

Review Article:**Health websites visual structure: the necessity of developing a comprehensive design guideline****Saeideh Valizadeh Haghi, Hamid Moghaddasi, Reza Rabiei, Farkhondeh Asadi ***

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*Corresponding Author: email address: asadifar@sbmu.ac.ir (F.Asadi)**ABSTRACT**

Using health-related websites and their information increasingly develops and some concerns on its quality arise as well. Different factors affect the quality of health websites which visual structure is one of the most important factors. The aim of the current study is to explain the role of health websites' visual structure in users' views on their quality and reliability as well as its role in obtaining health information by users. Furthermore, the need for a comprehensive guideline for designing such websites is discussed. The review showed that health website's appearance has an important role in users view on its credibility. Furthermore, it was revealed that there is no comprehensive national or international guideline to health websites design. Considering the importance of visual structure of health websites, there is an emergent need to develop a national guideline to obviate the problems of non-consistent, poor or personalized design of health websites.

Keywords: Health website visual structure; Website design guideline; Health information**INTRODUCTION**

Accessing health information in broad range and vast scope is possible due to information technology development [1] Nowadays, many people try to acquire health-related information for themselves and their relatives[2, 3]. Medical consultations are completed with other information resources such as the internet, brochures, books, magazines, TV and radio [1]. Among them, the internet has the main role via health-related websites [4]. This is a mass medium and an international network for people searching information on every possible subject, including health care information [2]. Searching the internet for health information is continuously increasing [5-7] so that about 50% and 75% of adults in the UK and the USA use the internet for retrieving health care information, respectively[6]. This network facilitates the search of and access to health information and exposes users to broad scope of many information

items and increasingly involves them in their health-related issues [8]. Health websites contain various information items, advices, guides, recommendations, and assessments related to health and related issues and their management [9-12]. These websites support patients and their families by providing information and can help them to have better patient-physician interaction though expanded information [13-16]. In addition, Internet-based information affects individuals' overall decisions on self-care issues and interaction with health providers [17-20]. Individuals need to high-quality information for involvement in their self-care [21]. The internet, however, has not any required standard for qualified information [22] and information in websites is not controlled [5]. This means that some websites may publish information with low quality or incorrect content not accord professional guidelines [5, 23]. Therefore, people encounter with low quality information [5,23].

Given that lay users cannot evaluate and identify quality online information, their health may be threatened by health websites[24]. Thus, there is increasing concern on the credibility and reliability of this information [5, 25, 26]. Different factors affect the quality of health-related websites[27, 28] which designing of a website is one of those factors. The current study aims to explain the role of health-related website's visual structure on users' views on their quality and reliability. In addition, the need to a comprehensive guideline for designing such websites will be discussed.

BACKGROUND

In general, different factors affect the quality of health websites and the design of the website is one of those key factors [29, 30]. Website structure, mainly, expresses the relationship between various parts of websites and classifies the functions of different parts of the website as well[31]. It includes Navigation design, Visual design, information architecture, Page layout, Aesthetic and Visual aesthetic balance in the general graphical view of websites, placement of page elements, content Presentation, images, and utilizing the media[27, 32-34]. The appearance of website has a significant impact on attracting the users' attention, so that the role of visual structure of health websites on the trust of users to these websites are more prominent than other factors in various texts and is of great importance. In addition, the appearance of website, is considered by the tools for evaluating health websites. For example, information accessibility is regarded as one of the six criteria needed for evaluating the quality of a health website in E-Europe2002 which is considered as one of the authoritative tools for health websites' evaluation [35]. In Netscoring tool, the design is one of the eight criteria for evaluating health websites[36]. In a systematic review of 79 studies on evaluating the quality of health-related Internet information, Eysenbach and colleagues[2002]concluded that website's visual structure which includes visual attractiveness and page layout, is of main criteria of the quality of health websites mostly considered by their users [37]. website appearance is one of the first features considered

by users and may cause them to rely on the information published by the well-designed websites [38]. The opinion of a user on a website is formed in 0.2 of a second when visiting a website and if its appearance looks appropriate from their views, they will verify the quality of information available on the web site as well[39]. In another study by Kim et al., it was found that the most trust to health websites is associated with its content, design and appearance [33]. Similarly, a review on the reliability of online health websites by Silence and colleagues [2004] showed that individuals may be affected by the appearance and design of a website and rely on websites with higher score in design and appearance than that with low quality appearance at the first glance. The findings showed that 94% of participants in this study considered the design features such as non-attractive appearance, non-professional design and applying inappropriate colours as factors which affect their lack of trust on websites. The study showed a direct relationship between weak design of health websites and their rejection by users [27]. Because the design of a website is one of the criteria which has the greatest impact on gaining users' trust on health websites [7, 10, 27-30, 33, 38, 40-44]. It should be considered that Some people have little information on the health topics and cannot judge on the health websites content and thus evaluate them based on the website appearance [45]. Nevertheless judgment and evaluation of health websites based on their appearance can be harmful to users [25]and even threaten users' health [24, 46]. Considering the lack of control on the quality of Internet information, It is possible that the available information on a well-appeared health website is incorrect and inaccurate which are dangerous for lay users[25]. In contrast, it is possible that the websites with unprofessional or discouraging design include vital and important health information but users ignore their rich content due to their weak design [24, 46]. On the other hand, the main problem reported by the users of health websites is related to their design features [42]. This could be due to the importance of website design and its role in facilitating users' information search [4, 47, 48]. It should be considered that users prefer information which is

retrieved easily and with least effort [4] and the design and appearance of website should provide pleasant experience for users [49]. If users encounter a website with a complex and non-user-friendly structure in which the needed information cannot be easily retrieved, users leave the website and refer to other websites with better design and more user-friendly features for satisfying their information needs [50]. This will bring negative consequences for the organization as they will lose their visitors due to poor design features. Furthermore it can harm users as they may be exposed to harmful (none valid) health information as the well-designed websites may not be enough authoritative and websites may tend to just advertise some products by attractive design and convince users and make probable abuse [18]. Thus, decision making on a website's visual design is of importance for every organization as the website of an organization has a main impact on its audience and is a powerful tool for service delivery[51]. Experts believe that websites should be user-friendly [52-54]. This indicates that a website should be designed in a way that satisfies the needs of intended users [51] in addition it should imply the organization missions as well as attract the users to refer back to the website in the future [29]. Some of users leave the web pages between 10 to 20 seconds but websites can attract users for longer period by offering them a clear content and user-friendly visual structure. Through this, the probability of users referring back to website will be increased[55]. However, some websites are created in limited time and or restricted budget which These restrictions prevent the use of the Professional Website Designers [50]. Using guidelines is the first step to help designers in website's visual design process[56]. Using guidelines is important as it's useful for end-users as well. Applying guidelines and pre-determined criteria enables users to use various features of the websites to fulfill their needs. Besides, the main and useful features of the website are manifested clearly due to better design[49]. These will increase users ability to better use of the websites as well as their overall satisfaction[57]. Visual structure design should be in accordance with principles and guideline as it will help to increase the websites consistency[58]. In this

regard, health organizations in some countries such as USA, UK and Australia have authored guidelines and national-wide standards for designing health websites.

The U.S. Department of Health & Human Services has published a guideline for designing health websites of the organizations under its supervision. Some items included in the guideline are design process, optimizing user experience, accessibility, main page design procedures, page layout, content presentation and the list of elements included in the website. Features that should be included in website design is assessed and ranked in this guideline[59]. The centre for disease control and prevention has published a guideline for designing health information websites to help website designers, content specialists and other public health professionals to design a proper health website for non-expert internet users. For instance, font size, font type, applied colours, paragraph length, the placement of main items, use of illustrations and images for better understanding and so on are of elements that have been highlighted in this guideline. The strategies included in this guideline complete the instructions considering the requirements of website design but have not considered the experience of the web users [60]. The National Health Service (NHS) has published a guideline which includes the design criteria for the websites of its affiliated institutions. The guideline has highlighted the requirements such as using standard logo of the organization, applying certain font types, elements placement, considering accessibility criteria. Furthermore, it Places much emphasis on the use of acceptable colours by NHS. It's necessary to follow the instructions of this guideline for All health professional members of the NHS, website managers and website design agencies attempting to design their health websites or redesign older ones as well as all websites using the title of NHS, [61]. In addition, the department of health of Australia has published a document entitled "Web development Guideline (WDG)". The document containing proposed instructions to adjust the appearance of the country's health websites In which issues such as usability and accessibility principles have been discussed [62, 63]. In total, the attempts taken by the various

international organizations to develop a design guideline for health websites, highlights the importance of existence of such guidelines. Any of these guidelines has been developed for organizational use and based on the needs of their users and thus they have paid attention to certain criteria. Regarding the attempt of world organizations at preparing such guidelines, the importance of utilizing guidelines while website design is more highlighted. It can be said that existence of a guideline is essential and critical for visual structure design of health websites.

CONCLUSION

The appearance of health websites has a main impact on users' trust on them. Thus health-related organizations attempt to design their websites in a way that is attractive to target users as a poor design implies that users will not be able to view the services provided by these organizations and the organization will lose its audiences and benefits as well. The role of guidelines in health websites design is considerable. Yet, there is no comprehensive international guideline for health websites design and only few health organizations in some countries such as USA, UK and Australia have developed some guidelines for designing such websites. These guidelines focus on their related organizational goals and user needs. However, all these guidelines have been developed based on organizational goals and their users' needs of those organizations. Focus of well-known international organizations on developing guidelines for health websites design shows the importance of visual structure of health websites and its positive impact on utilization those websites. Developing a comprehensive guideline for designing health websites can be useful for users, designers and organizations involved in health care services from various aspects.

The current study which was conducted through reviewing a variety of resources on the importance of web design, demonstrate that guidelines published by different international organizations are not following same criteria which leads to creating websites with different

visual structure. Given that the appearance of health websites is effective in the judgment of users and their trust in web sites, using a comprehensive guideline will lead the judgment and trust of users to focus on quality and content validity. Furthermore, the users will be guided to more informed use of the information. The existence of a comprehensive guideline is an appropriate manual for designing health websites of the organizations that have no enough investment for employing expert designers and will lead to savings in the cost of those centres. Moreover, other health organizations and individuals can improve their websites validity through following the developed guideline which will lead to effective use of health websites content by people as well as aiding them to make better decisions on health-related issues. Given that there is no comprehensive guideline for health websites design in the international level, it is suggested that a standard guideline to be developed to reduce the problems of non-consistent, poor, or personalised design of health websites. Similarly, there is no appropriate standardized guideline in national level in Iran's case. Thus, it is recommended to investigate preparing such a guideline in future studies to Obviate the problems of non-consistent, poor, or personalised design of health websites.

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