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Development of a User-friendly Health Promotion Website to Spread Evidence-based Information in Italy

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Keywords

Health communication • Website • Health literacy • Digital platform • Health promotion

Summary

Introduction. Appropriate communication models and strategies are crucial in order to strengthen preventive and health promotion interventions via digital platforms. Today, 52.23% of the Italian population use the Internet as a source of health-related information. The aim of the "Insegna Salute" project was to create a website that would enable people to satisfy their knowledge health needs and increase their awareness in the field of prevention.

Methods. *To develop the website, a qualitative literature research* was carried out to collect an overview of effective online health communication strategies and tools before, during and after the COVID-19 pandemic. Further, we implemented the website insegnasalute.it according to the one-to-many (screen-to-face) communication model. The second part of the research focused on identifying tools to ensure the constant update of the platform. Finally, we proceeded with the creation of the visual identity.

Results. The research resulted in 28 sources regarding health

Introduction

Information and Communication Technologies (ICT) are a set of technologies that provide access to information via telecommunications and enable users to create and exchange contents. The advent of ICT in the 1990s and their subsequent worldwide diffusion have influenced human life, improving the quality of services and activities and reducing their costs. Their widespread applications have brought changes to the functioning of the public, private and non-profit sectors, including that of public health organizations [1].

According to the DIGITAL 2023 report, approximately 64.4% of the world's population has access to the Internet; 91% of online users access the web from smartphones, while 65.6% also connect from laptop or desktop computers. Users aged from 16 to 64 years access the Internet for the following main reasons: to find information, to stay in touch with friends and family, to keep up to date with news and events, to watch videos, TV programmes and movies, and to find out how to do things [2].

In Italy, 86.1% of the population access the Internet; 94% of users between 16 and 64 years of age do so from smartphones, and 77.3% also from laptops or

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communication, vaccine hesitancy, online health information seeking, visual identity, current digital and social trends and mis/disinformation. Many publications reported that healthcare professionals (HCPs) are the main providers of evidence-based information and the most effective agents against misinformation. Furthermore, most of the articles advocated the use of digital technologies, such as social media and websites, along with proactive and targeted communication strategies.

Conclusions. Vaccination hesitancy and other health prevention issues require accurate tools to build trust-based relationships between users and healthcare professionals. In line with the preventive guidelines issued by the Italian Ministry of Health, new tools, such as "Insegna Salute", integrate health knowledge with communication strategies. In the wake of the COVID-19 pandemic, preventive measures are essential to protect the population from misinformation spread and the probability of getting ill.

desktops. Their main reasons are: to find information, to keep up to date with news and events, to find out how to do things, to find new ideas or inspiration, to gather information on places and to organise vacations and travel [3]. Moreover, 52.23% of Italians seek healthrelated information online [4]. However, 52.4% of adults (> 18) are concerned about online misinformation [3, 5]. Since the early 2000s, online health information has proliferated, and attitudes toward physicians and health organizations have changed. As individuals now feel more empowered and actively involved in taking decisions regarding health issues, many turn to the Internet as their primary source of health-related information before seeking medical attention [6]. However, the quality of online health information can vary enormously, ranging from professionally reviewed and evidenced-based information to personal opinions and conspiracy theories [7, 8]. Moreover, individuals do not always have the skills to understand whether online information is reliable or not. This can lead to unnecessary distress and can increase the tendency to self-diagnose and self-treat. By contrast, if online health information is used with awareness, it can also have a positive impact, as improving the patient-physician relationship [9, 6, 10].

Since 2020, following the COVID-19 pandemic, an era of unprecedented "infodemic" has emerged. Indeed, the World Health Organization (WHO) has identified the "uncontrolled spread of false information", including misinformation on vaccines, as one of its pressing health concerns for the coming decade [11, 12]. In this regard, studies carried out in Italy have reported that people who access the available evidence-based information and institutional websites display greater acceptance of vaccination. By contrast, individuals who use social media or the Internet as their first source of information are more likely to be vaccine hesitant, owing to the frequent incorrectness of such sources [13, 14]. Indeed, in navigating the web, e-health literacy skills have become crucial, as they can mitigate the effects of false information on vaccination. Providing health literacy skills and implementing certified online evidence-based sources are therefore essential to fight the "infodemic" phenomenon [15, 16, 10].

Historically and consistently, healthcare professionals (HCP), healthcare organizations and academic institutions have played a leading role in driving vaccination acceptance. Furthermore, HCP-led messaging via social media platforms has been proven to be beneficial during recent public health crises and vaccination campaigns. Pro-active strategies that focus on effectively and safely engaging HCPs via social media foster collaboration between medical and public health communities, thereby spreading accurate information and correcting misinformation online. These initiatives offer promising approaches to improve vaccination coverage and prevent health problems [16, 17, 12].

To be successful, communication strategies aimed countering misinformation must be targeted at to specific subgroups, as enhanced specificity in interventions can efficiently mitigate the spread of the infodemic [8]. For instance, large-scale research indicates that approximately half of online healthrelated search sessions do not concern the individual's own health, but rather that of another person. Searches are more likely to occur when there is a significant emotional connection between the individuals involved, particularly in intrafamily relationships such as parentchild relationships. The results of these studies indicate that parents worldwide frequently rely on the Internet to seek information regarding their child's health-related symptoms and guide their decisions [18]. According to a recent survey, 60% of parents in Italy stated that they would use the Internet to search for information on vaccines [19].

Meta-analyses indicate that fact-checking or debunking can serve as effective methods of rectifying misinformation [20]. Developing platform-based interventions that verify the source and quality of information is a potentially effective approach to tackle widespread misinformation. Public organisations are among the main stakeholders involved in implementing these interventions [20].

A valid example of a successful preventive platform is the Italian VaccinarSi project. Created in 2013 by the Italian Society of Hygiene and Preventive Medicine (SItI), this vaccine communication website was designed to fight vaccination hesitancy. Following the success of the national website, several Italian Regions began to develop their own regional versions [19].

In this setting, the project "Insegna Salute" was developed by the Department of Health Sciences of the University of Genoa (Italy), with the aim of creating a website to share all the health promotion and preventive actions targeting the population, such as informative health and vaccination campaigns. The website provides a source of evidence-based information that allows users to satisfy their knowledge health needs and raise awareness in the field of prevention, by combating misinformation and teaching the skills needed to recognise reliable sources.

Materials and methods

To develop the website, previous studies on the implementation of online awareness-raising projects on health topics were sought via the main search engines: PubMed, Scopus and Google Scholar. The topics of interest and analysis mainly concerned health communication, vaccine hesitancy, communication models and strategies, website design and the target populations of the projects.

The methodology adopted for the research was qualitative, with the intention of collecting information regarding the online seeking behaviour of the population from a socio-communicative point of view. During the harvesting process, the research group paid special attention on effective communication interventions and strategies applied in contexts comparable to "Insegna Salute". The primary literature search did not include any geographical criteria, whereas the secondary search was restricted to Italian contents. Overall, the investigation was limited to data published since 2015, in order to obtain a perspective before, during, and after the COVID-19 pandemic.

Each source collected was verified and applied coherently with the specific case, in order to determine the most effective approach to the development of the website and its content.

Regarding websites designed for information and educational purposes, the one-to-many (screen-toface) communication model is the most widely used. Therefore, this tool will be used and combined with other specific targeted communication strategies to achieve the goal stated above.

The second part of the research process concerned the identification of tools that would allow the platform to be constantly updated over time. Tools such as Google analytics and questionnaires are implemented in order to verify its effectiveness, by analysing the number of visitors and their satisfaction with the platform and to ascertain individuals' online health information seeking tendencies.

Another crucial step in the "Insegna Salute" project was the creation of the visual identity, which started by

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Authors	Publication year	Main Theme/Topic	Main conclusions	Methods of evaluation
Yifeng Hu [5]	2015	Online health communication	Technologies can be implemented as tools to improve health communication.	Systematic review
Tan SS et al. [6]	2017	Patient-Physician Relationship Online health communication	Internet health information seeking can improve the patient-physician relationship.	Systematic review
Getman R et al. [9]	2018	Vaccine Hesitancy Online health information	A crowd-based mode of authority, that provides understandable information about vaccines, may be more effective at distributing pro vaccine messages.	Media Analisys
Kubb C et al. [18]	2020	Online health information Parents online behaviour	More studies are needed to understand parental online search behaviours and support parents in their medical decision making.	Systematic review
Islam MS et al. [7]	2021	COVID-19 Online health communication Vaccine Hesitancy	Tracking COVID-19 vaccine misinformation in real-time and engaging with social media to disseminate correct information could help safeguard the public against misinformation.	Online content analysis
Garett R et al. [12]	2021	Vaccine hesitancy Online health information	Public health experts, the medical community and vaccine advocates should correct misinformation online. In addition to social media engagement, new digital tools and applications may be useful in this effort.	Systematic review
Hernandez RG et al. [16]	2021	COVID-19 Online health information Vaccine Hesitancy	Strategies focused on efficiently and safely engaging HCPs on social media and sustaining efforts across vaccine implementation stages will help prevent misinformation.	Algorithms and online content analisys
Viswanath K et al. [17]	2021	COVID-19 Online health information Vaccine Hesitancy	Implementing a pro-active communication campaign strategy must ensure that people are willing to vaccine and that vaccination is uniform across different population groups.	Online survey
Bordin P et al. [19]	2021	Health information website Vaccination	Findings can help website developers to update future strategies to increase the platform popularity and optimize visitors' engagement.	Google Analytics
Zhang J et al. [20]	2021	Online health information Vaccination	Fact checking using evidence-based sources can minimize misinformation.	Online survey experiment
Arghittu A et al. [28]	2021	Health information website Vaccination	Initiatives, such as health information website must be implemented to fight vaccine hesitancy.	Google Analytics
Arghittu A et al. [14]	2021	COVID-19 Online health communication Vaccination	Cooperation between the media and scientific professional can constitute an effective network in debunking disinformation and providing evidence- based sources.	Google Analytics
Kim S et al. [8]	2022	COVID-19 Online health information	The existence of groups with unique characteristics allows targeting of misinformation mitigation strategies.	Online Survey
Wu P et al. [10]	2022	Online health information	E-satisfaction should be further enhanced by information seeking as online healthcare practices evolve and change.	Online Survey
Dib F et al. [11]	2022	COVID-19 Online health information eHealth literacy	e-Health and media literacies should be viewed as fundamental skills that allow citizens to recognize online mis/disinformation and ensure informed decision about vaccination.	Systematic Review
Pierri F et al. [15]	2022	COVID-19 Online health information Vaccine Hesitancy	Results support a need for interventions that address misbeliefs, allowing individuals to make better-informed health decisions.	Online misinformation analysis
Covolo L et al. [22]	2022	Online health information	The result obtained for the survey suggest the need to improve health literacy in the general population. Healthcare professionals need to equip themselves with framework to respond effectively to their patients' needs.	Online Survey
Tagini S et al. [25]	2022	COVID-19 Online health information Vaccine Hesitancy	Vaccine-related communications should be clear and understandable to prevent the spreading of misunderstandings and fake information, that may foster people's insecurities and distrust. Efficacious vaccine-related communications may be crucial to inform policymakers and public authorities in the case of possible future infectious outbreaks.	Online Survey

Tab. I. Summary of the medical papers selected in the present article.

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Authors	Publication year	Main Theme/Topic	Main conclusions	Methods of evaluation
Arghittu A et al. [1]	2023	COVID-19 Online health information	It is urgent to strengthen and innovate the network of territorial social-health services and to devise new integration strategies, promoting the active participation of citizenship.	Systematic Review
Bianchi FP et al. [13]	2023	COVID-19 Vaccination hesitancy Online health information	Achieving high vaccination coverages requires a multifactorial approach that demands major social, scientific, and health efforts. The success of vaccination campaigns in this population depends on the capillarity and consistency of the implemented interventions.	Systematic Reviews and Meta-Analyses (PRISMA)
Bianchi FP et al. [27]	2023	Online health information	A multifactorial approach is needed so that institutions can regain the trust of the population and thus better manage the feelings of online users and use mass media and social media as health promotion tools, to fight the issue of VH and understand the role of social and traditional media.	Systematic Reviews and Meta-Analyses (PRISMA)
Ferrara M et al. [26]	2023	Vaccine Hesitancy	It is necessary to strengthen the trust of the population through the implementation of health communication and public education strategies. Scientific literacy must continue to support families and individuals in discerning evidence from opinions.	Systematic review
Zhang Q et al. [24]	2023	Parents online behaviour	Operators need to create a user-friendly platform and improve information quality. Physicians and related organizations can raise awareness and assist patients in developing the skills to appropriately comprehend and utilize information online.	Online survey
D'Andrea et al. [23]	2023	Online health information	An important result of the study is that online health information seekers consider the family doctor a point of reference both for obtaining information and for discussing the information found online. The respondents mainly rely on official sources for health information research. Educational strategies should be activated at the school level to train students to become more aware of the risk associated with online health information.	Online survey

Tab. I (follows). Summary of the medical papers selected in the present article.

defining the goals of the project and determining how these could best be represented through a composition of elements and colours. This process involved several professionals: physicians, communication specialists, public health experts and medical graphics designers. Indeed, the visual identity is the manifestation of the product and is intended to evoke certain feelings in the viewer. It also makes the entity recognisable by giving more depth to the entire project structure [21].

Results

As a result of the literature research, 28 sources were selected. Of these, 24 were medical journals papers, 1 was a visual identity online article, 2 were digital and social scenario reports and 1 was a Eurostat database [1-28].

Out of the 24 medical papers (Tab I), 5 were published between 2015 and 2020 and dealt with the pre-COVID-19 online dissemination of health information and vaccination hesitancy. The rest (19) were defined as post-COVID-19 (2021-2023) papers: 9's main topics were health communication problems during the pandemic, while the other 10 covered topics such as primary care and strategies for fighting online misinformation. The main evaluation methods and tools used in the articles were: systematic reviews, analyses of media and online content, online surveys and Google analytics. Furthermore, 11 of the total were Italian and provided more specific knowledge about the setting for our website.

Of the latter, 2 papers reported that participants relied less frequently on online health information than expected. The first one, stated that 36.5% of the study participants believed that online information did not improve their health knowledge, and 40.8% that online information did not influence their health [22]. Moreover, in the second one, 37% of the participants reported that they rarely turned to websites for health information and 46% stated that they had little trust in information obtained from websites [23].

Finally, multiple team-work sessions led to the creation of the visual identity, which symbolises a pencil and a tree (Fig. 1). The aim was to represent the goals of the website: to educate and inform the population over a lifelong perspective. The colours most often used in education and awareness-raising settings of health

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prevention are orange and green. Indeed, green is often associated with trust, while warm colours such as orange convey positivity. Figure 1 shows the visual identity of the "Insegna Salute" project.

Discussion

Many publications cited HCPs as the main agents for the dissemination of evidence-based information and those who could most effectively fight mis/disinformation (see Tab. I). Furthermore, as previously said in the "Results" section, most articles advocated the use of digital technologies, such as social media and websites, combined with the implementation of active and targeted communication strategies.

During the literature search, no sources were found to refute the use of digital platforms for the dissemination of health information. Most of the articles collected supported the fact that online media were found to be crucial in the last few years in the processes of educating the population on health.

Today, it is essential to adopt these combinations in order to enhance initiatives for health prevention and promotion, thereby supporting the goals of the "lifecourse" approach, which is aimed at maintaining wellbeing throughout life. Therefore, the *insegnasalute. it* website adopts the "one-to-many" (screen-toface) communication model, which is used in mass communication and is aimed at educating and informing the population. The model involves one sender, who transmits to several receivers through a one-way communication channel, such as television or radio. Its application can also be targeted via devices that allow network access (screen-to-face), such as computers, smartphones and tablets. Thus, the interaction features of these tools can be linked to a more authoritative and

informative communication, addressing the scientific knowledge of topics.

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As the website has a user-centred design, it features a dynamic and user-friendly interface. The aim is to let individuals navigate the website easily and find the information they are looking for [24]. Another key feature is the use of clear and understandable language and terminology [25, 26]. Users are also able to learn the meanings of various scientific terms, thanks to a dedicated page called "Glossario". Moreover, in order to help people to distinguish between correct from false information and to increase their level of health literacy, a dedicated section shows them how to use online health information in a safer and more conscious way. Sections are dedicated to preventive health topics, the Department's projects, news from the Italian Ministry of Health and from the medical-scientific field.

Over the last few years, the concept of the superstar scientist has been debunked, as it is not effective in promoting health information. Instead, what is required is the widespread availability of institutional channels managed by teams of specialists in medicine, health, communication and psychology [27]. Our work team will make sure that the information reported will be transparent, objective and based on reliable scientific sources, which will be available for more specific consultation.

As specified above, the goal is not only to inform people, but also to understand and meet their needs. Google Analytics, questionnaires and surveys therefore provide data on users' health literacy, needs and online healthseeking behaviour, thus enabling the *insegnasalute.it* website to be constantly updated and its effectiveness enhanced. In addition, a newsletter will keep users informed about articles published on the website and news of interest [14, 28]. It is, however, important to remember that the pattern of visits to the website will be unpredictable and might be related to news facts or other events [19].

Conclusions

According to several studies, the features most required of a digital platform are performance expectancy, effort expectancy, social influence, perceived risk, and eHealth literacy. The new technology must therefore be easy to use and effective, satisfy users and attract new ones, respect privacy guidelines and provide accurate and comprehensible health information [27].

Vaccination hesitancy and other health prevention issues can only be addressed through the use of proper and accurate tools that allow a trust-based relationship to be built.

The creation of a dedicated digital platform enables on-site interventions to have continuity, through the constantly updated information provided and the communications sent to newsletter subscribers. In accordance with the 2020-25 National Prevention Plan guidelines provided by the Italian Ministry of Health, modern tools are used in combination with health knowledge and new communication strategies. Indeed, in the wake of dangerous global events such as the COVID-19 pandemic, preventive measures have become essential in order to protect the population from the spread of communicable diseases.

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Informed consent statement

Not applicable.

Conflict of interest statement

The authors have no conflict of interest.

Authors' contributions

EF and DP: designed the study and coordinated the research; EF: wrote the manuscript; LV, CM and DP: critically reviewed the draft paper and made important contributions; LV, CM, CST, BR, MC and EM: drafted and developed the content of the website; EF, LV, BR and MC: participated in the development of the visual identity; all authors have read and approved the final manuscript.

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