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**The Diverse Evaluation  
Regarding Printed Health  
Education Materials between  
Breast Cancer Patients and  
Nurses by using Preliminary  
Structural Scale**

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between Breast Cancer Patients and Nurses by using Preliminary Structural Scale

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## 中文摘要

# The Diverse Evaluation Regarding Printed Health Education Materials between Breast Cancer Patients and Nurses by using Preliminary Structural Scale

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## 中文摘要

一份能讓人接近的平面衛教媒體應該是容易閱讀與了解的。許多研究指出，好的設計之平面衛教媒體應具備下列策略如：內容、語言、組織、編輯與印刷、插畫圖表與學習動機等。乳癌平面衛教媒體，大多出版內容針對早期診斷、限制殘障、復健或綜合以上三者來編輯。但是，極少相關研究針對病患與護理人員觀點，對平面媒體進行評價。本研究透過自編之結構式問卷進行調查，期能了解初步發展之平面衛教媒體評價問卷之適用性，及病患及護理人員對近五年乳癌平面衛教媒體之評價結果。

15 位乳癌婦女，平均年齡為  $54.8 \pm 5.7$  (年) 與 15 位平均年齡為  $30.7 \pm 7.15$  (年) 之腫瘤科或一般外科之護理人員為研究對象。運用編之結構式問卷分別對 20 份之平面衛教媒體進行評價，平面衛教媒體來源為衛生所，醫院，非營利組織基金會與網站。另外，在閱讀每份媒體後，依照一顆星至五顆星之標準給予總結性評價，最後，每位研究對象再依據個人需求，對平面媒體列出發展時應注意的優先順序。

病患組在 20 本平面媒體中的評分普遍高於護理人員組。病患組之評分結果趨

向一致；相對地，護理人員間對於 5 本平面媒體評分不一致。再者，對於平面媒體之名次排序中，前三名媒體中僅其一兩組間名次相近，其餘序位有所不同；相對地，後三名之平面媒體序位在兩組間則趨向一致。這也顯示，病患和護理人員對於認定較差的平面媒體有相近的評價。在總結性評價部分，兩組對於平面媒體大多給予中上（3-4 顆星）評價，僅護理人員對於數本媒體給予兩顆星。最後，在衛教媒體需求上，病患較注重內容與組織部份，但較不在意學習動機與圖表插畫。相反地，護理人員較注重內容與學習動機，較不在意組織與圖表插畫。本研究結果可提供未來媒體製作者在編製乳癌平面衛教媒體時之參考。

關鍵字：評價

平面衛生教育媒體

乳癌病患

# The Diverse Evaluation Regarding Printed Health Education Materials between Breast Cancer Patients and Nurses by using Preliminary Structural Scale

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## **Abstract**

**Introduction:** The effectiveness of the printed material is not only delivering knowledge but also reinforcing behavior. The information can be accessibility if readers can easily read and understand. Various studies have reported that a well-designed information material is characterized several categories, such as content, language, organization, layout, illustration, and learning motivation. For breast cancer, many printed materials have been produced including detection, disability limitation, rehabilitation, and comprehensive information. However, few study was investigated the patient's and nurses` perspective of the marketed printed materials. The purpose of this study was to compare the result of evaluation of the printed materials with breast cancer between patients and nurses for developing a suitable health education material.

**Method:** In this study, 15 women who aged  $54.8 \pm 5.7$  with breast cancer and 15 nurses who aged  $30.7 \pm 7.15$  have been working in General Surgery or Oncology.

They used a Likert- scale to evaluate the 20 printed materials was published in five years by public health centers, hospitals, charitable organizations, and medical centers website. In addition, the summary evaluation was assessed with 1 star to 5 stars. Materials need was listed for participants` need. **Result:** the mean of evaluation of each material in patients was higher than nurses. The result of evaluation of Coefficient of concordance of all printed materials in patients were significant ( $P < .05$ ,  $p < .001$ ). In contrast, five out of 20 were incoherent in nurses. Otherwise, the two groups have the similar perspective with ranking the last one- third materials. It means that patients possessed the ability of assessment to discriminate the quality of the printed materials. On summary evaluation, most materials were given 3-4 stars in patients. Yet two of the materials which published on the medical centers website were 2 stars in nurses. Materials need in two group was little different. Patients preferred the category of content and organization, and none of them chosen motivation for priority need. On the other hand, nurses` main concern was content and motivation. For the last three materials need, layout and illustration were their choice in both of groups. The study has aimed to understand the reader viewpoint for professionals for developing the effectual printed material.

**Key Words:** Evaluation

Printed health education material

Breast cancer patient

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終於體會到什麼是”終於”的感覺。在這漫漫長夜的研究所生活，終將劃下句點。回首過去，只想對自己說：我盡力了。

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## Introduction

Cancer has been the first cause of mortality in Taiwan in this decade, and breast cancer has been the second most common malignancy in women. Women who are diagnosed with breast cancer usually have sought medical information when they feel uncertain or uncomfortable. In addition to understanding their prognosis and treatments, the patients must learn to manage side effects, nutrition, and exercise (Beaver & Witham, 2007; Byar, Berger, Bakken, & Cetak, 2006; Grabsch et al., 2006; Manning-Walsh, 2005; Latalski, Kulik, Skorzynska, & Zolnierczuk-Kieliszek, 2001; Chuang & Chin, 2002; Cowley, Heyman, Stanton, & Milner, 2000). The source of the patient's information is usually from physicians or nurses. Unfortunately, in Taiwan, the meeting is less than 6.5 minutes per patient in the outpatient department (Liu, 2001). Women with breast cancer are restricted from asking for more information to address their concerns or clarify uncertainties. The physician or nurse may not be able to distinguish what information their patients need in a few minutes. Consequently, the health education material plays an important role for patient education.

There are many kinds of health education materials on breast cancer available, for example, posters, compact discs (CDs), video compact discs (VCDs), handbooks, or booklets. For a CD or VCD, electrical equipment is necessary, and it is not conveniently accessible to women. Due to the limited time with physicians or nurses, face- to- face teaching may not be administered in the outpatient department in Taiwan. Chang (2004) described that the average 50-year-old women with breast cancer preferred the written health education materials, because the handbook or leaflet is portable and can be shared with the family or patient group anytime. Jazieh et al. (1999) reported that the leaflet about side- effect of chemotherapy was useful for patients, and they could inform friends and family about treatment. Therefore, the printed information material could be the best method of delivering the information to

the under-served population.

Effective health education can increase the healthy behavior due to knowledge (Griffin, McKenna, & Tooth, 2003; Paul, Redman, & Sanson-Fisher, 2003; Weinman, 1990). Well-designed written health education materials can advance healthy behavior. Hoffmann et al. (2004) described that effective written information need to be noticed, read, understood, believed, and remembered by the patient. They also contended that content, language, organization, layout and typography, illustrations and cover, and learning and motivation are significant categories for developing good quality information material. Additionally, being patient-orientated is necessary.

Many studies have mostly focused on breast cancer through self-examination, breast screen tests, or post-operation care or exercise. Little information has been paid to the evaluation of the printed health education materials for women with breast cancer, and if their information needs have been met. Further investigations are needed in order to understand the printed materials, which are published to be valuable and suitable for disadvantaged women. In this paper, we will develop a structural scale and collect printed health education materials for breast cancer. Also, we will invite nurses and breast cancer patients to evaluate the published material and rank them in order of importance and treat of the result of accordance of evaluation by using preliminary structural scale between patients with breast cancer and nurses.

## **Method**

### **The sample of the printed health education materials**

A broad search from public health centers, hospitals, charitable organizations, and medical centers website discovered 52 accessible health education materials. Exclusion criteria of the printed materials were the demote topic of breast cancer, indirectly related to the theme of breast cancer, and not published in five years. From these selections, it consists of 20 booklets and flyers on breast cancer detection,

treatment, rehabilitation, and comprehensive information are chosen. Based on the Levels of application of preventive measures in the natural history of disease (Leavell & Clark, 1965; Glazer, Kirk, & Bosler, 1996), each printed material was categorized to one of the following descriptions: detection (early diagnosis), disability limitation (treatment and prevent complication) in secondary prevention, rehabilitation (retraining and education) in tertiary prevention, and comprehensive information. Table 1 lists each material, date of publication, the publisher, and material type.

Table 1 The printed health education material of breast cancer in Taiwan

The detection stage focuses on the method of diagnosis and screen of breast cancer. In addition, the awareness of breast cancer is mentioned.

PM	Detection						
	Date	Title	Publisher	Type	Page	Main Contents	Approximate Diagram%
A	2005	Mammography	Government department	Flyer	2	Importance of mammography	10%
B	2005	Mammography	Government department	Flyer	2	Importance of mammography	50%
C	2002	Breast cancer	Government department	Flyer	2	The currents of breast cancer	50%
D	2006	Breast cancer diagnosis and treatment	Research Institutes	Booklet	27	Diagnosis, screen, stage, and treatment on breast cancer	5%
E	2006	Breast cancer prevention and treatment	Medical central Hospital	Flyer	2	Breast self- examination and mammography	0%

The treatment and prevent complication stage of breast cancer is mainly about exercise after surgery, self- care of chemotherapy, and prevention and care edema.

PM	Treatment and prevent complication						
	Date	Title	Publisher	Type	Page	Main Contents	Approximate Diagram%
F	2006	Prevention and care edema on breast cancer	Charitable organizations	Flyer	2	The cause and symptom of edema Prevention and care edema	5%
G	NA	Chemotherapy on breast cancer	Charitable organizations	Flyer	2	Chemotherapy and self- care	50%
H	2005	Prevention edema after surgery on breast cancer	Medical central Hospital	Flyer	1	Avoid wound or infection Prevention and care edema	0%
I	2005	Rehabilitation after breast cancer surgery	Medical central Hospital	Flyer	8	The exercise after surgery in different stages	70%
J	2005	Chemotherapy and you	Medical central Hospital	Flyer	12	The side effect of chemotherapy Emotion care Nutrition and chemotherapy	0%
K	2005	What do I do / after chemotherapy ?	Medical central Hospital	Flyer	3	Eating and diarrhea and chemotherapy	50%

The rehabilitation stage aims the psychology of breast cancer patient. Many patients wrote the articles to describe how to overcome the disease to encourage the diseased women.

PM		Rehabilitation					
	Date	Title	Publisher	Type	Page	Main Contents	Approximate Diagram%
L	NA	You can overcome cancer(one personal about her flight against breast cancer experience)	Charitable organizations	Booklet	4	The experience of a woman with breast cancer	10%
M	NA	The family of loving your breast	Charitable organizations	Booklet	55	The personal support information	30%
N	2006	Family Support Annual Journal- for breast cancer	Charitable organizations	Booklet	70	The personal support information	30%
O	NA	Care passport for breast cancer	Charitable organizations	Booklet	20	The personal medical history	60%

The Comprehensive Information is intended to initiate the comprehensive information from diagnosis, treatment to care to people.

PM		Comprehensive Information					
	Date	Title	Publisher	Type	Page	Main Contents	Approximate Diagram%
P	2006	Female breast self care booklet	Charitable organizations	Booklet	32	The currents of breast cancer Prevention and treatment of breast cancer Breast self- examination Exercise for breast	40%
Q	NA	How to face breast cancer	Charitable organizations	Booklet	35	The symptom of breast cancer The stage of breast cancer The treatment of breast cancer	30%
R	2006	Facts on breast cancer	Charitable organizations	Flyer	9	Knowing breast cancer Breast self-examination Diagnosis and treatment of breast cancer Self- care after surgery	30%
S	NA	The principle of breast cancer diagnosis and treatment	Medical central Hospital	Flyer	18	The principle of diagnosis and treatment with breast cancer Surgery of breast cancer	5%
T	NA	Breast cancer diagnosis and treatment	Medical central Hospital	Flyer	9	The principle of diagnosis and treatment with breast cancer Breast self- examination	0%

NA: not available, PM: printed material

### **Participants' requirements and setting**

A sample of women, who had been treated for breast cancer at one northern teaching Hospital in Taipei, Taiwan, had agreed to participate in the research after the permission from the administration department of the hospital and individual consent form. The eligibility criteria includes woman who a) was diagnosed malignancy of breast cancer, b) had undergone surgery, chemotherapy, radiotherapy, or hormone therapy, c) mentally and physically was able to participate in the study, and d) had the ability to read and write in Chinese. The total numbers are 15.

A sample of nurses, who have worked at the medical center and oncology center in Taipei, Taiwan, had agreed to participate in the research after the process of the snowball sampling and individual consent form. The eligibility criteria includes nurse who a) has worked at the ward of Oncology or General Surgery, b) has cared breast cancer patients, c) mentally and physically was able to participate in the study, and d) had the ability to read and write in Chinese. The total numbers are 15.

### **Instruments**

We searched many previous studies which focused on the principle of the effective written materials. The recommendation for designing effective written health education materials by Hoffmann et al. (2004) was complete, simple and latest information, and we modified some content for adaptability in this study. The structural scale was separated into four subscales. Based on the recommendation written by Hoffmann et al. (2004), the printed health education materials are measured into 6 categories. These are as follow: content, language, organization, layout and typography, illustration, and learning motivation. Each category was measured using 7, 10, 8, 4, 4, and 5 items, respectively. It is assessed using a Likert-type scale, ranging from 1 – strongly disagree to 5 – strongly agree. In addition, demographic information was measured including age, marital status, income, level of

education, and medical history for breast cancer women, and including age, gender, level of education, work seniority, and department for nurses.

The questionnaire of reliability analysis was measured internal consistence reliability. To examine the reliability of the two groups, we respectively calculated one person who evaluated the 20 printed materials and totally 300 datum were intended each group. The Cronbach's  $\alpha$  was .89 in patients group and .92 in nurses.

Three of the professionals whose field on nursing, medical, and public health were invited to analysis content validity. The content validity index was 0.94.

To summarize the evaluation, the score is given from 1 star to 5 stars after reading each information material. A score of 1 star represent that the information material is the worse; a star of 2 is bad; a star of 3 is good; a star of 4 is better; and a star of 5 reflects the excellent material. The response score provides the quality of information material. The participants rank the information materials needs into 6 categories. It includes content, language, organization, layout and typography, illustration, and learn and motivation. These ranked to understand participants preference as their choices for the printed health education materials.

### **Data Analysis**

The nonparametric test was experienced in this study. Frequency distributions were used for demographic of the two samples. A statistics test of the evaluation of the printed materials for 2 independent variables was examined using Mann-Whitney U. and Kruskal-Wallis H for 3 or more independent variables. Spearman rank correlation was used for the evaluation of correlations. Otherwise, Kendall's W(a) test was calculated for evaluation and the priority needs of printed material of coefficient of concordance. SPSS Version 13.0 statistical analysis program was used to analyze data.



## Results

The participants of breast cancer women were a support group for breast cancer in the hospital and 80% were 50-59 years old with mean  $54.8 \pm 5.77$  years. The education level was 60% high school and 40% college degree. A majority (73.3%) income was less than 1200 \$US/month range. Among the participants, 33% of the disease duration was more eight years and 80% were receipted surgery therapy, chemotherapy, 40% radiotherapy, and 53.3% had taken oral hormone therapy.

The participants of professionals who have been working at Oncology or General surgery ward in the medical center and oncology center are nurses. All participants were female and ages ranged from 25 to 44 with mean  $30.7 \pm 7.15$  years. Among participants, 60% of nurses graduated from university and 40% from junior college. In the work experience, 53.3% was less than five years and 46.7% was more than five years. Approximately 66.7% nurses work in the General surgery and 33.3% in the Oncology ward. Full samples demographics are given as table 2 and 3.

Table 2 Demographic characteristic of patients with breast cancer

Characteristic	Frequency (n)	Percent (%)
<b>Age</b>		
40-49	1	6.70
50-59	12	80.00
60-69	1	6.70
>70	1	6.70
<b>Marital status</b>		
Married	12	80.00
divorced	2	13.30
widowed	1	6.70
<b>Education level</b>		
High school diploma	9	60.00
Junior college	6	40.00
<b>Economic (\$NT/month)</b>		
< = 20000	5	33.30
> 20000- 40000	6	40.00
> 40000- 60000	2	13.30
> 60000- 80000	2	13.30
<b>Disease duration (years)</b>		
< = 2	3	20.00
> 2 - 4	3	20.00
> 4 - 6	2	13.30
> 6 - 8	2	13.30
> 8	5	33.30
<b>Surgical</b>		
yes	12	80.00
no	3	20.00
<b>Chemotherapy</b>		
yes	12	80.00
no	13	20.00
<b>Radiotherapy</b>		
yes	6	40.00
no	9	60.00
<b>Oral hormone therapy</b>		
yes	8	53.30
No	7	46.70

Table3 Demographic characteristic of health professional

Characteristic	Frequency (n)	Percent (%)
Gender		
male	0	0
female	15	100.00
Age		
<=29	8	53.30
>=30	7	46.70
Education level		
junior college	6	40.00
university	9	60.00
Work experience		
<=5年	8	53.30
>=6年	7	46.70
Work place		
Oncology	5	33.30
General surgery	10	66.70

Table 4 Six categories of the printed materials content

PM <sup>a</sup>	Group	Sum	content		language		organization		layout		illustration		motivation		
			Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U		
A	P <sup>b</sup>	24.06	6.00	3.90(.34)		3.94(.48)		4.00(.46)		4.05(.51)		4.13(.50)		4.02(.43)	
	N <sup>c</sup>	22.68		3.23(.82)		4.08(.44)		3.93(.50)		3.90(.42)		3.71(.70)		3.80(.60)	
B	P	24.01	14.00	4.01(.06)		4.04(.40)		3.95(.47)		3.96(.45)		3.71(.68)		3.98(.35)	
	N	24.26		3.80(.48)		4.10(.52)		4.20(.44)		4.06(.56)		4.16(.71)		3.90(.53)	
C	P	24.16	.00*	4.02(.36)	39.50*	4.06(.39)	75.00	3.98(.41)	80.50	4.00(.34)	46.00*	4.06(.60)	82.50	4.01(.25)	.00***
	N	21.33		3.55 (.55)		3.86(.50)		3.87(.46)		3.55(.60)		3.73(.74)		2.76(.44)	
D	P	24.10	8.00	4.25(.51)		4.04(.42)		3.83(.43)		3.85(.45)		3.91(.61)		4.18(.45)	
	N	22.44		4.25(.42)		3.53(.65)		3.91(.49)		3.65(.68)		3.53(.57)		3.54(.72)	
E	P	17.76	3.00	3.69(.13)		3.60(.49)		3.45(.60)		3.51(.71)		NA		3.48(.78)	
	N	15.63		2.92(.69)		3.56(.51)		3.40(.57)		3.25(.56)		NA		2.48(.66)	
F	P	24.21	8.00	4.16(.36)		4.06(.33)		4.00(.36)		3.90(.33)		3.93(.56)		4.14(.45)	
	N	22.47		4.19(.46)		3.86(.41)		3.95(.46)		3.41(.55)		3.25(.42)		3.78(.69)	
G	P	24.65	.00*	4.03(.38)	30.5***	4.01(.38)	70.00	4.49(.46)	40.00*	4.00(.26)	63.00*	4.06(.49)	86.00	4.04(.34)	96.00
	N	22.19		3.40(.53)		3.73(.52)		3.79(.55)		3.46(.85)		3.91(.74)		3.86(.69)	
H	P	18.15	1.00*	3.75(.58)	53.5*	3.77(.53)	80.50	3.68(.61)	72.50	3.38(.51)	108.00	NA		3.57(.73)	89.50
	N	16.49		3.08(.66)		3.45(.74)		3.30(.82)		3.33(.42)		NA		3.32(.99)	
I	P	24.36	12.00	3.95(.54)		4.02(.42)		4.03(.45)		4.01(.38)		4.08(.60)		4.25(.49)	
	N	24.21		3.84(.48)		3.62(.39)		3.92(.37)		3.90(.33)		4.50(.55)		4.40(.58)	
J	P	19.75	4.00	4.11(.34)		4.00(.38)		4.02(.37)		3.61(.52)		NA		3.98(.49)	
	N	18.49		3.69(.47)		3.75(.65)		3.73(.60)		3.46(.64)		NA		3.84(.94)	

PM <sup>a</sup>	Group	Sum	content		language		organization		layout		illustration		motivation		
			Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U
K	P	23.85	3.00*	3.98(.30)	24.00***	4.02(.15)	75.00	4.02(.22)	59.50*	3.93(.41)	90.00	3.80(.68)	89.50	4.09(.43)	70.00
	N	22.20		3.37(.40)		3.93(.48)		3.67(.65)		3.76(.48)		3.60(.69)		3.84(.49)	
L	P	24.22	.00*	3.96(.47)	36.00*	4.04(.51)	61.00*	4.11(.44)	43.50*	3.90(.49)	52.00*	4.16(.63)	70.00	4.02(.53)	87.5
	N	21.51		3.34(.55)		3.80(.29)		3.54(.46)		3.31(.65)		3.71(.78)		3.78(.89)	
M	P	24.48	5.00*	3.91(.58)	53.00	4.08(.40)	89.00	4.01(.55)	27.50**	3.85(.59)*	50.00*	3.85(.67)	66.00	4.76(.86)	98.00
	N	21.01		3.35(.51)		3.88(.48)		3.30(.61)		3.18(.60)		3.33(.63)		3.97(.76)	
N	P	24.92	2.00*	4.12(.45)	94.00	4.10(.44)	86.00	4.03(.51)	73.50	4.13(.46)	24.00***	4.25(.52)	49.50*	4.28(.49)	91.50
	N	22.81		4.10(.53)		3.95(.50)		3.75(.45)		3.31(.53)		3.60(.50)		4.09(.55)	
O	P	24.42	4.00*	4.11(.45)	90.50	4.04(.34)	88.00	3.98(.50)	66.50*	4.06(.40)	66.00*	4.15(.50)*	69.50*	4.06(.39)	101.50
	N	22.96		3.93(.45)		3.96(.33)		3.75(.24)		3.51(.71)		3.71(.69)		4.08(.47)	
P	P	24.67	11.50	4.17(.41)		4.16(.43)		4.05(.37)		3.88(.61)		4.28(.45)		4.10(.46)	
	N	25.08		4.21(.66)		4.10(.37)		4.39(.47)		3.80(.46)		4.30(.59)		4.20(.80)	
Q	P	24.12	11.00	4.15(.49)		4.07(.48)		4.05(.48)		3.71(.50)		4.05(.68)		4.08(.51)	
	N	25.01		4.54(.45)		3.34(.43)		4.22(.54)		3.75(.59)		4.60(.47)		4.54(.48)	
R	P	23.54	5.00*	4.08(.52)	74.00	4.02(.51)*	64.50*	4.03(.52)	71.00	3.73(.55)	96.50	3.78(.66)		3.88(.41)	106.00
	N	22.03		3.74(.58)		3.66(.46)		3.60(.56)		3.30(.63)		3.85(.71)		3.78(.56)	
S	P	19.79	.00*	4.07(.42)	64.00*	3.88(.39)	20.50***	3.99(.46)	6.00***	3.88(.42)	52.00*	NA		3.94(.38)	29.50***
	N	15.69		3.68(.59)		2.98(.65)		2.70(.49)		3.28(.69)		NA		3.02(.68)	
T	P	19.85	.00*	4.14(.51)	29.50***	4.02(.34)	34.00*	4.03(.56)	48.50*	3.70(.70)	92.50	NA		3.94(.55)	36.50*
	N	16.43		3.40(.76)		3.30(.59)		3.35(.76)		3.31(.89)		NA		3.05(.90)	

a: printed material, b: patient, c: nurse, \*p<.05, \*\*p<.01, \*\*\*p<.001, NA: not available, The bigger the value of U, the less significant it is.

The evaluated printed materials included content, language, organization, layout and typography, illustration, and learning motivation. As table 4 shown, in most categories among 20 materials, patients gave the higher score more than nurses. The interval range of mean of the categories by nurses is larger than patients but layout and typography. They could rely their professional on to assess the quality of printed material, and the interval range of mean is respectively 1.42, 1.14, 1.69, 1.35, and 2.06 in each category except layout and typography. In contract, among patients group, the interval range of mean is 0.7, 0.56, 1.04, 0.53, and 1.28 at content, language, organization, illustration, and motivation. Otherwise, the result of sum was significant, and then the categories were detailed to describe. As a result, the more significant findings were presented on content, and less on illustration.

In nurses group, the highest mean was focused on the “Q printed material,” and content, illustration and learning motivation were their favor. This material introduces the newest breast cancer information about treatment and caring, and the simple and understandable illustration enhance patient to read. Also, the material keeps the blank space to encourage reader to write down something they can do. This design can engage reader in. In language and organization, the highest mean is 4.10 and 4.39 in “P printed material.” This colorful booklet uses the short sentences and avoids the abbreviations to present the management of breast cancer, and only one idea per sentence indeed pays patients attention. For layout and typography, the highest score, which is “B printed material”, is 4.06, and it is only one more than 4.0. The bold print in the heading emphasizes the important information, and 14-point font size reduces eye fatigue. On the other hand, the highest mean was on the “P printed material” of the language and illustration in patients group. This flyer avoids negative words and uses common words to introduce how to care women breast. Also, this flyer clearly shows the process and benefits of mammography with an

adequate amount diagrams make easier to understand. Other highest mean of the categories were presented the different printed materials.

Table 5 Correlation coefficients of the rank of the printed materials in patients and nurses

	patient	nurse
patient	1.000	.658**
nurse	.658**	1.000

\*\*p<0.01

Table 5 describes the correlation coefficients of the rank of the printed materials in patients and nurses groups. There is significant difference (.685,  $p < .01$ ) in correlation coefficients. For the previous three printed material, the two groups have different opinion; on the other hand, they have the similar outlook on the last one- forth printed materials. The Correlation coefficients of the rank in both group belongs moderate correlation.



Table 6 Mean and rank of the printed material

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
P Mea	4.01	4.00	4.02	4.01	3.55	4.03	4.10	3.63	4.06	3.95	3.97	4.03	4.07	4.15	4.07	4.11	4.02	3.92	3.95	3.97
N	3.78	4.04	3.55	3.74	3.12	3.74	3.69	3.29	4.03	3.69	3.70	3.58	3.50	3.80	3.82	4.18	4.17	3.67	3.13	3.28
P Rank	11	13	9	11	<b>20</b>	7	<b>3</b>	<b>19</b>	6	16	14	7	4	<b>1</b>	4	<b>2</b>	10	<b>18</b>	16	14
N	7	<b>3</b>	15	8	<b>20</b>	8	11	17	4	11	10	14	16	6	5	<b>1</b>	<b>2</b>	13	<b>19</b>	<b>18</b>

Table 6 presents each printed material mean and rank. The excellent mean in nurses group is 4.18 is “P printed material,” and the similar opinion in the patients group ranks the second. The second and third choice was “Q printed material,” and “B printed material,” but the different estimates in patients group were listed the tenth and thirteen, respectively. For patients group, the greatest printed material is “N printed material,” then “P printed material” is their second favor. However, the “N” and “G” in nurses group were ranked sixth and eleventh. Otherwise, the rank of the last three printed materials was equivalent in patients and nurses groups. “E printed material” was evaluated the last one of the 20 printed materials, and the mean ranges 3.55 in patients and 3.12 in nurses. The “H printed material” and “S printed material” were listed last one-fourth. Consequently, both group had the same attitude for the poor printed materials. Patients group indeed has the ability to judge the last four printed materials as nurses group. These miserable materials exposed some disadvantages including showing English, no illustration or pictures, long paragraph, and using jargon without explains.

Table 7 Results of Coefficient of concordance of the printed materials

materials	A		B		C		D		E		F		G		H		I		J	
groups	P <sup>a</sup>	N <sup>b</sup>	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Kendall's W(a)	.98***	.18*	.95***	.15*	.97***	.45***	.96***	.37***	.92***	.43***	.96***	.37***	.96**	.17*	.97**	.14	.96***	.45***	.98***	.21*
materials	K		L		M		N		O		P		Q		R		S		T	
groups	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Kendall's W(a)	.96***	.19*	.95***	.11	.93***	.33*	.97***	.36***	.97***	.12	.98***	.13	.98***	.76***	.95***	.16*	.95***	.38*	.97***	.06

\* p < .05, \*\*\* p < .001, a : patients, b: nurses

Table 7 describes the reliability index for each printed material. In patients group, Kendall's W(a) ranged from .92 to .98 (p < .001), and the significant differences were found. It means the consequences of evaluation were consistent in patients. On the other hand, in the nurses group, five of the 20 materials were incoherent, and others were consistent.

Table 8 The difference of dependent variable for printed materials

I.V.			content	language	organization	layout	illustration	motivation
	Sum	Mann-Whitney U	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<b>Age</b>								
<= 59	22.41(.42)	9.00	4.07(.28)	4.02(.28)	4.01(.31)	3.90(.19)	3.03(.34)	3.38(.30)
>= 60	21.22(.40)		3.87(.07)	3.86(.01)	3.84(.18)	3.53(.42)	2.89(.09)	3.23(.16)
<b>Education level</b>								
High school	22.08(.45)	13.00	4.01(.32)	3.96(.28)	3.95(.31)	3.89(.20)	2.91(.27)	3.36(.36)
Junior College	22.57(.39)		4.09(.21)	4.06(.27)	4.05(.30)	3.80(.32)	3.18(.35)	3.39(.14)
<b>Marital status</b>								
Married	22.40(.42)	13.00	4.05(.30)	4.02(.30)	4.03(.31)	3.87(.19)	3.05(.33)	3.38(.31)
Widow & Divorced	21.79(.45)		4.04(.21)	3.95(.17)	3.82(.22)	3.78(.47)	2.86(.26)	3.34(.16)
<b>Economic(NT / M)</b>								
<=40000	22.17(.43)	13..50	4.00(.28)	3.99(.30)	3.99(.35)	3.86(.26)	2.98(.33)	3.35(.32)
>40000	22.58(.41)		4.16(.26)	4.04(.19)	4.00(.12)	3.85(.23)	3.10(.32)	3.43(.17)
<b>Disease duration (years)</b>								
>6	22.89(.42)	9.00	4.16(.23)	4.10(.29)	4.09(.33)	3.93(.19)	3.11(.37)	3.50(.30)
<=6	21.59(.42)		3.91(.28)	3.89(.22)	3.88(.25)	3.77(.29)	2.91(.24)	3.23(.20)
<b>Chemotherapy</b>								
Yes	23.14(.43)	11.00	4.16(.30)	4.10(.32)	4.21(.31)	3.94(.11)	3.10(.15)	3.63(.46)
No	22.05(.42)		4.02(.27)	3.98(.27)	3.93(.29)	3.83(.27)	2.99(.35)	3.30(.20)
<b>Radiotherapy</b>								
Yes	22.39(.44)	13.00	4.08(.25)	4.04(.29)	4.03(.36)	3.86(.29)	2.99(.36)	3.39(.34)
No	22.11(.39)		4.00(.33)	3.94(.25)	3.93(.20)	3.85(.20)	3.05(.27)	3.34(.19)

I.V.			content	language	organization	layout	illustration	motivation
	Sum	Mann-Whitney U	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<b>Oral hormone therapy</b>								
Yes	22.92(.44)	10.00	4.14(.23)	4.09(.31)	4.14(.33)	3.99(.12)	3.09(.34)	3.47(.33)
No	21.77(.42)		4.02(.27)	3.92(.22)	3.86(.21)	3.74(.27)	2.95(.31)	3.28(.23)
<b>Surgical therapy</b>								
Yes	21.84(.41)	11.00	3.95(.11)	3.84(.03)	3.88(.18)	3.89(.09)	2.98(.14)	3.32(.18)
No	23.18(.26)		4.07(.30)	4.04(.29)	4.01(.32)	3.84(.28)	3.84(.28)	3.38(.31)
<b>Nurses'</b>								
<b>Age</b>								
<=29	21.58(.34)	8.00	3.71(.11)	3.77(.33)	3.80(.10)	3.61(.38)	2.91(.28)	3.78(.35)
>=30	20.88(.33)		3.64(.07)	3.67(.23)	3.61(.31)	3.45(.48)	2.83(.20)	3.68(.24)
<b>Education level</b>								
Junior college	21.28(.35)	14.50	3.68(.26)	3.74(.29)	3.72(.34)	3.56(.50)	2.84(.22)	3.74(.32)
University	21.24(.32)		3.69(.16)	3.71(.30)	3.71(.30)	3.51(.39)	2.90(.26)	3.72(.31)
<b>Work experience</b>								
(years)	21.61(.34)	8.00	3.72(.30)	3.78(.33)	3.80(.29)	3.61(.37)	2.92(.28)	3.78(.34)
<=5	20.87(.33)		3.64(.20)	3.67(.23)	3.60(.31)	3.45(.48)	2.83(.20)	3.68(.25)
>5								
<b>Work place</b>								
General surgery	21.09(.42)	17.50	3.74(.19)	3.69(.18)	3.70(.27)	3.52(.35)	2.88(.26)	3.76(.26)
Oncology	21.23(.33)		3.66(.28)	3.74(.33)	3.71(.34)	3.54(.47)	2.87(.24)	3.71(.33)

As table 8 showed that demographic characteristic of samples was not related to the six categories of the printed materials in patients and nurses groups.

Table 9 Results of the evaluation of the different printed materials type in patients and nurses groups

Material type	Sum	Mann-Whitney U	content		language		organization		layout		illustration		motivation	
			Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U	Mean (SD)	Mann-Whitney U
Patients														
Booklet	24.54	5.00*	4.09(.12)	24.50	4.07(.04)	7.50**	4.15(.38)	22.50	3.91(.14)	39.00	4.09(.16)	14.00	4.21(.26)	13.50**
Flyer	23.94		3.99(.14)		3.95(.13)		3.97(.23)		3.82(.21)		3.94(.16)		3.95(.21)	
Nurses														
Booklet	23.76	8.50	3.96(.45)	22.00	3.79(.26)	33.50	3.83(.37)	36.50	3.50(.24)	43.00	3.82(.45)	23.50	4.02(.31)	19.00
Flyer	21.18		3.53(.34)		3.68(.31)		3.64(.38)		3.53(.27)		3.83(.37)		3.52(.54)	

\* p<.05, \*\* p<.01

The results of the evaluation of the different printed materials type in patients and nurses groups are shown at table 9. In patients, the significant finding was presented ( 5.00, p<.05 ). The two type's materials were differently displayed. In detail, the significant categories were language and motivation. For some flyers, they indeed expressed so many jargon and English that patients cannot understand. Furthermore, patients cannot be easily enhanced learning motivation. However, the non significant finding was exposed in nurses group.

Table 10 Results of the evaluation of the different stages of prevention measure in patients and nurses groups

Prevention measure	Sum	Kruskal-Walls H	content		language		organization		layout		illustration		motivation	
			Mean (SD)	Kruskal-Walls H	Mean (SD)	Kruskal-Walls H	Mean (SD)	Kruskal-Walls H	Mean (SD)	Kruskal-Walls H	Mean (SD)	Kruskal-Walls H	Mean (SD)	Kruskal-Walls H
Patients														
Detection	23.50	11.32*	3.97 (.20)	4.01	3.94 (.19)	4.78	3.84 (.23)	9.43*	3.87 (.22)	3.93	3.95 (.18)	2.98	3.93 (.26)	4.07
Treatment	23.78		3.99 (.14)		3.98 (.10)		4.04 (.25)		3.80 (.25)		3.96 (.12)		4.01 (.23)	
Rehabilitation	24.72		4.02 (.10)		4.06 (.03)		4.28 (.46)		3.98 (.13)		4.10 (.17)		4.28 (.33)	
Comprehension	23.98		4.12 (.04)		4.03 (.10)		4.03 (.02)		3.78 (.09)		4.04 (.25)		3.98 (.96)	
Nurses														
Detection	21.30	1.40	3.55 (.51)	1.78	3.82 (.27)	4.45	3.86 (.28)	2.17	3.68 (.31)	4.12	3.78 (.26)	5.00	3.29 (.63)	3.70
Treatment	21.54		3.59 (.39)		3.72 (.17)		3.73 (.23)		3.55 (.22)		3.81 (.53)		3.84 (.34)	
Rehabilitation	22.08		3.68 (.39)		3.89 (.07)		3.58 (.21)		3.32 (.13)		3.58 (.17)		3.98 (.14)	
Comprehension	23.46		3.91 (.45)		3.47 (.42)		3.65 (.68)		3.48 (.26)		4.25 (.37)		3.71 (.67)	

\* p<.05

The results of the evaluation of the different stages of prevention measure in patients and nurses groups are shown at table 10. In patients, the significant finding was presented ( 11.32, p<.05 ). In detail, the significant categories were organization. The rehabilitation was the highest score which is 24.72 in four stages and may be explained these patients have been staying this stage. In contrast, the non significant finding was established in nurses group.

Table 11 Six categories of the printed materials of Correlation Coefficients in patients groups

	content	language	organization	layout	motivation	illustration
language	.915**					
organization	.797**	.921**				
layout	.746**	.688**	.662**			
motivation	.827**	.709**	.675**	.555*		
illustration	.668**	.687**	.640*	.535*	.612*	
sum	.950**	.963**	.920**	.765**	.832**	.768**

\* p < .05, \*\* p < .01

Table 12 Six categories of the printed materials of Correlation Coefficients in nurses groups

	content	language	organization	layout	motivation	illustration
language	.895**					
organization	.809**	.899**				
layout	.653**	.827**	.796**			
motivation	.711**	.753**	.745**	.631*		
illustration	.690**	.690**	.622*	.406	.829**	
sum	.905**	.973**	.941**	.841**	.851**	.752**

\* p < .05, \*\* p < .01

Table 11 & 12 listed six categories and the sum of the printed materials of Correlation Coefficients in patients and nurses groups. Most of the categories of the printed materials and the sum were shown significant positive correlations. Seven of the correlation ( $\gamma$ ) belong very high correlation ( $\gamma = 0.8$ ,  $p < .001$ ), twelve are high correlation ( $\gamma = 0.6-0.8$ ,  $p < .05$ ,  $p < .001$ ), and two are moderate correlation ( $\gamma = 0.4-0.6$ ,  $p < .05$ ) in patients. In contrast, ten belong very high correlation ( $\gamma = 0.8$ ,  $p < .001$ ) and ten are high correlation ( $\gamma = 0.6-0.8$ ,  $p < .05$ ,  $p < .001$ ) (Wu & Tu, 2005).

Table 13 Priority needs of the printed materials in patients and nurses groups

group	Content		Language		Organization		Layout		Illustration		Motivation	
	priority	count	priority	count	priority	count	priority	count	priority	count	priority	count
patients`	1	10	1	3	1	1	1	1	1	0	1	0
	2	1	2	2	2	4	2	2	2	5	2	1
	3	2	3	2	3	3	3	3	3	3	3	3
	4	1	4	0	4	1	4	2	4	6	4	5
	5	0	5	5	5	3	5	5	5	1	5	1
	6	1	6	3	6	3	6	2	6	0	6	5
Nurses`	1	6	1	2	1	0	1	1	1	1	1	5
	2	6	2	2	2	3	2	0	2	0	2	4
	3	2	3	1	3	2	3	3	3	4	3	3
	4	1	4	6	4	3	4	1	4	3	4	1
	5	0	5	4	5	3	5	2	5	6	5	0
	6	0	6	0	6	4	6	8	6	1	6	2

The rank of the priority needs of the printed material showed at table 13. Content was selected the first choice by 10 patients. Three people preferred language, and others chosen organization and layout and typography, respectively. None of them decided illustration and learning motivation. On the other hands, six people preferred content, and motivation was chosen the first main concern by 5 of fifteen nurses. For language, layout and typography, and illustration were respectively preferred by 2, 1, and 1 people. None choose organization. Consequently, patients are considerate that organization is more important than nurses. However, the nurses may not pay attention in logical organization because of their professional.



Table 14 Coefficient of concordance of the printed materials needs

	patients	nurses	Patients & nurses
N	15	15	30
Kendall's W(a)	.219*	.349*	.287*

\*  $p < .05$

The printed material needs included content, language, organization, layout and typography, illustration, and motivation. Table 14 showed the consistence index of the printed materials needs. In patients, the Coefficient of concordance of printed material needs showed significant result ( $p < .05$ ), and the correlation of the material needs are related to in this group. Approximately (70%) patients focused on content. The significant difference was appeared the nurses group. They thought motivation is important as content. For patients & nurses groups, their needs were related ( $p < .05$ ). They had the similar choice in content which was chosen the priority need. Besides, they decided language, layout, and illustration which were listed last one- third needs. Otherwise, organization was selected the second need in patients' choice, but it was the last need in nurses. None of patient preferred to motivation which was the nurses' favor. As a result, the two groups had the similar needs in the first priority and last one- third. Because of the position of the nurses, not only the evident information but also improving behavior and engaging the reader in are essential concerns. In patients, they could prefer the purposed, valuable, and correct printed materials, but they may not have confidence to be assured learning motivation by printed materials.

## Discussion

Results from this study have identified the evaluation of the printed materials in women with breast cancer and professionals and their material needs. Patients group had higher evaluated score than nurses group for each material. For patients, they may know the quality of the bad or worse material is, but they were afraid to appraise the low score because of their patient role. In addition, because the publisher is professional, they thought it was not allowed against professional. These may be explained they gave higher score than nurses.

A majority (85%) materials were summarized good (3 stars) and 15 % were better (4 stars) in patients. For nurses, three of materials were summarized badly (2 stars). Four were better materials, approximately others were good, but none were excellent. Mumford (1997) found the information leaflets quality designed by nurses

were one was very poor, five were fair, and eight were good. The quality of the printed information were evaluated by patients who were from a stroke rehabilitation unit of a hospital, the scores raked respectively 8.5, 8.5, and 9.0 in ease of reading, ease of understanding ,and satisfaction with written information (Tooth & Hoffmann, 2004). Whelan et al. (1998) reported that cancer patients were satisfied with the printed materials which mean of satisfaction increased from 3.3 to 3.8 of using a 5-point Likert scale, and 87% of the patients thought receiving the printed materials was important.

In this study, the materials were shown high evaluation by patients. They seemed to satisfy these information of materials, especially the content-evident materials. For the diseased patients, the up-to-date information may reflect their real experience, such as treatment. Based on the patients' role, they loved the contented- materials, which included the evident, attractive, and purposed information to make sure they can be cured or be alive. The similar result was reported that readers preferred the inclusion of diagram, clear and simple presentation of the information, and useful materials (Davis et al., 2006). The previous studies (McKenna & Scott, 2007; Griffin et al., 2003; Coulter, Entwistle, & Gilbert, 1999) reported that the principles of the content and design includes showing the purpose, providing how- to information, and the accurate and up-to- date content. Boyd (1987) pointed out that a printed material should contain the what, why, and when of information.

Printed materials can effectively deliver the information to the readers if the materials easily read and understand (Paul et al., 2003; Mumford, 1997; Weinman, 1990). The accessibility printed material is not only producing change in knowledge, attitude, and behavior but also recalling information (Ashraff, Malawa, Dolan, & Khanduja, 2006; Weinman, 1990). Boyd (1987) thought the dark on light contrast background, and preferably 12-point font size could improve printed materials.

Furthermore, Hoffmann et al. (2004) point out that learning objectives can enhance readers to recall information and increase self-efficacy when understanding. Unfortunately, patients in this study are not certain to become the behavior from the knowledge. They can not be enhanced the learning motivation for some reason. Patients may prefer to be encouraged or to be firmly told "you just do this." by physicians or nurses. Hutchison and Campbell (2002) found although 39 of forty patients answered the booklets scale which were 7 or above were helpful, 87.5% thought the booklet had had no effect when making decision. They seem to rely on the

physicians or nurses to teach them. Tooth and Hoffmann (2004) reported that the participants preferred a face- to face discussion, and a doctor was the best information source (Grime et al., 2007; van Veenendaal, Grinspun, & Adriaanse, 1996).

Motivation may not be induced by a non- verbal communication tool. Patients may need the firm promise from the professionals to decrease their anxiety, or they may not be ready to face the disease prognosis in some patients (Hutchison & Campbell, 2002). For these patients, the response of psychosocial or emotion should be altered (Daugherty, Ratain, & Grochowski, 1999). Furthermore, individual motivation was not be enhanced by materials but themselves. As a consequence, the written materials seem to become an adherent tool for patients.

Otherwise, Powe, Daniels, Finnie, & Thompson (2005) described the education level is not related to the ability of the reading and comprehension, and 12<sup>th</sup> grade education in this study is not expected as high. As a result, the jargon or abbreviations indeed can not be understood by patients. Many studies (McKenna & Scott, 2007; Rodgers & Namaganda, 2005; Griffin et al., 2003; Paul et al., 2003; Dickinson, Raynor, & Duman, 2001) described that using short sentences, succinct and common language, avoid jargon are essential for the printed materials for patient. The intimidating language would discourage people to pick up the printed materials to read (Davis, Armstrong, Dignan, Norling, & Redmond, 2006). Similarly, the low score 'pamphlet were characterized jargon, long, and complex sentences (Paul et al., 2003).

In addition, the materials needs are concerned for developing written material. Patients in this study preferred content and organization instead of motivation and illustration. Because of the patient role, they may not as professional as nurses read printed materials without organization. The logical flow could create the cause and effect and make understanding. Paul et al. (2003) found that the “low score” pamphlets were designed with no use of organizing devices and a logical flow.

However, illustration is not important point for these patients. The different findings which showed a diagram were considered important factor by patients with colon cancer (Davis et al., 2006). Using simple and culturally illustrations, pictures, or symbols and adequate spacing are essential points with the principle of the design of the printed materials (McKenna & Scott, 2007; Griffin et al., 2003; Strydom, Forster, Wilkie, Edwards, & Hall, 2001). The same point also is described that the addition of drawings and diagrams may be an important factor in promoting understanding

(Beaver & Luker, 1997). They may think the printed materials necessarily read or be valuable if their needs were matched even without diagram.

Nurse's perspective of printed material is important, and they could have the serious viewpoint to assess the materials. For the shorter hospital stayed patients, the effective printed materials can help them to understand what nurse teaches and save time of consultation. Differently, in spite 44% of the doctor's views of printed material were 'ambiguous to neutral and 36% "overtly negative," 20% of the doctors were 'moderately positive' to support the written information (Vander Stichele, De Potter, Vyncke, & Bogaert, 1996). Compare with patient, nurses were concern learning motivation. Grime, Blenkinsopp, Raynor, Pollock, & Knapp (2007) described that the compliance of information was their concern. They thought the implement is as vital as content. They believe that behavior can be reinforced by printed materials for patients.

The printed materials were related to the public organization. For the two bad materials, the information is posted on the medical centers website. They have shown much information with breast cancer as possible, and the comparable finding was shown "too wordy" language can not be accepted by readers (Davis et al., 2006). Most of the "better" printed materials were published by charitable organizations. They use the explained- illustrations, short but firm sentences, and the newest information to pay readers attention. For the Bureau of Health Promotion, which is government department, most of publishes were summarized "good". They could improve a lot if referencing the materials that published by charitable organizations.

Fortunately, patients possess the ability of judging the materials which ranked the last one- forth, and they no more read the complex materials. As a result, the well-designed printed material is necessary in order to distribute the information.

## **Conclusion**

The printed materials are important for patients, especially the categories of content and organization were preferred. Therefore, the current or up- to -date information are necessary. Also, the logical flow can improve understanding. Although motivation was not concerned by these patients, it is important category for nurses. Professional should understand why motivation cannot be enhanced, and psychosocial may be noted. Patients have possessed the ability to judge the printed

materials and no more read the complex materials which including long paragraph, jargon or abbreviation. For nurses, they believe that motivation can be increased by printed materials. The effect may be expressed if professional encourage them.

The effective printed materials indeed increase readers' self- efficacy and decrease anxiety, and the motivation was enhanced. The categories of the effective design printed materials including content, language, organization, layout, illustration, and learning motivation are essential factors.

### **Limitation**

The limitations in this study must be addressed. The numbers of participants are patients and nurses in this study were small. However, it took 4 hours and 1.5 hours for patients and nurses to finish scales for 20 printed materials. The total time spend in data collection is 15 hours make this study difficult to recruit sample. The samples will be larger if possible. Further research is needed to understand the material needs in different disease stages in creating an excellent and high quality printed material.

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