

Breast cancer information communicated on a public online platform: an analysis of 'Yahoo! Answer Japan'

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ABSTRACT

INTRODUCTION: Japan is a developed country with high use of Internet and online platforms for health information. 'Yahoo! Answer Japan' is the most commonly used question-and-answer service in Japan.

AIM: To explore the information users seek regarding breast cancer from the 'Yahoo! Answer Japan' web portal.

METHODS: The 'Yahoo! Answer Japan' portal was searched for the key word 'breast cancer' and all questions searched for the period of 1 January to 31 December 2014 were obtained. The selected questions related to human breast cancer and were not advertisements or promotional material. The questions were categorized using a coding schema. High and low access of the questions were defined by the number of view-counts.

RESULTS: Among the 2392 selected questions, six major categories were identified; (1) suspected breast cancer, (2) breast cancer screening, (3) treatment of breast cancer, (4) life with breast cancer, (5) prevention of breast cancer and (6) others. The highest number of questions were treatment related (28.8%) followed by suspected breast cancer-related questions (23.4%) and screening-related questions (20%). Statistical analysis revealed that the treatment-related questions were more likely to be highly accessed.

CONCLUSION: Content analysis of Internet question-answer communities is important, as questions posted on these sites would serve as a rich source of direct reflection regarding the health-related information needs of the general population.

KEYWORDS: Breast cancer; 'Yahoo! Answer Japan'; epidemiology

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Introduction

Seeking health information online is very common in Japan.¹ It has been reported that 80% of the Japanese population have Internet access, and 60% use the Internet to seek medical help.² In Japan, 'Yahoo! Answer' is a widely used online question-and-answer service, with 22 million unique visitors every day.³ 'Yahoo! Answer' is an open portal where members can post questions and answers, and anyone can view this information.

Breast cancer is the leading cause of cancer death in women aged 20–59 years, and the second most commonly diagnosed cancer in the world.^{4,5} It has been reported that almost one-quarter of total breast cancer diagnoses are in the Asia-Pacific region, including 12% from Japan.⁶ The objective of this descriptive study is to explore what information regarding breast cancer is asked about in 'Yahoo! Answer Japan'.

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WHAT GAP THIS FILLS

What is already known: Health information seeking online is generally two-fold: searching for information on webpages and user-driven communication in social-media sites. The usability and impact of these two platforms in health-care-information seeking is being widely researched.

What this study adds: There is another type of platform where users can directly ask questions and get answers from other users; this is 'Yahoo! Answer Japan'. Health information seeking from this platform has not yet been studied. This research explores the information users seek regarding breast cancer in the 'Yahoo! Answer Japan' web portal.

Methods

Data source

'Yahoo! Answer Japan' is an online portal for people in Japan. Any member can log in and submit their question. Other registered members can see those questions and reply. Whenever anyone clicks on a question to view it, the view count gets recorded. Total view counts and number of replies is visible below each question. Non-members cannot reply, but they can see the questions and answers.

Data extraction

We searched 'Yahoo! Answer Japan' with the key word 'breast cancer' on 16 April 2015 and obtained all questions asked for the period 1 January to 31 December 2014. All questions were extracted based on the last updated date and recorded in a study database with a unique identification number. View counts and number of answers for each question were also recorded. We included only questions related to human breast cancer. As most of the questions were in the Japanese language, two native Japanese medical students (AO and NS) independently screened the database to extract the appropriate questions and then translated the questions into English. Any disagreement between them was resolved by discussion with another author (SA).

Data analysis

Based on a pilot screening of 200 randomly selected questions, using a quantitative content analysis approach,⁷ a coding schema was developed to categorize questions for analysis. Six major categories were developed: (1) suspected breast cancer; (2) breast cancer screening; (3) treatment of breast cancer; (4) life with breast cancer; (5) prevention of breast cancer; and (6) others. The first four categories were further subdivided, as shown in Table 1. Based on view counts of each question and using the median split approach,^{8,9} we categorized the questions into two groups: high accessed and low accessed. If the view count was less than or equal to the median number of view counts, we defined the question as 'low' accessed. If the view count was greater than the median number of total view counts, we defined the question as 'high' accessed. Stepwise logistic regression (forward inclusion method) was used to identify associations between the major categories and the level of access. All variables having a univariate level of significance at $P < 0.10$ were selected for inclusion in the base model for multiple regression analysis. To account for the possibility that the posts earlier in the year would have accumulated more views than posts at the end of the year, we included the duration of the post between the date-of-posting to date-of-extraction in our final model. Unadjusted and adjusted odds ratios (AORs) along with 95% confidence intervals (CIs) were calculated. All reported P -values were two-sided, and $P < 0.05$ was considered significant. The Hosmer–Lemeshow test was used to assess model fit. SPSS version 22.0 (IBM Corporation, Armonk, NY, USA) was used for all analysis.

Results

The initial search returned 2794 questions. Of these, 401 (14.4%) were excluded, leaving 2393 questions for further analysis, as shown in Figure 1. The distribution and representative examples of the six major categories and subcategories of questions are provided in Table 1. Most questions were regarding treatment of breast cancer (689/2393; 28.8%), and within this category,

most questions were about the side-effects of treatment (143/689; 20.8%). The ‘suspected breast cancer’ category is where users conversed about the symptoms related to breast cancer. People mostly asked about stiffness (342/560; 61.1%) and

pain (304/560; 54.3%). Most questions included in the screening category reflected anxiety after the positive detection of breast cancer (230/479; 48.0%). Also, a substantial portion of questions reflected anxiety before screening (72/479;

Table 1. Major categories of breast cancer-related questions from ‘Yahoo! Answer Japan’; representative example from each of the major categories, frequencies of the major categories and subcategories

Major categories	Representative examples	N (%)	Subcategories	N (%)
Treatment of breast cancer	I received chemotherapy and after that I had partial excision of breast cancer. Could you give me advice about next treatment? I am 42 years old. My doctor told me that it would be up to me to decide if I want hormone therapy or chemotherapy. It means that I have to decide myself!	689 (28.8)	Side-effects of treatment	143 (20.7)
			Additional information about treatment	121 (17.6)
			Selection of treatment	116 (16.9)
			Verification of doctors' information	101 (14.7)
			Recurrence of breast cancer after treatment	72 (10.5)
			Selection of hospital and doctors	61 (8.9)
			Life expectancy after treatment	58 (8.4)
			Cost of treatment	48 (7.0)
			Others	50 (7.3)
Suspected breast cancer	I feel pain in my lump of left breast from 1 year ago. The intensity of pain changes with time. I am 21 years old. I feel pain before menstruation. Is it symptom of breast cancer?	560 (23.4)	Stiffness	342 (61.1)
			Pain	304 (54.2)
			Unusual secretion from breast	70 (12.5)
			Itching	35 (6.2)
			Swelling	34 (6.1)
			Others	50 (8.9)
Breast cancer screening	When you took the first screening, didn't you think it was shameful?	479 (20.0)	Anxiety after screening	230 (48.1)
			Anxiety before screening	72 (15.1)
			Cost of screening	31 (6.5)
			Different ways of screening	23 (4.8)
			Selection of screening technique	20 (4.2)
			Others	141 (29.5)
Life with breast cancer	I did surgery of complete removal but I got bone metastasis. My husband supports me very well but the anti-cancer drugs are really expensive and we are having difficulty living. I want to work but I can't because of the side-effects of drugs. I can't taste food. I am seriously thinking of stopping the drugs. I want to enjoy last days of my life without treatment. What is my life expectancy without treatment? Please give me advice.	287 (12.0)	Care of sick	71 (24.7)
			Insurance coverage	34 (11.8)
			Sexual activity	27 (9.4)
			Hair loss	27 (9.4)
			Maintain work	27 (9.4)
			Food choice	20 (7.0)
			Child care	11 (3.8)
			Others	60 (20.9)
Prevention of breast cancer	Does not wearing bra at night prevent breast cancer?	287 (12.0)	No subcategory	
Others	Please tell me about cytology of breast cancer	327 (13.7)	No subcategory	

15.0%). Conversations in the category of 'life with breast cancer' were about the management of different aspects of living with breast cancer. The most common subcategory was 'care of sick' (71/287; 24.7%). In the 'prevention of breast cancer' category, questioners asked breast cancer prevention-related questions. The last major category was named as 'others', where 327 people asked questions about breast cancer that did not fall under any of the above categories.

Table 2 shows the statistical association of major categories with high and low view counts. Questions related to suspicions of breast cancer were 22% less viewed (95% CI: 0.64 – 0.96) than questions not related to suspicions of breast cancer. Questions about the treatment of breast cancer were accessed 2.03-fold more (95% CI: 1.67 – 2.46) than questions that did not mention breast cancer treatment. No significant associations were found between other major categories and level of view counts. The Hosmer–Lemeshow test indicated that the logistic regression model fitted the data in our study well (P -value = 0.95).

Discussion

This study explored questions that people asked about breast cancer on the 'Yahoo! Answer Japan' web portal. We found that side-effects of treatment, stiffness and pain as symptoms, anxiety

after screening, and providing care to patients were the main topics of information-seeking from the 'Yahoo! Answer Japan' online platform. All these major categories included subcategories with myriad questions, such as maintaining daily life, anxieties, verification of doctors' information, cost of treatments, etc. Upon defining high and low access based on the view count, we observed that questions related to treatment of breast cancer are accessed more than other categories.

To the best of our knowledge, this is the first study to analyse breast cancer-related contents of an online portal. Some population-based studies have reported findings that support our results. For instance, a study conducted among Dutch family physicians reported that breast pain and lump/mass in the breast are the two most commonly mentioned symptoms when female patients have breast-related complaints.¹⁰ Thus, our finding that they are the most common issues regarding suspicion of breast cancer discussed in 'Yahoo! Answer Japan' is reasonable. A study in Japan showed that 70% of women recalled psychological distress after breast cancer screening,¹¹ which also reflects our results, as the anxiety subcategory after screening had the highest portion of questions in the breast cancer screening category.

We also observed that people tended to wish to verify doctors' information (e.g. doctors have recommended a treatment but patients wanted to have a second opinion or further clarification through peer conversation on 'Yahoo! Answer Japan', or the amount of information that doctors provided was not sufficient to satisfy patients who wanted more information). This might reflect the fact that Japan lacks the concept of having community-based family doctors and most Japanese people do not have access to health-care practitioners for health-care discussions.¹²

A few limitations of this study should be considered. First, although we examined the widely used question-answer site, 'Yahoo! Answer Japan', there are two other major sites including 'teach! Goo' and 'OKwave' that we did not include in our study. Second, we collected the data from questions updated during the year 2014 so

Figure 1. Inclusion and exclusion of questions related to breast cancer from 'Yahoo! Answer Japan'

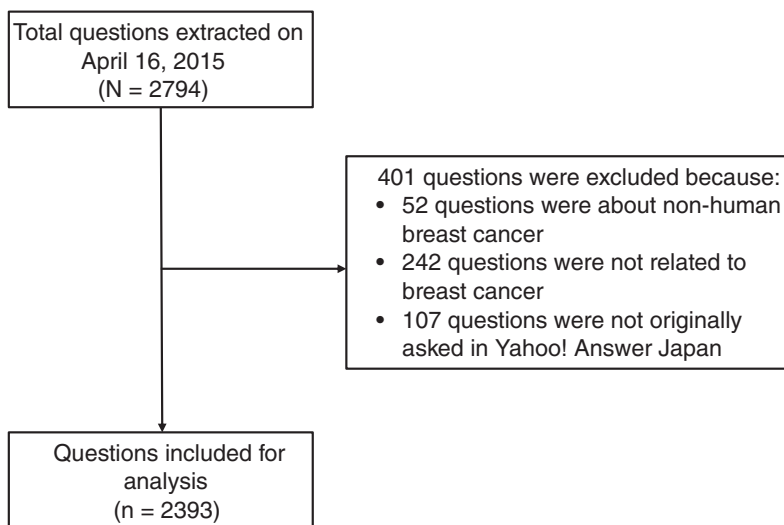


Table 2. Association of selected topics with level of access to the question on 'Yahoo! Answers, Japan'; in relation to breast cancer in Japan

Characteristics		Low access (<i>n</i> = 1197)	High access (<i>n</i> = 1196)	Unadjusted OR OR (95% CI)	<i>P</i> -value	Adjusted OR OR (95% CI)	<i>P</i> -value
Principal topics, <i>n</i> (%)							
Suspected breast cancer	No	864 (36.1)	969 (40.5)	0.61 (0.50–0.74)	0.000	0.78 (0.64–0.96)	0.019
	Yes	333 (13.9)	227 (9.5)				
Screening of breast cancer	No	943 (39.4)	972 (40.6)	0.86 (0.70–1.05)	0.128	–	–
	Yes	254 (10.6)	224 (9.4)				
Treatment of breast cancer	No	947 (39.6)	758 (31.7)	2.19 (1.82–2.63)	0.000	2.03 (1.67–2.46)	0.000
	Yes	250 (10.4)	438 (18.3)				
Life with breast cancer	No	1050 (43.9)	1058 (44.2)	0.93 (0.73–1.19)	0.575	–	–
	Yes	147 (6.1)	138 (5.8)				
Prevention of breast cancer	No	1120 (46.8)	1112 (46.5)	1.10 (0.80–1.51)	0.564	–	–
	Yes	77 (3.2)	84 (3.5)				
Others	No	1016 (42.5)	1046 (43.7)	0.81 (0.64–1.02)	0.068	–	–
	Yes	181 (7.6)	150 (6.3)				

OR, odds ratio; CI, confidence interval.

questions last updated in another year were not included. However, future work could examine the longitudinal evolution of inquiries regarding breast cancer information through time. Finally, 'Yahoo! Answer Japan' is anonymous and there was no available information about the identity of the questioners (e.g. age and sex of the questioners). This hinders precise characterisation of the users, but as our objective was to explore the information-seeking patterns on an online platform, this limitation does not invalidate our findings.

Seeking health-related information from online, peer-based social support groups by patients, caregivers and providers is common.¹³ Inspired by this attitude of consumers, many studies on the content analysis of social media sites such as Facebook, Twitter and YouTube have been conducted.^{14,15} Aside from social media, the online question-and-answer community is growing with time, but there are very few studies based on the contents of this community.¹⁶ Content analysis of Internet question-answer communities are important, as questions posted on these sites provide a rich source of direct reflections regarding health-related information demanded by the general population. Further research is needed to understand how the

contents of question-and-answer communities inform and improve patient-centred care.

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COMPETING INTERESTS

None to declare by any author.

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ETHICAL APPROVAL

Ethical approval was not required for this study.