"Can I Trust You, Doc?" : User Perception Of Online Health Information

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***Abstract*—Klikdokter.com is one of websites that provides information service about health. Besides, it also provides live chat service i.e., question and answer about health which is directly claimed and answered by the specialist doctors. According to the survey conducted by IndoPacific Edelman and Research Unit and Community Service of Public Health Faculty of Indonesia University, the amount of 79% doctors believes in the most accurate health information source on the internet. Moreover, a study entitle Patients Use of the Internet for Medical Information shows that 53,5% out of 512 patients use internet as a media to find out information about health. The trust of doctors and internet users towards health information is indeed influenced by several factors. Therefore, the aim of this research is to analyze the factors that influence the trust of users towards the health information uploaded on klikdokter,com using ten construct variables. The data is collected from klikdokter.com users with 250 respondents. The data is analyzed using structural equation modeling analysis (SEM). The result shows that factors that influence Trust are perceived information quality, source expertise and argument quality.**

Keywords - SEM;confirmatory research; online health information

I. INTRODUCTION

Many kinds of health information are available on the internet. A research conducted by Pew Research Center California Health Care Foundation finds that 8 out of 10 health questions begin with internet searching. To the amount of 72% internet users search for health information related to serious condition, general information, and specific health problem. Another finding shows that 77% users begin with search engine such as Google, Bing, or Yahoo. 13% said that they begin the searching through website about health first. Only 2% who begin the searching through Wikipedia while another 1% begin the searching through social media such as Facebook [1].

A high level of users' interest to do the health information searching via internet is due to the number health website. There are more than 70.000 website that provide health information [2]. One of them is klikdoktercom. Klikdokter.com is one of the health portals that promote Health, Information and Education about health based on Bahasa Indonesia which is designed not only for medical community but also society in Indonesia. Practically, klikdoktercom has an editorial staff consists of editorial team which supports both general practitioner and specialist doctors. Klikdoktercom also provides live chat service i.e., question and answer with doctors who are expertise in their field [3].

According to the facts above, it is interested to have further research about the users' trust towards health information provided in klikdokter.com. In this case, the users do not know whether that information comes directly from the doctors. Furthermore, they also do not know whether the information they get is responsible and accountable. It means that the users are expected to use the available information correctly. Moreover the users also should find an effort to understand and to decide whether that information is correct or not. If the users have limited knowledge about health, it is indeed not an easy thing to do [4].

Another problem is related to the live chat service provided by klikdokter.com which is directly claimed by the doctors who are expertise in their field. In this case, the users can virtually do the live chat without knowing whether it is the doctor who answers the questions from users.

According to the problems above, there is a connection between the user and doctor. If there is a mistake in diagnosing, so the doctor's answer would not be responsible and accountable. Moreover, it would be getting worse if patient does not understand that the answer or medical suggestion from the doctor is incorrect.

In this case, a high level of internet using to search for health information is influenced by particular factors so that the users can trust the website. It makes the users not hesitant to always use internet to search for health information.

The research method used is adapted from some previous studies, such as a study conducted by Koo and Wati [5] entitle *E-Healthcare Service: An Investigation of the Antecedents, Moderating Roles, and Consequences* noted that the webs quality and perceived credibility of a health site affects the users' satisfaction towards the site so that it can increase the intention to use. It is supported by a study conducted by M. Y. Yi et al. [6] entitle *Untangling the antecedents of initial trust in Web-based health information: The roles of argument quality, source expertise, and user perceptions of information quality*

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and risk which connects antecedents factors that affect users' trust towards health information through online access. These two studies show that there is a correlation between intention to use and trust. Consequently, a study entitles *Technology Acceptance Model for the Use of M-Health Services among health related users in UAE* proves the correlation. That study is conducted by Alloghani, M et al. [7] which states 4 factors that affects Intention to Use of health service users. They are *Perceived Usefulness, Perceived Ease of Use, Trust, and Security.*

This research aims to examine whether the factors can influence the users' trust towards the health website; klikdokter.com.

II. MODEL STRUCTURE AND HYPOTHESES

The methodology used in this research is confirmatory quantitative that is used to examine the model and hypothesis conducted by (Koo dan Wati [5]; M. Y. Yi *et al.* [6] and Alloghani, M *et al.* [7]). Data is analyzed using Structural Equation Modelling (SEM) that is used to analyze independent variable and dependent variable which connect each other to form a model. The SEM analysis is conducted in 2 steps; structural model test and measurement model test. Structural model shows the correlation between constructs which is generally linear. Measurement model is used to measure the correlation between indicator and variable.

Model in the Fig. 1 is a model that is used in this research. It shows a correlation among each construct. There are 9 constructs investigated in this research and 34 manifest variables or indicators. The nine constructs and 34 manifest are presented in Table 1.

A. Definition of each construct

Web Quality

Koo and Wati [5] note that five dimensions of Website Quality; Information Quality, Information Presentation, Website Attractiveness, Navigation, and Technical Support have direct influence in increasing Perceived Credibility.

Argument Quality

In the consultation and suggestion, there is a high level of consequence from the trust and incorrect implementation of information. Therefore users should search high quality health information in the internet. Users tend to measure component of argument which is relevant, accurate and useful [8].

Perceived Quality

The high level of health information quality represents a more relevant, accurate, up-to-date and complete information. When those aspects are completed, it can decrease the risk [6].

Source Expertise

Some studies has identified that Source Expertise is necessary to build credibility from online health information. Some researchers believed in that statement. In the management of online health consultation, source expertise will affect the information credibility so that it will decrease Perceived Risk [6].

Perceived Risk

Health information is directly connected with prosperity and risk due to the acceptance and usage of the health information. However, before the acceptance and the usage, users should ensure that they receive well-structured health information so that users can minimalize the risk [6].

User Satisfaction

Bhattacherjee, A [9] argues that user satisfaction is psychology condition of the users on two times; before using the site and after using the site.

Perceived Usefulness

According to Alloghani, M *et al* [7], perceived usefulness is defined as to what extent the m-Health is beneficial for the users. If the patients and doctors feel that the online health information service is useful and able to increase their productivity, as a result they will have intention to use it.

Perceived Ease of Use

When users feel that a particular system can ease the users in doing their tasks, the users will have intention to always use it [7].

Security

The ultimate goal of online health service is not only to increase the quality life of patients but also to get security and privacy. The distribution of health service via online device can cause some problems such as lost control, data security, data encryption, information distribution and privacy [7].

Intention to Use

Intention to use is defined as a readiness to utilize the site. Hassenzahl and Trautman [10] suggest that character of the site influence the users' interpretation.

Trust

Alloghani, M *et al.*[7] finds a direct effect between trust and intention to use. Besides, another study also found that trust is a social factor that influences a large effect towards the use of mobile commerce technology, one of them is Online health information [11].

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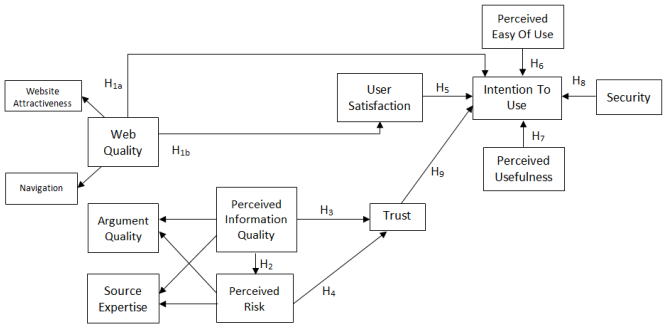

Figure 1. Research Model

Table 1. Definition of the nine constructs

	Item	Definition	Sub-construct	References
Constructs	Web Quality	The degree to which website produced has attributes of graphic, layout, and design required by the user	Navigation Web-attactiveness	[5,17]
	Perceived Informtion Quality	The degree to which information produced has the attributes of content, accuracy, and relevancy required by the user	Source Expertise Argument Quality	[6]
	Perceived Risk	The degree to which the user believes that using the website is not risky		[6]
	User Satisfaction	The degree of user satisfaction with the website		[18]
	Perceived Ease Of Use	The degree to which the website is easy to use		[19]
	Perceived Usefulness	The degree to which a person considers that using a website for the services of healthcare will be advantageous to him/her		[20]
	Security	The degree of protection from the website		[7]
	Intention To Use	The degree of a user willingness to use a new health information website		[7,21]
	Trust	The degree to which a website is trusted		[7]

B. Hypotheses for the constructs

User satisfaction refers to the summary psychological state resulting when the emotion surrounding confirmed expectation are coupled with the customer's prior feelings about the consumption experience [9] and intention to use is defined as willingness to use the website [12]. Therefore, we hypothesized:

H1a : Website quality has a positive effect on intention to use
H1b: Wesite quality has a positive effect on user satisfaction

It is reasonable to expect perceived information quality will have negative impact on perceived risk. Nicolaou and McKnight [13] suggest that by increasing the perceived worth of exchanged information, perceived information quality reduces risk perceptions. High quality information means that the information is more relevant, accurate, and complete. When more relevant, accurate, and complete information is provided, it should help reducing the uncertainty associated with following an advice from stranger. Thus, we hypothesize:

H2 : Perceived information quality has a negative effect on perceived risk

High levels of perceived information quality should be directly associated with higher levels of initial trust. Previous research identifies information quality as an important trust-building mechanism in online interaction [14], and a direct determinant of trusting beliefes in exchange relationships [13]. Based on this reasoning, we hypothesize:

H3: Perceived information quality has a positive effect on trust

The link between perceived risk and trusting beliefs has been confirmed by prior research. Nicolaou and McKnight [13] argue that trust influences the perception of risk, and hypothesize that:

H4: Perceived risk has a positive effect on trust

Research has shown that online health seekers are satisfied with the internet as a health information source, are relieved by the information they find on internet, and in turn, develop their intention to use. From IS perspective, users' information system continued intention is determined primarily by their satisfaction with prior IS use [9]. Hence, we hypothesized:

H5: User satisfaction has a positive effect on intention to use

When users perceive a particular systems as ease of use and help them to complete their task and activities, they feel using a system is comfortable and convenient to them, then they will have the desire to use that system accordingly [7]. Thus, we assume that:

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H6. Perceived ease of use has a positive effect on the intention to use

Research has define that perceived usefulness as the degree to which a person considers that using a website for the services of healthcare will be advantageous for him/her. In other words, if patients and doctors feel that the website services are useful and will improve their life, enhance their work perfomance and assist them to increase their productivity, hence this usefulness will encourage to the intention to use [7]. Based on the above mentioned reasoning, we hypothesize:

H7: Perceived usefulness has a strong significant effect on the intention to use

The main aim of accepting online health services includes not only improving the quality of patients life, but also acquiring security and privacy related to their medical data [7]. Thus, we assume that:

H8: Perceived security has an effect on the intention to use

The author in [15] suggested that previous experiences have the significant effect on the current level of user trust. In addition, author in [11] indicated that trust is a social factor that has major influence on the users of mobile commerce technology. Therefore, we hypothesized:

H9: Perceived trust has a positive effect on the intention to use

Based on the above hypotheses, we developed the research model as shown in Fig. 1.

III. DATA ANALYSIS

A. Basic Data Analysis

The research data were collected using a paper-based and online-based questionnaire. The questionnaire was distributed to the user with experience of using klikdokter.com. No gender or age limitation was imposed on respondents to ensure representativeness of the sample and sampling results. A total of 250 paper-based and online-based questionnaire were distributed during Aug ~ Sep 2016. Table 2 presents the descriptive analysis of the sample.

Table 2. Descriptive Analysis of the sample

Item	Category	Sample size	%
Gender	Male	70	28
	Female	180	72
Age	14-31	234	93.6
	More than 32	16	6.4

The variables in the proposed model were measured using 5-likert scale from one (Strong Disagree) to five (Strongly Agree) to evaluate the responses from the participants.

Table 3. Construct Measures

Items	Items' measurement
Web Quality	I like the look and feel of the klikdokter.com
	Klikdokter.com site is an attractive website
	It is easy to find what I am looking for on the klikdokter.com
	It easy to move around on the klikdokter.com
Perceived Information Quality	Klikdokter.com provides health information that the questioner is seeking for (relevancy)
	Klikdokter.com provides accurate health information (accuracy)
	The consultation is based on accurate health information (accuracy)
	Klikdokter.com provides newest health information (currency)
	The diagnosis of the consultation is based on newest health information (currency)
	Klikdokter.com provides sufficent health information regarding the symptoms of the questioner (completeness)
Perceived Risk	How risky do you feel it would be to make a decision based on the health information provided by Klikdokter.com?
	How risky do you feel it would be to accept and apply the provided health information to your life?
	How risky do you feel it would be to accept and apply the provided health information to the lives of other important to you?
User Satisfaction	I am satisfied with my decision to get or not to get a online health information
	If I had it to do all over again, I would feel differently about the online health information
	My choice to get ot not to get online health information was a wise one
Trust	I trust using Klikdokter.com
	I feel secure putting my personal information on Klikdokter.com
	I trust this website to be the best my option
Perceived Usefulness	I believe that klikdokter.com meets my needs
	I believe that klikdokter.com does everything I would expect it to do
Perceived Ease Of Use	I believe that klikdokter.com is clear and understandable
	I believe that klikdokter.com is easy
	I believe learning to use klikdokter.com is easy for me
	I believe klikdokter.com does not require a lot of mental effort
Security	I believe klikdokter.com is financially secure
	I believe I'm not worried about the security
	I believe klikdokter.com is highly protected
	I believe klikdokter.com has enough

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	protection to make me feel comfortable
	Believe that I'm adequately protected by law in klikdokter.com from any issues that might occur when using klikdokter.com services.
Intention To Use	I intend to use klikdokter.com in the future
	I would continue to see myself using klikdokter.com for handling health information issues
	Using klikdokter.com makes learning more interesting
	I would seriously consider searching about health information in klikdokter.com again

B. SEM Analysis

Structural equation modelling (SEM) statistical analysis is used to analyze the data that is collected through questionnaire. SEM is a series of statistical method that allow complex relationships between one or more independent and dependent variables. Though there are many ways to describe SEM, it can be remarked that SEM allows one to perform some type of multivariate data.

The ten proposed hypothesis were tested using AMOS. AMOS is a software program used for structural equation modeling (SEM). In order to answer the hypothesis, there are several steps that should be completed as explained on the methodology.

1) Missing data and Outlier Test

Missing data test in this research shows that there is no missing data. On the other hand, outlier test is used to find the gap of a data with measuring score of mahalanobis distance. Outliers are found by first computing a Mahalanobis Distance and once that is done the Mahalanobis scores are screened in the same manner that multivariate outliers are screened. To compute Mahalanobis distance in SPSS you must use regression/linear under analyze. By measuring it with level of mistake, the result shows 72.443. The data that has mahalanobis distance more than 72.443, it is called outlier and it must be omitted. Out of 250 questionnaires, there are 37 outliers. Consequently, the data that can be analyzed is 213 data.

Table 4. Cronbach alpha score

Factor	Cronbach Alpha	Factor	Cronbach Alpha
Limiting-value	**>0.6**	**Limiting-value**	**>0.6**
WQ	0.818	PE	0.837
PIQ	0.810	PU	0.836
PR	0.878	SC	0.903
US	0.592	IN	0.836
TR	0.644		

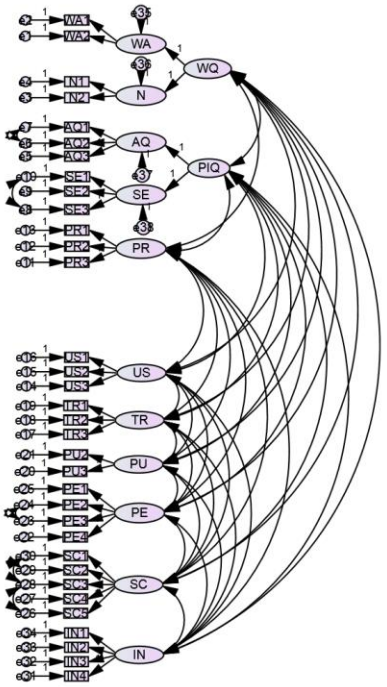

Figure 2. Overall Model Fit after being modified

Table 5. The Result of Measurement Model Fit Test

Indeks	Limit	Value	Note	References
Chi-square	>0.05	986.561	Good Fit	[23]
CMIN/ DF	<3.00	1.981	Good Fit	[23]
GFI	> 0.8	0.805	Good Fit	[23]
NFI	> 0.8	0.849	Good Fit	[23]
CFI	> 0.9	0.918	Good Fit	[23]
RMSEA	< 0.08	0.063	Good Fit	[23]

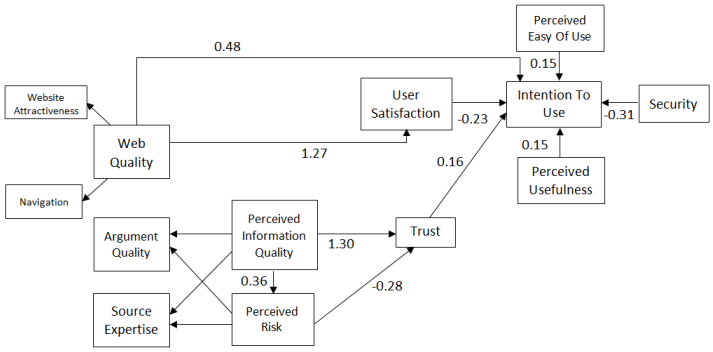

Figure. 2. Structural Model Fit using path analysis

2) Reliability Test

Reliability test is a test that uses parameter value of cronbach alpha with limiting value of more than 0.6. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability [22]. The value of cronbach alpha for each

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variable in this research is showed on Table 4. Cronbach's alpha is not a statistical test - it is a coefficient of reliability (or consistency). Table 4 shows that the alpha coefficient of the seven constructs (WQ, PIQ, PR, PE, PU, SC, IN) more than 0.8, suggesting that the constructs have relatively high internal consistency.

3) Overall Model Fit

In order to test the suitability between the data and model, overall model fit is used. Fig. 2 represents a modified overall model fit with omitting some indicator variable or manifest and construct.

The result of overall model fit is showed on Table 5. According to the table analysis result, research model meets the criteria of good fit and marginal fit. It can be concluded that the research model is fit and is ready to structural model test.

4) Structural Model Fit

Path Analysis method is used to test the Structural Model Fit. The test of model fit is used to know the correlation between each construct in the model. Fig. 3 shows structural model fit that uses Path analysis. The result of Structural Model Fit can be seen on the Table 6. On the first order of structural model, estimate value or factor loadings is a correlation value between variable and error/ Meanwhile on the second order, estimate value is a correlation value among factors (construct) and higher construct.

Table 6. The result of structural model test dan SEM hypothesis model

Hypothesis	Estimate	C.R.*	P*	Supported
PR<---PIQ	0.358	2.887	0.004	Yes
US<---WQ	1,271	8.640	***	Yes
TR<---PR	-0.028	-0.818	0.413	No
TR<---PIQ	1.298	11.251	***	Yes
WA<---WQ	1.000			Yes
N<---WQ	1.000			Yes
AQ<---PIQ	1.000			Yes
SE<---PIQ	1.000			Yes
IN<---WQ	0.484	0.935	0.350	No
IN<---TR	0.164	1.149	0.251	No
IN<---PU	0.147	1.636	0.102	No
IN<---SC	-0.031	-0.483	0.629	No
IN<---PE	0.145	0.491	0.623	No
IN<---US	-0.023	-0.166	0.868	No

Note: * p<0.05, * C.R >1.96

IV. RESEARCH RESULTS

A. Hypothesis 1a Discussion

According to the test of hypothesis 1a is denied, its display of a klikdokter.com website does not guarantee that the respondents will continue using it as a media to search for health information. In other words, the quality of website does not significantly influence the intention to use.

B. Hypothesis 1b Discussion

According to the test hypothesis 1b is accepted, it can be concluded that the more interesting the display of a klikdokter.com is, the more satisfied the respondents will be. It shows that the quality of website influence significantly towards the users' satisfaction.

C. Hypothesis 2 Discussion

According to test of hypothesis 2 is accepted, it can be concluded that respondents consider the information on the klikdokter.com do not emerge anxiety towards the risk. It shows that the quality of health website information on klikdokter.com do not significantly influence the respondents' risk.

D. Hypothesis 3 Discussion

According to the result of hypothesis 3 is accepted, it can be concluded that the more qualified the health information is, the more trusted the respondent to the doctors. It shows that the information quality positively influence the trust.

E. Hypothesis 4 Discussion

According to the hypothesis 4 is denied, it can be concluded that the risk emerged caused by klikdokter.com as a media to search for health information will not increase the trust of its website. It shows that the comprehension of risk does not significantly influence the trust.

F. Hypothesis 5 Discussion

According to the result of hypothesis 5 is denied, it can be concluded that the respondents' satisfaction does not guarantee that they will keep using the klikdokter.com to search for health information. It shows that the satisfaction of the respondents does not significantly influence their intention to use.

G. Hypothesis 6 Discussion

According to the result of hypothesis 6 is denied, it can be concluded that the easiness of searching health information in klikdokter.com does not make the respondents will keep using it in the future. It shows that the easiness of using website does not significantly influence to their intention to keep using it.

H. Hypothesis 7 Discussion

According to the result of hypothesis 7 is denied, it can be concluded that if the respondents cannot feel the benefit of klikdokter.com as a media to search health information, they will not have intention to keep using it. It shows the comprehension factor about benefit does not significantly influence the intention to keep using it.

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I. Hypothesis 8 Discussion

According to the result of hypothesis 8 is denied, the security website that can help respondents in controlling private data in klikdokter.com does not make this health website become the only health website they use in the future. In other words, the security system in the klikdokter.com does not significantly influence their intention to keep using it.

J. Hypothesis 9 Discussion

According to the result of hypothesis 9 is denied, it can be concluded that the level of respondents' trust does not influence the intention to keep using klikdokter.com as a media to search for health information. In other words, factor of trust does not have significant effect towards the intention to use.

V. Conclusions

The data analysis shows that there are factors that influence the users' trust towards klikdokter.com; perceived information quality that covers source expertise and argument quality. Respondents truly concern to the health information quality on klikdokter.com without caring about the risk, easiness and benefits. The high qualified health information is enough to make the respondents trust in klikdokter.com. Besides, the respondents also care about the display website quality in term of layout, nuance, and graphic. This can be an additional satisfaction from the respondents when using klikdokter.com to search for health information.

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