

# Seeking Consensus: A Content Analysis of Online Medical Consultation

Ming-Hsin Phoebe Chiu

Graduate Institute of Library and Information Studies,  
National Taiwan Normal University,  
162 He-Ping East Road, Section 1, Taipei (106), Taiwan, R.O.C.  
phoebechiu@ntnu.edu.tw

**Abstract.** Online medical consultation allows patients and caregivers to query, communicate, and interact with medical and health professionals in an online synchronous or asynchronous setting. This study explores the questions and answers (Q&As) posted on an asynchronous online medical consultation website, Taiwan eDoctor. In this paper, preliminary research findings of 720 questions were reported. Analysis of questions was structured around five research themes: (1) length; (2) when to seek consultation; (3) strategies of communicating chief complaints; (4) intent to seek consultation; and (5) types information provided. This study makes implications in designing an interactive online medical consultation system.

**Keywords:** Online medical consultation, content analysis, medical information retrieval.

## 1 Introduction

Information asymmetry lays influence on the disclosure of medical information, as it is usually controlled and manipulated by medical and health professionals. The rise of health awareness promotes patients, family and caregivers, and health-aware individuals to actively seek information for their medical information needs. The convergence of the Internet and health and medical practice creates a diversity of medical information communication, and the emergence of online medical consultation substantially changes the mode of physician-patient communication.

Health information seeking takes place in many situations through various approaches. It takes place when people are feeling sick and suffering pain, or when being healthy and wanting to know to stay healthy. People seek health and medical information from friends and relatives; seek medical advice from primary care physicians; and solicit patients' experience from physicians' rating websites or blogs. A special type of health information is online medical consultation. With such service, patients and caregivers interact with health and medical professionals in synchronous chat or asynchronous threaded discussion. Questions can be asked freely and answers are provided by certified health and medical professionals. The communication may

take form of private email, chatroom or instant message, threaded discussion board, or even video conferencing. The service provides patients and caregivers the ability acquire health and medical knowledge at their convenience, often free of charge. It has also been called teleadvice, telemedicine, teleconsultation, e-consultation, or email consultation if consultation is mediated by email (Umefjord, 2006).

As the rise of IT adoption in healthcare is getting more and more popular, users of health information needs are beginning to see the benefits of online medical consultation. Past research has identified the benefits of online medical consultation as being able to reduce uncertainty and improve medical services (Caiata-Zufferey, Abraham, Sommerhalder, & Schulz, 2010). This study focuses on online medical information seeking in the context of medical consultation. It is designed as two-directional, with the goal to explore the intents demonstrated through the questions and answers (Q&As) in online medical consultation, to analyze the characteristics of physician-patient communication, and to discover the role and function of online medical consultation in the perspective of physician-patient communication.

## 2 Research Design and Methods

As an exploratory study, it collected and analyzed online medical consultation entries from Taiwan eDoctor (<http://sp1.hso.mohw.gov.tw/doctor/Index1.php>), a medical consultation website funded and operated by Ministry of Health and Welfare in Taiwan. Taiwan eDoctor is one of the largest and most-used Taiwan-based consultation services. Its' primary communication language is Traditional Chinese. The health and medical related questions are asked by everyday users, while are answered and endorsed by certified health and medical professionals, like physicians, nurses, and nutritionists.

Data collection was conducted by randomly selected and collected 50 resolved consultation entries for each clinical department, resulting a total of 1200 entries as the primary data set. All health consultation entries were classified into 24 clinical departments, predefined by Taiwan eDoctor. These clinical departments are internal medicine, dentistry, surgery, pediatrics, orthopedics, ophthalmology, Chinese medicine, dermatology, urology, family medicine, geriatrics and gerontology, obstetrics & gynecology, physical medicine and rehabilitation, oncology, psychiatry, otolaryngology, neurology, surgical neurology, radiology, pulmonology, plastic surgery, gastroenterology, diving and hyperbaric medicine, cardiology, and breast and thyroid surgery.

Analysis of questions asked by patients and caregivers was structured around five research themes: (1) length of question; (2) when to seek consultation; (3) strategies of communicating chief complaints; (4) intent to seek consultation; and (5) types of consultation. Analysis of health and medical professional's answers were guided by four research themes: (1) length; (2) consultation strategies; (3) intent of seeking consultation; and (4) forms of seeking consultation. Content of the questions were first analyzed qualitatively to construct codes of each of the research theme, and each code can be explained as the properties of the theme. Then the analysis was conducted

quantitatively with frequency count to determine the patterns and characteristics of how consultation was sought. Up to date, 600 entries were fully analyzed; questions from askers and answers from medical and health professionals were analyzed and reported separately. This paper will only report on the “Question” part with data of 12 clinical specialties.

### 3 Preliminary Findings

#### 3.1 Length of Question

The preliminary results presented in Table 1 found that the average length of a question was 153 words, but question length varied between clinical specialties. Questions of psychiatry, cardiology, and oncology with the average length of 303 words, 196 words, and 187 words were among the three longest types. Questions of “diet and nutrition” and “plastic surgery” were among the shortest, with the average length of 102 and 95 words. This finding may reflect differences in behavior among askers facing different medical problems. Medical problems of psychiatry, cardiology, and oncology are often long-term and dramatic, and so are the treatment and recovery. The question length of such problems demonstrates how complicated the nature of medical problems is. In contrast, questions for “diet and nutrition” and “plastic surgery” are mostly fact-based statement. For example, “Does Vitamin C help clear acne?” or “How long does Botox last?” This type of questions are relatively shorter, and often with only one or two statements ending with question marks. Counting the frequency of the actual use of question mark in the question statement is a way to identify the number of explicit concerns addressed during the consultation. The analysis of the average length of questions by clinical specialties allows for understanding of the complexity and ambiguity of different medical concerns.

**Table 1.** Average length of questions

Clinical Specialties	Average Length (# of words)
Physical medicine and rehabilitation	97
Oncology	110
Psychiatry	219
Otolaryngology	110
Radiology	273
Neurology	114
Surgical neurology	117
Pulmonology	122
Plastic surgery	73
Gastroenterology	84
Cardiovascular surgery	132
Breast and thyroid surgery	117

#### 3.2 When to Seek Consultation

Regarding when to seek consultation, Table 2 shows that over half (53%) of the questions were asked when the user is feeling ill or injured, and starting to think s/he

might be ill (23%). The “when” factor for about 10% of the questions can’t be identified, and these questions are primarily fact-based, for example “How safe is hyaluronic acid?” A sum of the questions occurred at “when feeling ill or injured” and “when thinking might be ill” reaches 75%. It suggests a high utilization of online medical consultation service is for diagnostic purposes. This pattern also indicates an interesting fact that consultation seekers are not only seeking for identification of illness or disorder, but also are concerned about their physicians’ medical decision. A closer look at the questions asked “when recovering” and “healthy, but not robust” reveals a “second-opinion” nature of the information that the askers desire.

**Table 2.** When to seek consultation (#/%)

	When healthy	When feeling ill or injured	When thinking might be ill	Healthy, but not robust	When recovering	Can not identified	Dead (ask by caregivers)
Physical medicine and rehabilitation	1(2%)	25(50%)	4(8%)	5(10%)	14(28%)	1(2%)	0(0%)
Oncology	0(0%)	35(70%)	12(24%)	0(0%)	0(0%)	2(4%)	1(2%)
Psychiatry	5(10%)	26(52%)	16(32%)	0(0%)	0(0%)	3(6%)	0(0%)
Otolaryngology	0(0%)	23(46%)	22(44%)	2(4%)	0(0%)	3(6%)	0(0%)
Radiology	16(32%)	14(28%)	5(10%)	0(0%)	0(0%)	15(30%)	0(0%)
Neurology	0(0%)	44(88%)	2(4%)	0(0%)	0(0%)	4(8%)	0(0%)
Surgical neurology	1(2%)	40(80%)	5(10%)	1(2%)	0(0%)	3(6%)	0(0%)
Pulmonology	1(2%)	31(62%)	12(24%)	0(0%)	0(0%)	6(12%)	0(0%)
Plastic surgery	7(14%)	12(24%)	2(4%)	25(50%)	0(0%)	4(8%)	0(0%)
Gastroenterology	4(8%)	18(36%)	22(44%)	0(0%)	0(0%)	6(12%)	0(0%)
Cardiovascular surgery	1(2%)	30(60%)	14(28%)	1(2%)	0(0%)	4(8%)	0(0%)
Breast and thyroid surgery	2(4%)	18(36%)	19(38%)	5(10%)	0(0%)	6(12%)	0(0%)
Total	6%	53%	23%	7%	2%	10%	0%

To look across clinical specialties, findings show that questions of “plastic surgery” have nothing to do with illness, disease, or disorder, but are raised about enhancing looks to become robust and perfect. High percentage of both neurology and surgical neurology questions are concerned with aspects of signs, symptoms, and worries; consultation and diagnosis service are often requested in these questions.

### 3.3 Strategies of Communicating Chief Complaints

In disclosing chief complaints, seekers engaged in three types of communication style: contextual, focal, and emotional. Contextual strategy was used to describe background information as well as the information coverage of current illness. Focal strategy, on the contrary, was direct and effective when a question was fact-based. Emotional strategy was often articulated through negative emotional remarks in the question narratives to draw attention to the questions.

Overall, 80% of the questions utilize contextual strategy, followed by emotional strategy (36%) and focal strategy (30%). 92% of oncology questions are contextual in communicating chief complaints. This may explain the lengthy nature of oncology questions presented earlier in the findings, because the cause of cancer is complicated and the treatment and recovery is not a straight-line process. A great detail of information must be provided in the chief complaints in order for medical professionals to make effective and constructive advice. Questions for pulmonology and plastic surgery are highly emotional, with 58% and 54% of the questions are found using emotional strategy. Emotional strategy is mostly employed when negative feelings and thoughts, such as anxiety and worry, arise. Positive feeling is also present in the use of emotional strategy, especially when consultation seekers show gratification to the answerers up front in hope to solicit their contact and help.

**Table 3.** Strategies of communicating chief complaints (#/%)

	Contextual (#/%)	Emotional (#/%)	Focal (#/%)
Physical medicine and rehabilitation	41(82%)	11(22%)	20(40%)
Oncology	46(92%)	19(38%)	9(18%)
Psychiatry	27(54%)	25(50%)	10(20%)
Otolaryngology	44(88%)	13(26%)	8(16%)
Radiology	24(48%)	19(38%)	29(58%)
Neurology	44(88%)	14(28%)	13(26%)
Surgical neurology	45(90%)	14(28%)	8(16%)
Pulmonology	42(84%)	29(58%)	13(26%)
Plastic surgery	37(74%)	27(54%)	21(42%)
Gastroenterology	44(88%)	13(26%)	15(30%)
Cardiovascular surgery	45(90%)	23(46%)	15(30%)
Breast and thyroid surgery	42(84%)	8(16%)	20(40%)
Total	80%	36%	30%

### 3.4 Intents of Seeking Consultation

This study identified 23 distinct intents to seek online consultation (See Table 4). Findings indicate that nearly half (47%) of the consultation seekers use the online consultation service for fact-based information. The questions are explicit and obvious, and they require specific answers, but not opinions. 26% of the questions are in need of confirmation regarding health condition and 20% are venting feelings. By cross tabulating clinical specialties and intents, some interesting findings are revealed. 98% of the Radiology questions are seeking fact of knowledge, and questions that demonstrate feelings and emotions most, are Psychology questions. Questions that seek treatment and medication side effect most are Oncology questions.

Table 4. Intent of seeking consultation

	Physical medicine and Rehabilitation	Oncology	Psychiatry	Otolaryngo-logy	Radiology	Neurology	Surgical-neurology	Pulmonology	Plastic surgery	Gastroenterology	Cardiovascular surgery	Breast and thyroid surgery	Total
Seeking fact or knowledge	19(38%)	26(52%)	9(18%)	2(4%)	49(98%)	39(78%)	27(54%)	22(44%)	17(34%)	23(46%)	16(32%)	35(70%)	47%
Seeking explanation	8(16%)	11(22%)	12(24%)	12(24%)	3(6%)	17(34%)	13(26%)	7(14%)	6(12%)	7(14%)	12(24%)	5(10%)	19%
Venting feelings	9(18%)	10(20%)	19(38%)	7(14%)	6(12%)	3(6%)	7(14%)	19(38%)	18(36%)	9(18%)	7(14%)	5(10%)	20%
Helping others to seek help	11(22%)	15(30%)	6(12%)	2(4%)	6(12%)	10(20%)	10(20%)	13(26%)	4(8%)	5(10%)	9(18%)	11(22%)	17%
Seeking advice on improving quality of life	1(2%)	2(4%)	1(2%)	0(0%)	0(0%)	1(2%)	3(6%)	0(0%)	5(10%)	1(2%)	0(0%)	1(2%)	3%
Seeking consultation on operation or surgical procedures	2(4%)	6(12%)	0(0%)	3(6%)	0(0%)	1(2%)	15(30%)	3(6%)	26(52%)	0(0%)	2(4%)	13(26%)	12%



Table 4. (Continued.)

Seeking consultation on treatment	4(8%)	16(32%)	2(4%)	7(14%)	1(2%)	5(10%)	6(12%)	6(12%)	8(16%)	0(0%)	0(0%)	0(0%)	0(0%)	9%
Seeking consultation on operation	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	8(16%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1%
Confirming health condition	0(0%)	10(20%)	8(16%)	19(38%)	13(26%)	7(14%)	12(24%)	16(32%)	7(14%)	20(40%)	19(38%)	23(46%)	26%	
Evaluating need for diagnosis	5(10%)	4(8%)	3(6%)	7(14%)	2(4%)	4(8%)	14(28%)	10(20%)	13(26%)	12(24%)	8(16%)	20(40%)	17%	
Seeking information on medical after-effect	0(0%)	8(16%)	0(0%)	0(0%)	0(0%)	0(0%)	3(6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2%	
Seeking support	0(0%)	0(0%)	1(2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0%	
Seeking consultation on health and medical insurance	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(2%)	3(6%)	0(0%)	2(4%)	0(0%)	0(0%)	0(0%)	1%	
Seeking consultation on drugs and medical products	1(2%)	0(0%)	3(6%)	1(2%)	0(0%)	7(14%)	4(8%)	6(12%)	6(12%)	3(6%)	2(4%)	1(2%)	5%	
Seeking advice on healthy living	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(4%)	0(0%)	1(2%)	0(0%)	0(0%)	1%	





### 3.5 Types of Information Provided

This study identifies 13 types information included in the questions. In face-to-face medical consultation in the hospital or clinic, description of symptoms and briefing on medical history and are critical sources for physicians to make diagnosis decision and to determine treatment and prognosis. However, in online medical consultation, only about half (52%) of the questions describe symptoms and medical history (30%). It reflects the intent that not all questions are medical diagnosis related (See Table 5) and require instant medical attention. This pattern shows that medical consultation seekers are not necessarily people who are ill; healthy or health-aware people are more responsible in seeking to cultivate their health knowledge. Questions that intend to seek fact or medical knowledge can be clearly answered without detailing chief complaints.

## 4 Implications of the Study

The content analysis of the online medical consultation questions uncovers a series of undergoing activities during the search formulation stage. For example, soliciting second opinion on diagnosis and seeking alternative treatment at the same time, suggests the multi-tasking nature of medical information seeking and retrieval. This study makes implications in designing an interactive online medical consultation system. For example, social tagging may be one aspect that allows consultation seekers to identify their intent and define the problems, considering the fact that online consultation seekers don't necessarily come to the service for medical information needs. In addition, providing a drop-down menu for a selection of current health status and intent, and allowing users to choose from the list may improve the clarity of question, increase the answering rate, and improve the quality of the answers .An analysis coexistence of health conditions, intents, consultation types, and strategies of communicating chief complaints may provide insight into effective physician-patient communication.

## References

1. Caiata-Zufferey, M., Abraham, A., Sommerhalder, K., Schulz, P.: Online Health Information Seeking in the Context of Medical Consultation in Switzerland. *Qualitative Health Research* 20(8), 1050–1061 (2010)
2. Umefjord, G.: *Internet Consultation in Medicine: Studies of a Text-based Ask the Doctor Service*. Umeå, Sweden: University of Umeå (2006)