



Internet and social media use for antibiotic-related information seeking: Findings from a survey among adult population in Italy



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ABSTRACT

Background: The Internet represents an increasingly common source of health-related information. Internet and Social Media can be used to promote a prudent use of antibiotics.

Objective: To establish the extent of Internet and Social Media use to search for antibiotic related information and the potential implications in health care among adult population in Italy.

Methods: This cross-sectional study was conducted from March to May 2017, among a sample of parents of public school students. A 2-stage cluster sample design was planned. An informed consent form and a questionnaire were given to selected students to deliver to their parents. The questionnaire included questions on knowledge, attitudes, and behavior toward antibiotic use, and questions about Internet use to gather information about antibiotics.

Results: A total of 913 parents completed the questionnaire, with a 67.4% response rate; 22.1% did not know when it was appropriate to use antibiotics. 32.3% of parents reported self-medication with antibiotics. 73.4% of respondents used the Internet to search for information about antibiotic use. Among social networks users, 46.5% reported the use of these media to get information about antibiotics and 45% of instant messaging app users share information about antibiotics. The results of the multiple logistic regression analysis showed that Internet use to search for antibiotic-related information was higher among females, younger subjects, with a higher level of education, in those who reported self-medication with antibiotics and in those who needed additional information on side effects of antibiotics from the GP compared with those who did not need any additional information. Internet use was significantly less likely in participants with cardiovascular diseases and cancer compared with those without chronic conditions, and in those who reported to strongly agree/agree, or were uncertain about antibiotic use without a GP prescription, compared with those who reported to be disagree/strongly disagree.

Conclusions: Internet and social media are widely used for antibiotic-related information seeking in the Italian population. Health organizations must consider social media within their communication strategy to promote the appropriate Web use for antibiotic-related information seeking in the general population, although more evidence is needed regarding the optimal mix of communication interventions.

1. Introduction

Antimicrobial resistance is a significant threat to public health that increases the costs of health care, with lengthier stays in hospitals and more intensive care required. Several studies have documented that inappropriate and excessive use of antibiotics is the predominant cause of the emergence and selection of resistant bacteria [1]. Numerous studies have been carried out to assess the general population's knowledge about antibiotics and antibiotic resistance [2], highlighting fragmented and incorrect information. To overcome this lack of

knowledge, several European countries [3,4], as well as the United States [5] have launched public awareness campaigns about appropriate antibiotic use.

In this context, the Internet and Social media can be useful health promotion tools, since they provide important communication opportunities among individuals, companies and organizations and also reduce the impact of traditional barriers to communication such as organizational hierarchy or socioeconomic status. As a reflection of society at large, healthcare has also benefited by the communication potential released by social media tools. Indeed, they offer the

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opportunity to spread and share health-related messages and to improve public health [6,7]. Moreover, they allow discussion about several health topics, with interventions of both patients and physicians [8]. According to Eurostat data, the Internet is the first source of health information for 51% of respondents from the 28 states of the European Union [9]. Countries with the highest percentages of web users to search for health-related information are Luxembourg (71%), Finland and Denmark (65%), Holland and Germany (63%). This figure for Italy is 31%, with a steady growth rate from 2010, according to several national studies [10–12]. Searching for health information online appeared to be a frequent activity among the population, which surf the Web to keep information about health services, diseases, and medical treatments, including antibiotics [10]. Regarding antimicrobial use, some studies have also highlighted a wide spread of “topic” on antibiotics and antibiotic resistance on social platforms such as Twitter and Facebook, confirming the possible use of such social media as effective tools to promote appropriateness in antibiotic use, although questions remain about their limitations, concerns regarding misinformation, and potential difficulties with the confidentiality of personal information. Health information on the Internet may be misinterpreted, compromising health behaviors and health outcomes [12]. Therefore it is necessary that such media are properly used, in order to prevent the spread of erroneous messages. In this regard, The Centers for Disease Control and Prevention (CDC), has issued guidelines and recommendations about the correct approaches for the diffusion of Internet messages about appropriate antibiotic use [13].

Despite the growing interest in this topic, studies investigating the active antibiotic information seeking behavior of the Italian general population are scanty. Therefore, this study was designed to establish the extent of internet access and use to gather information about antibiotic use and the potential implications in health care among adult population in Italy.

2. Methods

2.1. Study population

This cross-sectional study was conducted from March to May 2017, among a sample of 1355 parents of public schools’ students in the geographic area of Catanzaro, in the South of Italy.

A two-stage cluster sampling design was planned. We first identified the clusters as all primary, middle and high schools, and then a random sample of 6 schools was selected. In the second stage a random sample of 12 classes from each selected school was recruited. All parents of students in the selected classes were eligible to participate in the survey. Before starting data collection, a meeting with the head of each selected school was arranged to present the project and to obtain permission and collaboration.

During the hours of school attendance, a letter, an informed consent form and a questionnaire to deliver to the parents, was given to all students in the selected classes. The letter included a brief description of the study objectives and its importance, inviting only one self-identified parent from each family to complete the questionnaire. Participants were assured about the voluntary participation to the survey and about confidentiality of the information provided, that was maintained by excluding personal identifiers. All participants provided written informed consent at the beginning of the survey prior to answering any question.

The sample size was determined before study initiation. It was calculated assuming that 50% of the respondents look online to obtain health-related information in accordance with prior European studies [9,14], a margin of error of 5%, and a 95% confidence level. Consequently, a sample of 385 parents was sought. By anticipating a response rate of 50%, the total sample size was inflated to 763 parents. We included an additional sample of 150 parents in case the response rate among Internet users was not adequate.

2.2. Review instrument

The questionnaire was developed based on previous studies and was pretested for length and content on a sample of 27 potential respondents. The questions in the questionnaire grouped into the following eight categories: (a) socio-demographic characteristics (gender, age, marital status, level of education and working activity); (b) information about chronic diseases and the main sources of information about antibiotics; (c) knowledge about antibiotic use; (d) attitudes toward self-medication with antibiotics; (e) self-reported practices related to antibiotics use; (f) information about Internet and social media use. The first questions in this section determined whether subjects have access to the Internet. If the parent had access to the Internet, he or she proceeded to other questions in section concerning to use the Web to search for information about antibiotics; (g) data about the effects of using the Internet to search for information about antibiotics and (h) needs of information regarding antibiotics use.

Each section elicited responses in yes or no questions or closed-ended questions with one possible answers to choose from a set provided by the researcher, in order to simplify the analysis of responses. Some questions allowed the possibility to give multiple answers to avoid losing precious information and break any possible yes or no pattern effect among the subjects of the survey. Some questions culminated with the option of providing additional comments. The answers were collected anonymously to minimize selective suppression of information by the subjects due to possible feelings of shame or social acceptance.

The study protocol was approved by the Ethics Committee of the “Mater Domini” Hospital of Catanzaro (Italy) (2017/02/16).

2.3. Internet and computing technologies

The systematic bibliographic search was carried out through electronic databases, including the National Library of Medicine (MEDLINE) and ISI Web of Science (ScienceCitation Index). The following medical subject heading (MeSH) terms were used individually and in combination in the search: 1) general population 2) antibiotic use, 3) health care information seeking, antibiotic related information, antibiotic information seeking and 4) Internet use, social media use.

Web search was developed to find out the list of all the primary, secondary and high schools in the area of Catanzaro, then we determined the sample size through an online calculator [15]; we also used an online random number generator to create a list of random numbers in order to select the schools to be included in the study [16]. After all, we sent a mail to the head of each selected school to present the project and obtain a meeting. Starting from a coding system of the answers obtained from questionnaires, Stata version 14 statistical software package [17] was used to create a dataset to store the data.

2.4. Statistical analysis

Descriptive analyses were used to describe demographic characteristics of participants, and to determine the prevalence of the Internet use. Moreover, two regression models were built. Specifically, a multivariate stepwise logistic regression analysis was performed to determine the independent association of several characteristics with the use of Internet aimed at antibiotic related information seeking (Model 1), and a multinomial logistic regression analysis was used to investigate, in the subgroup of parents who used Internet to search for antibiotic related information, determinants of considering useful the information found on the Web (Model 2). In this model the outcome variable was categorized into three levels: parents who consider the online information always/almost always useful (baseline group), sometimes useful, and never/almost never useful.

The following explanatory variables were included in both models: gender (male = 0 female = 1), age (continuous), education level (three

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