CHAPTER 4

RESULT

Phase 1 (December 2005 - January 2006)

Among the 1,596 of 3,000 (53.2%) who responded to the questionnaires, only 1,247 had completed all questions in the Health-Related Self Report (HRSR) scale for depression. Of 1,247 subjects; 93.34%, 3.45% and 3.21% have D score of 24 or less, 25-29 and 30 or more respectively (figure 4.1). There are no statistically significant differences of percent distribution in gender and age between the 1,247 complete D score group and the 1,753 incomplete D score group. Based on a cut-off point 25 or more and 30 or more on the HRSR scale study, the point prevalence of probable depression is 6.6 % while the point prevalence of depression is 3.21 %. Of 83 subjects with probable depression, 12.05%, 31.32% and 40.96% are no pain, acute pain and chronic pain subjects respectively.
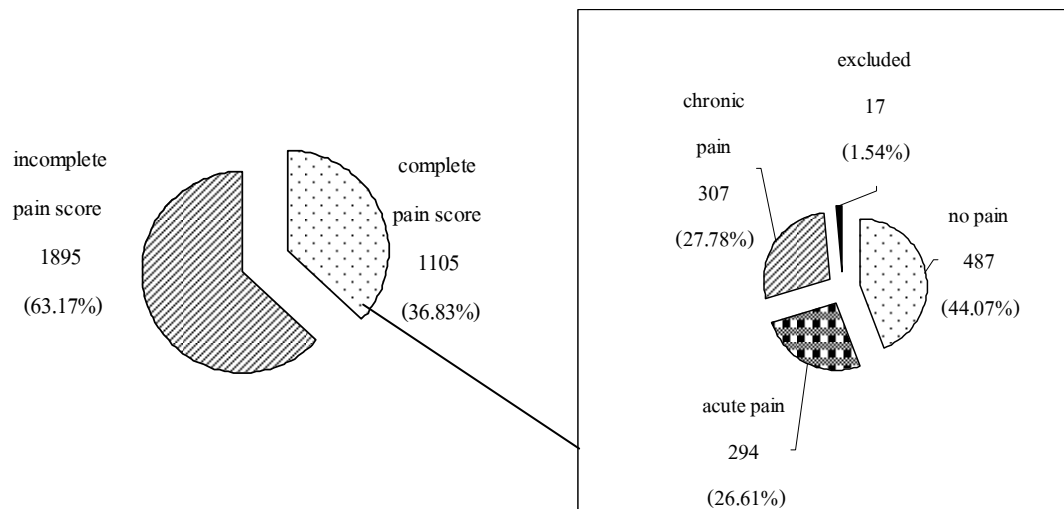
Figure 4.1

Percent of depression score respondents
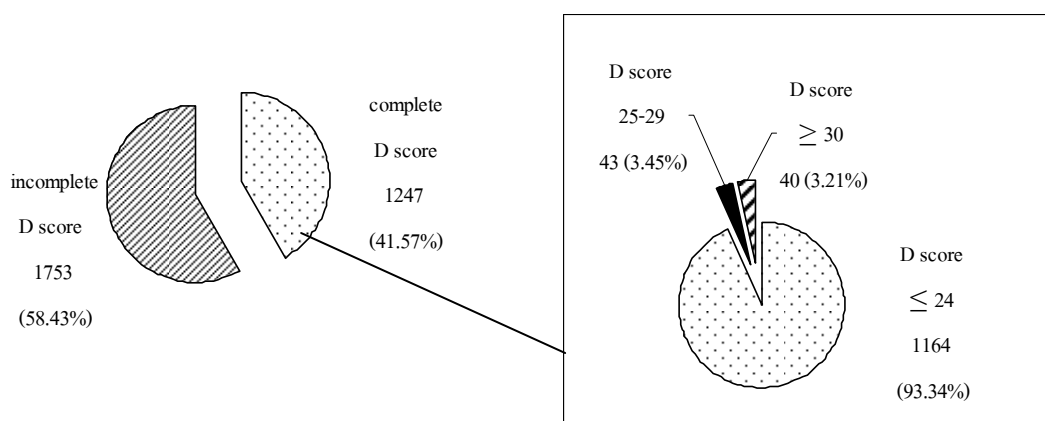
Among 1,596 respondents, 1,105 subjects had completed all questions in the pain report (figure 4.2). Of the1,105 subjects there were 487 no-pain subjects (44.07%) and 307 chronic-pain subjects (27.78%).
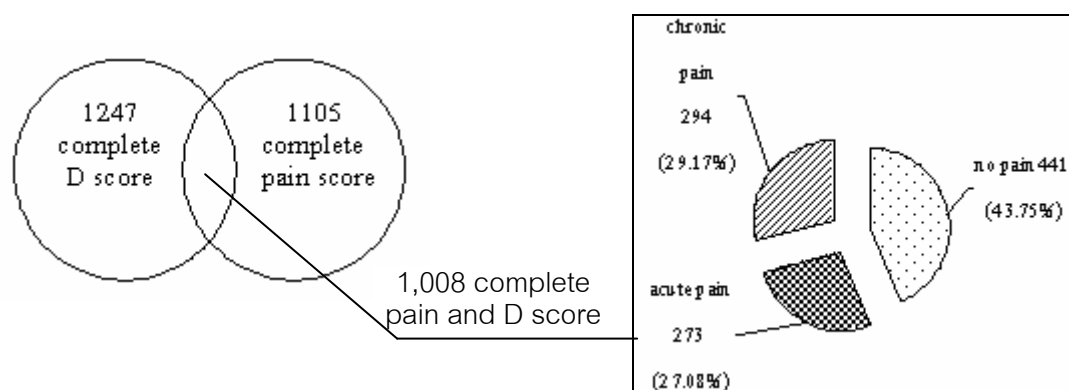
Figure 4.2

Percent of pain score respondents

From 1,247 completed D score respondents and 1,105 completed pain score respondents, only 1,008 subjects completed all questions in both depression and pain score (figure 4.3). These subjects are no pain 43.75%, chronic pain 29.17% and acute pain 27.08%.
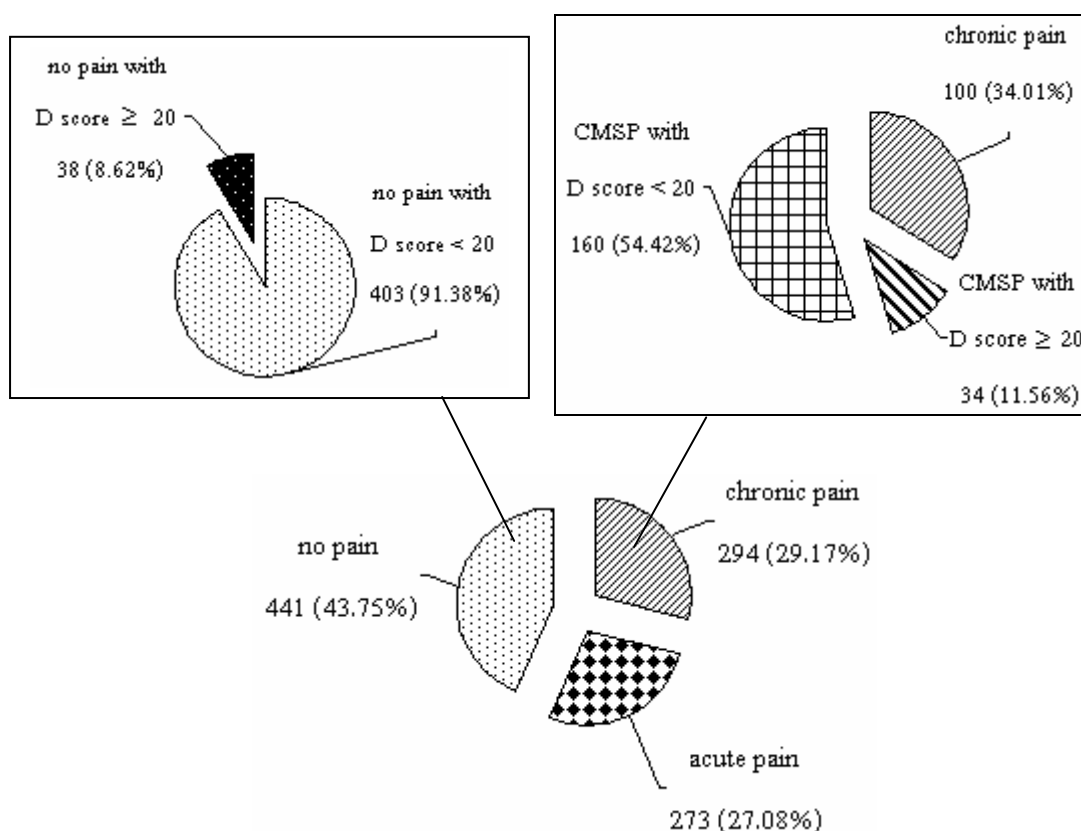
Figure 4.3

Subjects with complete pain score and D score

In this study a cut-off point D scores of 20 was used to select the case for phase 2 and phase 3. The score of 20 or more was selected as high risk of depression because it is the minimum D score of mild to moderate depression from previous study (Kasantikul et al., 1997).

Figure 4.4

No pain and chronic pain subjects with low risk depression (D score < 20)

and high risk depression (D score $\geq$ 20)

In figure 4.4, there are 403 no-pain subjects with low risk depression and 38 no-pain subjects with high risk depression. And there are 194 diagnosed as chronic musculoskeletal pain (CMSP) which consists of 160 CMSP with low risk depression and 34 CMSP with high risk depression. For phase 2, 150 no-pain subjects with consent were selected by random sampling from 403 no-pain subjects with low risk depression

and 160 chronic musculoskeletal pain (CMSP) subjects with consent were included. For phase 3, 34 CMSP subjects with high risk depression were studied.

Of 194 CMSP subjects (19%), the site-specific 6 month or more are: shoulder girdle 4.0%, upper arm 1.1%, forearm 2.3%, pelvic region and thigh 0.6%, lower leg 13.0%, ankle and foot 1.1%, back and sacrum 22.6%, and multiple site 55.4%. For the percent of D scores in each specific pain site, it is found that the percent of back pain and multiple site pain subjects with probable depression (D score of 25 or more) is higher than of other site pain subjects.

Table 4.1

The percentage of depression screening by risk factors

in 194 chronic musculoskeletal pain subjects

Risk Factors	n	Risk depression	Probable depression	p-value
Gender				
- male	81	98.8	1.2	0.002*
- female	108	86.1	13.9	
Age (years)				
- 15-29	27	85.2	14.8	0.253
- 30-59	162	92.6	7.4	
Marital status				
- single	45	88.9	11.1	0.542
- couple	142	92.3	7.7	
Education				
- no education to primary school	104	89.4	10.6	0.551
- high school to high certificate	63	93.7	6.3	
- bachelor degree or higher	19	94.7	5.3	

Note: Cut off point D score of 25 was used to study the association: risk depression (D score <25),

probable depression (D score $\geq$ 25)

Table 4.1

The percentage of depression screening by risk factors

in 194 chronic musculoskeletal pain subjects (cont.)

Risk Factors	n	Risk depression	Probable depression	p-value
Income				
- sufficiency	144	95.1	4.9	0.004*
- insufficiency	38	78.9	21.1	
Poor family relationship				
- no	112	96.4	3.6	0.003*
- yes	75	84	16.0	
Poor officemate relationship				
- no	135	93.3	6.7	0.215
- yes	46	87.0	13.0	
Poor community relationship				
- no	138	91.3	8.7	1.00
- yes	48	91.7	8.3	
Health problem number				
- one problem	125	92.8	7.2	0.560
- more than one problem	56	89.3	10.7	
Pain duration				
- between 6 months to 1 year	57	91.2	8.8	0.776
- more than 1 year	131	92.4	7.6	
Pain site				
- one site	77	96.1	3.9	0.028*
- more than one site	95	86.3	13.7	
Pain Intensity				
- pain score < 50	100	98.0	2	<0.001*
- pain score $\geq$ 50	78	83.3	16.7	

Note: Cut off point D score of 25 was used to study the association: risk depression (D score <25),

probable depression (D score $\geq$ 25)

Table 4.1

The percentage of depression screening by risk factors

in 194 chronic musculoskeletal pain subjects (cont.)

Risk Factors	n	Risk depression	Probable depression	p-value
Pain disability				
- disability point < 3 (no disability – low disability)	104	93.3	6.7	0.075
- disability point $\geq$ 3 (high disability)	6	66.7	33.3	
Specific Pain site				
- upper limb	13	100.0	0.00	NA
- lower limb	26	100.0	0.00	
- back and sacrum	38	92.1	7.9	
- multiple site	95	86.3	13.7	

Note: Cut off point D score of 25 was used to study the association: risk depression (D score <25),

probable depression (D score $\geq$ 25)

In this study the scores collected by GCPQ are considered separately for pain intensity and pain disability because there is the limitation of validity of pain disability data.

Univariate analysis for the association of potential risk factors and the depression score of 194 CMSP subjects in table 4.1 shows that significant differences in percentage of depression grouping (risk depression and probable depression) are found in gender, income, family relationship, pain site and pain intensity.

The higher percentages are found in female, insufficient income, poor family relationship, multiple pain site and high score of pain intensity. The other potential risk factors such as age, marital status, education, officemate relationship, community

relationship, pain duration, pain disability and health problems are not significantly different.

Table 4.2

Coefficient of selected variables in multiple logistic regression of probable depression

	Model 1 Coefficient (S.E.)	Model 2 Coefficient (S.E.)
Constant	-6.39	-6.32
Gender	1.93 (1.09)	2.37 (1.06)*
Income	1.06 (0.67)	
Family relationship	1.06 (0.69)	
Pain site	0.77 (0.73)	1.19 (0.70)
Pain intensity	1.76 (0.82)*	2.10 (0.79)*
Log Likelihood	- 33.67	-37.52
Pseudo R^2	0.32	0.24
Hosmer and Lemshow test	0.90	0.27

Note: Cut off point D score of 25 was used to study the association: risk depression

(D score <25), probable depression (D score $\geq$ 25)

Multivariate analyses are done by logistic regression to determine association of all significant factors from table 4.1. Two models compare the candidate risk factors (table 4.2). Pain site and pain intensity are the important variables in this hypothesis study, so both variables have to be run in every model. Model exploring demonstrates that the variable significantly associated to probable depression in all models is pain intensity. Model 1 demonstrates that the subjects with any status of income and family relationship have the equal risk to probable depression, but female subjects have the high risk although it does not significant associates. When the income and family relationship variables were excluded in the model 2, it demonstrates that gender significantly associates to probable depression. That means the income and

family relationship influence to gender. So model 2 is good fits and is able to explain the variance of probable depression occurrence more accurately than the other model (table 4.3). It explains the association of variables which is given by Ln [p/(1-p)] = - 6.32 + 2.37 gender + 2.10 pain intensity. It also shows that females had a risk about 10.72 times as high as males. While the subject with a high score of pain intensity had the risk about 8.15 times to the one with low score of pain intensity.

Table 4.3

Predicted Logistic regression of probable depression and risk factors in 194 CMSP

Risk factor	coefficient	S.E.	Sig.	OR	95.0% C.I. for OR	
					Lower	Upper
Gender	2.37	1.06	0.03	10.72	1.33	86.22
Pain site	1.19	0.7	0.09	3.27	0.83	12.94
Pain intensity	2.10	0.79	0.01	8.15	1.72	38.72
Constant	-6.32					

Note: Cut off point D score of 25 was used to study the association: risk depression (D score <25), probable depression (D score $\geq$ 25)

Phase 2 (January 2006-August 2006)

This phase was carried out for 6 months because there was flood disaster in the study area during September to November 2006. One hundred and fifty NP subjects and 160 CMSP subjects were followed up for D score and pain score in the 3rd and 6th months. Results showed that in the 3rd month, 68% of 150 NP subjects and 76.25% of 160 CMSP subjects completed the questionnaire. In the 6th month, the percentage of completed questionnaires was up to 74% of 150 NP subject and 82.5% of 160 CMSP subjects. Finally only 82 of 150 no-pain subjects (54.67%) and 103 of 160 CMSP subjects (64.38%) completed the 6 months follow-up period.

Univariate analysis for the association of potential risk factors and pain in table 4.4 shows that there are a higher percentage of pain subjects in age, marital status, education, and community relationship. The higher percentages are found in adults (30-59 years), couples, low education, and poor community relationship. Entire the time of follow-up, there are no significant differences of the demographic factors in NP group (P>0.05). But for CMSP group there is significant differences of officemate relationship (P<0.05).

Table 4.4

The percentage of the no pain (NP) and chronic musculoskeletal pain (CMSP) subjects by demographic factors at the beginning of phase 2: follow-up phase

Demographic factors	number	NP (n=82)	CMSP (n=103)	p-value
Gender				
- male	83	47.0	53.0	0.511
- female	102	42.2	57.8	
Age (years)				
- 15-29	48	77.1	22.9	<0.001*
- 30-59	137	32.8	67.2	
Marital status				
- single	67	62.7	37.3	<0.001*
- couple	116	34.5	65.5	
Education				
- no education to primary school	78	26.9	73.1	<0.001*
- high school to high certificate	81	60.5	39.5	
- bachelor degree or higher	21	47.6	52.4	
Income				
- sufficient	148	43.9	56.1	0.633
- insufficient	33	48.5	51.5	

Table 4.4

The percentage of the no pain (NP) and chronic musculoskeletal pain (CMSP) subjects

by demographic factors at the beginning of follow-up study (cont.)

Demographic factors	number	NP (n=82)	CMSP (n=103)	p-value
Poor family relationship				
- no	126	48.4	51.6	0.122
- yes	58	36.2	63.8	
Poor officemate relationship				
- no	149	47.0	53.0	0.267
- yes	33	36.4	63.6	
Poor community relationship				
- no	151	49.7	50.3	0.001*
- yes	33	18.2	81.8	

Table 4.5 shows the percent increase of high risk depression (D score of 20 or more). It reveals that in the 3rd month the incidence of high risk depression in no-pain group and CMSP group is 7.32% and 7.77% respectively. In the 6th month the incidence case in no-pain group and CMSP group is 2.44% and 2.91% respectively. The percent increase of high risk depression in CMSP subjects is little higher than in no-pain subjects in each 3 month period. In detail, it is found that nobody in no-pain group has sustained high risk depression in both periods. However, in the CMSP group there are 3 subjects who sustained high risk depression in both periods.

At the 3rd month and 6th month of the follow up period, 42.7% and 18.3% of the 82 NP subjects reported pain. Only 12.63% of 82 subjects reported pain in both periods but all of them had no high risk depression. Of 6 NP subjects with high risk depression in the 3rd month, only 4 subjects reported pain. However, the in-depth interview in the incidence group for the relationship between the event and an increase of high risk depression shows that only one case reported pain affected mentally.

Table 4.5

Percent increase of high risk depression (D score of $\geq$ 20) in no-pain and

CMSP subjects during six months follow-up

case	n	% increase of high risk depression (n) incidence		% increase of high risk depression prevalence
		Month 3	Month 6	
No pain	82	7.32 (6)	2.44 (2)	9.76
CMSP	103	7.77 (8)	2.91 (3)	10.68

For the CMSP group, 20.0% and 30.9% were free from pain at the time of the 3rd and 6th months respectively. Only 12.63% of 103 CMSP subjects were free from pain the entire time and nobody had high risk depression. The in-depth interview in the incidence group of CMSP cases shows that 6 of 11 subjects reported pain affected mentally. The other 5 subjects reported problems of debt, insufficient income and their offspring's behavior.

Table 4.6

The number of occurrences of high risk depression (D score of $\geq$ 20)

in no-pain and CMSP groups in the follow up period

|	Case		RR	95% Confidence Interval	
	No pain N=82 (%)	CMSP N=103 (%)			
Month 0	0	0	-	-	-
Month 3	6 (7.32)	8 (7.77)	1.06	0.38	2.94
Month 6	2 (2.44)	6 (5.83)	2.39	0.50	11.52
p-value	0.033*	0.005*			

In table 4.6, Cochran's Q test showed significant difference of the occurrence of high risk depression the entire time in the no-pain group and in the CMSP group (P<0.05). At the beginning, there was no difference of occurrence of high risk depression between both groups. In cross-sectional study of 3rd month and 6th month, it was found that relative risk increased at the 6th month. In the 3rd month, the probability of high risk depression in CMSP is 7.77% while in NP is 7.32%. It shows that there is a 1.06 greater probability of occurrence of high risk depression for CMSP than for NP (95% CI 0.38-2.94). At the 6th month, the probability of occurrence of high risk depression in CMSP is 5.83% while in NP is 2.43%. It shows that there is a 2.39 greater probability of occurrence of high risk depression for CMSP than for NP (95% CI 0.50 -11.52).

Phase 3

Period 1

Figure 4.5

The pain site-specific 6 month or more of 34 CMSP with

high risk depression (D score of $\geq$ 20)
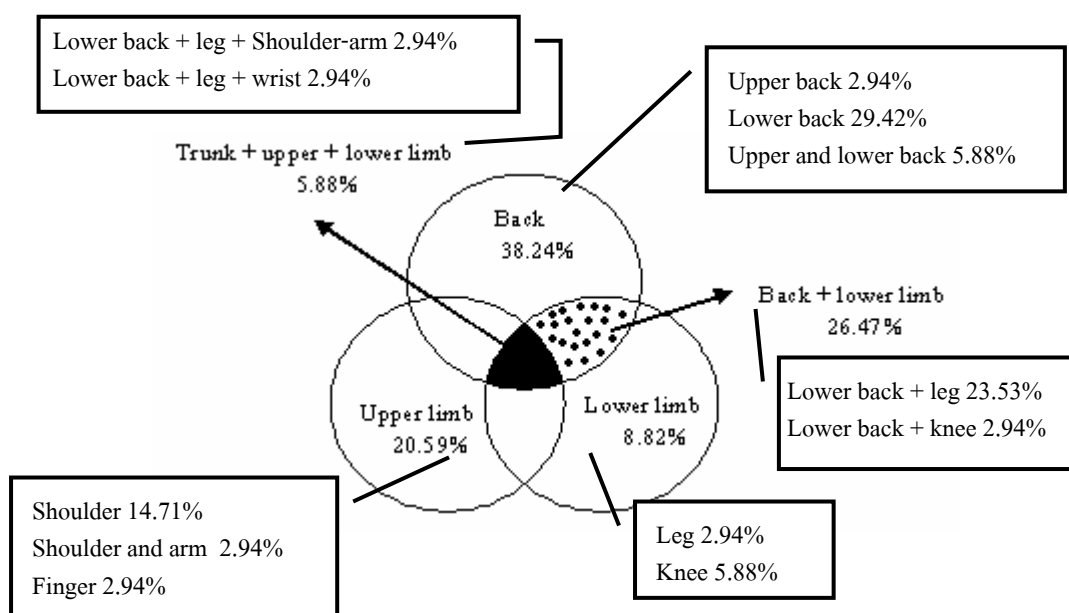
Thirty-four out of 194 CMSP subjects were selected for this study having high risk depression. The pain site specific 6 months or more is shown in figure 4.5. The percent of back pain is highest, 38.24% and the next is back with lower limb pain, 26.47%. The detailed specific pain sites are 29.42%, 23.53%, 14.71% for lower back pain, lower back with leg pain and shoulder pain respectively.

The general characteristics of these subjects are presented in table 4.7. The higher percent of CMSP with high risk depression are found in females, adults, couples, low education, and poor family relationship. For pain factors, the higher percent of CMSP with high risk depression is found in high pain intensity score, multiple pain site and longer pain duration.

Table 4.7

General characteristics of 34 CMSP with high risk depression (D score of $\geq$ 20)

General Characteristics	CMSP with high risk depression	
	n	%
Gender		
- male	9	26.5
- female	25	73.5
Age (years)		
- 15-29	7	20.6
- 30-59	27	79.4
Marital status		
- single	9	26.5
- couple	25	73.5
Education		
- no education to primary school	20	58.8
- high school to high certificate	12	35.3
- bachelor degree or higher	2	5.9

Table 4.7

General characteristics of 34 CMSP with high risk depression (D score of $\geq$ 20) (cont..)

General Characters	CMSP with high risk depression	
	n	%
Income		
- sufficient	22	64.7
- insufficient	10	29.4
Poor family relationship		
- no	12	35.3
- yes	22	64.7
Poor officemate relationship		
- no	17	50.0
- yes	14	41.2
Poor community relationship		
- no	22	64.7
- yes	11	32.4
Pain intensity		
- pain score < 50	9	26.5
- pain score $\geq$ 50	22	64.7
Pain site		
- one site	6	17.6
- more than one site	26	76.5
Pain duration		
- between 6 months to 1 year	9	26.5
- more than 1 year	24	70.6
Pain disability		
- disability point < 3 (no disability – low disability)	17	85.0
- disability point $\geq$ 3 (high disability)	3	15.0

Table 4.7

General characteristics of 34 CMSP with high risk depression (D score of $\geq$ 20) (cont..)

General Characters	CMSP with high risk depression	
	n	%
HRSR-D score		
- HRSR-D score of 20-24	18	52.9
- HRSR-D score of $\geq$ 25	16	47.1

At the beginning of this period (before treatment), 34 CMSP subjects were structure in-depth interviewed about the pain problem, family relationship, family history of depression, and socio-economic information. From the qualitative supported data, 22 of 34 subjects reported that pain is their big problem because it decreased their efficiency. This lower work efficacy resulted in lower income. The other 12 subjects thought that the pain is their normal problem that they have to accept and endure. Their favorable method to relieve pain is drug usage although the pain could not be completely relieved or no longer be relieved. Of 34 subjects, 28 subjects took drugs bought from the shop (15 subjects) and taken from primary care unit (13 subjects). The reason for buying the drug is that it is more effective than drugs from community health center. Fifteen of 28 subjects have peptic ulcer problems. Most of them did not favor going to hospital for health service because of many reasons. The first reason is that they cannot stop working because of loss of payment. The second is that there is no money to go to hospital. The other reason is that it is expensive to go to hospital. All of them have never done exercise for pain relief. Twenty-two of 34 have family relationship problems. Fourteen subjects had problems with someone in the family but they could talk together occasionally. But the other 8 subjects had strong differences in their family and did not talk to one another. Only one has a family history of depression.

According to the above information, the techniques for pain relief appropriate for them should be techniques that are easy and practical for them to do

everyday without cost. So the self help technique: mobility exercises, flexibility exercises (stretching), strengthening exercises and muscle relaxation exercises were used as treatment in this study. All of their musculoskeletal problems were identified by physical therapy assessment. And they were treated by self mobility, flexibility exercises and/or strengthening exercises for the problems of each case for 3 months.

After treatment for 3 months, the results in figure 4.6 show that the median of pain score decreased significantly from 60 at the beginning to 40 at the end (P<0.05). And the median of the D score decreased significantly from 24 to 20 (P<0.05).

Figure 4.6

Box plot of pain score and D score across the time of treatment
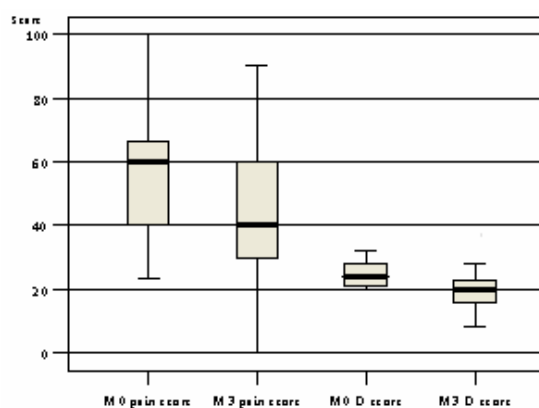
Period 2

According to plan, the expected subjects for treatment in this period were 34. Because of the problem of food disaster in some study areas, some subjects had problems of habitation, jobs or income. Three out of 34 subjects dropped out. Only 31 CMSP subjects completed this period. All of them were re-evaluated for new baselines of pain score and D score. Fifteen and 16 CMSP subjects for 2 groups were purposively divided. Group A, 15 CMSP subjects were treated by period 1 techniques (self mobility, flexibility exercises and/or strengthening exercises, lifestyle and working

education). Group B, the other 16 subjects were treated by a combination of period 1 techniques and progressive muscle relaxation exercises.

Table 4.8

The percentage of the group A and group B subjects by demographic factors

at the beginning of period 2

Demographic factors	n	Group A	Group B	p-value
Gender				
- male	8	50.0	50.0	1.000
- female	23	47.8	52.2	
Age (years)				
- 15-29	7	57.1	42.9	0.685
- 30-59	24	45.8	54.2	
Marital status				
- single	9	44.4	55.6	1.000
- couple	22	50.0	50	
Income				
- sufficient	20	60.0	40.0	0.245
- insufficient	9	33.3	66.7	
Poor family relationship				
- no	11	45.5	54.5	0.809
- yes	20	50.0	50.0	
Poor officemate relationship				
- no	14	64.3	35.7	0.256
- yes	14	42.9	57.1	
Poor community relationship				
- no	20	50.0	50.0	1.000
- yes	10	50.0	50.0	

Univariate analysis for the association of potential risk factors in table 4.8 shows that there are no significant differences in the percentages of group A and group B in all factors.

Pain score and D score at the beginning of treatment between group A and B is not significantly different (table 4.9). After treatment for 3 months, table 4.9 shows that there are no significant difference between the median of the pain score and D score in group A at the beginning and at the end of treatment of period 2 (P>0.05). But in group B, the median of the pain score decreases significantly from 50 to 30 at the end of treatment, while the D score does not change significantly. However, the pain score and D score between both groups are not significantly different at the end of period 2 (P>0.05).

Table 4.9

Pain score and D score in group A and B

	Month 0 Median	Month 3 Median	P-value
Group A Pain score HRSR-D scores	30 18	40 13	0.889 0.247
Group B Pain score HRSR-D scores	50 19.50	30 17.50	0.037* 0.083

Qualitative report on case study

According to the consideration of the individual subjects, it is found that the compliance on the exercise is the important factor effecting to the pain score and depression score. Additional factors as describing in the table 14.10 and 14.11 also are considerate as the predisposing factors.

Table 4.10

The change of pain score, D score, and the events entire the treatment periods (from interview) in group A

Case	Month 3 Pain score	Month 3 D score	Flood disaster	Income insufficient	Family problem	Office relat. problem	Com. relat. problem	Pain accept as fate	Exercise compliance
1	+	+	yes	yes	yes	no	no	yes	yes
2	-	-	yes	no	no	no	no	yes	yes
3	+	-	yes	no	no	no	no	no	no
4	-	-	no	no	no	no	no	yes	yes
5	Same	Same	no	no	no	no	no	no	yes
6	-	-	no	yes	yes	no	no	no	yes
7	-	-	no	no	no	no	no	yes	yes
8	Same	-	yes	no	no	no	no	no	yes
9	+	+	no	yes	yes	no	no	yes	yes
10	+	Same	yes	yes	yes	no	no	no	no
11	-	-	no	no	yes	yes	no	no	yes
12	-	-	yes	no	yes	no	yes	no	yes
13	+	+	yes	yes	yes	no	no	no	no
14	+	+	yes	no	yes	no	no	no	no
15	+	-	yes	no	no	no	no	no	yes

+ increase; - decrease; Com. = community; relat. = relation

Figure 4.7

Pain score and D score of individual subjects at the beginning and the end of treatment in group A
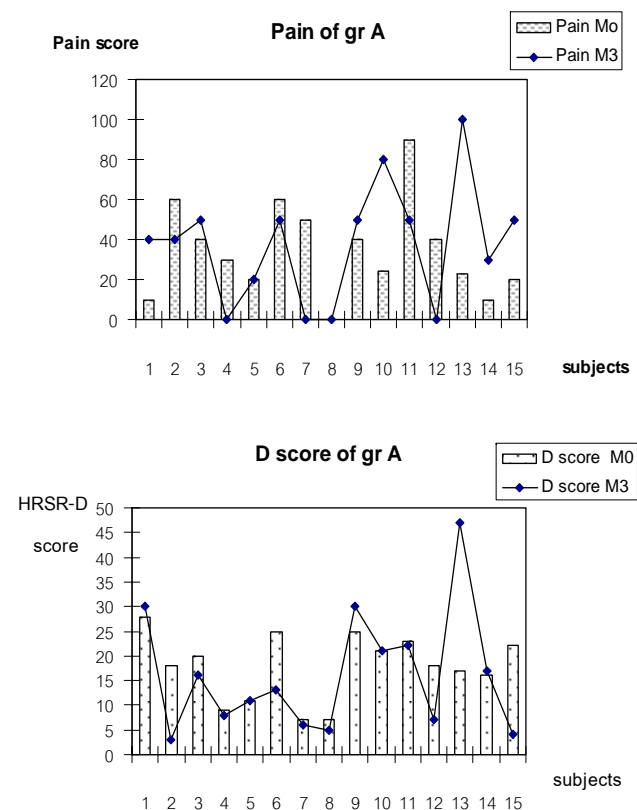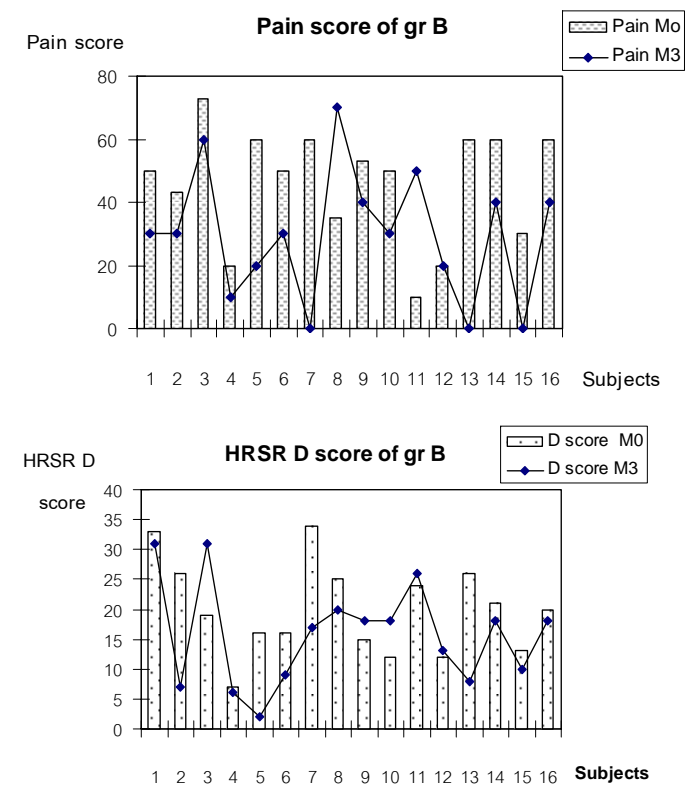
Table 4.11

The change of pain score, D score, and the events entire the treatment periods

(from interview) in group B

Case	Month 3 Pain score	Month 3 D score	Flood disaster	Income insufficient	Family problem	Office Relat. problem	Com. Relat. problem	Pain accept as fate	Exercise compliance
1	-	-	yes	no	yes	no	no	no	yes
2	-	-	no	no	no	no	no	no	no
3	-	+	no	yes	yes	no	no	yes	yes
4	-	-	no	no	no	no	no	no	yes
5	-	-	yes	no	no	no	no	yes	yes
6	-	-	yes	no	yes	no	no	no	yes
7	-	-	no	no	yes	yes	yes	yes	yes
8	+	-	yes	yes	no	yes	no	no	yes
9	-	+	no	yes	no	yes	no	no	yes
10	-	+	yes	yes	yes	no	no	yes	yes
11	+	+	yes	yes	no	no	no	yes	yes
12	Same	+	yes	no	no	no	no	no	no
13	-	-	yes	no	yes	no	no	no	yes
14	-	-	yes	no	no	no	no	no	yes
15	-	-	yes	no	no	no	no	yes	yes
16	-	-	yes	no	no	no	no	yes	no

+ increase;   - decrease; Com. = community; relat. = relation

Figure 4.8

Pain score and D score of individual subjects at the

beginning and the end of treatment

in group B

Pain score of gr B

HRSR D score of gr B

Group A's information in table 4.10 and figure 4.7 show that all subjects* (6 of 15 subjects) with decreasing pain score also have decreasing D score. All of them have good compliance to the exercise although some had one or more problem on the following factors; flood disaster, income insufficient, and family problem. There are 7 subjects with increasing pain score. Four of 7 subjects have increasing D score, 2 subjects have decreasing D score and 1 subject has the same D score. Two of 4 with increasing both pain and D score have the good compliance to the exercise but the other 2 subjects have poor compliance.

Two good compliance subjects (No. 1 and 9) have the increasing both pain and D score because they were severe affected from flood disaster. In that time, they had to meet the big problem of the insufficient income because of the decreasing of product order and unemployment in consequence to increasing the debt and severe poor family relationship. For the other 2 subjects with increasing pain and D score; they are not compliant to the describing exercise; they had met the severe flood disaster at their habitant. One had no job and no income because of the flood disaster of working place too.

For group B, they were treated by the combination of pain self management (self mobility, flexibility exercises and/or strengthening exercises, lifestyle and working education) and progressive muscle relaxation exercises. The individual informations are presented in table 4.11 and figure 4.8. Thirteen of 16 subjects have decreasing pain score, by 10 of 13 subjects also have decreasing D score. Only 3 subjects (No. 3, 9, and 10) have increasing D score in spite they have good compliance to exercise.

The interview data of 3 subjects shows many reasons that affecting their mood. The subject No.3 had very poor family relationship to his brother because of the big quarrel. The subject No. 9 and No. 10 have severe insufficient income resulting from the flood disaster in working place.

In group B, There are 2 subjects with increasing pain score. One of subjects (No.8) has decreasing D score, the reason of increasing pain score is he had

to work for continuous 2 turn of job period (for 16 hours) that is requirement of the factory in that time. He was willing to do it because of more income although he had higher pain intensity. The other subjects (No. 11) had the increasing both pain and D score because of the big problem of habitant and working place in consequence to severe insufficient income.