

A Comprehensive Model for Measuring Information System Performance for Treating Chronic Adhesive Capsulitis

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Abstract

This paper is to develop a comprehensive model for measuring information system performance for treating chronic adhesive capsulitis. The data were collected by interview and questionnaires from August 10 to September 25, 2015. The X²-test was used to observe a statistically significant difference of general characteristics between experimental and control group. As a result, firstly, for marital status, the percent of single (21.3%) in the experimental group were significantly a lower rate than the proportion (36.0%) of single in the control group ($X^2=3.41$, $p<0.05$). Secondly, for the effectiveness of massage therapy, respondents' score (32.19 ± 0.57) after application significantly increased than respondents (17.59 ± 1.55) before application of a comprehensive model ($t=-0.16$, $p=0.00$). Thirdly, for health practice, the result of follow-up survey in patients with adhesive capsulitis of shoulder, the mean scores of health practice showed an increase in the experimental group, regardless of the time elapsed of 60 days after the information application. Therefore, the comprehensive model of this system will contribute to reducing chronic adhesive capsulitis of shoulder in the future.

Keywords: *Comprehensive model, Information system, Performance, Adhesive capsulitis, Self-activities*

1. Introduction

Adhesive capsulitis of shoulder also known as frozen shoulder is a painful and disabling condition of unclear part in which the upper limb. The bone and muscle tissue surrounding the aponeurosis of the shoulder becomes inflamed and hard, greatly restricting movement and causing chronic work [1-3]. Pain is usually continuity, worse at evening, and with winter temperature. Certain movements or state can present condition of tremendous pain and cramping. Adhesive capsulitis occurs well after the 50-year-old women. Particularly, it often occurs shoulders aching with the disease. It was characterized by a hard movement from the 60 to 80 years old that occurs in 3-7% is a common disease [3-5]. Movement of the shoulder is severely limited, with pain loss of both shoulder and passive limitation of movement^[1] The part is sometimes caused by disorder, leading to lack of movement due to pain and stiffness of shoulder but also often arises spontaneously with no obvious trigger element. Rheumatis and surgery of shoulder joint can also cause a condition of pain and limitation of movement similar to adhesive capsulitis. periods of use may cause inflammation [6-7].

In adhesive capsulitis, there is a lack of synovial fluid, which normally helps the shoulder bone, a ball and socket bone, move by lubricating the gap between the upper limbs and the socket in the shoulder blade. The shoulder capsule thickens, swells, and tightens due to bands of scar part that have made inside the ligament. As a result, there is less room in the bone for the upper limbs, making movement of the shoulder limitation. This restricted space between the capsule and ball of the upper limb distinguishes adhesive capsulitis from a less complicated, painful, stiff shoulder [5, 8].

The incidence of adhesive capsulitis is about 5 percent in the general population. The incidence of adhesive capsulitis is about 5 percent in the general population. Occurrence is rare in children and people under 30 but peaks between 50 and 60 years of age. Women are more often influenced than men and it is common in patients with diabetes mellitus. The incidence of adhesive capsulitis is about 3 percent in the general population. At least in its idiopathic form, the condition is much more common in women than in men. The disease presents approximately 70% of patients who are women aged 40–60. Adhesive capsulitis is more frequent in diabetic patients and is more symptoms and more disorder than in the non-diabetic population. Recent vaccine-related shoulder disorder are increasing in patients with women [9, 10].

People with diabetes mellitus, cerebrovascular accident, pneumothorax, degenerative arthritis, or angina pectoris are at a higher risk for frozen shoulder. Injury or surgery to the shoulder or upper limb may cause blood flow damage or the capsule to tighten from reduced use during recovery. Adhesive capsulitis has been indicated as a possible adverse effect of some forms of highly active muscle therapy. Some cases have also been reported after mastectomy and lung surgery. Surgery is recommended nonsurgical treatment is not effective. But there are complications. That is stiffness and pain continue even with therapy. The condition can lead to depression, pain, disorder in the cervical part and back and severe weight loss due to long-term lack of deep sleep. People who suffer from adhesive capsulitis may have extreme difficulty concentrating, working or performing daily life activities for extended periods of time [11, 12].

In order to treatment the disorder, we should look for practical and useful contents. However, there were few researches to deal with contents of information system for the treatment in patients with adhesive capsulitis so far.

Therefore, a comprehensive model of adhesive capsulitis is needed to control the increasing prevalence of adhesive capsulitis and conduct its related desirable outcomes. Thus, this paper is to estimate a comprehensive model of an information system for treating chronic adhesive capsulitis. That is, the paper is to develop an information system for improving adhesive capsulitis. A comprehensive and systematic adoption of an information system to minimize the damage of adhesive capsulitis of shoulder will contribute more to the rapid disorder loss and discomfortable function.

2. Materials and Methods

2.1 Study Materials

The subjects of this study were 150 persons who have visited in orthopedic surgery at a general hospital in Metropolitan province which was willing to participate in the program. The subjects were randomly classified into two groups of each part 75. One group was for the experimental group and the other group was for the control group. The experimental group of 75 patients which was assigned as part by application of a comprehensive model, while the control group of 75 patients was assigned as part without application of a comprehensive model.

2.2 Contents of A Comprehensive Model

The contents of a comprehensive model are as follows. Skill, motivation, timeliness, impact, improvement and others in Figure 1. For detailed contents, there are recognition, attitude, accurate, improvement. In addition, time assigned for patients with frozen shoulder is as follows. Discussion, teaching, efficiency, evaluation and others. There were accurate entry of patient status and therapeutic procedure and evaluation of information system quality in Figure 2-3.

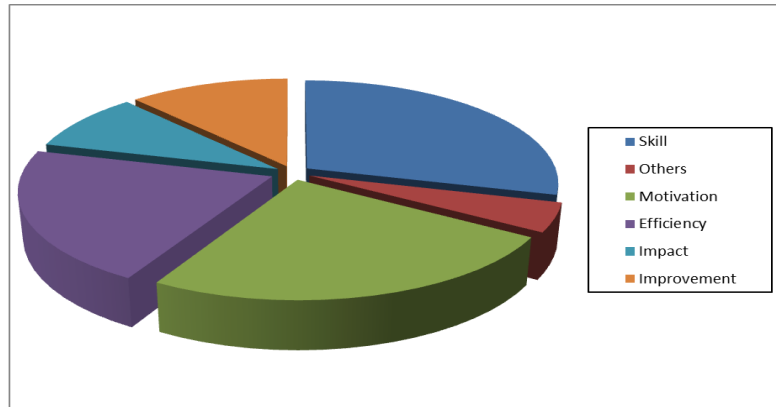


Figure 1. Contents of A Comprehensive Model

2.3. Study Methods

The X^2 -test was used to observe a statistically significant difference of general characteristics between experimental and control group. The pairwise t-test was done to compare the change of self-activities before and after application of a comprehensive model. The t-test was also performed to determine a statistically significant difference between the two groups on user satisfaction of the information system for measurement of activities of daily living for the prevention of recurrence in adhesive capsulitis.

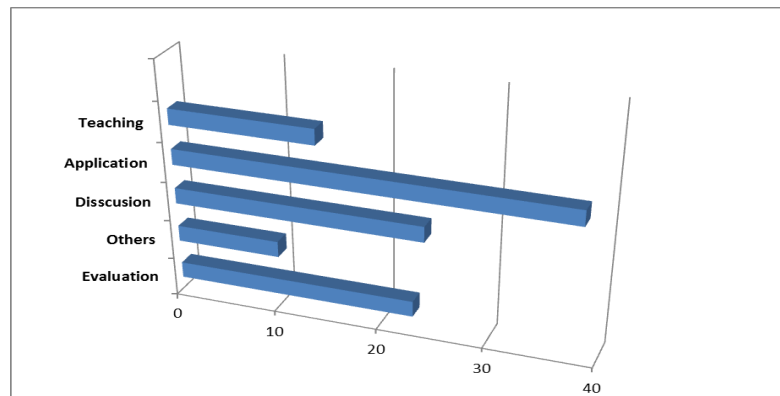


Figure 2. Time Assigned for Patients with Chronic Adhesive Capsulitis

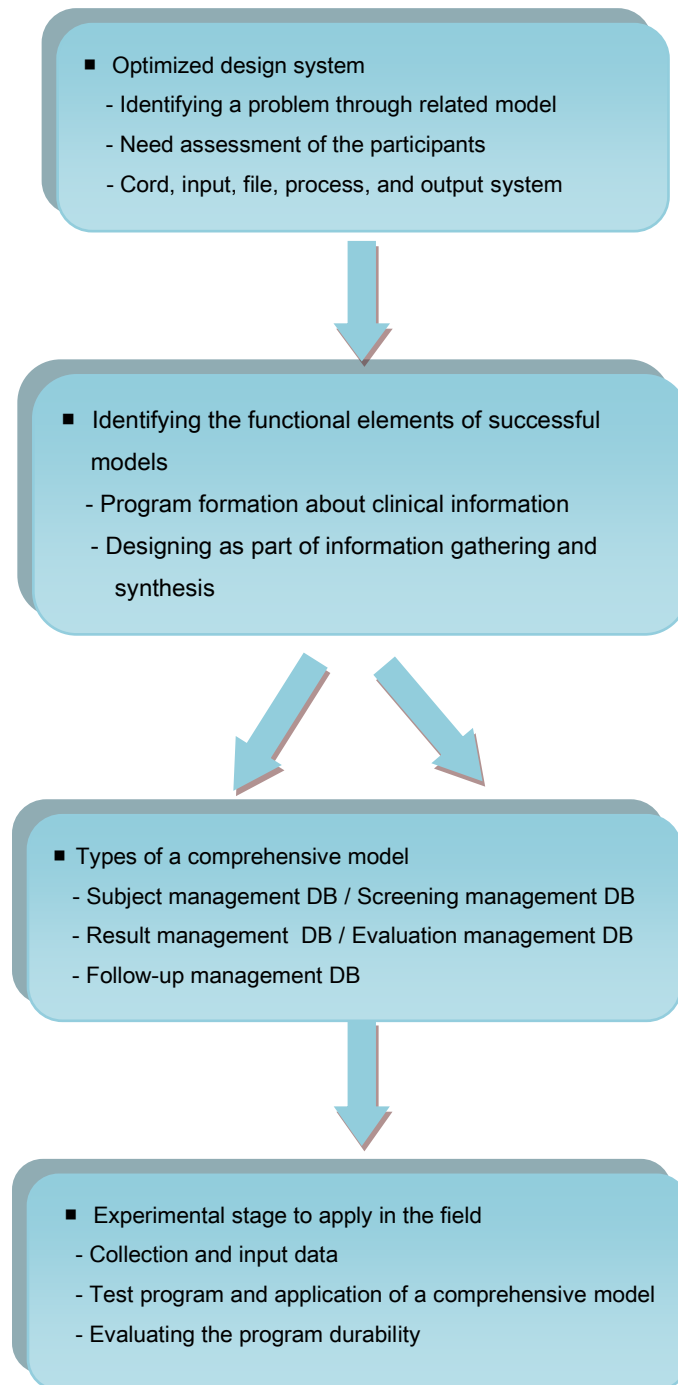


Figure 3. A Comprehensive Model for Patients with Chronic Adhesive Capsulitis

3. Results

3.1. Basic Information of Subjects in This Study

Table 1 presents basic information of subjects in this study. The subject's gender was analyzed. Male with 54.7% in the experimental group showed more than female with 52.0% in the control group. Female with 45.3% in the experimental group showed a lower rate than female with 48.0% in the control group. In the other hand, for marital

status, the percent of single (21.3%) in the experimental group were significantly a lower rate than the proportion (36.0%) of single in the control group ($X^2=3.41$, $p<.05$).

Table 1. General Characteristics of Subjects in This Study

Variables	Experi	Cont	X^2
	N(%)	N(%)	
Gender			
Male	41(54.7)	39(52.0)	9.28
Female	34(45.3)	36(48.0)	
Age			
≤39	7(9.3)	10(13.3)	10.37
40-49	15(20.0)	18(24.0)	
50-59	30(40.0)	21(28.0)	
≥60	23(30.7)	26(34.7)	
Monthly income			
≤99	16(21.3)	10(13.3)	5.62
100-200	11(14.7)	17(22.7)	
201-299	27(36.0)	30(40.0)	
≥300	21(28.0)	18(24.0)	
Marital status			
Single	16(21.3)	27(36.0)	3.41*
Married	59(78.7)	48(64.0)	
Education level			
Under middle	19(25.3)	22(29.3)	10.6
High school	25(33.3)	34(45.3)	
Over college	31(41.3)	19(25.3)	
Total	75(100.0)	75(100.0)	

* $p<0.05$

3.2. Comparison of Self-Activities After Application of a Comprehensive Model

Table 2 represents the comparison of self-activities after application of a comprehensive model. For the change of shoulder pain, respondents' score (24.63 ± 0.79) after application significantly decreased than respondents (31.50 ± 1.47) before application ($t=0.48$, $p=0.00$). For physical function, respondents' score (32.19 ± 0.57) after application significantly increased than respondents (17.59 ± 1.55) before respondents ($t=-0.16$, $p=0.00$) after the massage.

Table 2. Comparison of Self-Activities After Application of a Comprehensive Model

	Before	After	t	P
	Mean±S.D	Mean±S.D		
Physical function				
Physical symptoms stiffness	34.97±0.62	28.14±1.52	2.06	0.00
Shoulder pain	31.50±1.47	24.63±0.79	0.48	0.00
Limitation of Movement	33.64±0.83	21.96±2.51	1.62	0.00
Stress	26.81±0.71	25.57±0.32	1.37	0.42
Massage	17.59±1.55	32.19±0.57	-0.16	0.00
Exercise	19.59±1.40	23.27±1.39	-0.42	0.38
Compress	11.62±0.39	30.15±0.82	-0.75	0.00
Dietary practice				
Onion intake	24.63±1.82	27.60±1.48	-2.74	0.52
Anchovy intake	25.84±0.36	32.17±0.85	-1.47	0.00
Milk intake	16.36±1.85	19.52±1.29	-0.28	0.49
Almond	9.72±0.72	12.49±0.51	-1.62	0.37
Clinical condition				
Sea mustard	26.95±0.34	33.71±0.39	-1.39	0.00
Smoking	22.62±1.59	21.62±1.46	3.74	0.59
Alcohol drinking	25.18±0.86	22.17±1.72	1.59	0.46
Diabetes mellitus	22.57±1.36	20.28±1.35	2.82	0.41
Hypertension	26.48±0.73	19.62±0.59	0.74	0.00
Cholesterol	26.75±1.29	22.49±1.67	0.51	0.34

3.3. Follow-up Survey of Health-Related Lifestyle Behaviors After Application

Figure 4-5 presents the follow-up survey of health-related lifestyle behaviors after application of the information system. For stress control, according to the health promoting behaviors after the application, the mean scores of the experimental group showed a decrease after the application than control group. On the other hand, for health practice, the result of follow-up survey in patients with adhesive capsulitis of shoulder, the mean scores of health practice showed an increase in the experimental group, regardless of the time elapsed of 60 days after the information application.

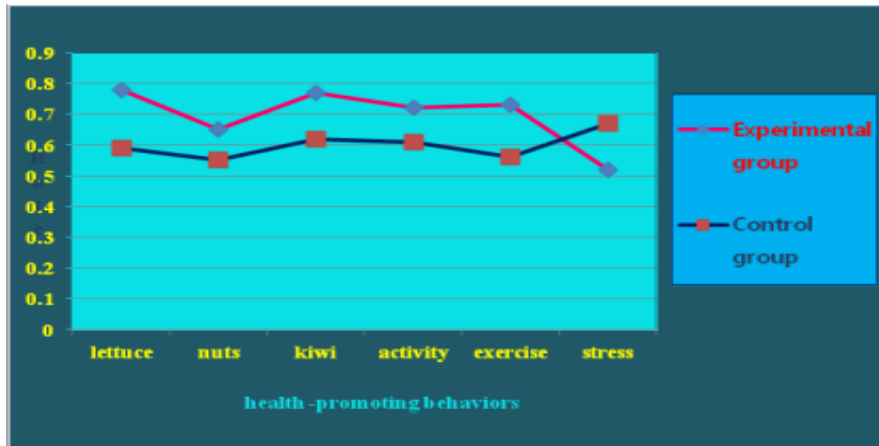


Figure 4. Follow-up Survey of Health Promoting Behaviors

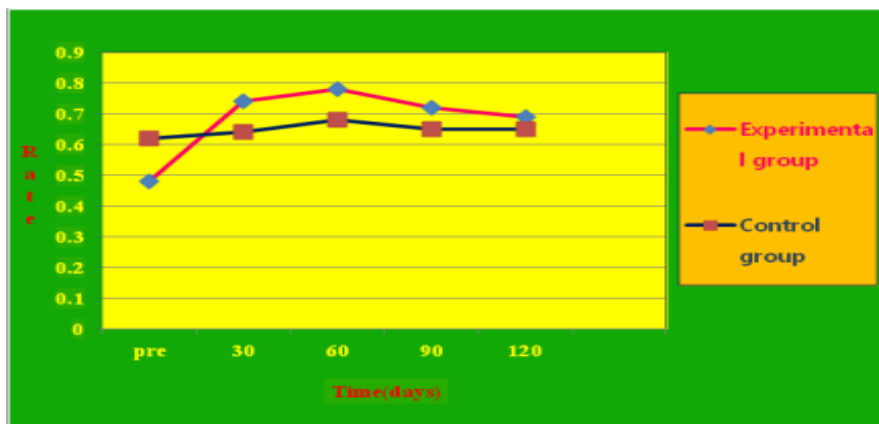


Figure 5. Follow-up Survey of Health Practice

4. Discussion

This paper is to estimate the effect of a comprehensive model of information systems for treating chronic adhesive capsulitis of shoulder. The application effect was significantly decreased the disorder rate of shoulder using application of the information system, and then multiple approaches is effective in reducing the adhesive capsulitis prevalence. As a result of this study, the message strategy, compression on healthy behaviors diminished the progression rate of disease. The finding was a difference to the previous studies on the frozen shoulder [13, 14]. This study suggests that patients with adhesive capsulitis of shoulder should be focused on real application testing to prevent the incidence of disease. Based on the result obtained by the research, it is anticipated that this may be used as an effective data for developing and intervening information system for the patients with adhesive capsulitis of shoulder. However, in order to prevent adhesive capsulitis, the results show that a comprehensive information is more useful than individual information program. After the experiment, the experimental group which experienced information application level on optimum information system showed the effectiveness of health practice in patients with adhesive capsulitis of shoulder. In comparison with the mean of shoulder stiffness, the experimental group's change was more positive, and there was significantly higher than control group.

As is stated above, we identified that experimental group of the application of daily activities has been effective for doing shoulder firm and pain control which alleviate the disorder of adhesive capsulitis in subjects. And the improvement was a significant

satisfactory. The finding was similar with the results of previous researches [15],[16]. Therefore, it is believed that the application of experimental group is a unique useful program for self-improvement of subjects. And it is a new way of information system for adhesive capsulitis patients. This research will contribute to establish the advanced system and the developed structure and ultimately to improve activities of daily living in patients with adhesive capsulitis of shoulder.

A comprehensive model is any organized model for the data collection, processing, storage, analysis and communication of information. Particularly, it is the research of complementary networks that patients and diseases use to collect, analysis, filter, analysis, process, create, distribute, and evaluation data.

A comprehensive information system is a system composed of patients and contents that processes or interprets information. The term is also sometimes used in more restricted senses to refer to only the software used to run a computerized database or to refer to only a computer system. The Information model is an academic study of information systems for a specific patient to improve the diseases and the complementary networks of hardware and software. The model is an information system having a definitive boundary, users, processors, stores, inputs, outputs and the previous mentioned communication networks.

Any specific information system aims to support operations, management and decision-making. An information system is the information and communication technology (ICT) that an organization uses, and also the way in which patients interact with this technology in support of business processes. Some patients make a clear distinction between information systems, computer systems, and process. Information systems typically include an ICT component but are not purely concerned with ICT, focusing instead on the end use of information technology. The information systems are also different from other processes. The model of information systems will help to improve the performance of treatment for patients with chronic adhesive capsulitis.

5. Conclusion

This paper is to develop a comprehensive model for measuring information system performance for treating chronic adhesive capsulitis.

As a result, firstly, for marital status, the percent of single (21.3%) in the experimental group were significantly a lower rate than the proportion (36.0%) of single in the control group ($X^2=3.41$, $p<0.05$). Secondly, for the effectiveness of massage therapy, subjects' score (32.19 ± 0.57) after application significantly increased than subjects (17.59 ± 1.55) before application of a comprehensive model ($t=-0.16$, $p=0.00$). Thirdly, for health practice, the result of follow-up survey in patients with adhesive capsulitis of shoulder, the mean scores of health practice showed an increase in the experimental group, regardless of the time elapsed of 60 days after the information application. Therefore, the information system using intervention will contribute to reducing chronic adhesive capsulitis of shoulder in the future.

Acknowledgments

I thank them for conducting the output of research to respondents who had participated in the development of a comprehensive model for measuring information system performance for treating chronic adhesive capsulitis. This paper was a revised and expanded version of a paper entitled "Effect of A New Information Adoption for Treating Chronic Adhesive Capsulitis", Workshop on Healthcare and Nursing 2016 presented at Jeju National University International Center, April 19-21, 2016

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