

Determinants of Consumer's Drug Leaflet Reading

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ABSTRACT

Reading drug leaflet when purchasing and taking drug is recommended for consumers. It is well documented that such behavior can give advantage of safe and effective medication to them. However, not every consumer regularly exhibits this behavior. To promote this behavior, it is thus necessary to understand factors affecting it. The study objective is to determine factors that influence the behavior of reading drug leaflet. Based on Social Cognitive Theory, a path model was hypothesized that availability, access and content of drug leaflet influenced self-efficacy to read drug leaflet. These variables, attitude, belief and other persons influenced the behavior. Every eleventh freshman student of a university in the Northern part of Thailand was included in the sample (n=384). A cross-sectional study using self-administered questionnaire was conducted in 2002. Sixty-one (17.5%) respondents reported regularly reading drug leaflet. Seven hypothesized paths were significant and meaningful. The hypothesized model demonstrated a good fit with the data and explained 36.8% of the variance in the behavior of reading drug leaflet. Low percentage of subjects performing regular reading suggests that interventions to promote this behavior are necessary. Based on these findings, interventions strengthening access, self-efficacy, other persons, content and availability of drug leaflet could promote the behavior of consumer's reading drug leaflet.

Key words: Consumer, Reading drug leaflet, Health behavior, Path model

INTRODUCTION

Background

In a health care system, drug therapy is an important method for treatment of people's health problems. Appropriate drug therapy would lead to safe and effective result for consumers. On the other hand, inappropriate medication could induce other complications (Colgan and Powers, 2001). Several phenomena occur in inappropriate medication. Many consumers took drugs with incorrect and /or insufficient knowledge about their drugs (Chambers et al., 1997; Peremans, 2000). Some consumers used drugs without knowledge of drug risk (Bryden and Fletcher, 2001). Unfortunately, it was found that some consumers were unable to speak in their own words how to take the drugs (Stoelben et al., 2000). Poor compliance of consumer was also reported in drug therapy (Lau et al., 2000). Unintentional

use of drug overdose could occur among consumers if they did not read drug leaflet (Ellen et al., 1998). It was indicated that inappropriate medication might be partly due to insufficient drug information that consumers had obtained (Bryden and Fletcher, 2001). Thus, it is essential to provide correct and sufficient drug information to them. Though medication might induce drug-related problems, it was considered that they were preventable (Marcellino and Kelly, 2001). To prevent inappropriate medication and to exert appropriate medication, informing written knowledge and instruction of drug is necessary for consumers.

Drug leaflet is a media of written drug information, officially provided with a drug product. It is a significant source of drug information that any consumer can get benefit from it. Drug leaflet will be useless if it is not read by a consumer. Reading drug leaflet is evident to give several improvements of drug therapy for consumers. Such improvements are increasing knowledge, improving compliance, increasing awareness of possible adverse drug reactions, improving satisfaction with drug information and enabling to make a decision on medication selection (Morris and Halperin, 1979; Gotsch and Liguori, 1982; Gibbs et al., 1989; Rosenberg et al., 1995; Deijen and Kornatt, 1997; Ciociola et al., 2001). It is accepted that behavior of an individual can contribute to a large extent to his health (Mechanic, 1995; Anderson, 1997). Hence, reading drug leaflet is considered as a significant health behavior each consumer can perform to gain appropriate medication for his better health.

World Health Organization (WHO) has launched health promotion programme as a public health movement to its members since 1986 (WHO, 1986). Health promotion is defined as the process of enabling people to increase control over, and to improve their health. Several strategies are proposed to conduct this movement. Included are to develop personal skill to improve health, to create supportive environment, to guarantee health care provision, to provide access to information and to empower person in controlling their health (WHO, 1986; 1988; 1991; 1997; 2000). A further step is to reify these strategies in actions. Reading drug leaflet, considered as a health behavior, is eligible to promote people to perform because it is correspondent to these strategies. To understand factors relating to this behavior would facilitate to produce effective interventions. Therefore it is necessary to determine such factors.

Theoretical Framework

Many behavior theories are applied in health behavior change. A theory proposed for intervention approach is Social Cognitive Theory (Elder et al., 1999). This theory describes the dynamically interacting of a triad, i.e., person, behavior and environment (Bandura, 1986). A person's behavior is influenced by the interactions of his personal factors, such as attitude, belief and self-perception, and his environments. A construct of the theory used to determine the health behavior is self-efficacy, a self-perception defined as the confidence of a person to perform a certain behavior.

It was reported that patients with epilepsy who had positive attitude toward the treatment would follow health regimen of such therapy (Kyngas, 2000a). Also consumers with positive attitude toward patient package inserts tended to read them (Stichele et al., 1991). Many university students read food labels because they believed that it contained important nutrition information (Smith et al., 2000). Likewise, several students who

considered drug leaflets useful would read them (Miselli, 1990). Personal influence was found to associate with health behavior. Parents and friends were persons who could influence adolescents on food selection, dietary consumption and complying drug regimen (Cusatis and Shannon, 1996; Feunekes et al., 1998; Kyngas, 2000b; Kyngas, 2001).

Availability of written medication information for patients is also an important factor. Adequate availability of drug leaflet for patients would enable them to read (Buck, 1998). Leaflet availability alone would not work if access to it does not occur. Association of access to fruit and vegetable and consumption behavior of young people was revealed (Richter et al., 2000). Poor access to health information might result in poor compliance (Lau et al., 2000). Access to leaflet information cannot ensure that an individual would read it. Some consumers had difficulties in reading and understanding package inserts (Stichele et al., 1991). Content of leaflet information usually written in scientific descriptions and jargons (Baker, 1997). Lay consumers who were not familiar with such contents would overestimate the difficulties (Smith et al., 1998). This could make consumers lack confidence or self-efficacy, and hardly read them. As a result, leaflet content might be a barrier of self-efficacy to read it, and the behavior of reading drug leaflet. Self-efficacy to perform a behavior was found to depend on related environmental factors. Availability and access were reported to associate with self-efficacy in several studies on health behavior, such as eating behavior (Cusatis and Shannon, 1996; Schwarze and Remer, 2000), and exercise behavior (Milligan et al, 1997; Dwyer et al., 1998). In drug therapy, self-efficacy to conform medication was found to relate to adherence to medication (Brus et al., 1999; Es et al., 2002).

In this study, the dependent variable was the behavior of reading drug leaflet. The variables expecting to affect it were attitude toward the behavior, belief in the behavior, other persons influencing to perform the behavior, availability of drug leaflet, access to drug leaflet, content barrier of drug leaflet and self-efficacy to read drug leaflet. According to the previous findings, this study hypothesized that availability, access and content barrier influenced self-efficacy, and these variables, attitude, belief and other persons influenced the behavior of reading drug leaflet by a path model as depicted in Figure 1.

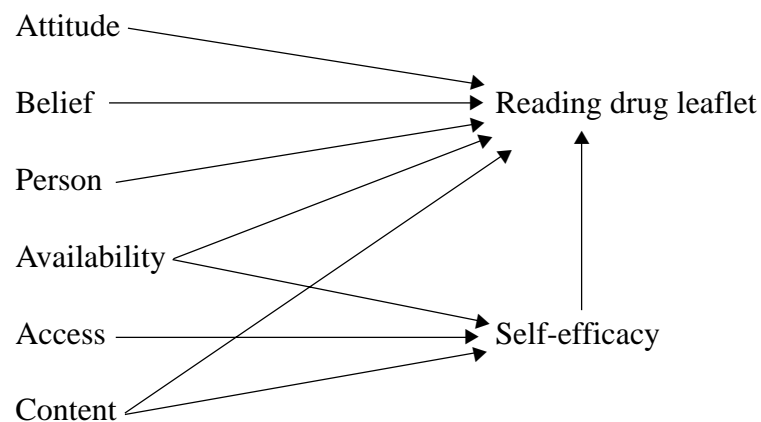


Figure 1. Hypothesized Model.

MATERIALS AND METHODS

Study Design

A cross-sectional study was conducted using self-administered questionnaire to collect data.

Subject

Freshman students of a university in the Northern part of Thailand were subjects of this study. Every eleventh student was included in the sample (n=384). Almost students resided in the university dormitories.

Material

To develop a questionnaire written in Thai language, interviewing 25 freshmen was conducted to formulate items associated with the study variables. A pretest of developed questionnaire was carried out among 34 freshmen to assess its reliability, validity and clearness. The questionnaire was partly revised and then used to collect data. At the heading of the questionnaire, subjects were informed that the following questions would involve with the behavior of reading drug leaflet when they purchased or took a drug. Demographic data was also included in the questionnaire.

Measures

Attitude toward reading drug leaflet was determined by subject responses to these three items: "Reading drug leaflet is a behavior very unnecessary to very necessary; very disadvantageous to very advantageous; very not important to very important". Responses were on a five-place scale ranging from negative (1) to positive (5).

Belief in reading drug leaflet was measured by subject responses to these four items: "Reading drug leaflet would enable to medicate drug correctly, safely, effectively and would prevent danger from medication". Responses were on a five-place scale ranging from definitely no (1) to definitely yes (5).

Person influencing to perform the behavior of reading drug leaflet was assessed by subject responses to these four items: "My parents, my friends, most people I have known and people who are important to me, think I should read drug leaflet". Responses were on a five-place scale ranging from strongly disagree (1) to strongly agree (5).

Availability of drug leaflet was based on subject responses to these four items:

- "Every drug has a drug leaflet available for every purchaser to read"
- "Every drug has adequate drug leaflet to contribute to every purchaser"
- "Every time I purchase a drug, I always receive a drug leaflet with the drug"
- "Every time I take a drug, I have a drug leaflet with the drug available to read"

Responses were on a five-place scale ranging from strongly disagree (1) to strongly agree (5).

Access to drug leaflet was determined by subject responses to these five items:

- "I always have a chance to read drug leaflet"
- "I can have a chance to read drug leaflet"

- “I can find a drug leaflet to read”
- “I have convenience in reading drug leaflet”
- “I have time to read a drug leaflet”

Responses were on a five-place scale ranging from strongly disagree (1) to strongly agree (5).

- Content barrier* of drug leaflet was measured by subject responses to these three items:
- “Content written in English is a barrier of reading drug leaflet”
 - “Content written in scientific terms is a barrier of reading drug leaflet”
 - “Content written in medical terms is a barrier of reading drug leaflet”

Responses were on a five-place scale ranging from strongly disagree (1) to strongly agree (5).

- Self-efficacy* to read drug leaflet was assessed by subject responses to these five items:
- “I am able to use my knowledge to read the leaflet content”
 - “I am able to read the leaflet content written in English”
 - “I am able to read the leaflet content written in scientific terms”
 - “I am able to read the leaflet content written in specific terms”
 - “I am able to read all the leaflet content”

Responses were on a five-place scale ranging from not very confident (1) to very confident (5).

- Reading drug leaflet* was based on subject responses to these four items:
- “Normally, I read the leaflet content in this amount”

Responses were on a five-place scale ranging from least (1) to entire (5).

- “Normally, I read the leaflet content in this manner”

Responses were on a five-place scale ranging from very unintentionally (1) to very intentionally (5).

- “Previously, every time I purchased a drug, I score my reading drug leaflet as follow”
- “Previously, every time I took a drug, I score my reading drug leaflet as follow”

Responses were on a five-place scale ranging from never (1) to every time (10).

All scales of item responses were labeled by words only at both ends, except for the last two items of reading drug leaflet that included scores.

Data Collection

This study was undertaken during the first semester of academic year 2002. Each subject would receive a cover letter and a questionnaire at his dormitory room found from the student file. A week later, three hundred and fifty six (92.7%) questionnaires were collected from those rooms. A total of 348 complete questionnaires (90.6%) was used for data analysis.

Data Analysis

Descriptive statistics was used to describe the sample. Reliability and validity were based on coefficient alpha (Cronbach alpha) more than 0.6, and factor loadings on a single

factor respectively. Pearson zero-order correlation coefficients of variables were calculated. Path analysis was conducted for the model. To estimate model fit, goodness of fit index, chi-square statistic and the comparison of original and reproduced correlation coefficients were used (Kerlinger and Pedhazur, 1973; Pedhazur, 1982). To demonstrate a good fit, goodness of fit should be more than 0.9, chi-square should be small and the discrepancy between the original and reproduced correlation should be less than 0.05. The level of significance was 0.05. All analyses were done on SPSS for Windows version 7.5.

RESULTS

The sample consisted of 133 males (38.22%) and 215 females (61.78%). The mean age of the sample was 18.38 ± 0.59 with a range of 17-20 year. Sixty one (17.5%) respondents reported regularly reading drug leaflet, i.e., reading drug leaflet every time when purchasing and taking a drug. Table 1 displays the summary of variable measures. Each measure was reliable and valid. Table 2 demonstrates the zero-order correlation coefficients of model variables.

Table 1. Summary of variable measures.

| Variable | Item | Min | Max | Mean | SD | Alpha | Factor loading |
|---------------|------|-----|-----|-------|------|-------|------------------------------|
| Attitude | 3 | 3 | 15 | 14.49 | 1.31 | .75 | .831, .837, .693 |
| Belief | 4 | 4 | 20 | 18.86 | 1.89 | .83 | .802, .845, .837, .777 |
| Person | 4 | 6 | 20 | 17.82 | 2.64 | .87 | .817, .866, .843, .869 |
| Availability | 4 | 4 | 20 | 16.12 | 3.03 | .75 | .716, .796, .745, .762 |
| Access | 5 | 6 | 25 | 20.07 | 3.93 | .88 | .842, .861, .794, .817, .814 |
| Content | 3 | 3 | 15 | 11.57 | 2.87 | .87 | .842, .924, .899 |
| Self-efficacy | 5 | 5 | 25 | 15.90 | 3.72 | .83 | .649, .773, .839, .825, .757 |
| Reading | 4 | 9 | 30 | 24.60 | 4.19 | .81 | .760, .763, .842, .841 |

Table 2. Zero-order correlation coefficients of variables.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-------|-------|-------|-------|--------|--------|-------|---|
| 1 Attitude | | | | | | | | |
| 2 Belief | .538* | | | | | | | |
| 3 Person | .414* | .357* | | | | | | |
| 4 Availability | .241* | .369* | .304* | | | | | |
| 5 Access | .283* | .423* | .497* | .518* | | | | |
| 6 Content | .062 | .023 | .009 | -.033 | -.113* | | | |
| 7 Self-efficacy | .135* | .254* | .181* | .303* | .359* | -.283* | | |
| 8 Reading | .235* | .333* | .406* | .339* | .566* | -.120* | .345* | |

*p<0.05

The hypothesized model with 10 path coefficients is presented in Figure 2. Two criteria commonly used to interpret the path coefficient are statistical significance and meaningfulness. It is suggested that a path coefficient less than 0.05 may be interpreted as not meaningful (Kerlinger and Pedhazur, 1973). According to the criteria, three path coefficients were not significant and not meaningful. Then they were removed from the model. Six path coefficients were significant and one path coefficient was meaningful. As a result, seven path coefficients were retained in the trimmed model demonstrated in Figure 3. The reproduced correlation coefficients (in parenthesis) between variables in the trimmed model are also shown in Figure 3. The trimmed model had a good fit with the data (goodness of fit index = 0.99; chi-square = .69, df = 3; all discrepancies of correlation coefficients were less than 0.05), and accounted for a large proportion of variance in the behavior of reading drug leaflet ($R^2 = .368$). The results indicated that the hypotheses were supported.

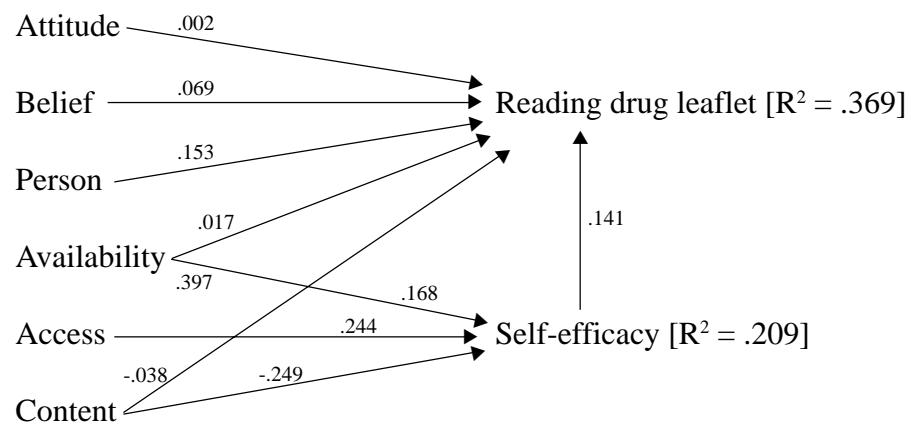


Figure 2. Hypothesized model with path coefficients.

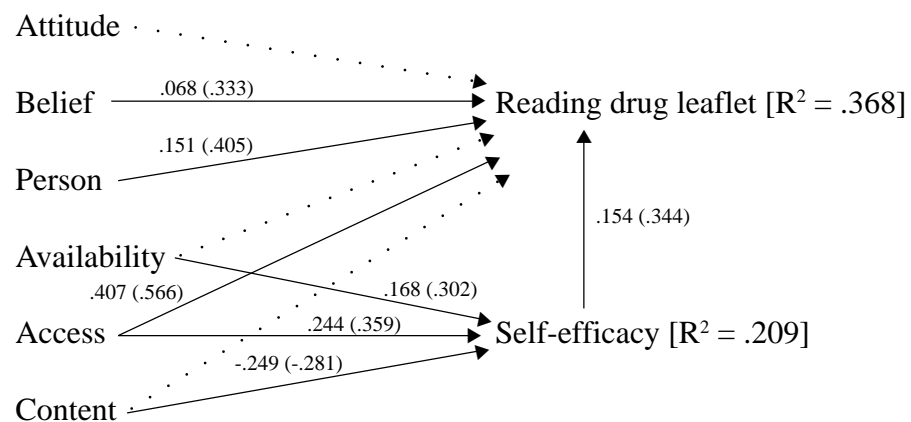


Figure 3. Trimmed model with path coefficients.

(reproduced correlation coefficients are in parenthesis, dashed lines are paths removed)

DISCUSSION

A result showed that about one fifth (17.5%) of respondents performed regular reading of drug leaflet. This percentage is quite low compared to that of some countries. In some developed countries, this percentage was about 70-80% (Miselli, 1990; Buck, 1998) and the country aimed to increase it. The low percentage suggests that most subjects do not read drug leaflet regularly when purchasing or taking drug. This is consistent with a study observing consumer's behavior when purchasing a drug (Burapadaja et al., 2000). As previously described, reading drug leaflet can provide appropriate medication. It is an important health behavior for any consumer because it is the step to reach drug information. Therefore it is essential to promote consumers to perform such behavior. The hypothesized model can be used to understand the influence of direct and indirect factors on reading drug leaflet. Furthermore, an intervention derived from the understanding can be carried out to increase the behavior.

The hypothesized model presents a good fit with the data. This finding supports the theory that personal and environmental factors of persons could influence their health behavior. In this case, attitude does not directly influence reading behavior. From stronger degree, access, self-efficacy, person and belief directly influence the behavior. Though availability and content barrier do not directly influence reading behavior, they indirectly influence the behavior via self-efficacy. Access not only directly but also indirectly influence reading behavior. Stronger than availability, both content barrier and access are influences greater than availability of self-efficacy. The three variables accounted for 20.9% of the variance in self-efficacy.

The influences of belief and other persons on reading behavior are correspondent to those on other health behaviors previously mentioned. It is believed that adolescents are suitable persons sustaining a behavior in the long run (Portner, 1996). Hence, reading drug leaflet should be fostered among consumers, especially adolescents who would become active adults responsible for appropriate drug therapy of their families. Additionally, influence of peer could stimulate adolescents to perform the behavior and extend it among them.

Self-efficacy is another influence on the behavior of reading drug leaflet. The environmental factors directly affecting self-efficacy are availability, access and content barrier. More availability and access would increase self-efficacy of consumers to read drug leaflet. The content barrier is the only factor having a negative influence on self-efficacy. Decrease of content barrier would increase self-efficacy. Hence, to enable consumer's self-efficacy to read drug leaflet, the content barrier should be decreased. Leaflet content should be developed on easy and understandable basis for general consumers. It is evident that the understanding level would increase with more understandable leaflet content (Burapadaja et al., 2002). Clear illustration of leaflet content was also desired (Jones et al., 2000).

Access is found to be a direct and an indirect influence on reading drug leaflet. Increase of access to drug leaflet could result in increase of reading drug leaflet. For most drugs dispensed in division, a drug product or package, such as a bottle of drug and a box of drug

packed in blister or strip form, is usually provided with a single drug leaflet. Moreover, a single drug leaflet is often attached to the bottle or printed on the box (Burapadaja et al., 2002). This manner of drug leaflet availability might be inconvenient for consumers to access and read it. A separate drug leaflet should be additionally provided with a drug product in order that it could possibly give consumers an easier and more convenient access. In addition, adequacy of drug leaflet for each drug strip could increase chance or access of consumer to read drug leaflet at the sites of purchasing or at homes.

Though reading drug leaflet is recommended for consumers to perform, it is not well conducted by most of them. Just recommendation may not be enough. Other interventions may be required. This health behavior is deserved to promote for the people. As for the public, thus a regulatory approach is needed to make this promotion concrete. For better health of people, the Food and Drug Administration, having authority and responsibility of drug issues should consider and conduct some interventions. The findings and suggestions of this study could be applied for such interventions.

Suggestion

This sample recruited from systematic random sampling had more females than males. Gender difference in the adolescent use of product label use was reported (Mangleburg et al., 1997). In this study gender might affect the reading behavior. Retest of the model on the sample with equal gender is suggested.

CONCLUSIONS

This study hypothesized a path model describing that availability, access and content barrier directly influenced self-efficacy; and these variables, attitude, belief and persons directly influenced the behavior of reading drug leaflet. Seven paths were significant and meaningful. The hypothesized model demonstrated a good fit with the data and explained 36.8% of variance in the behavior. Access, self-efficacy, other persons, content barrier and availability were important factors directly and indirectly influencing the behavior. Low percentage of subjects with regular reading indicated a need of intervention to promote this behavior. Interventions strengthening such important factors could increase the behavior of reading drug leaflet.

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