Factors affecting health-related information seeking among Thai patients

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บทคัดย่อ - งานวิจัยเรื่องปัจจัยที่มีผลต่อการค้นหาข้อมูลสุขภาพของผู้ป่วยในประเทศไทย มีวัตถุประสงค์เพื่อวิเคราะห์ปัจจัยด้านประชากรศาสตร์(เพศ อายุ การศึกษา รายได้) ว่าส่งผลต่อความแตกต่างของข้อมูลสุขภาพที่ต้องการอย่างไร(อาการป่วย การวิเคราะห์อาการป่วย การรักษา การใช้ยา ผลต่อเนื่องจากการรักษา การดูแลผู้ป่วยที่บ้าน อาหารสำหรับผู้ป่วย การออกกำลังกาย) ประชากรเป้าหมายจำนวน 385 คน โดยต้องเป็นผู้ที่เคยค้นหาข้อมูลด้านสุขภาพทางระบบอินเทอร์เน็ต และไม่มีปัญหาสุขภาพขั้นรุนแรง สถิติในการวิเคราะห์ข้อมูลใช้สถิติเชิงพรรณนาและเชิงอนุมาน(การทดสอบที การวิเคราะห์ความแปรปรวน การเปรียบเทียบเชิงซ้อน) ผลที่ได้จากการวิจัยพบว่าข้อมูลที่มีความต้องการมากที่สุดคือผลต่อเนื่องจากการรักษา ส่วนข้อมูลที่มีความต้องการต่ำสุดคือข้อมูลการออกกำลังกาย จากการวิเคราะห์ไม่พบความแตกต่างเรื่องความต้องการข้อมูลอย่างมีนัยสำคัญของผู้ตอบแบบสอบถามที่มีเพศและอายุแตกต่างกัน ส่วนระดับการศึกษาที่แตกต่างกันพบความแตกต่างในเรื่องข้อมูลการดูแลผู้ป่วยที่บ้าน โดยกลุ่มที่มีการศึกษาสูงกว่าจะต้องการข้อมูลมากกว่า และกลุ่มที่มีรายได้แตกต่างกันพบความแตกต่างของข้อมูลที่ต้องการในเรื่องการวิเคราะห์อาการป่วยโดยกลุ่มของผู้ที่มีรายได้สูงต้องการข้อมูลมากกว่ากลุ่มผู้ที่มีรายได้ต่ำกว่า โรงพยาบาลอาจใช้ข้อมูลจากงานวิจัยเป็นพื้นฐานในการสร้างระบบลูกค้าสัมพันธ์ โดยนำเสนอข้อมูลแก่ผู้ป่วยให้ตรงตามความต้องการและเป็นประโยชน์มากที่สุด

คำหลัก – ข้อมูลสุขภาพ; ปัญหาสุขภาพ; เว็บไซต์สุขภาพ; ระบบลูกค้าสัมพันธ์ของโรงพยาบาล;อินเทอร์เน็ต

Abstract— the research purpose is to analyze the health-related information that could be searching through the internet. The hypothesis is the demographic different (gender, age, educational background, and income level) effecting the difference in need for health information (sign of illness, diagnosis, healing, drug, aftereffect, home ward, food for patient, and workout). The population consisted of 385 respondents who used internet for seeking health information and do not have any serious health problem in specific disease. The statistics used are descriptive and inferential (independent t-test, one-way ANOVA, and LSD). The result found that information that most wanted are aftereffect of treatment and the least wanted is workout. There were no significant different in gender and age. The significant different are in educational background (home ward) and in income level (diagnosis). The hospital could use this information as the basic knowledge to create customer relationship management system with the patient by providing specific information to their needs.

Keywords- Health Information; Health Problem; Health Website; Hospital CRM; Internet

I. INTRODUCTION

Internet plays important role in every organization. There is increasing of using internet channel for seeking health-related information [1][2]. The research from [3] found that 74% of respondents used the internet to look for health-related information for both themselves and family member. Research from [4] in 2001, surveyed on website with high quality and trusted health information stated that the number is over 100,000 websites with continuous increasing number. There are lots of surveys [5][6][7][8] during 2003-2006 about health-related information via internet. The research was in US (56-79%), Denmark (62%), Norway (59%), Germany (49%), Poland (42%), Latvia (35%), Portugal (30%), and Greece (23%). In Thailand, there is not explicit number of internet user over the health information seeking, but we believed that the number will also increasing rapidly as pervasive used of smartphone.

The variety of information based on level of correctness, quality, and the trusted source of information. In healthcare service, Internet has been used as the communication channel to provide healthcare information and health service to public, also called e-health [9]. In the past, health-related information usually appeared in the form of written material and all kinds of media from some health organization. Along with the growth of internet and communication technology, people are getting used to receive information through Internet including healthcare.

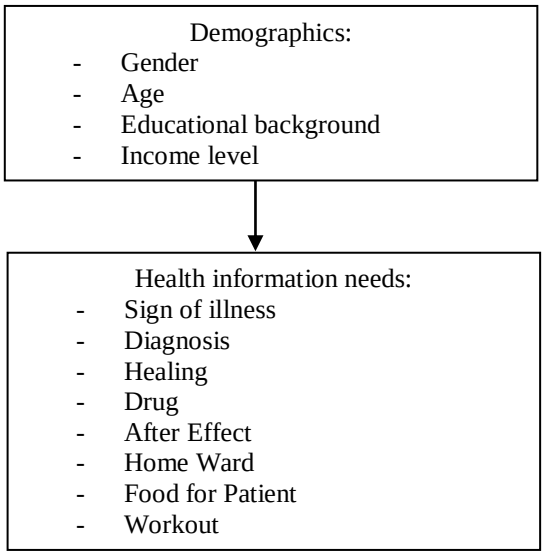
The hospital itself has changed their health service from not only diagnosis and therapy but also to provide other information such as homeward and nutritious. The hospital could use the internet to strengthen the relationship with their patients. Besides providing them with efficient way of treatment, they could also support them with health-related information. Due to the more

intensity of competition among hospital, CRM could be used as another strategic method.

The research objective aims to find the different factor of patient toward the need of health-related information from the internet. The result could be helpful for the hospital to analyze the group of patient and strengthen relationship with them. They can provide more specific information according to what patient's interested and useful for them.

II. Conceptual Framework

The research hypothesis stated that the different demographic characteristics (gender, age, educational background, and income level) affect different health information needs (Sign of illness, Diagnosis, Healing, Drug, Aftereffect, Home Ward, Food for Patient, and Workout).



The questionnaire has been used as a tool with the patient at general hospital in Bangkok, Thailand with 385 populations, age between 35-65 years old during 2017. The populations are the patients and relatives and familiar with seeking health information from internet. For the health condition, they must not be in severe condition of any health problem because we want their answers to be more general, not specific to any disease condition. The selected age between 35-65 years because people in this age are mature enough for taking care of themselves and responsible for their own medical expense.

The dependents variables are gender, age, educational background and income level. The independent variables are the eight categories of health-related information which are sign of illness, diagnosis, healing, drug, aftereffect, home ward, food for patient, and workout. According to the research purpose, we want to provide information more specific to the group of different patients.

III. Literature Review and Related Studies

The meanings of terms used conceive from [10]:

- Sign of illness: is the disease indicator. There are some specific sign of a disease such as weight loss, allergic, weakness, and headache.
- Diagnosis: is the forecasting of disease's outcome after some analysis of patients physical. In general practice, the physician does not give patient a diagnosis unless they ask for.
- Healing: is the attempting method to alleviate the illness from disease. Healing could be in the form of medication, surgery, and approach.
- Drug: is the type of medicine that applies to treat the patient. They also include any substance to cure the injury.
- Aftereffect: is an indirect effect of a therapy or medicine. They are the secondary effect of disease other than the main symptom.
- Home ward: is the process of home health service to the patient after the staying in hospital. This can be done by either the professional caregiver or the family member.
- Food for Patient: is the food that analyzed with the purpose to help patient recovering from their illness. This food could be useful for normal person wanted to stay healthy and prevent the disease.
- Workout: is the activity that creates by the movement of physical body or mental part. Sometimes workout could be used as a treatment to help patient recurring from specific symptom. The normal person also can used workout as a method to stay healthy and fitness.

The research on market segmentation of health information [11] suggested that the groups of people with higher internet used are higher education, metropolitan city dwellers, and healthy people. The residential area was the most important factor for health commodities online shopping. Their result could be used for market segmentation of health products and the study was conducted in South Korea.

The study from [12] has an objective to identify the factor that influences information seeking for healthcare and lifestyle. The findings indicated that factor affecting seeking behavior is health behavior. The benefit to the marketing firm is to promote positive health behavior for the prospect customers. This behavior will increase the motivation for seeking health information.

The income inequality seems to have some association with poor health. There are some researches that suggest the result of income level to the stress, the scarcity of material resources that support health and possible harm

in health care. There is a relationship between income level and the lower life satisfaction in female adolescents but not related to symptom as suggested by research [13]. The study on E-health service has conducted in 7 European countries. As a result, they found the difference between internet user and general population in health status and demographic variable [14].

In the study of internet role on patient-knowledge decision making from Australia, found that healthcare information from internet had impact on decision-making of patient. The affect extent depended on ability of patient to understand and discuss this knowledge with their physician and clinician [15].

IV. Analysis of Data

Analysis of data according to each category using descriptive statistics (frequency, percentage, mean, and standard deviation) displays in table 1-3.

TABLE 1. DISPLAY NUMBER (FREQUENCY) AND PERCENTAGE OF DEMOGRAPHIC DIFFERENCES.

Demographic Category	Number (frequency)	Percentage (%)
Gender		
Male	189	49.1
Female	196	50.9
Age		
35-45 yrs	147	38.2
45-55 yrs	134	34.8
55- 65 yrs	104	27.0
Education		
<Bachelor	188	48.8
Bachelor	168	43.6
Master	26	6.8
> Master	3	0.8
Income level		
Poor	102	26.5
Average	133	34.5
Comfortable	128	33.2
Wealthy	22	5.7

The respondents are almost equal in gender and age. The educational background can be divided into less than bachelor and bachelor in large group. The income level come from rating themselves of the patients when consider their comfortable with living expense. Most of the patients rated income level as average and comfortable with the small amount of respondents that rated themselves as poor and wealthy group. Because we use the target population in public general hospital so we do not have much of the wealthy group.

TABLE 2. DISPLAY MEANS AND STANDARD DEVIATION FOR THE CATEGORY OF HEALTH INFORMATION NEEDS.

Health Information needs	Level of Need			
	$\bar{x}$	S.D.	Meaning	Order
Sign of illness	2.40	0.588	Most	3
Diagnosis	2.35	0.648	Moderate	4
Healing	2.41	0.644	Most	2
Drug	2.41	0.635	Most	2
After Effect	2.45	0.623	Most	1
Home Ward	2.29	0.648	Moderate	6
Food for Patient	2.33	0.644	Moderate	5
Workout	2.26	0.646	Moderate	7

The most information need is aftereffect while the least needed is workout. We notice from the survey that the patients need deeper information than we expect because the aftereffect information is not what most of the website providing. The hospital should keep information easy to understand for the patients and their relatives.

Hypothesis 1: The different demographic characteristics affect different health information needs.

Hypothesis 1.1: The different in gender affects the health information needs.

The analysis of hypothesis using Independent t-test and One-way ANOVA presented from table 3-9 as follows:

TABLE 3. DISPLAY DIFFERENT DEMOGRAPHIC TESTING DATA AFFECTS THE HEALTH INFORMATION NEED, CLASSIFIED BY GENDER

Category of Health Information	t-test for Equality Mean					
	Gender	$\bar{x}$	S.D	t	df	Sig.
Sign of illness	Male Female	2.37 2.44	0.592 0.583	-1.231	383	0.219
Diagnosis	Male Female	2.31 2.39	0.653 0.643	-1.225	383	0.221
Healing	Male Female	2.39 2.43	0.640 0.649	-0.641	383	0.522
Drug	Male Female	2.39 2.43	0.656 0.616	-0.653	383	0.514
After Effect	Male Female	2.41 2.49	0.609 0.636	-1.297	383	0.195
Home Ward	Male Female	2.34 2.24	0.654 0.639	1.500	383	0.135
Food for Patient	Male Female	2.35 2.31	0.623 0.664	0.578	383	0.563
Workout	Male Female	2.28 2.24	0.651 0.641	0.459	383	0.647

* Significant at the statistical level 0.05

The analysis suggested that there are no difference in health information need between male and female.

Hypothesis 1.2: The different in age affects the health information need.

TABLE 4. DISPLAY DIFFERENT DEMOGRAPHIC TESTING DATA AFFECTS THE HEALTH INFORMATION NEED, CLASSIFIED BY AGE

Category of Health Information	Source of Variation	SS	df	MS	F	Sig.
Sign of illness	Between groups	0.192	3	0.064	0.184	0.907
	Within groups	132.406	381	0.348		
	Total	132.597	384			
Diagnosis	Between groups	0.815	3	0.272	0.644	0.587
	Within groups	160.546	381	0.421		
	Total	161.361	384			
Healing	Between groups	0.141	3	0.047	0.112	0.953
	Within groups	159.194	381	0.418		
	Total	159.335	384			
Drug	Between groups	1.913	3	0.638	1.587	0.192
	Within groups	152.712	381	0.402		
	Total	154.625	384			
After Effect	Between groups	0.235	3	0.078	0.201	0.896
	Within groups	149.027	381	0.391		
	Total	149.262	384			
Home Ward	Between groups	1.154	3	0.385	0.917	0.433
	Within groups	159.843	381	0.420		
	Total	160.997	384			
Food for Patient	Between groups	1.019	3	0.340	0.819	0.484
	Within groups	158.087	381	0.415		
	Total	159.106	384			
Workout	Between groups	1.415	3	0.472	1.133	0.336
	Within groups	158.611	381	0.416		
	Total	160.026	384			

* Significant at the statistical level 0.05

The analysis shows no difference in health information need among different age of correspondents.

Hypothesis 1.3: The different in educational background affects the health information need.

TABLE 5. DISPLAY DIFFERENT DEMOGRAPHIC TESTING DATA AFFECTS THE HEALTH INFORMATION NEED, CLASSIFIED BY EDUCATIONAL BACKGROUND

Category of Health Information	Source of Variation	SS	df	MS	F	Sig.
Sign of illness	Between groups	2.383	3	0.794	2.324	0.075
	Within groups	130.214	381	0.342		
	Total	132.597	384			
Diagnosis	Between groups	2.059	3	0.686	1.641	0.179
	Within groups	159.302	381	0.418		
	Total	161.361	384			
Healing	Between groups	1.063	3	0.354	0.853	0.466
	Within groups	158.272	381	0.415		
	Total	159.335	384			
Drug	Between groups	1.749	3	0.583	1.449	0.228
	Within groups	152.876	380	0.402		
	Total	154.625	383			
After Effect	Between groups	1.477	3	0.492	1.269	0.285
	Within groups	147.785	381	0.388		
	Total	149.262	384			

Home Ward	Between groups	3.425	3	1.142	2.760	**0.042***
	Within groups	157.573	381	0.414		
	Total	160.997	384			
Food for Patient	Between groups	0.497	3	0.166	0.398	0.754
	Within groups	158.609	381	0.416		
	Total	159.106	384			
Workout	Between groups	1.555	3	0.518	1.246	0.293
	Within groups	158.471	381	0.416		
	Total	160.026	384			

* Significant at the statistical level 0.05

The study found that difference in educational background affect significantly only for the health information need in home ward. The analysis continues with the discussion to compare of significant difference between each group of educational background by using the Least Significant Difference (LSD).

TABLE 6. POST HOC TEST (LSD) BETWEEN EACH EDUCATIONAL BACKGROUND FOR THE HEALTH INFORMATION NEED (HOME CARE)

Education	$\bar{x}$	< Bachelor	Bachelor	Master	>Master
		2.28	2.33	2.04	3.00
<Bachelor	2.28		-0.51	0.24	-0.72
			0.457	0.078	0.054
Bachelor	2.33			0.29	-0.67
				0.034*	0.073
Master	2.04				-0.96
					0.015*
>Master	3.00				

* Significant at the statistical level 0.05

The study suggested that the higher the education, the more they need information on home ward. The reason behind this might be if the respondents are the knowledgeable one in the family, other could ask for their opinion on the home ward related matter. In other side, they might want these information to take care themselves while staying at home after left the hospital.

Hypothesis 1.4: The different in income level affects the health information need.

TABLE 7. DISPLAY DIFFERENT DEMOGRAPHIC TESTING DATA AFFECTS THE HEALTH INFORMATION NEED, CLASSIFIED BY INCOME LEVEL

Category of Health Information	Source of Variation	SS	df	MS	F	Sig.
Sign of illness	Between groups	0.935	3	0.312	0.902	0.440
	Within groups	131.662	381	0.346		
	Total	132.597	384			
Diagnosis	Between groups	3.466	3	1.155	2.788	**0.040***
	Within groups	157.895	381	0.414		
	Total	161.361	384			
Healing	Between groups	1.694	3	0.565	1.365	0.253
	Within groups	157.641	381	0.414		
	Total	159.335	384			
Drug	Between groups	0.739	3	0.246	0.609	0.610
	Within groups	153.886	380	0.405		
	Total	154.625	383			
After Effect	Between groups	1.551	3	0.517	1.334	0.263
	Within groups	147.711	381	0.388		
	Total	149.262	384			
Home Ward	Between groups	0.608	3	0.203	0.481	0.695
	Within groups	160.390	381	0.421		
	Total	160.997	384			

Food for Patient	Between groups	0.504	3	0.168	0.403	0.751
	Within groups	158.603	381	0.416		
	Total	159.106	384			
Workout	Between groups	1.093	3	0.364	0.873	0.455
	Within groups	158.933	381	0.417		
	Total	160.026	384			

* Significant at the statistical level 0.05

The results showed that the income inequality affect the health information need for diagnosis among patients. The analysis continues with the discussion to compare of significant difference between each group of educational background by using the Least Significant Difference (LSD).

TABLE 8. POST HOC TEST (LSD) BETWEEN EACH INCOME LEVEL FOR THE HEALTH INFORMATION NEED (DIAGNOSIS)

Income level	$\bar{x}$	Poor	Average	Comfortable	Wealthy
		2.32	2.35	2.30	2.73
Poor	2.32		-0.22	0.19	-0.40
			0.792	0.826	**0.008***
Average	2.35			-0.22	-0.40
				0.606	**0.010***
Comfortable	2.30				-0.42
					0.005*
Wealthy	2.73				

* Significant at the statistical level 0.05

The respondents who considered themselves as wealthy class of income have significantly interested in diagnosis information more than other group. They tend to believe that they have a choice to know within the patient's right and they can choose among various hospitals. This group needs more specific information on diagnosis before they can make a decision on health problem.

V. CONCLUSION

There are not much difference in the population distribution for both gender and age with slightly difference in educational background and income level. For the information need, the result showed that aftereffect is most wanted and the workout information is least wanted. Against general belief that when patients searching information, they want to know about healing method. Most of the health website provides the healing method and drug information for seeker. From the survey, we will see another aspect of information; patients also want to know the effect of their illness. They want to strengthen their health and stay fitness. The sign of illness, diagnosis, healing, and drug are much more specific to the disease and individual patients, so they want to receive those information directly from their medical doctor.

The group of information that less wanted are food, home ward, and workout. Researchers suggested that these information are more general and the seeker can find in other sources more easily and convenient. The recommendation to hospital is to provide health information through their CRM with patient, more specific on aftereffect, healing method, drug used, sigh of illness, and diagnosis of each illness. These groups of information should send directly to each patient and also provide in general public hospital system.

For the hypothesis testing, researchers did not find the significant difference in gender and age. The significant differences are in educational and income level. The educational affect differently in home ward information. The higher of their education (master and higher) resulted in wanting more of home ward information. The higher education respondents could be in a position to taking care of their independents that left the hospital and also might want to taking care of themselves.

The difference in income level resulted in significantly difference in diagnosis information which comes from the medical doctor. Compare with other group, the wealthy respondents wanted more diagnosis information. In the treatment process, we usually use the word "second opinion" which refers to re-examine the patient symptom. The wealthy group is more concern about their health and they wanted to ascertain with their treatment. They also want to understand the illness analysis before making a decision on treatment. If the hospital wants to keep the royalty of these wealthy patients, the diagnosis could be used as strategic information. By providing more detail information on diagnosis to patient will make more confident to the hospital.

The recommendation from the hospital is to create the system providing health-related information. For the eight categories of data, researcher suggests only four that are aftereffect, drug, healing, sign of illness, and diagnosis. These types of information are more trusted if comes from the hospital. The information seekers want to receive health information from the organization that is specializing in medical matter. The rest of information (food for patient, home ward, and workout) are more general to the normal person than patients. There are lots of organization such as Caretaker Company, nutrition firm, and fitness centre to provide such information with their products and services. The hospital should concern with the specialize information of their expertise.

For the information delivering method, we suggest to use the application on smartphone as informational channel. Instead of hospital website which is sooner will be obsolesces. Not just show information, but the hospital should create the member system for both customer and prospect or general public. By using the subscribing system, the hospital should be able to provide more specific and useful information to the member. The system will be used as part of Customer Relationship Management system to strengthen the customer royalty to hospital.

What affecting different data acquisition, the result showed two demographic variables which are educational background and income level. The research suggested hospital to pay more attentions to these two groups. Consider by the customer aspects, the higher education and wealthy people are more valuable to the hospital payback in term of monetary. We should keep this prospect customer group by strengthen the relationship with them.

VI. LIMITATION AND FURTHER STUDY

The research was targeted at the population in one general public hospital, where most of the patients and relatives considered themselves as middle-class group. As we ask them to classify their living status, most of them responded as average. With the data analysis, we found the significant difference in income level. So if we want to investigate more thoroughly in this aspect, we should select the target at private hospital, where there are more of wealthy group.

The other source of information beside questionnaire, we could use the data from health related website or search engine. That information could provide us with more detail on actual data of information seeking.

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