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Perceptions of Bruneian Clients about Online Medicine Information

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Abstract

Objectives: This study aimed to explore the perceptions of clients in Brunei Darussalam about online medicine information and to investigate determinants for the use of preferred medicine-related websites.

Methods: Bruneian clients who met the eligibility criteria were purposively sampled and asked to fill out a structured questionnaire. An in-depth interview was also conducted to triangulate the survey data.

Results: A total of 189 respondents completed the survey with the response rate of 75.6%. Half of the medicine information seekers (55.6%) were women and mostly between the age of 18 and 49 years. The majority of the respondents (90.5%) accessed the Internet from home, and 49.2% spent approximately 1 to 2 hours searching for the required medicine information. They mostly perceived searching online medicine information was speedy and convenient (84.7%). Information on side effects and indications of drugs (87.3% and 79.4%) was largely sought on the Internet. Most respondents (79.4%) were satisfied with the retrieved medicine information. Determinants for the use of medicine-related websites were not detected.

Conclusions: Clients conveniently obtained medicine information from the Internet aside from seeking advice from physicians and pharmacists. Their online medicine information needs and information reliability merit further studies.

Key words

Perceptions; Clients; Medicine information; Internet; Brunei Darussalam

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Introduction

Medicine information has dramatically increased over the past 10 years, and the Internet has proved to be an important source of the information.[1] Nowadays patients or consumers have actively been involved in their health care and need information to make a decision about medication use.[2] To feel in control of their own health, they prefer to seek health information and treatment options on the Internet.[3] Additionally, Peterson *et al*. [4] pointed out consumers' use of online information affects their attitudes towards the medication use and adherence. Their perceptions of online medicine information therefore need to be fully investigated.

A study of Pew Internet and American Life Project [5] reported in 2004 that 26% of American adults have searched the Internet for prescription drug information, but few trust the online drug marketplace. Moreover, most British adolescents perceive the Internet as a useful source for finding health and medicine information.[6] In Brunei Darussalam, more than half of the population are classified as Internet users.[7] Some of them have accessed the Internet to check medicine information, as evidenced by requesting clarifications from doctors or pharmacists for the information that they received from the Internet. Nevertheless, their perceptions and needs for medicine information on the Internet remained unexplored.

As there was no previous study on opinions of patients or customers about online medicine information in Muslim countries or in Brunei Darussalam, this study was intended to investigate clients' perceptions of over-the-counter and prescribed medicine information available on the Internet, and to examine determinants for the use of preferred medicine-related websites. The term 'Bruneian clients' was used here to represent both patients and customers residing in Brunei Darussalam. The study findings would benefit pharmacists, other healthcare professionals and clients in terms of online medicine information use and information seeking behaviours.

Methods

The study was a public survey that was approved by the Brunei Darussalam Ministry of Health. It was conducted from November 2008 to August 2009. Details of the methodology are elaborated below.

Study population and sample. Bruneian clients who were healthy or being treated for a disease aged 18 and over, willing to participate in the study, and utilized the Internet to search medicine information were included in the study. Exclusion criteria embraced those who could not understand the questionnaire. A sample size of 96 was determined according to the approximate number of Internet users (i.e. 199,532 persons [7] in 2008), 50% of online medicine information seekers, and 10% margin of errors at a 95% confidence level. When a response rate of at least 50% was contemplated, 192 copies of the questionnaire were required for distribution. Nevertheless, a total of 250 copies was planned for the survey in order to obtain more respondents.

Study instrument. A structured questionnaire was developed based on a pilot study and relevant literature. The questionnaire was primarily prepared in English, but a translated version of Bahasa Malaysia was also available if needed. It comprised of 21 questions with a series of open- and closed-ended formats. The closed-ended queries offered choices with the nominal scale, e.g. 'yes' or 'no'. The questionnaire was divided into three sections, i.e. respondent's views on searching medicine information on the Internet, perceptions of online medicine information, and respondent's details. All questions were carefully constructed for ease of reading and interpretation. The questionnaire was then checked for content validity by one expert and three pharmacists, and piloted in nine clients. Amendments were made to the questionnaire, such as wording and the sequence of the questions, based on the comments and feedback to improve the overall comprehensiveness.

Survey and data analysis. To conduct the survey, 250 copies of the questionnaire, either hard copies or electronic files, were dispatched to clients in all districts through healthcare professionals, e.g. pharmacists or nurses, during March – April 2009. The questionnaire copies were distributed to reflect the number of population in four districts of Brunei Darussalam, i.e. Brunei-Muara (150 copies), Belait (50 copies), Tutong (30 copies) and Temburong (20 copies). The population in the country was estimated in 2009 at 406,200.[8] Brunei-Muara, where Bandar Seri Begawan the capital is located, was the most populated (69.8%) followed by Belait, Tutong, and Temburong in a forest reserve (16.5%, 11.2%, and 2.5%, respectively).

The persons who met the eligibility criteria were contacted by the practitioners using a purposive or snowball sampling, i.e. where existing clients recruit future ones from their acquaintances. Moreover, the researcher (RHMS) performed an in-depth interview with 10 clients using all questions of the questionnaire so as to triangulate the survey data. Verbal informed consent had been obtained from the potential participants before they agreed to fill out the questionnaire. One month after that, reminder letters or e-mails were sent to the clients in order to remind them of completing the questionnaire. All completed questionnaires were compiled, and data were analyzed using descriptive statistics in PASW Statistics 18 (SPSS-IBM Co., Chicago, IL). A Chi-squared test was also used to test the determinants for the use of medicine-related websites with the significance level (α) set at 0.05.

Results

In this study, 189 respondents completed the questionnaire with the response rate of 75.6% (189/250). Of which, 177 were hard copies and 12 Words files. The respondents' characteristics are demonstrated in Table 1. The number of females was marginally higher than males (55.6% and 44.4%), and their age mostly ranged from 18 to 49 years old, with the mean age of 36.4 years (SD 10.3). Approximately two-thirds of the respondents were working in the government sector. The majority (61.9%) had completed their diplomas or undergraduate degrees, and 73.5% lived in Brunei-Muara that is the largest district.

Perceptions of searching medicine information on the Internet. As shown in Table 2, the majority of respondents (90.5%) usually accessed the Internet from their homes, followed by workplaces and cyber cafés. Reasons for searching online medicine information included quick access (84.7%) and limited time to discuss with physicians or pharmacists (25.4%). Other reasons (12.7%) were to know the medicine content and to develop further understanding of diseases and relevant medicines. Half of them (49.2%) spent 1 – 2 hours searching medicine particulars. When asked about preferred websites relating to medicine information, more than three quarters (77.8%) did not specify any preference. However, 33 medicine-related websites elaborated by some respondents are listed in Table 3. Examples of preferred websites embraced Mayo Clinic, NetDoctor, and Medicines.org.

With respect to web search engines, they mostly utilized Google (86.2%) and Yahoo (34.9%) owing to the ease of use and provision of a wide range of information. A metasearch engine, Mamma (www.mamma.com), was also stated. Most of them faced some problems about slow Internet speed (39.2%) and information overload (35.4%). From their points of view, the important features of medicine-related websites should include up-to-date, accurate and reliable information and ease of searching medicine details they needed.

Perceptions of online medicine information. In Table 4, top 5 topics of medicine information embraced side effects, indications for use, how to use the medicine, precautions, and mechanism of action. The reasons for this are that they needed to understand more about the topics (76.2%) and to help them comply better with the prescribed medication (54.0%). They mainly used the searched medicine information for themselves (69.8%) and family or relatives (56.6%).

The majority (79.4%) listed the medicine names they sought from the Internet. The most common medicine groups reported were gastro-intestinal,

cardiovascular, respiratory, central nervous systems, and anti-infective medicines. For instance, the gastro-intestinal medicines cited were omeprazole, Buscopan® (hyoscine butylbromide), and loperamide. Some examples of cardiovascular medicines mentioned included amlodipine, atenolol, and atorvastatin. Cough and cold remedies as well as anti-asthmatic medicines were the most commonly sought medicines in the respiratory group. Other respondents also looked for information on herbal and traditional medicines from the Internet. Most respondents (79.4%) seemed to be satisfied with the retrieved medicine information, but few were not content with it. A couple of negative reasons, with the respondent codes in the brackets, included:

"Least information and difficult to understand" – (BM13)

"Information should be centralized and managed by appropriate government agency." – (BM50)

"Not reliable" – (BM52)

"Not all the information you want to know is there" – (BM108)

In addition to the Internet usage, respondents primarily selected physicians, medicines information leaflets and books as their medicine information sources (58.7%, 57.7%, and 49.2%, respectively). Only a handful of clients (11.6%) made additional comments, but nearly all of them expressed favorable attitudes towards the online medicine information.

Determinants for the use of preferred medicine-related websites. In Table 5, the degrees of associations between respondent details (i.e. gender, age groups, occupation, education, and satisfaction with medicine information) and the use of medicine-related information websites were very low, i.e. ranging from 0.5% to 13.3%. There was no significant association of these factors (all P values > 0.05). Thus, determining factors for the use of preferred websites were not established in the study.

Discussion

Nearly two times as many as required respondents (189/96) completed the survey. The results reflected the views of medicine information seekers who were females in a slightly higher proportion than males, aged below 50 years, and well educated. The similar pattern of gender and age groups was also found in other studies.[9-11] Women are more likely than men to browse the Internet for health and medicine information on account of their care-taking roles[9,10]. The age group in the range of 18 to 49 years tends to search medicine information on the Internet [11], as the advanced technology is more attractive to this generation; the World-Wide Web was just developed in 1989 [12]. They are more computer literate and able to seek medicine information for themselves and other family members. However, a study conducted in gastroenterology patients revealed most Internet users seeking health and medical information were in their early 50s and had the chronic diseases[13]. These contradictory results could be best explained by the Wilson Model [14] that asserted individual needs for information underpin their information seeking behaviors.

A very high percentage of respondents accessed the Internet at home, as they could leisurely browse webpages in their own time roughly 1-2 hours. Most of them made use of the Internet in order to get the medicine information rapidly and to reduce the appointments with physicians or pharmacists. Bessell and his team [15] also found that patients or customers also seek a wide range of online drug information to resolve conflicting advice and to obtain information on alternative treatments as well as additional information about the benefit and risks of the prescribed medications. Only one-fourth of the clients had their preferred medicine-associated websites. To most people, they would probably be familiar with the medicine-related websites only after they had used a search engine that directed them to the sites. It should be noted that the well-know database, Drugs.com (www.drugs.com), was not mentioned by any respondents probably owing to its infrequent use in the country.

In this study, Google and Yahoo were the most cited search engines. One possible explanation, as confirmed by our findings, is that these search engines are fast to access and regularly updated with links to worldwide websites.[16] Since the Internet is a free medium that anybody can put in all types of information, the public should have skills in evaluating information. Without the appraisal skills, they would misjudge the information, receive excessive information and be easily confused.[10] Misinterpretation of online medicine information may lead to anxiety and poor compliance with drug therapy.[4] However, an organization, such as the Health on the Net Foundation (www.hon.ch), that accredits health information websites can be of help with the accurate and reliable medicine information. As the side effects and indications of medicines were mostly sought by the clients, it implied the clients were very concerned about the medicines they have taken and wanted to know more about the topics. This was partly comparable to a survey of UK medicine information help lines [17] that found the most common queries received by the public are adverse effects, dosage and administration, and medicine interactions including alcohol.

Almost 80 percent of the respondents were satisfied with the searched medicine information, for all answers to non-judgmental questions, i.e. side effects, indications or other medicine details, could be easily found online to meet their needs and expectations. Some respondents were disappointed with the medicine information, possibly because they did not get the required data. In case they obtained the needed information, they might find it difficult to comprehend or insufficient to clarify their thoughts. This depends on their abilities to search, filter, interpret or evaluate the information.[6] Physicians, together with leaflets and books, were mostly construed as the essential sources of medicine information. It signified most Bruneians still preferred to discuss with doctors medicines and related information from the Internet, as they thought physicians are knowledgeable about medicines. Pharmacists in this study came fourth as the preferred drug information source. Hence, it is vital that pharmacists' roles as drug

experts should widely be publicized, and they could exploit or provide reliable drug information on the Internet[18].

Limitations

It was observed during practice that differences in gender and age groups likely determine the clients' use of medicine-related websites. People who worked in healthcare settings or had relatives with health services background tended to have their preferred medicine websites. Therefore, their occupation and education background seemed to affect the website usage. Equally important was the observation that clients who were satisfied with their medicine information were likely to have preferred websites. However, the statistical test did not confirm these determinants, as no association between these factors and the use of medicine-related websites could be found. It should be noted that with the small sample, i.e. 42 respondents who had preferred websites, the statistical power is not enough to detect the associational significance. Additionally, there might be other factors involved in the use of preferred medicine websites, such as clients' awareness and the quality of websites, which were not investigated here.

Conclusion

This study could investigate the perceptions of patients and customers about medicine information on the Internet and examine determinants for the use of medicine-related websites. Most clients affirmed the online medicine information was useful to find solutions to medicine problems, and it was comparatively fast and convenient to access the information on the Internet in their own time. Healthcare professionals, particularly physicians and pharmacists, still play an important role in providing patients with suitable medicine information via face-to-face or Internet consultation. Although the determinants for the use of specific medicine-related websites were not detected, it rendered an insight into the clients' information seeking behaviors. Based on the findings of this study, appropriate guidelines could be developed to help the public search reliable medicine information or design a practical website with all salient features they need. Apart from that, pharmacists and healthcare practitioners may suggest their patients the useful medicine-related websites. Policy makers would also be able to initiate a policy on the appropriate use of online medicine information. More studies are required to explore clients' online medicine information needs, information reliability, and the impact of online medicine information on patient-practitioner relationships. These may enable healthcare professionals to plan for effective counseling schemes in the future.

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Table 1 Respondents' characteristics (n=189)

Characteristic	Attribute	Number of respondents (%)
Gender	Male	84 (44.4)
	Female	105 (55.6)
Age	18 – 29	58 (30.7)
	30 - 39	56 (29.6)
	40 - 49	52 (27.5)
	50 – 59	21 (11.1)
	≥ 60	2 (1.1)
Occupation	Government sector	123 (65.1)
	Private sector	49 (25.9)
	Other, e.g. students	17 (9.0)
Highest education	Certificate	30 (15.9)
	Diploma	73 (38.6)
	Undergraduate	44 (23.3)
	Postgraduate	21 (11.1)
	Other, e.g. high school	21 (11.1)
District	Brunei-Muara (BM)	139 (73.5)
	Belait (BE)	26 (13.8)
	Tutong (TU)	20 (10.6)
	Temburong (TM)	4 (2.1)

Table 2 Perceptions of searching medicine information on the Internet (n = 189)

Statement	Perception	Number of respondents (%)
Place to use the Internet[a]	Home	171 (90.5)
	Workplace	74 (39.2)
	Cyber café	23 (12.2)
	Other, e.g. library, etc.	11 (5.8)
Reasons for use of Internet to get medicine information[a]	To get the information quickly via the Internet.	160 (84.7)
	Not enough time during consultation with the doctor or pharmacist.	48 (25.4)
	Too timid to ask the doctor or pharmacist.	8 (4.2)
	Other, e.g. to know the medicine content, etc.	24 (12.7)
Duration of medicine information search	< 1 hour	75 (39.7)
	1 – 2 hours	93 (49.2)
	> 2 hour	21 (11.1)
Use of preferred medicine-related websites	Yes	42 (22.2)
	No	147 (77.8)
Web search engine for searching medicine information[a]	Google	163 (86.2)
	Yahoo	66 (34.9)
	MSN Search	16 (8.5)
	Other, e.g. Mamma, Ask.com, etc.	10 (5.3)
Reasons for selecting the preferred search engine[a]	Easy to use	129 (68.3)
	Convenient	84 (44.4)
	Broad range of information	114 (60.3)
	Reliable information	47 (24.9)
	Other, e.g. existing on webpage, etc.	8 (4.2)
Problems in searching for the required information[a]	It is difficult to get the information needed	42 (22.2)
	Information is doubtful.	56 (29.6)
	Information is difficult to understand.	55 (29.1)
	The Internet speed is slow.	74 (39.2)
	It provides too much information.	67 (35.4)
	Other, e.g. confusing and wrong info, etc.	25 (13.3)
Important features of a medicine-related website[a]	It is easy to search the information needed	114 (60.3)
	The website gives accurate and reliable info.	102 (54.0)
	Information is up-to-date.	119 (63.0)
	Information is easy to understand.	96 (50.8)
	Information can be quickly located.	99 (52.4)
	Author's qualification and contact details	43 (22.8)
	The website is accredited (officially approved).	67 (35.4)
	The presentation/layout looks professional.	39 (20.6)
	Other, e.g. no advertisement, etc.	11 (5.8)

[a] **More than one answer could be selected, thus making the total percentages over 100.**

Table 3 List of medicine-related websites specified by respondents

	Preferred Website		Preferred Website
1.	http://www.mayoclinic.com	18.	http://www.medweb.com
2.	http://www.netdoctor.co.uk	19.	http://www.medline.com
3.	http://www.medicines.org.uk	20.	http://www.rphworld.com
4.	http://www.pharmacytoday.org	21.	http://www.who.int
5.	http://www.mydr.com.au	22.	http://www.pubmed.com
6.	http://www.mims.com	23.	http://www.epocrates.com
7.	http://www.pharmacytimes.com	24.	http://www.patient.co.uk
8.	http://www.srilankapharmacy.com	25.	http://emedicine.medscape.com
9.	http://medlineplus.gov	26.	http://www.rpsgb.org
10.	http://www.herbaline.com.my	27.	https://www.google.com/health
11.	http://www.medicines.org.uk	28.	http://www.pharmj.com
12.	http://www.pharmacy.gov.my	29.	http://www.bnf.org
13.	http://www.womenhealth.com	30.	http://www.jantanhebat.com
14.	http://www.doctoronline.com	31.	http://dir.yahoo.com/Health/medicine
15.	http://www.medscape.com	32.	http://www.rxlist.com
16.	http://www.wikipedia.com	33.	http://www.gnc.com
17.	http://www.natural-medicine.ca		

Table 4 Perceptions of online medicine information (n = 189)

Statement	Perception	Number of respondents (%)
Topics of online medicine information searched[a]	Brand name of the medicine	77 (40.7)
	Generic name of the medicine	78 (41.3)
	Indication for medicine use	150 (79.4)
	How to use the medicine	113 (59.8)
	Mechanism of action (how the medicine works)	92 (48.7)
	Strength of the medicine	57 (30.2)
	Side effects	165 (87.3)
	Interactions	66 (34.9)
	Precautions	101 (53.4)
	How to store the medicine	41 (21.7)
	What to do if miss the dose	34 (18.0)
	What to do if overdose	41 (21.7)
	Other, e.g. available medicines, price, etc.	12 (6.3)
Reasons for searching the topics above[a]	To understand more about the related topics	144 (76.2)
	To confirm the information given by the doctors or pharmacy	80 (42.3)
	To comply better with the use of medicines	102 (54.0)
	Other, e.g. curiosity, general knowledge, etc.	17 (9.0)
Person who uses the searched medicine information[a]	Myself	132 (69.8)
	My family or relatives	107 (56.6)
	My friends	50 (26.5)
	Other, e.g. colleagues, students, etc.	20 (10.6)
List the searched medicine names	Yes	150 (79.4)
	No	39 (20.6)
Satisfaction with the medicine information	Yes	150 (79.4)
	No	39 (20.6)
Other preferred source of medicine information aside from the Internet[a]	Doctors	111 (58.7)
	Pharmacy – pharmacists and support staff	86 (45.5)
	Journals	53 (28.0)
	Books	93 (49.2)
	Medicine information leaflet	109 (57.7)
	Other, e.g. family, friends, mass media, etc.	17 (9.0)
Provide additional comments	Yes	22 (11.6)
	No	167 (88.4)

Table 5 Associations of respondents' variables and the use of preferred medicine information websites

Variable	Attribute	Use of Websites (% by row)	Cramer's V value[a]	χ^2 value	P value
Gender	Male	18 (21.4)	0.017	0.055	0.814
	Female	24 (22.9)			
Age group	18 – 29 years	13 (22.4)	0.005	0.004	0.998
	30 – 49 years	24 (22.2)			
	> 50 years	5 (21.7)			
Occupation	Government sector	31 (25.2)	0.133	3.352	0.187
	Private sector	10 (20.4)			
	Other: students	1 (5.9)			
Education	Undergraduate	13 (29.5)	0.109	2.243	0.326
	Postgraduate	3 (14.3)			
	Other: Dip and Cert	26 (21.0)			
Satisfaction with medicine information	Satisfied	35 (23.3)	0.052	0.519	0.471
	Unsatisfied	7 (17.9)			

[a] **Demonstrates degrees of association.**