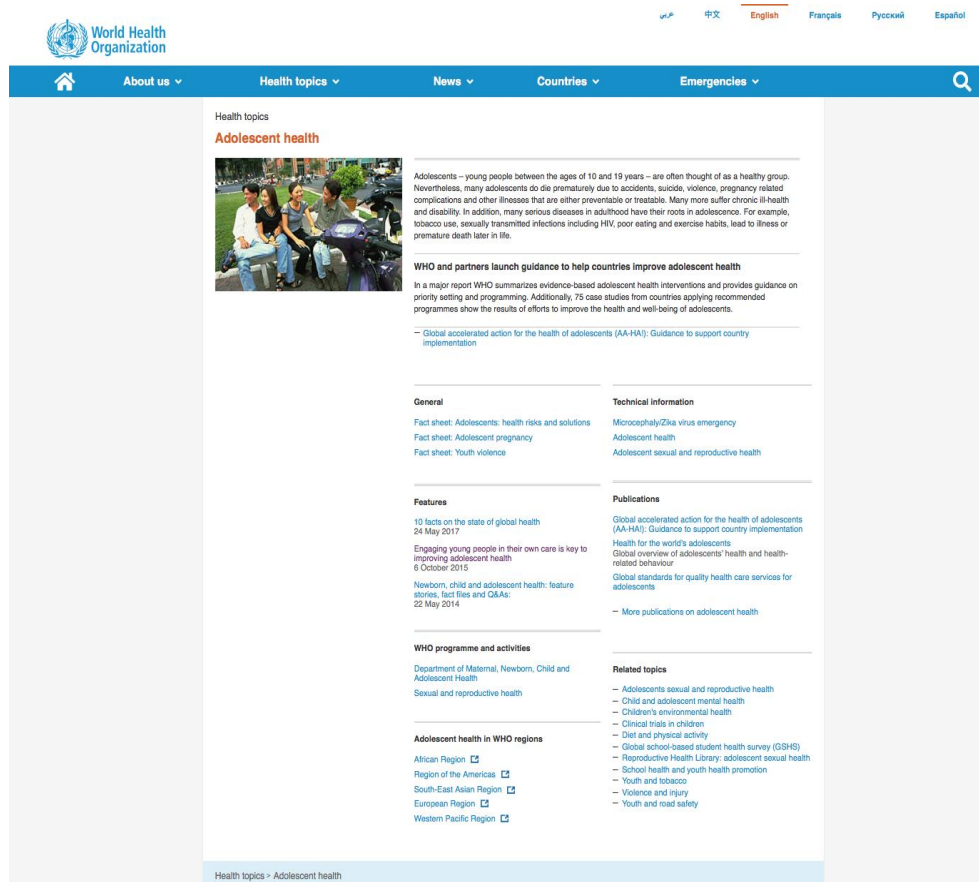
Fig. 8: *TeenMentalHealth.Org* Home Page

As in the case of *Healthdirect* and *SAHM* websites, care and precision are taken regarding the choice of textual material in each browsable section of the *TeenMentalHealth*.Org selected webpages (Bateman 2014). Sentences are usually short and technical jargon is rarely used. Blocks of text are usually *introduced* by headings and subheadings and the information is usually distributed into bulleted lists. In terms of the linguistic mode of communication, fewer occurrences of *you* personal pronouns (85) and *your* possessive adjectives (32) have been found in *TeenMentalHealth.Org* in comparison with *Healthdirect* and *SAHM* websites. Given the informational purposes of the TeenMentalHealth.Org website whose primary role is to direct and coordinate international health within the United Nations' system, and the broad range of intended web readers in terms of nationality, ethnicity, and age, adolescents are not frequently directly addressed.

Few pronominal instances of the inclusive *we* (34 occurrences) pronoun and *our* (29 occurrences) adjective are strategically used to make potential readers more receptive to web producers' claim

(18) If *we* don't act to change *our* consumption and production patterns, *we* will cause irreversible damage to our environment […]
We hope you will feel inspired to take action and do what you can to have a healthy and nutritious diet.

Overall, the *TeenMentalHealth.Org* website shows very few expressions of empathy, as in the case of the subsections narrating adolescents' personal experiences as shown in Figure 9 below.

Fig. 9: *TeenMentalHealth.Org* "Adolescents' Personal Experiences"

Here, empathy is shown by presenting the topic in terms of how a girl (Isabel Fazarkeley) feels about her health condition and gives Kate's (Isabel's mother) personal perspective on the information and advice provided by the medical expert (Dr Bill, Isabel's doctor), acting as a powerful exemplar for other teenagers.

On the other hand, *TeenMentalHealth.Org* often resorts to depersonalization in order to inform and give advice or to warn about risks, as shown in the following extracts.

(19) Depression is the third leading cause of illness and disability among adolescents, and suicide is the third leading cause of death in older adolescents (15–19 years). Violence, poverty, humiliation and feeling devalued can increase the risk of developing mental health problems.

Whereas the active voice is the norm, few instances of the passive voice are used to create a distance from the action, making the statement less threatening:

(20)   Violence (including harsh parenting and bullying) and socio-economic problems are recognized risks to mental health.

Or presenting a logical explanation for health conditions:

(21)   Most eating disorders affect females more commonly than males. Eating disorders such as anorexia nervosa, bulimia nervosa and binge eating disorder are characterised by harmful eating behaviours such as restricting calories or binge eating.

Questions occasionally serve to organize information and draw the reader into the topic, as in the case of "What we do?" and "Did you know?," or "What is a sustainable diet?." In this regard, imperatives, when used, would be understood as prompting or reminding adolescents that something 'ought to be done,' in particular circumstances as in the extract reported below.

(22)   Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. But in addition to increased future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects. […].
How can overweight and obesity be reduced? […] *limit* energy intake from total fats and sugars; *increase* consumption of fruit and vegetables, as well as legumes, whole grains and nuts; and *engage* in regular physical activity (60 minutes a day for children and 150 minutes spread through the week for adults).

As we can see in the extract reported above, the statements in the paragraph formulated before the question "How can overweight and obesity be reduced?" are used to contextually direct or instruct prospective young readers in the adoption of healthy behavior by providing them with reasons for action and consequently behavioral change (as indicated in the list of things that 'ought to be done' - *limit*, *increase*, *engage*).
Modals (*can* 101 occurrences, *may* 32 occurrences) when used, accommodate general epistemic statement about what is 'possible' or 'probable.'

(23)   Emotional disorders commonly emerge during adolescence. In addition to depression or anxiety, adolescents with emotional disorders can also experience excessive irritability, frustration, or anger. Symptoms can overlap across more than one emotional disorder with rapid and unexpected changes in mood and emotional outbursts. Younger

adolescents may additionally develop emotion-related physical symptoms such as stomach ache, headache, or nausea.

Globally, depression is the ninth leading cause of illness and disability among all adolescents; anxiety is the eighth leading cause. Emotional disorders can be profoundly disabling to an adolescent's functioning, affecting schoolwork and attendance. Withdrawal or avoidance of family, peers or the community can exacerbate isolation and loneliness. At its worse, depression can lead to suicide.

Here, a variety of symptoms and causes in long-term health are shown as possible or probable in relevant circumstances, conveying the web producers' representation of reality in authority-marking scheme.

Unlike *Healthdirect* and *SAHM*, *TeenMentalHealth.Org* also provides a consistent number of dynamic, multimedia, up-to-date reports, describing why adolescents need specific attention, differently from young children and adults. It presents a global overview of adolescents' health, including the latest data and trends, and discusses the determinants that influence their health-related behavior.

Looking at the visual mode of communication, it is interesting to start the analysis from the *TeenMentalHealth.Org* Home Page (Figure 8). On the left-hand side of the page, immediately below the title "Adolescent Health," the page displays an image that is quite small in size and depicts four young adults (both male and female), presumably belonging to the same race (probably Asian), sitting together and smiling at each other. Next to the image, there is a brief account of the most common threats and health problems that young people may face or suffer from during the transitional phase of growth and development between childhood and adulthood:
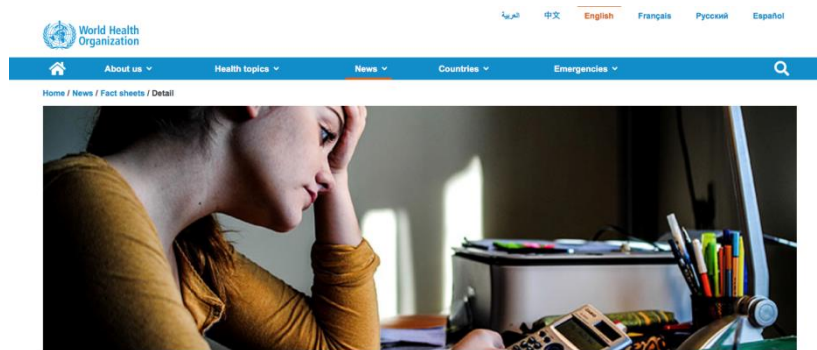
(24) Adolescents – young people between the ages of 10 and 19 years – are often thought of as a healthy group. Nevertheless, many adolescents do die prematurely due to accidents, suicide, violence, pregnancy related complications and other illnesses that are either preventable or treatable. Many more suffer chronic ill-health and disability. In addition, many serious diseases in adulthood have their roots in adolescence. For example, tobacco use, sexually transmitted infections including HIV, poor eating and exercise habits, lead to illness or premature death later in life.

Website navigation is clear and simple, with the information distributed in images, fonts, colors, navigation menus, as well as short and simple texts distributed into two to three boxes of a set of vertically aligned hyperlinks for the surfing public, as shown in the screenshot reported in Figure 8. Scrolling down the Home Page, the content is organized around eight vertically aligned browsable pages labelled as Global Accelerated Action for the Health of Adolescents (AA-HA!):

Guidance to support country implementation, General, Technical information, Features, Publications, WHO programme and activities, Adolescent Health in WHO regions, Related topics. When surfing through the hyperlinks, there is an aesthetically identical layout with images and texts standing out visibly from a white background, immediately below the WHO logo and the general website navigation menu.

The amount of texts and visuals used to structure the content is not equally balanced, since the selected webpages are devoid of images in favor of text. The representational metafunction[13] (Kress and van Leeuwen 2006, 27) of these images, that is, the representational and communicational functions they serve and the way in which they are integrated into a meaningful whole, is revealed in the portrayal of young females and males of diverse ethnic origins, performing actions and/or showing expressions that are related to the health topic under discussion. For instance, in Adolescents: health risks and solutions subsection (Figure 10), a girl is portrayed with a sad expression, sitting at a desk and holding her head in her hand.

With few exceptions (as in Figure 10), the surroundings or environment where the subject is located are clearly marked (Figure 11), which is in line with the international nature of the website and its main goals.

Fig.10: *TeenMentalHealth.Org* "Adolescents Health Risks and Solutions"

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[13] According to Kress and van Leeuwen (2006), the visual, like all semiotic modes, has to serve several representational and communicational requirements. Starting from Halliday's (1978; 1985) theoretical notion of metafunction, they apply the ideational, the interpersonal, and the textual metafunctions to all semiotic modes because they are not specific to speech or writing.

Fig. 11: *TeenMentalHealth.Org* "Adolescent Pregnancy"

The simplicity of the browser technology allows for more data resources to be added to such pages in a scalable system, and links between relevant health care pages and publications are provided to help in locating specific information. To illustrate briefly, the Adolescent pregnancy (Figure 10) subsection displays Key facts, Context, Health consequences, Economic consequences, WHO responses, and lists a number of suggested references. Overall, updated graphics, statistics, and videos featuring stories and fact files are designed and skillfully placed to support the content (Bateman 2014). The predominant use of the website for informational purposes is readily apparent in those pages, where the focus of the international producers is on adolescent health interventions and guidance on priority setting and programming (Figure 12).
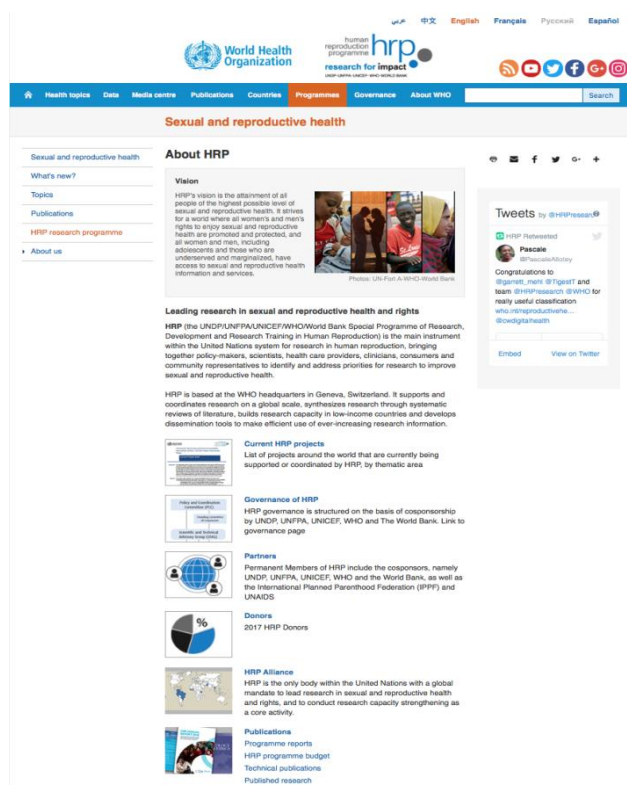

Fig. 12: *TeenMentalHealth.Org* "About HRP"

4. Conclusions

The World Wide Web is increasingly transforming the landscape of health communication, showing an ever-growing globally-networked, multilingual and multicultural information environment. Not only is the range of health-related resources extremely varied, but also website designers and controllers are quite different, ranging from governmental institutions and universities to independent organizations and corporations operating on a specific health issue. The present study has tried to identify the communication strategies used in health communication for adolescents over three online platforms: *Healthdirect*, *SAHM*, and *TeenMentalHealth.Org*. The analysis shows that what is clearly shared by the selected websites is the attention to serve as positive role models, set clear boundaries and expectations and guide adolescents to make the best choices, an important aspect which aligns *Healthdirect*, *SAHM* and *TeenMentalHealth.Org*. with Koluchi and Lemish's (2011) analysis on what is shared by all cultures when communicating with children and young adults.

The micro-linguistic data examined from CDA perspectives have shown the most relevant elements (i.e., pronouns, adjectives, active/passive voice, questions, imperatives, modal verbs, etc.) that shape aspects of knowledge and relationships in the language and discourse of adolescents' health care deployed via the Web. Linguistic data, such as the pronoun you co-occurring with other grammatically structured features of the texts, reveal a specific interest, particularly in *Healthdirect* and *SAHM* websites, to construct direct concern and contact with young readers, who are encouraged to become active agents who take an active role in their healthcare options.

Strategies for communicating health information, namely, definition, accessibility, design, structure, visual components, self-explanatory links, clarity of text, language, have been found in all three websites, even though to different degrees. While technical terms are introduced for all, in order to acquaint the young readers with the medical language, they might hear at the doctor's or at the specialist's clinic, fewer details, as well as links to other websites/webpages, are given to *Healthdirect* readers in comparison to those provided for *SAHM* and *TeenMentalHealth.Org* web-users. This lies, understandably, in the nature of the organizations (*SAHM* and *TeenMentalHealth.Org* are managed by multidisciplinary companies based in different countries) that run and are responsible for the dedicated platforms. *TeenMentalHealth.Org*, for instance, adopts a less personal approach, whereas *Healthdirect* and *SAHM*, try to engage more directly with the reader. This is particularly evident in the *TeenMentalHealth.Org* pages presenting programs and statistics: the information remains just that, facts and evidence that are not personalized to make them more palatable to young

readers. In contrast, *Healthdirect* and *SAHM* have specific browsable sections and subsections addressing adolescents directly and presenting the information through boys and girls, in line with the policy used in UNICEF's "Children in digital world."

With the exception of Healthdirect, the images and videos provided in *SAHM* and *TeenMentalHealth.Org* seem to have an impact within different cultures and emphasize the wider culturally-neutral infrastructure of the Web. In this regard, the representation of the attributes and qualities given to subjects in the pictures and videos displayed reveals different ways of attracting the adolescents' interest in the depicted topic and makes apparent the degree of involvement and interaction of each website with the potential viewers in line with the different cultural background of the intended audience, i.e., from a more direct approach in *Healthdirect* and *SAHM* (placing young patients first in *Healthdirect*, presenting topics in terms of emotions, reporting personal and culturally-based perspective on information and advice or self-reflection in *SAHM*), to a more indirect one in *TeenMentalHealth.Org* (placing the community first, presenting topic in terms of programs, facts, statistics, depersonalizing to inform and give advice or to warn about risks).

Overall, the scientific and technical, albeit friendly and reassuring, approach to the health condition is strategically mixed with a constructive and encouraging stance. The results of the analysis conducted on the linguistic resources, visual images and the visual processes used in *Healthdirect*, *SAHM* and *TeenMentalHelath.org* websites for creating meaning confirm that each of them are consistent with their own web producers' purposes of communicating health information to young people. Future research might consider the impact of adolescent health websites on the lives of children and young adults and their interactions with health services, for instance, the impact of web-mediated communication on a range of behaviour, so that adolescents' potential for their well-being and healthy development is maximized.

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