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# The differences on the information commitments toward online medical information between people in the hospital and general public

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**Abstract:** The purpose of present study is to explore peoples' online medical information commitments (MIC) and to compare peoples' online MIC between different groups. A Medical Information Commitment Survey (MICS) was employed to investigate peoples' evaluative standards of assessing online medical information and their searching strategies used on Internet. Two groups, including 247 samples from the group of people in hospital and 293 samples from the group of people in general public, were surveyed. The results showed that the MICS was a sufficiently reliable tool to assess peoples' MIC. It was also found that for seeking more credible online medical information, people would tend to employ both basic and sophisticated evaluative standards (i.e. mixed standards) for judging online medical information, and to utilize "elaboration," the advanced searching strategy, as well. Especially for people in hospital, they showed higher tendencies to use mixed standards and "elaboration" searching strategy than people in general public.

**Keywords:** Information commitment, medical information, Internet

## 1. Introduction

With the exploration of online information in recent years, Internet has become a preferred source of medical information (Lemire, Pare, Sicotte, & Harvey, 2008; Morahan-Martin, 2004). Many people around the world accustom themselves to search medical and health information on Internet (McMullan, 2006; Renahy, Parizot, & Chauvin, 2010). The abundant online information plays the role that provides people to have more opportunities to manage their own health problem and to make decision about medical issues (Morahan-Martin, 2004; Renahy, et al., 2010).

However, the plentiful medical information on Internet not only makes people feel overwhelming, but also suffers its low credibility (Metzger, 2007; Morahan-Martin, 2004). The quality of online health information varies dramatically. Most of them are inaccurate and incomplete (Metzger, 2007). The quality of online medical information is one of the issues that has received considerable attentions (Hanif, Read, Goodacre, Chaudhry, & Gibbs, 2009; Lemire, et al., 2008). The questionable quality of online medical information has resulted in potential dangers related to its unsuitable use (Benigeri & Pluye, 2003).

Therefore, understanding how people search online medical information and evaluate their credibility has become an essential issue.

For investigating peoples' online information evaluative standards and searching strategies, Tsai (2004) has interviewed with a group of web users and then proposed a theoretical framework called as "Information commitments" (IC). The IC framework includes two components: a set of *evaluative standards* for assessing the web-based material and the information *searching strategies* on Internet. According the framework, an Information Commitment Survey (ICS) was developed and confirmed as a reliable tool for investigating students' information commiment by previous studies (Liang & Tsai, 2009; Wu & Tsai, 2005, 2007). Therefore, for understanding peoples' information commiment (i.e. evaluative standards and searching strategies) toward online medical information, a Medical Information Commitment Survey (MICS) was developed, and the validity and credibility would be assessed in this study.

Moreover, Wu and Tsai (2005) have suggested that peoples' information commitments might vary across individuals. In other words, different information searchers may possess various evaluative standards and searching strategies. For example, web users with more health consciousness and perceived health risk showed tendency to search medical information online (Yun & Park, 2010). Further, Eysenbach (2003) indicated that most patients will seek explanatory information about their diseases or treatments before or after their consulting with doctors. If they or their relatives were diagnosed with a medical condition, most people will seek information from multiple websites on the Internet (Morahan-Martin, 2004). These results imply that people in such a context (i.e. people in hospital) might have a higher information need for accurate and abundant medical information. Consequently, when seeking online medical information, they might use different evaluative standards and searching strategies from those in general public. This present study attempts to compare information commitment toward online medical information possessing by these two different populations.

In sum, two research questions will be investigated in this study:

- Is the MICS as a sufficient tool to measure people's information commitments toward medical information on Internet?
- Is there any difference on medical information commitment on Internet between these two groups, patients in the hospital and people in general public?

## 2. Method

### *2.1 Participants*

The participants of this study were 540 volunteers, ranging in age from 30 to 69 years (M= 45.1 years), who all had experiences toward online medical information searching in Taiwan.

For investigating the online medical information commitment in different context, relevant information was collected from two groups: 247 people in hospital (135 males and 112 females) and 293 people in general public (140 males and 153 females). The people in former group, including patients or, patients' relatives and friends, were surveyed when they were in hospital, while the people in latter group were volunteers in general population who showed interests to this survey.

### *2.2 Instrument*

In order to investigate people's evaluative standards and searching strategies, a questionnaire called "Medical Information Commitment Survey (MICS)" was employed in this study. The MICS, which was modified from Wu and Tsai's (2005) ICS, comprised three scales: (1) standards for accuracy, (2) standards for usefulness, and (3) searching strategy. Each scale contains two orientations. The six orientations which include 30 items construct the main structure of the MICS:

- *Multiple sources as accuracy scale (Multiple sources) with 4 items*: measuring the extent to which web users will validate the correctness of unknown online medical information by various sources. *Sample item*: *I will try to find more websites to validate whether the medical information is correct.*
- *Authority as accuracy scale (Authority) with 5 items*: assessing the extent to which web users will examine the accuracy of unknown online medical information by the 'authority' of the websites or sources. *Sample item: I will believe in its accuracy if the medical information appears in some websites recommended by experts.*
- *Content as usefulness scale (Content) with 5 items*: measuring the extent to which web users will assess the usefulness of the online medical information by the relevancy of its content. *Sample item: If it can provide more related links, the medical information for me is useful.*
- *Technical issues as usefulness scale (Technical) with 4 items*: assessing the extent to which web users will judge the usefulness of the online medical information by the ease of retrieval, the ease of searching or the ease of obtaining information. *Sample item: If it does not take much time to be retrieved, the medical information is useful for me.*
- *Elaboration as searching strategy scale (Elaboration) with 6 items*: measuring the extent to which web users will have purposeful (metacognitive) thinking or integrate online medical information from several websites to find the best fit that fulfills their purpose. *Sample item: I can integrate the medical information obtained from a variety of websites.*
- *Match as searching strategy scale (Match) with 6 items*: investigating the extent to which web users will apt to start searching from single searching engine, or find only a few websites that contain the most fruitful and fitted information when they search for online medical information. Their strategy is oriented towards matching the purposes of their search. *Sample item: If I find the first relevant medical information website, I will not search others.*

The MICS in present study employed a six point Likert-scale which statements were presented with bipolar strong disagree/strong agree (from strong disagree=1 to strong agree=6). As aforementioned, the three scales ("Multiple sources", "Content", and "Elaborate") which experts commonly used are categorized as sophisticated information commitments while the others ("Authority", "Technical", and "Match") which novices commonly utilized are categorized as less sophisticated.

The modified items are all examined by experts. The reliabily and validity of the MICS will be examined through EFA in this study,and further adopted to investigate people's information commitment toward online medical information.

## 3. Results

### *3.1 Factor analysis*

To clarify the structure of MICS for exploring people's medical information commitment, a series of exploratory factor analysis by principle component analysis with varimax rotation were used. The results of EFA revealed that a total of six factors were extracted with eigenvalues exceeding 1.0: "Multiple sources", "Authority", "Content", "Technical", "Elaborate" and "Match." These factors accounted for 61.11% of variance. The factors and responding factor loadings of items are presented in Table 1. Moreover, the reliability (alpha) coefficients for these factors are 0.74, 0.80, 0.87, 0.79, 0.86, and 0.86 respectively, and overall alpha is 0.86. Therefore, the MICS were suggested as a sufficiently reliable tool for assessing people's online medical information commitment.

Table 1. Factor loadings and Crobach's α values for the six scales of the MICS (n=540)

| Item | Factor1: | Factor2 | Factor3 | Factor4 | Factor5 | Factor6 |
|---|---|---|---|---|---|---|
| Factor 1Multiple sources: α=.74 (4 items, mean= 4.96, SD= .53) | | | | | | |
| Multiple sources 1 | .64 | | | | | |
| Multiple sources 2 | .73 | | | | | |
| Multiple sources 3 | .76 | | | | | |
| Multiple sources 4 | .68 | | | | | |
| Factor 2: Authority α=.80 (5items, mean= 4.67 SD= .69) | | | | | | |
| Authority 1 | | .61 | | | | |
| Authority 2 | | .61 | | | | |
| Authority 3 | | .82 | | | | |
| Authority 4 | | .78 | | | | |
| Authority 5 | | .70 | | | | |
| Factor 3: Content α=.87 (5 items, mean= 4.99, SD= .59) | | | | | | |
| Content 1 | | | .72 | | | |
| Content 2 | | | .80 | | | |
| Content 3 | | | .81 | | | |
| Content 4 | | | .72 | | | |
| Content 5 | | | .68 | | | |
| Factor 4: Technical α=.79 (4 items, mean= 4.60, SD= .80) | | | | | | |
| Technical 1 | | | | .73 | | |
| Technical 2 | | | | .70 | | |
| Technical 3 | | | | .79 | | |
| Technical 4 | | | | .72 | | |
| Factor 5: Elaboration α=.86 (6 items, mean= 4.75, SD= .66) | | | | | | |
| Elaborate 1 | | | | | .68 | |
| Elaborate 2 | | | | | .80 | |
| Elaborate 3 | | | | | .80 | |
| Elaborate 4 | | | | | .67 | |
| Elaborate 5 | | | | | .76 | |
| Elaborate 6 | | | | | .70 | |
| Factor 6: Match α=.86 (6 items, mean= 3.91, SD= .96) | | | | | | |
| Match 1 | | | | | | .68 |
| Match 2 | | | | | | .76 |
| Match 3 | | | | | | .80 |
| Match 4 | | | | | | .79 |
| Match 5 | | | | | | .80 |
| Match 6 | | | | | | .74 |
| % of variance | 7.62 | 9.29 | 11.42 | 8.79 | 12.04 | 11.96 |
| Eigenvalue | 2.29 | 2.79 | 3.43 | 2.64 | 3.61 | 3.59 |

### *3.2 Scores on the six scales*

For further investigate people's information commitment toward online medical information, Table 1 also shows people's average scores and standard deviations of the six scales of the MICS. The people scored highest on the "Content" (an average of 4.99), followed by "Multiple sources" (an average of 4.96), "Elaboration" (an average of 4.75), "Authority" (an average of 4.67), "Technical" (an average of 4.60), and "Match" (an average of 3.91).

People's average scores in the first four scales (i.e. evaluative standards) are all higher than four points and the average scores in "Multiple sources" and "Content" almost close to five points. It implied that people in this study might apt to employ all these evaluative standards, so-called as a "mixed standards" tendency. Moreover, using "Multiple sources" and "Content", which are considered as more sophisticated evaluative standards, are much preferred.

Regarding to the part of searching strategies, people showed a neutral preference to employ "Match" as a searching strategy (M=3.91). Nevertheless, using "Elaboration" as a searching strategy is much preferred (M=4.75).

### *3.3 Group differences on information commitments*

For comparing the differences on online medical information commitments between the two groups (people in hospital and people in general public), a series of t-tests were used. Table 2 shows the results of comparisons on MICS scales identified by t-tests. The results indicated that, on the one hand, the people in hospital are more oriented towards using "Multiple sources" (t=2.53, p<.05), "Authority" (t=4.44, p<.001), "Content" (t=4.15, p<.001), "Technical" (t=2.86, p<.01) as evaluative standards. On the other hand, they tend to employ "Elaboration" (t=2.47, p<.05) as searching strategy to seek online medical information, and to show less orientation toward using "Match" (t=-3.90, p<.001) than people in general public.

Table 2. Groups' comparison of the ICS Scales between the group of General publication (n=293) and Hospital (n=247)

| Scale | Groups | Mean | t value |
|---|---|---|---|
| Multiple sources | Hospital | 5.03 | 2.53* |
| | General | 4.91 | |
| Authority | Hospital | 4.80 | 4.44*** |
| | General | 4.55 | |
| Content | Hospital | 5.10 | 4.15*** |
| | General | 4.90 | |
| Technical | Hospital | 4.71 | 2.86** |
| | General | 4.51 | |
| Elaboration | Hospital | 4.82 | 2.47* |
| | General | 4.69 | |
| Match | Hospital | 3.73 | -3.90*** |
| | General | 4.05 | |

*p< .05; **p<.01; ***p<.001

Regarding to the evaluative standards, people in hospital would show a higher tendency than people in general public on all standards for judging the accuracy and the usefulness of online medical information. In other words, people in hospital might much prefer to filter the online medical information with mixed standards. Moreover, in terms of searching strategies, their search strategy is more oriented to "Elaboration" which is commonly used by experts, and less oriented to "Match" which is commonly held by novices.

## 4. Discussion and Conclusion

In this study, MICS is confirmed as a sufficiently reliable tool to measure people's information commitments toward online medical information by exploratory factor analysis. The structure of MICS in the present study is consistent with the results from Wu and Tsai's (2005; 2007) and Liang and Tsai's (2009) studies. Accordingly, the framework proposed by Tsai (2004) is also adequate for assessing people's information commitment toward online medical information in this study.

From the scores of each scale in MICS, people in this study apt to judge the online medical information with mixed standards. The results from Benotsh and Kalichman's (2004) research indicated that inaccurate or misleading information found on Internet might have potentially negative impacts on the medical decision making. For seeking accurate online medical information, people have to verify the information carefully. Therefore, using mixed standards for assessing online medical information might be one of the possible tendencies.

Due to the specific situation people encounter when searching medical information on Internet, the evaluative standards which are commonly held by novices might play as "basic" standards. When searching online medical information, people commonly confront medical terminologies. These terminologies might be some key words as good start points for online medical information searching, but they are also obstacles for impeding the comprehension of health information (Liu & Lu, 2010). Moreover, the Internet is a huge database with explosive information. Too much medical information retrieved also causes information overload (Zeng et al, 2004). By using these basic evaluative standards, for example, people could find preliminary understandings toward a medical terminology from a website organized by governments. Hence, these standards would provide basic assistances for helping people to interpret the medical terminologies and to reduce the information overload as well.

Most importantly, in this study, people still show higher orientations to employ "Multiple sources" for the accuracy of, and "Content" for the usefulness of online medical information. Tsai (2004) has indicated that these evaluative standards which are commonly held by experts would lead to an effective information seeking, and be helpful for seeking adequate online medical information. Therefore, people could find medical information with more credibility with these advanced evaluative standards.

In addition, people in this study showed a strong preference for using "Elaboration" as a searching strategy which is also preferred by university students and medical students in previous studies (Wu & Tsai, 2007; Liang & Tsai 2009). "Elaboration" is categorized as an advanced searching strategy and commonly expressed by experts (Tsai, 2004). As known as the abundant unreliable information online, using "Exploration" should be a preferred searching strategy for exploring useful and adequate online medical information.

By comparing the means of MICS, there are significant differences on the evaluative standards and searching strategies between the people in hospital and people in general

public. First, people in hospital have higher scores on the four evaluative standards than people in general. In other words, people in hospital show a higher orientation to employ "mixed standards" to judge online medical information than people in general do. Second, people in the hospital also have higher tendency to use "Elaboration" as a searching strategy than people in general do. For deeply and carefully understanding the diagnoses and the information of their diseases, people in hospital would summarize and compare the online medical information they found.

People in hospital (patients or their relatives) often encounter a more critical medical problem than people in general public. They have a higher need for seeking most credible medical information as references to deal with the medical problem. Therefore, using mixed standards and elaboration as a searching strategy for verifying online medical information they found is more expectable for people in hospital.

## 5. Implications and future study

MICS, the tool developed in this study, might be a reliable tool for exploring people's information commitment toward online medical information. More related studies are suggested to be conducted for extending our understanding toward different groups. And the reliability and validity could be confirmed by using advanced statistical methods, such as Confirmatory Factor Analysis (CFA). Furthermore, due to the crucial influences of online medical information on peoples' health, people (especially for people in hospital) would tend to employ mixed information commitment when searching online. For helping people get more credible online medical information, some instructional courses should be presented. People might have chances to cultivate their information commitment. It would be helpful for them to hold advanced information commitment toward online medical information, and to find reliable information for dealing with their medical problems.

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