

## Online Health Search Experience: Sentiments from South East Asia

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### ABSTRACT

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Performing an online health search is a popular activity conducted on the Internet. Research studies from developed countries provide information on source used, type of search performed and devices used to perform the search. However, the same cannot be said about the online health information searching scene in South East Asia. Online health information searching is gaining popularity in South East Asia. Citizens in these countries are turning to the Internet to obtain health information quickly. Current research studies pertaining to online health information searching in South East Asian is limited, particularly relating to search experiences of South East Asian health searchers. Search experience is pertinent as it could deter or encourage the possibility of conducting future health searches. In this research study, a user study was conducted to describe the online search experience of South East Asian health searchers. A face to face interview with 50 participants was conducted. The interview was audio recorded and transcribed verbatim. Results indicate participants have positive and negative search experiences. In some cases, post search outcomes influenced the search experience. Results of this research study contribute to the growing domain of knowledge in relation to online health information searching. Results of this study also provide an understanding pertaining to the search experience of South East Asian online health searchers.

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## 1. Introduction

Results of a Pew Internet and American Life Project in February 2012 study reports using a search engine is one of the most popular methods to perform a health search on the Internet (Purcell, Brenner, & Raine, 2012). The same survey reports 80% of Internet users have searched for health based information online ranging from information on memory loss and dementia to information on end of life decisions (Fox, 2012). In 2011, citizens searched for new health topics such as information on food and drug safety, childbirth and pregnancy (Fox, 2012; Purcell, Brenner, & Raine, 2012). These new topics were not searched for in previous years. Results of both these surveys (Fox, 2012; Purcell, Brenner, & Raine, 2012) indicate not only is health information searching

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a popular type of search but the scope and range of searches performed is also growing. A more recent survey indicates 77% of Internet users in the United States search online for health information (Fox, 2014). In Europe, 6 out of 10 people go online to search for health information (Boyer, 2013). Results of a survey conducted by Health on the Net Foundation indicate British citizens search for health information at least once a day (Boyer, 2013). American, European and British online health seekers indicate health information obtained from the Internet helped them improve their health knowledge (Higgins et al., 2011). Search engines, websites run by organizations, homepages owned by doctors, online support groups and blogs authored by health advocates are commonly used as the domain to perform a health search (Higgins et al., 2011).

Pew Internet survey results indicate 52% of smartphone owners, have used their phone to look up health or medical information and 9% of smartphone owners have downloaded an application specifically to track or manage health issues (Pew Research Centre, d.u). Seven in ten U.S. adults have tracked a health indicator for themselves or for someone else using a mobile device (Pew Research Centre, d.u). Thus, health concerns have also moved to the mobile sphere. Results of a research study indicate that search engines are more extensively used to search for health information in comparison to social media applications (De Choudhury, Morris, & White, 2014). The premise behind source preference is distinct. Online searchers use search engines to learn about general information and health conditions while social media applications are used to gather information about the impact of health conditions and for deriving a general understanding about medical procedures (De Choudhury, Morris, & White, 2014). Results of these research studies indicate aspects of online information searching are well researched in developed countries and there is a wealth of information pertaining to health information searching.

Online health information searching is slowly gaining popularity in South East Asian countries that fall under the category of developing economies (SEADE) (International Monetary Fund, 2014). However, research studies pertaining to the online health information searching scene in SEADE is scarce. Results of a research study conducted at two companies in Malaysia indicate online health searchers are mostly female university graduates aged between 18-29 years (Saad, 2013). Among topics searched for are information about diet, nutrition, vitamins or nutritional supplements (Saad, 2013). In an urban city in Malaysia, health searchers dominantly use Google however sites like MedlinePlus, Medline, The Mayo Clinic, The National Institute of Health Website (NIH), The Johns Hopkins University Website and WebMD are also utilized (Inthiran, Alhashmi, & Ahmed, 2013). In a rural community in Sarawak, East Malaysia, online information sources are used to obtain health information (Mohd-Nor, Chapun, & Justin, 2013). Undergraduate students in Thailand use online sources to obtain information on general health, disease and treatment, and nutrition (Kitikannakorn & Sitthiworanan, 2014). A research study of SEADE parents online health information searching behavior indicates parents are motivated to search for information online for doctor and non-doctor visit purposes. Google is the most popular search engine used to perform a health search (Inthiran & Ireous, 2015). While much can be gleaned from these research studies what remains unknown is the online search experience of SEADE searchers.

Search experience is pertinent because performing an online health information search is not a trivial task. To a certain extent it requires expert knowledge, the need to issue technical or medical

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terminology and the ability to provide context (Nadkarni, 2000; Can & Baykal, 2007). In addition, the inherent nature of a health search makes it dissimilar to other types of searches (Hersh, 2009). Due to lack of medical knowledge and experience, lay online health searchers in SEADE may not be satisfied with the search experience. In general, research studies conducted in developed countries indicate positive and negative connotations in relation to online health search experience. It is postulated that online health searchers in developed countries are more experienced, mature and have higher health literacy rates in comparison to SEADE online health searchers (Chen, Tsai, & Wang, 2014). SEADE online health searchers being new to the process of health searching may experience a less than satisfactory search experience. As such our aim is to describe the search experience of SEADE online health searchers. Specifically, the research question of how SEADE online health consumers feel (sentiments, emotions) after having performed a health search is tackled. Our focus is on SEADE because these countries are poised to catch up with worldwide advances in information technology and economic growth in the coming years (Binh, 2014). There are technological plans in place to provide citizens of SEADE with the best possible and affordable ICT access (ASEAN ICT Masterplan, 2015). In addition, these countries are beginning to establish free and publicly available health portals for their citizens in an effort to educate citizens and to improve health literacy (Health Information Today, 2012 and Wee, 2013).

## 2. Related Work

The area of online health search experience has yet to be researched in SEADE. Thus in this section, literature related to online search experience in developed countries is reviewed to set the scene. Early research studies indicate online health consumers experience common issues mainly, information overload (Can & Baykal, 2007), the inability to comprehend search results (Eysenbach & Kohler, 2002) and the inability to locate information (Yang et al., 2011). It is possible to suggest that these issues are somewhat related. For example, due to a health consumers inability to comprehend search results a health consumer may be under the impression that he or she was not able to locate required information. Difficulties experienced during a health search may result in searchers experiencing search related stress issues, abandoning the search and maybe becoming emotionally tired and distraught. Conversely, other research studies indicate that while the search process was suboptimal, health consumers successfully found answers to their queries in an average of 5 minutes (Eysenbach & Kohler, 2002). In addition, health searchers also indicated obtaining new knowledge from the search process (De Choudhury, Morris, & White, 2014). In the United States online health searchers indicate information saturation and fatigue as key reasons for terminating a search process (Payne, Lister, West, & Bernhardt, 2015). This shows that over the years online health searchers have experienced positive and negative search experiences.

Research studies pertaining to parents search experiences for their children have also been analysed. Results indicate parents were dissatisfied with the returned results and report feeling frustrated as they were not able to assist their children in their times of need (Yang et al., 2011). This added to the feeling of helplessness. Main negative experiences were the inability to find answers and

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locating incomplete answers (Khoo, Bolt, & Babi, 2008). Parents with children under the age of five suffering from acute childhood illness indicate their pre-consultation search activities using Internet resources were not successful (Jones et al., 2014). In other cases parents of pediatric patients struggled to find valid and authoritative information (Kostagiolas et al., 2013). In most cases the sheer volume of information caused an information overload problem (Gage & Panagakis, 2012). Parents also report being emotionally dissatisfied with their search experience. Parents of children suffering from cancer indicate they feared what they might find on the Internet and were constantly overwhelmed by conflicting online resources (Gambini, 2012). They found information on the Internet untrustworthy, inaccurate and frightening. In some cases doctors played the role of an advisor by telling parents not to search for their child's condition on the Internet because this experience will not be a pleasant one (Kostagiolas et al., 2013).

On the other hand, parents with children undergoing surgical procedures indicate information they had found on the Internet was easy to understand. Most parents specifically used the Internet to learn more about diagnosis and surgical procedures (Boston et al., 2005). This allowed parents to ask specific questions and to be more informed of their child's condition and treatment options (Kostagiolas et al., 2013). Parents experienced productive sessions from using the Internet to search for health information. In a case study analysis of rare disease diagnosis, parents were able to make correct diagnosis using Google (Bouwman et al., 2010). Mothers with newborns indicate that they were able to locate information on the Internet which was not explained by their doctor. Mothers found that information on the Internet helped them make informed decisions when deciding on treatment options (Berhardt & Felter, 2004). Parents also value social and emotional support they received via the Internet through chat forums (Scharer, 2005; Feldman, 2007). Mothers value Internet forums as a safe and non-judgemental way to share experiences (O'Connor & Madge, 2004). Results indicate parents also experience positive and negative search experiences when searching for health information for their children. While the main issues experienced appear to be similar, there seems to be an emotional connection to the experience.

The increase in health searching online has also caused some side-effects. Online health consumers express increased anxiety when searching for health information. Anxiety levels increase when the following criteria are met in the search results page: the mention of serious conditions, the presence of escalatory terminology and the lack of presence of non-serious conditions. The term 'cyberchondria' is coined to describe this symptom (White & Horvitz, 2009). In addition, health-related Internet use is associated with small but reliable increase in depression (Bessiere et al., 2010). There are several reasons for the increase in depression rate. Among them are: online health consumers are not able to distinguish between good and poor quality medical advice, only one third of users verify Internet information with their doctor to ensure accuracy and non-medical professionals are sometimes misinformed from factually incorrect websites. This may lead to inaccurate self-diagnosis, poor health behavior or potentially unnecessary worry for the ill and healthy. While it is encouraging to see the Internet being used to perform health based searches, the after-effect of a search may create false alarms and untoward repercussions to health consumers.

The health searching scene in SEADE is at its infancy, thus it is hypothesized that SEADE online health searchers may find the search experience challenging and have more negative connotations

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related to the search experience. There are several reasons for this claim. First, in general, SEADE citizens have low health literacy (Chen, Tsai, & Wang, 2014). In addition it is acknowledged that health consumers from high-income countries demonstrate higher level of health literacy (Nutbeam, 2000). Countries in SEADE fall between the middle to low income category thus participants originating from these countries may demonstrate low health literacy. This in turn could influence search experience. Second, participants from high income countries seek health information actively (Anker, Reinhart, & Feeley, 2011). This practice of actively seeking health information could provide health consumers with more confidence. On the other hand, SEADE health consumers' sporadic practice of searching for health information may only lead to irresolute search experiences. Third, it may be possible that citizens in SEADE would require health information to be provided in the local language (Why Language Matters for the Millennium Development Goals, 2014). Fourth, citizens in developing countries lack proper health knowledge which in turn influences their ability to seek out and understand health information (Raj et al., 2015) and could negatively influence search experiences. In addition, the disparities in access to health information in developing countries (Berkman et al., 2004) would only hinder SEADE health consumers from experiencing a satisfactory search experience. For these reasons it is believed that SEADE health consumers' search experience would differ from those reported from more developed countries. Hence, it is pertinent to understand the search experiences of SEADE online health consumers, so that relevant measures can be taken to improve SEADE online health consumers search experience.

### **3. Methodology**

A purposeful homogenous sampling technique was used. Participants were recruited via call for participation notices placed in universities and on bulletin boards at community centres. The snowball technique was also used. Participants contacted the researcher and an appointment was set up at a convenient location and time. Participants had to be 18 years or above. Participants had to be a citizen and residing in a SEADE country, could not be from the healthcare or allied healthcare profession and must have performed an online health search prior to participating in this study.

#### *3.1 Data Collection Procedure*

A semi-structured face to face interview and questionnaire was used. The English language was the medium used to conduct the interview. The questionnaire was designed to collect socio demographic details, general search experience and health search experience. The interview contained open ended questions relating to search experience. Interview questions were adopted based on a previous research study (Kostagiolas et al., 2013) and based on the authors' own research questions. The semi-structured interview was used to collect information for a larger study (Inthiran & Soyiri, 2015) but for the purpose of this study only questions pertaining to search experience are provided. Specifically results for the following questions are presented: i) what was your overall search experience

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like? and ii) could you explain why you felt this way? The interview was audio recorded.

A pilot test was conducted prior to the main experiment. The pilot test was conducted with five participants. As a result of the pilot test, interview questions were fine tuned and the sequence of the questions were re-ordered. Results of the pilot test were not reported. Each interview lasted for an average of fifteen minutes. The longest interview session for this study was twenty minutes and the shortest was ten minutes. The main experiment took place after the pilot test. At the beginning of the interview, participants were informed of the purpose of the research study. Participants were given an explanatory statement and consent form.

### *3.2 Data Analysis*

Results from the questionnaire were analyzed using descriptive statistics. The audio recording was transcribed verbatim. This technique was selected to allow close links to be created between the data and the researcher (Strauss & Corbin, 1998). The open coding method was used and coding categories were derived inductively from the audio recording to fit the grounded theory approach (Strauss & Corbin, 1998). A master list of codes was created first, which was based on induction. These codes were revisited after every third participant. The codes were then reduced to themes using the constant comparative method. The author conducted the transcription, derivation of codes and themes. An independent researcher cross checked the transcription, codes and themes based on the audio recording. This was done to increase the validity of the results.

### *3.3 Participants*

There were 50 participants in this study. There were 30 female and 20 male participants. Participants' average age was 36 years (SD=4.7). Participants' education qualifications ranged from a diploma to a PhD. All participants were working professionals in various fields such as business management/marketing, engineering, information technology, administration, consultants and business owners. On average participants had a general search experience of 15.9 years (SD=4.1). Participants had an average health search experience of 6.6 years (SD=2.3). Participants searched for health information as and when they needed to do so. The majority of searches were performed for themselves or for family members. In some cases the searches were performed for a friend or work colleague. The time duration of a search ranged from 5 minutes to 45 minutes. Participants comprised of the following nationalities: Malaysian (40%), Indonesian (24%), Thai (20%) and Cambodian (16%). Google was the main source used to perform a health search with 80% of participants solely performing a search using this search engine. The remaining 20% of participants indicated using Google and specialized health sites such as WebMD, National Health Services, National Institute of Health and hospital websites. Minimal (2.5%) participants reported using social networking applications such as Facebook groups to perform a health search.

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## 4. Results

Participants reported more positive than negative search experiences as a result of performing an online health search. Only 10 participants indicated a negative search experience. Participants either had a positive or negative search experience to report; no participant had experienced both positive and negative experiences in the past. In the following sections, descriptions of these experiences are provided.

### *4.1 Negative Search Experience*

The information overload issue was the main negative concern. Participants complained that there is too much information on the page and that information on the page is also not properly structured. This made the process of searching for information cumbersome. In some cases participants lamented that there were too many links on the page.

- Participant A: Information is good but there is too much information, and information is all over the place.
- Participant S: There are too many links... just too much information on the page
- Participant M3: ... I went through a lot of sites and then I get confused and I do not know what to click on

Participants also reported being distracted on the page with pop ups and advertisements which disturbed their concentration.

- Participant A: There are too many pop ups and advertisements. Why should they appear?
- Participant M: Some places have too many distractions... weight loss advertisement appears all over

Participants indicated information found disturbed them emotionally and mentally. This led to fear and to a certain extent limited the search activity from proceeding further. As a coping mechanism some participants questioned the comments and arguments presented on the site while others ignored any serious implications presented on the page.

- Participant M: sometimes I get scared... but I don't take things too seriously
- Participant R: ... I get disturbed emotionally; sometimes information that comes out for a simple situation can take you up to cancer ... it is disturbing
- Participant M1: some of the items you find are unfounded ... they don't explain how they arrived at this information ...
- Participant S1: if I am scared off any information I will just ignore it ... I have to think positively ...

In summary, negative connotations are due to three main reasons: information overload and page setup issues distractions on the page, and disheartening information.

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#### 4.2 Positive Search Experience

On the contrary participants who reported having a satisfactory search experience indicated that it was easy to locate and read information. Salient benefits included the ability to satisfy the thirst for knowledge and become less insecure about a medical condition.

- Participant R: It was easy to locate information and it was complete
- Participant T: I get what I want from several links
- Participant B2: Information was easy to read; it was simple
- Participant M: ... I became less insecure of the health situation after reading information. I am more informed now ...

Participants who used social media applications were amazed at the response rate and speed of feedback and interactivity of members on Facebook community groups.

- Participant R: ... immediately people from around the world provide information ... they are very fast ... you can get a whole discussion going from a simple post

Results also indicate participants use post search outcomes as a measure of search satisfaction. For example, participants were satisfied when information helped in the recovery process of an illness. The same is true for when information found coincided with diagnosis and treatment recommended by the doctor. This indicates participants' perception of the online search experience covers aspects beyond the search session.

- Participant M2: ... information that I found helped my recovery ...
- Participant M3: ... if it matches with information from the doctor then I am happy ... actually there was one situation where I think the doctor found information from the Internet (from the same page I read) because he was saying things exactly as what I have read ...

In summary, positive connotations are due to three main reasons: easy to locate information, quick response rate, and findings similar to what doctor said and helpful to recovery.

## 5. Discussion

Results of previous research studies indicate online health searchers experience positive and negative experiences. Results of this research study also indicating the same albeit more participants indicate positive connotations as a result of the search process. In comparison to previous literature, results of this study provide some similarities and differences as to why participants experience these sentiments. Results of previous research studies indicate participants experience an information overload issue (Can & Baykal, 2007; Gage & Panagakis, 2012) and can be disturbed emotionally

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and mentally (Gambini, 2005; White & Horvitz, 2009; Bessier et al., 2010). Results also indicate the same (information overload), however additionally participants indicate being distracted by advertisements, pop ups on the site and dissatisfied with the structure of the page. In general, authoritative health sites such as WebMD and government health sites do not have pop up advertisements on the page. Results of this survey clearly indicate that the type of pop ups that are considered distracting are weight loss and advertisements type pop ups; however, we note occasionally that some authoritative websites like the American Cancer Society may have a pop up (for donation) and provide the ability to participants to remove the popup. Moreover, these pop ups only appear from time to time and are not a permanent fixture of the site. Thus, the type of advertisement and freedom of the searcher to be in control of removing the popup advertisement is important. This suggest that participants in SEADE were not using authoritative sources when performing the search.

Participants also indicate issues with the style, format and structure of the page. This clearly provides implications for the need to redesign health pages to suit different categories of users. For example this might include the ability to identify a searcher based on generic categories like novice, intermediate and expert. As such, a user who identifies himself as a novice could be given pages that are simple and clean (without hyperlinks). Should the user be interested in more detailed results, the intermediate profile could be selected. Thus, the searcher would have the freedom of obtaining simple or more technical information. Similarly, the same strategies could be applied to returned results. For example, returned results should have an indicator or the technicality level. A data mining tool could be used to rate the technicality level of a page. Thus, aside from only being returned with results, participants would also have an indicator of the page. Hence, participants would also be provided with the freedom to select results accordingly. This strategy would reduce negative connotations associated with the structure and style of a page.

Results of previous research studies indicate participants experienced information saturation (Payne, 2015) search fatigue (Payne, 2015), were unable to locate authoritative or trustworthy information (Gambini, 2012), found conflicting information (Gambini, 2012), found incomplete answers (Khoo, Bolt, & Babi, 2008) and were not successful at obtaining relevant results (Khoo, Bolt, & Babi, 2008). However, results of this research study did not indicate these issues. On the contrary results of this study indicate participants found it easy to locate information, and that information found was complete and easy to read. Perhaps participants only performed superficial types of searches rather than in-depth critical searching. This indicates that SEADE online health searchers were elementary at their search approach due to low health literacy (Chen, Tsai, & Wang, 2014). It is postulated that citizens in developed countries performed thorough appraisal throughout their search sessions. This indicates the level of maturity and depth of the search demonstrated by online health searchers in developed countries. It is also hypothesized that the source and search domain used to perform the search may have influenced the experience. For example, SEADE online searchers mainly perform searches on Google, and information returned may be suitable for layman consumption, whereas online searchers in developed countries may use medical specific or technical sites. Medical, scientific literature and technical sites provide detailed explanation and scientific information, and the information may be harder to comprehend especially for searchers without medical background.

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As for positive experiences, results of previous research studies indicate participants found information easily (De Choudhury, Morris, & White, 2014) and learnt more about a health concern (Boston et al., 2005). Similarly, results of this research study also indicate the same findings, but results of this research study do not indicate participants making correct diagnosis, locating information not explained by the doctor or making informed decisions as reported in previous research studies (Boston et al., 2005; Bouwman et al., 2010; Kostagiolas et al., 2013). This indicates SEADE online searchers perform an online search to obtain basic understanding of a health situation, but they rely on doctors to take full responsibility for diagnosis and treatment. SEADE online searchers are also satisfied when they obtain responses from social media applications quickly. While results of research studies conducted in developed countries indicate participants use social medical applications and platforms, the response rate and level of interactivity did not seem to be highlighted as criteria (Scharer, 2005; Feldman, 2007; O'Connor & Madge, 2004). This indicates participants in developed countries and SEADE online searchers have different evaluation criteria. It is also postulated that the nature and structure of communication that took place on social media differed between countries.

Interestingly, post search activities also influenced search experience, particularly when information found helped in the recovery process and when information found coincided with the doctors' advice. The influence of post search activities on search experience is also particular to SEADE searchers. It is postulated that some SEADE searchers may not have the confidence to evaluate the search session on their own and thus relied on external factors (such as recovering from a health condition and with the doctor provide concurring information) to determine search session efficacy. This only seems to be the case for positive search experiences as participants do not report negative connotations when information found did not match consultation advice given by the doctor or when information found did not help in the recovery process. SEADE online searchers do not indicate having spoken to the doctor about having searched for information or having a conversation about information found. In this sense, it appears that SEADE online searchers take a more passive role. This could be due to the socio cultural differences that exist in South East Asian countries (Claramita, Van Dalen, & Van der Vleuten, 2011).

There is a clear difference in evaluation strategies employed by online health searchers in developing and developed countries. Similarly, there is a clear explanation given as to why a search session is classified into a positive or negative search session. Negative experiences are classified into page style and structure, distracting pop ups and disheartening results. Positive experiences are classified into easy to location information, fast response received and post search activities.

## **6. Limitation**

This research study is not without limitations. Results of this research study cannot be generalized as this user study was conducted on a small scale and did not include participants from all representative SEADE countries. Similarly, we did not ask further or more probing questions in relation to what could be done to turn negative search experiences into positive ones.

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## 7. Conclusion and Future Work

Results of this research study provide preliminary information and understanding on the search experience of SEADE online health searchers. In addition to contributing to the existing literature in relation to online health information searching this research study provides insights from South East Asia along with theoretical and practical contributions. In future work, the plan is to perform a larger user study to explore other aspects of online health searching, such as details of the search session, information sharing activities and post search activities. It is hoped that in a larger scale study, socio demographic characteristics of a SEADE searcher could be used to form links with search experience.

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