ORIGINAL ARTICLE

Literacy of Cold Medication Labeling among Patient with Hypertension in Indonesia

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Abstract

Introduction: Non-prescription medication is relatively safe but not risk free and can lead to serious adverse drug events if used without attention to the information printed on the label. Medication literacy includes the ability to read and comprehend medication label. The aim of the study was to describe health literacy focused on the ability to read cold medication label and identify factors that associated with it among patient with hypertension in Sleman District, Yogyakarta Province, Indonesia. **Materials and Methods:** A cross-sectional questionnaire was developed and validated. In-person interviews include a literacy assessment which was conducted among 109 respondents in five primary health centers in Sleman District, Yogyakarta Province, Indonesia, during September –December 2017. A convenience sampling technique was used. Respondents were asked to read information printed on the cold medication label. The correct information was assessed and categorized. Descriptive statistic and Chi-square test were used in the analysis. **Results:** Most of the respondents read the name of medicine and indications correctly. More than half of the respondents mispronounced to active ingredients (69.7%). Respondents were not able to read dosage (74.3%), frequency of intake (54.1%), side effects (83.5%), and contraindications (89.0%). There were 85.3% respondents categorized into illiterate. The correct sentence: Education level was associated with the ability to read medication label ($P = 0.038$). **Conclusion:** This study found that ability patients on reading medication label need to be improved. Information on medication label majority printed on small font size caused patients inability to read medication label correctly. Key strategies to improve readability of medication labels should be developed.

Key words: Cold medication label, health literacy, patient hypertension, Sleman

INTRODUCTION

Health literacy is the individuals' capacity to obtain, process, and understand basic health information and services needed to make an appropriate health decision.[1] Health literacy in the context of medication use was defined as medication literacy. Medication literacy is the degree to which individuals can obtain, comprehend, communicate, calculate, and process patient-specific information about their medications to make informed medication and health decisions to safely and effectively use their medications, regardless of the mode by which the content is delivered. This includes the ability to read and comprehend medication label.[2,3]

Non-prescription medication is relatively safe but not risk free and can lead to serious adverse drug events if used without attention to the information printed on the label. The use of cold medication contains oral decongestants among patient with hypertension must be with attention. An oral decongestant can cause adverse drug events on individual who has uncontrolled high blood pressure.[4,5] Preventable adverse drug events can be caused by a poor understanding of medication instructions, which, in turn, are highly influenced by health literacy. To properly use their medications, individuals are required to read their medications labels, read the associated medical information, comprehend the instructions, and sometimes calculate the proper dose to take. [2]

A program to improve the use of medication correctly and rationally was formulated by the Ministry Health of

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Republic Indonesia in 2015. This program conducted based on the use of over-the-counter medicine without health professional supervision. Individuals are asked to read some of the information on medication label before they take a medicine. Individuals that unable to read were at risk for misunderstanding information on the medication label.[6] This study was aimed to describe health literacy focused on the ability to read common cold medication label and identify factors associated with it among patient with hypertension in Yogyakarta Province, Indonesia.

MATERIALS AND METHODS

Study design and population

The research was a cross-sectional survey study. Respondents for the study were selected using convenience sampling technique at Sleman District, with a total population of 1 million people in 2018. Respondents were patient's hypertension age 18 years and above who attended one of the five outpatient primary health care centers at Tempel I, Ngaglik I, Mlati I, Sleman, and Berbah subdistricts, Sleman District, Yogyakarta Province, Indonesia, in September –December 2017. Hypertension respondents were determined based on the diagnosis of physician and treated with the antihypertensive agent. Respondents were excluded if they inability to do the communication with the interviewer during the study.

Questionnaire

The questionnaire contains characteristics of respondents, Rapid Estimate of Adult Literacy Medicine (REALM) instrument to assess health literacy, and the instrument to assess the ability to read medication label. REALM was adapted from a study developed by Davis *et al*.[7] and modified by the author to appropriate the purpose of the study. Meanwhile, the ability to read medication label was assessed by instrument adapted from a program that conducted by the Ministry Health of Republic Indonesia.[6] An instrument was a label of cold medicine Mixagrip Flu® (manufactured by PT. Dankos Farma) that used as a hypothetical scenario. The hypothetical scenario was used because there were many products of cold medicine in Indonesia. The product is the most frequently advertised products and probably familiar (in name and its potential use) to most of Indonesian. The validity of the instruments was confirmed by pharmacy and media experts. Cohen's Kappa was used to assess reliability. The result found that inter-rater reliability of the REALM modified instrument was 0.835 and the medication label instrument was 0.672.

Data collection

The researcher administered the structured interview that included characteristics of respondent (gender, age, education, occupation, income, distance between home and primary health care, health insurance, source to get medication information, duration of hypertension, and health literacy). To assess health literacy, respondents were asked to read eight medical terms printed on the REALM modified instrument. Meanwhile, to assess the ability to read medication label, respondent was asked to read the label of cold medicine Mixagrip Flu® containing seven types of information: Name of medicine, active ingredients, indications, dosage, frequency of intake, side effects, and contraindications. The researcher rated each response as correct, mispronounced, and not attempted. Bahasa Indonesia was used during the interview.

All data were scored. Each item of REALM modified and medication label was pronounced. The item which pronounced correctly was scored 1 point. The item which mispronounced and not attempted was scored 0 point. Respondents were regarded as mispronounced if incorrect or need a help to read. Respondents who could not read the item were regarded as not attempted. According to the scoring criteria, health literacy and the ability to read medication label were calculated. The total score of health literacy was calculated by adding the scores of the eight medical terms, and the ability to read medication label was calculated by adding the scores of the seven type information. REALM modified instrument scores were categorized into four grade levels: 3rd grade or less (score 0), 4th–6th (score 1–3), 7th–8th (score 4–6), and 9th grade or higher (score 7–8). Medication label instrument scores were categorized into illiterate (score 0–3) and literate (score 4–7).

Data analysis

In this study, descriptive statistics (frequency, percentage, mean, and standard deviation [SD]) were used to report the characteristics of respondent and the ability to read medication label. Chi-square test was used to examine association between characteristics of respondent and the ability to read medication label. $P < 0.05$ was considered to be statistically significant. Age, education, occupation, duration of hypertension, and health literacy were recategorized to fit the analysis. The statistical analysis was performed using SPSS statistical software (SPSS for Windows, version 23, SPSS Inc., Chicago, IL, USA).

RESULTS

A total of 109 respondents were included in this study. Table 1 outlines the sociodemographic and personal characteristic variables of the respondents. The majority of respondents were female (70.6%), aged 60–69 years old (33.9%), had graduated from senior high school (35.8%), not employed (47.7%), monthly income about ≤1.000.000 IDR (67.9%), distance between home and primary health care

Table 1: Characteristics of respondent

Characteristics	*n*=109(%)
Gender	
Male	32 (29.4)
Female	77 (70.6)
Age (year), mean±SD	59.61±10.85
18–29	1 (0.9)
30–39	4 (3.7)
40–49	11 (10.1)
50–59	35 (32.1)
60–69	37 (33.9)
≥70	21 (19.3)
Education	
No formal education	6 (5.5)
Primary school	34 (31.2)
Junior high school	20 (18.3)
Senior high school	39 (35.8)
Higher education	10 (9.2)
Occupation	
Not employed	52 (47.7)
Non-government employee	41 (37.6)
Government employee	16 (14.7)
Income (IDR)	
≤1.000.000	74 (67.9)
>1.000.000	35 (32.1)
Distance between home and primary health care (km)	
≤2	63 (57.8)
>2	46 (42.2)
Health insurance	
Without insurance	11 (10.1)
Insurance	98 (89.9)
Source to get medication information	
Health professionals	102 (93.6)
Non-health professionals	7 (6.4)
Duration of hypertension (year)	
0–5	91 (83.5)
6–10	12 (11.0)
>10	6 (5.5)
Health literacy, mean±SD	7.3±1.76*
≤3th grade	5 (4.6)
7–8th grade	8 (7.3)
>9th grade	96 (88.1)

*Health literacy scores range from 0 to 8, SD: Standard deviation

was ≤2 km (57.8%), under the health insurance (89.9%), get medication information from health professionals (93.6%), had hypertension ≤5 years (83.5%), and >9th grade level on health literacy (88.1%). The mean age of the respondents was 59.61 (SD 10.85).

The ability to read the medication label is shown in Table 2. Most of the respondents read the name of medicine and indications correctly. More than half of the respondents mispronounced to active ingredients (69.7%). Respondents were not able to read dosage (74.3%), frequency of intake (54.1%), side effects (83.5%), and contraindications (89.0%). The mean of ability to read medication label score was 2.35 (SD = 1.45). Majority of respondents were categorized into illiterate (85.3%). Only 14.7% of respondents were literate to medication label. Thus, the most correctly read information reported by the respondents was name of medicine (93.6%), indications (67.9%), frequency of intake (31.2%), dosage (14.7%), side effects (10.1%), active ingredients (9.2%), and contraindications (8.3%), respectively. Only two respondents were able to read all the seven types of information on the medication label.

In this study, education was the only factors that associated significantly with the ability to read the medication label (P = 0.038) as shown in Table 3. The group of illiterate was consisted of 91.7% of respondents who had not graduate from senior high school and 77.6% of respondents who had graduated from senior high school. Meanwhile, in the group of literate, the percentage of respondents who had graduated from senior high school (22.4%) was higher than the other (8.3%).

DISCUSSION

To the best of our knowledge, this is the first study about health literacy, especially, focused on the ability of patient hypertension to read cold medicines label in Yogyakarta Province, Indonesia. Health literacy plays a major role in reading the names, dosages, indications, and potential side effects of medication.[8] The proper reading on medication label is an important part of to prevent adverse drug events and medication error. The study about medication labeling among Malaysian was conducted, and the study showed that the most frequent information reported by the respondent was dosage, method of administration, frequency of intake, the purpose, name of medicine, expiry date, storage condition, and registration number.[9]

Respondents claimed that the name of medicine and indications were easy to read because this medicine was familiar among of them. The other types of information were difficult to read because most of them printed on small font size. This finding might be caused by the information on cold medicines label printed on different font size. The font sizes of name, active ingredients, and ingredients were larger than dosage, frequency of intake, side effects, and contraindications. This study found that the majority of respondents were elderly and categorized into illiterate. Elderly respondents showed

Table 2: The ability to read medication label among respondents

Type of information	*n*=109 (%)
Name of medicine	
Correct	102 (93.6)
Mispronounced	1 (0.9)
Not attempted	6 (5.5)
Active ingredients	
Correct	10 (9.2)
Mispronounced	76 (69.7)
Not attempted	23 (21.1)
Indications	
Correct	74 (67.9)
Mispronounced	9 (8.3)
Not attempted	26 (23.9)
Dosage	
Correct	16 (14.7)
Mispronounced	12 (11.0)
Not attempted	81 (74.3)
Frequency of intake	
Correct	34 (31.2)
Mispronounced	16 (14.7)
Not attempted	59 (54.1)
Side effects	
Correct	11 (10.1)
Mispronounced	7 (6.4)
Not attempted	91 (83.5)
Contraindications	
Correct	9 (8.3)
Mispronounced	3 (2.8)
Not attempted	97 (89.0)
Ability to read medication label, mean±SD	2.35±1.45*
Illiterate	93 (85.3)
Literate	16 (14.7)

*Ability to read medication label score range from 0 to 7, SD: Standard deviation

lower prevalence in reading medication label due to decrease visual capabilities and impaired cognition.[10,11] This study found that the ability to read medication label corroborated with familiarity, experience, health knowledge, and visual capabilities. Multiple reasons associated with low health literacy were limited background of health knowledge and health professional's facile use of the medical term.[12]

Cold medicines could affect uncontrolled blood pressure among patient with hypertension.[5] Patients who had illiterate provide several consequences including poorer health status, lack of knowledge about medical conditions, decreased comprehension of medical information, poorer self-reported health, increased hospitalizations, and increased health-care costs.[13]

Education was the only factor that associated with the ability to read medication label. This study corroborated that respondents with higher education reported higher prevalence in reading medication label. Misunderstanding of label instruction was significantly associated with education level.[9,14] Education affects individual ability on reading, listening, and understanding health information.[1]

We are aware of the limitations of the present study. First, the standard instrument, especially, to assess the ability to read medication label has not yet developed in Indonesia. This study showed that most respondents were high literacy but illiterate because both of instruments printed in different font sizes. REALM modified instrument was printed on 72 point size. Meanwhile, the medication label instrument was the original label from its pharmaceutical industry. The font size of this instrument was unknown but smaller than REALM modified. The difference between real size versus created instrument causes the REALM Modified as created instrument was more easier to read. Second, it was performed in a single setting, only one medicine was used in the hypothetical scenario, and therefore, the sample may not be representative of all Indonesian population. This may have given rise to bias.

The finding of the study showed an angle of health disparities among patient hypertension in Indonesia. Majority of respondents were unable to read medication label. The ability to read medication label was associated with education level. Therefore, efforts should be made toward improving literacy to read medication label. Continuous awareness, education campaign, and strategy toward understanding medication label need to be carried out. The program of the Ministry Health of Republic Indonesia called Gerakan Masyarakat Cerdas Menggunakan Obat (campaign to use medicine correctly and rationally by reading medication label first) should be encouraged. Future research, the readability of over-the-counter label should be interest because these substances may improve consumers' ability to reading and understanding medication use.

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COMPETING INTEREST

The author(s) declare that they have no competing interest.

Table 3: Association between characteristics of respondent and the ability to read medication label

Characteristics	Ability to read medication label		*P*-value
	Illiterate *n*(%)	Literate *n*(%)	
Gender			
Male	25 (78.1)	7 (21.9)	0.234
Female	68 (88.3)	9 (11.7)	
Age (year)			
<60	44 (86.3)	7 (13.7)	0.792
≥60	49 (84.5)	9 (15.5)	
Education			
< Senior high school	55 (91.7)	5 (8.3)	0.038*
≥ Senior high school	38 (77.6)	11 (22.4)	
Occupation			
Not employed	42 (80.8)	10 (19.2)	0.200
Employed	51 (89.5)	6 (10.5)	
Income (IDR)			
≤1.000.000	66 (89.2)	8 (10.8)	0.097
>1.000.000	27 (77.1)	8 (22.9)	
Distance between home and primary health care (km)			
≤2	56 (88.9)	7 (11.1)	0.218
>2	37 (80.4)	9 (19.6)	
Health insurance			
Without insurance	7 (83.6)	4 (36.4)	0.055
Insurance	86 (87.8)	12 (12.2)	
Source to get medication information			
Health professionals	87 (85.3)	15 (14.7)	1.000
Non-health professionals	6 (85.7)	1 (14.3)	
Duration of hypertension (year)			
≤5	78 (85.7)	13 (14.3)	0.726
>5	15 (83.3)	3 (16.7)	
Health literacy			
Low	5 (100)	0	1.000
High	88 (84.6)	16 (15.4)	

*significant at *P*<0.05

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