

Depression, Social Support, and Coping Strategies in Individuals with Spinal Injury Depression with Spinal Injury Patients

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ABSTRACT

Objective: To investigate the prevalence of and factors associated with depression, the social support received by, and the coping strategies used by individuals with spinal injury.

Materials and Methods: Individuals with spinal injury who received follow-up evaluation at the Siriraj Hospital during 2016 to 2018. The instruments used included a general information, the Zung Self-Rating Depression Scale (Thai version), the Social Provisions Scale, and the Spinal Cord Lesion-Related Coping Strategies Questionnaire (Thai version).

Results: Eighty-six individuals with spinal injury (age: 43.1 ± 15.7 years, 66.3% male) were included, and 59.3% had some level of permanent impairment. The prevalence of depression was 55.8%. Depression was found to be negatively associated with all social support domains. Regarding coping, depression was shown to be negatively associated with the fighting spirit, but positively associated with the social reliance strategy. Multivariate analysis by multiple logistic regression showed level of impairment ($p=0.005$), guidance provision ($p=0.040$), fighting spirit strategy ($p=0.031$), and the social reliance strategy ($p=0.032$) to be independently associated with depression.

Conclusion: The prevalence of depression among SCI was 55.8%. The results revealed the types of social support received, and the coping strategies used by individuals with spinal injury after hospital discharge. These findings can be implemented in an intervention to reduce depression among the individuals with spinal injury such as the promotion of the guidance provision which is provided by the professionals and the arrangement of a counseling psychology workshop focusing on effective coping strategy, especially for individuals with paraplegia and tetraplegia.

Keywords: Spinal cord injury; depression; social support; coping strategies; SCI (Siriraj Med J 2021; 73: 518-525)

INTRODUCTION

Psychological problems, including feelings of discouragement and hopelessness, increased stress, and onset of depression, often develop among individuals with spinal cord injury who have experienced loss of physical functions due to spinal cord injury (SCI),

and these psychological problems can adversely affect daily routines and other activities of daily living.¹ These psychological problems, particularly depression, are very likely to develop in individuals with spinal cord injury with severe and chronic loss that are unable to accept their loss and successfully adapt to their new reality.²

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Among SCI patients who returned to living in the community after receiving medical care, it was found that 32% had depression³, 23% had moderate depression, and 21% had severe depression. Hoffman, *et al.*⁴ conducted a study to evaluate depression among individuals with spinal cord injury at 1 year and 5 years after their injury, and that research group found depression rates of 21% and 18%, respectively. A previous study from Thailand found that 39% of SCI patients had depression after their discharge from Siriraj Hospital.⁵

An important factor relating to depression is social involvement, and the relationships that they have with and the support that they receive from family, friends, and the community. A lack of social support is a risk factor for depression.⁶ Patient satisfaction with the social interactions that they have and the social support that they receive promotes and enhances positive psychological adjustment.⁷ A study that investigated association between social relationship and depressive behaviours among 182 SCI patients, found lower levels of depression among patients that had social relationships that made them feel valuable.⁸

Psychological factors, like the patterns or strategies used to cope with problems, were also found to be associated with depression among SCI patients.⁹ If patients develop a negative perception of themselves due to feelings of being incapable of dealing with problems or of being dependent upon others, depression will eventually develop.¹⁰ Elfström, *et al.*¹¹ examined the coping strategies of those with disability due to SCI and they found ineffective coping strategies (e.g., social reliance) to be significantly positively associated with depression scores. Similarly, an investigation of coping strategies among SCI patients living in different social and cultural contexts found a higher overall level of depression in settings where a greater number of patients employed the social reliance coping strategy when compared to settings where a comparatively lower proportion of patients adopted and used that same coping strategy.¹²

Since depression is a common consequence of SCI, enhanced understanding of this disorder in this vulnerable patient population will improve prevention, diagnosis, treatment, and outcomes. An examination of depression and its relationship with social support and coping strategies will yield additional broader insight into the psychological impact of SCI after hospital discharge and continue to receive follow-up care from Siriraj Spinal Care Unit.

Accordingly, the aim of this study was to investigate the prevalence of and factors associated with depression, the social support received by, and the coping strategies

used by individuals with spinal injury that continued to receive follow-up care from the Siriraj Spinal Unit after hospital discharge. The results of this study will be used to develop and improve mental healthcare strategies designed to enhance patient quality of life after hospital discharge and while receiving follow-up care from the Siriraj Spinal Unit.

MATERIALS AND METHODS

Participants

This study is a Questionnaire-based research study with a prospective data collection. The study population consisted of individuals with spinal injury who received follow-up evaluation and care at the Siriraj Spinal Unit of the Department of Orthopaedic Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand during the November 2016 to December 2018 study period. Individuals with spinal injury that met all of the following criteria were included: (1) age greater than 18 years; (2) having good consciousness; and, (3) having good ability and willingness to answer the following assessment tools: the Thai version of the Zung Self-Rating Depression Scale, the Social Provisions Scale, and the Thai version of the Spinal Cord Lesion-Related Coping Strategies Questionnaire (SCI-CSQ). Patients with active psychosis or with a history or diagnosis of depression before SCI were excluded.

Assessment instruments

The Thai version of the Zung Self-Rating Depression Scale¹³ is a measurement of depression severity that consists of 20 items. Scoring ranges from 0 to 80. A score of equal to or less than 30 suggests no presence of emotional problems or depression, whereas a score greater than 30 suggests the presence of depression. Test-retest and split-half methods were applied for reliability testing, and the scale's reliability was found to be 0.73.¹³

The Social Provisions Scale, which was developed by Russell and Cutrona in 1985¹⁴, comprises 24 items. Each item is scored from 1 (do not agree at all) to 4 (absolutely agree). Scoring ranges from 24 to 96. This scale is used to measure the provision of social support for an individual in six domains, including social integration, reassurance of worth, reliable alliance, guidance, opportunity for nurturance, and attachment. The total score for each domain is calculated by summation of all item scores within each domain. A higher score indicates a higher level of social provision in that social support domain.

The Thai version of the Spinal Cord Lesion-Related Coping Strategies Questionnaire (SCI-CSQ)⁹ consists of 12 items. Items 1, 2, 6, and 11 indicate the use of the

acceptance strategy; items 3, 5, 7, 10, and 12 suggest the use of the fighting spirit strategy; and, items 4, 8, and 9 signify the use of the social reliance strategy. The patient's response indicates the degree of agreement, as follows: *strongly disagree* = a score of 1; *disagree* = a score of 2; *agree* = a score of 3; and, *strongly agree* = a score of 4. Scoring ranges from 12 to 48. The mean score of each strategy is reported, and a higher score indicates more frequent use of that strategy.

After receiving study approval from the Siriraj Institutional Review Board (SIRB) [Si 636/2016(EC1)], written informed consent was obtained from all enrolled study participants. The following data were collected from patient medical records: age, gender, education level, income, marital status, level of impairment, injury severity, cause of injury, and time since injury. Patient level of depression and quality of life were assessed using the Thai version of Zung Self-Rating Depression Scale, the Social Provisions Scale, and the SCI-CSQ-THAI, respectively.

Statistical analysis

SPSS Statistics software (SPSS, Inc., Chicago, IL, USA) was used to perform all statistical analyses. Categorical data are presented as frequency and percentage, and continuous data are presented as mean plus/minus standard deviation or median and range. Associations between depression and both social support and coping strategies among individuals with spinal injury after hospitalization were analyzed by Pearson's correlation coefficient (r). Chi-square test or independent t-test was used to evaluate the relationship between depression and factors that included age, gender, educational level, marital status, income, cause of disease, duration of disease, severity of disability, and severity of injury. Multiple logistic regression was used for multivariate analysis, factors with a p -value < 0.10 in univariate analysis and clinical relevant were adjusted for in multivariate model. And those results are shown as adjusted odds ratio and 95% confidence interval. A p -value of less than 0.05 was considered statistically significant for the results of multivariate analysis.

RESULTS

Eighty-six individuals with spinal injury were included. The demographic and clinical characteristics of included individuals with spinal injury are shown in Table 1. The mean $\pm$ standard deviation age of individuals with spinal injury was 43.1 ± 15.7 years (range: 18-84), and 66.3% were male. Most individuals with spinal injury (29.1%) had a bachelor's degree, and 50% were single/unmarried. The majority of individuals with spinal injury (57%)

sustained their injury in a traffic accident. Regarding level of impairment - 40.7%, 40.7%, and 18.6% of individuals with spinal injury had no impairment, paraplegia, and tetraplegia, respectively. The average duration of disease after injury was 61.0 ± 60.5 months (range: 3 months to 21 years).

The prevalence of depression in this study was 55.8%, and the average depression score was 32.4 ± 12.6 . Regarding social support, the mean scores of the six domains of social provision (SD) were, as follows: 13.5 ± 2.0 for attachment; 13.2 ± 2.1 for reliable alliance; 13.1 ± 2.3 for guidance; 12.4 ± 2.2 for opportunity for nurturance; 12.5 ± 2.0 for social integration; and, 12.1 ± 2.1 for reassurance of worth. The mean scores for the coping strategies were 17.5 ± 1.9 for fighting spirit; 12.4 ± 1.9 for acceptance; and, 7.5 ± 1.9 for social reliance (Table 2).

Pearson's correlation coefficient (r) was used to analyze associations between depression and both social support and coping strategies among individuals with spinal injury after hospitalization. That analysis revealed a moderately negative association between depression and all domains of social provision (r range: -0.527 to -0.644). Regarding association between depression and coping strategies, our results showed that depression are no significant correlation with the acceptance ($r = -0.014$, p value 0.898) and the fighting spirit ($r = -0.348$) strategies, and a positive relationship with the social reliance strategy ($r = 0.043$) (Table 3).

Univariate analysis by chi-square test or independent t-test was used to evaluate the relationship between having depression and factors that included age, gender, educational level, marital status, income, cause of disease, duration of disease, severity of disability, severity of injury, social provision, and coping strategies. That analysis revealed level of impairment ($p = 0.004$), severity of injury ($p = 0.006$), all domains of social provision (all $p < 0.001$), and the fighting spirit strategy ($p = 0.001$) to be significantly associated with depression.

Multivariate analysis by multiple logistic regression showed level of impairment ($p = 0.005$), the guidance provision ($p = 0.040$), the fighting spirit strategy ($p = 0.031$), and the social reliance strategy ($p = 0.032$) to be independently associated with depression. individuals with paraplegia or tetraplegia had depression with an adjusted odds ratio of 14.7 (95% confidence interval [CI]: 2.24-95.59, $p = 0.005$) compared to those with no disability. For the guidance provision, the fighting spirit strategy, and the social reliance strategy, we found that for every 1-point increase in score, the adjusted odds ratio of depression decreased 48% (95% CI: 0.28-0.97), 0.58 times (95% CI: 0.35-0.95), and 0.62 times (95% CI: 0.40-0.96), respectively (Table 4).

TABLE 1. Demographic and clinical characteristics of included people with spinal injury (N=86).

Characteristics	Mean $\pm$ SD or n (%)
Age (years)	43.1 $\pm$ 15.7
Male gender	57 (66.3%)
Education	
- Primary school	17 (19.8%)
- Secondary school	23 (26.7%)
- Vocational certificate	15 (17.4%)
- Undergraduate	25 (29.1%)
- Postgraduate	6 (7.0%)
Marital status	
- Single	43 (50.0%)
- Married	29 (33.7%)
- Divorced/separated/widowed	14 (16.3%)
Income (Thai baht/month)	2,500 (0-100,000)*
Cause of injury	
- Traffic accident	49 (57.0%)
- Fall	27 (31.3%)
- Violence	4 (4.7%)
- Other	6 (7.0%)
Level of impairment	
- No	35 (40.7%)
- Paraplegia	35 (40.7%)
- Tetraplegia	16 (18.6%)
Severity of injury (n=75)	
- Complete	24 (27.9%)
- Incomplete	27 (31.4%)
Time since injury (months)	36 (3-252)*

Abbreviation: SD, standard deviation

* Median (range)

TABLE 2. Mean depression score, social support domain scores, and coping strategy scores of 86 included spinal injury patients..

Scores	Mean $\pm$ SD
Depression	32.4 $\pm$ 12.6
Social integration	12.5 $\pm$ 2.0
Reassurance of worth	12.1 $\pm$ 2.1
Reliable alliance	13.2 $\pm$ 2.1
Guidance	13.1 $\pm$ 2.3
Opportunity for nurturance	12.4 $\pm$ 2.2
Attachment	13.5 $\pm$ 2.0
Acceptance	12.4 $\pm$ 1.9
Fighting spirit	17.5 $\pm$ 1.9
Social reliance	7.5 $\pm$ 1.9

Abbreviation: SD, standard deviation

TABLE 3. Analysis for association between depression and the 6 social support domains and the 3 coping strategies.

Domains/strategies	Pearson's correlation coefficient (r)	p-value*
Social integration	-0.573	<0.001
Reassurance of worth	-0.644	<0.001
Reliable alliance	-0.565	<0.001
Guidance	-0.604	<0.001
Opportunity for nurturance	-0.527	<0.001
Attachment	-0.577	<0.001
Acceptance	-0.014	0.898
Fighting spirit	-0.348	0.001
Social reliance	0.043	0.694

A *p*-value<0.05 indicates statistical significance*

DISCUSSION

This study found a prevalence of depression among individuals with spinal injury after hospitalization of 55.8%. Our finding was much higher than the 21.6%¹⁸, 27%¹⁹, and 28%²⁰ rates reported by other studies. However – in contrast to the >30 point cutoff used in our study to define presence of depression using the Zung Self-Rating Depression Scale, those studies used a score of ≥50 as the cutoff. Regarding social support, most individuals with spinal injury in this study used the attachment provision, whereas most individuals with spinal injury in other studies conducted in other countries used the reliable alliance provision. These differences between and among studies may be due to sociocultural context and influences. Thai culture is rooted in kinship in which support and interdependent relationships are often found²¹; therefore, individuals with spinal injury may be more strongly drawn to the attachment provision than the other domains of the Social Provisions Scale.

To assess coping strategies, we used the Thai version of the Spinal Cord Lesion-Related Coping Strategies Questionnaire to measure the coping strategies of individuals with spinal injury after hospitalization.⁹ This Thai language assessment tool is relatively short, is uncomplicated, and is easy to understand. Importantly, these features make this tool reliably useful among individuals with spinal injury with lower levels of education. Moreover, this assessment was previously used to evaluate Thai individuals with spinal injury, and the results of that

study revealed that Thai individuals with spinal injury most frequently used the fighting spirit strategy.¹⁵ This strategy was also reported to be the coping strategy of choice of individuals with spinal injury included in studies conducted in other countries.^{16,17}

Concerning the relationships between depression and both social support and coping strategies among individuals with spinal injury after hospitalization, the results of this study revealed that depression negatively associates with all domains of social provision at a moderate level. Depression increases when individuals with spinal injury perceive less social support, and it decreases when individuals with spinal injury perceive more social support. This same finding was reported by a previous study that identified lack of social support as being a risk factor for depression.⁶ Individuals with spinal injury who received low social provision, who were withdrawn, or who had low social opportunities were likely to be at greater risk for developing depression.²² Thus, patient satisfaction with the social interactions that they experience and the social support that they receive will promote positive psychological adjustment and reduce the likelihood of depression onset among individuals with spinal injury. Moreover, depression has a negative relationship with the acceptance strategy at the lowest level, and with the fighting spirit strategy at a low level. Therefore, depression is less likely to be found among individuals with spinal injury who adopt the acceptance strategy or the fighting spirit strategy.

TABLE 4. Univariate and multivariate analysis for factors significantly associated with depression.

Factors	No depression (n=38)	Depression (n=48)	p-value [#]	Adjusted odds ratio (95% CI)	p-value ^{##}
Gender			0.586		
Male	24 (63.2%)	33 (68.8%)			
Female	14 (36.8%)	15 (31.2%)			
Education			0.268		
Lower than bachelor's degree	23 (60.5%)	32 (66.6%)			
Bachelor's degree or higher	15 (39.5%)	16 (33.4%)			
Marital status			0.215		
Single	22 (57.9%)	21 (43.8%)			
Married	9 (23.7%)	20 (41.7%)			
Divorced/separated/widowed	7 (18.4%)	7 (14.6%)			
Income (Thai baht/month)	4,500 (0-100,000)	800 (0-90,000)	0.290		
Cause of injury			0.250		
Traffic accident	22 (44.9%)	27 (55.1%)			
Fall	14 (51.9%)	13 (48.1%)			
Violence	0 (0.0%)	4 (100%)			
Other	2 (33.3%)	4 (66.7%)			
Level of impairment			0.004		0.005
Normal	22 (57.9%)	13 (27.1%)		1.00	
Paraplegia/Tetraplegia	16 (50.0%)	16 (50.0%)		14.65 (2.25-95.59)	
Severity of injury			0.006		
Complete	10 (26.3%)	14 (29.2%)			
Incomplete	6 (15.8%)	21 (43.8%)			
Normal	22 (57.9%)	13 (27.1%)			
Time since injury (months)	45 (3-252)	36 (4-240)	0.141		
Social support domain scores					
Social integration	13.6±1.7	11.6±1.8	<0.001	0.83 (0.49-1.41)	0.490
Reassurance of worth	13.3±1.7	11.1±1.8	<0.001	0.65 (0.37-1.13)	0.128
Reliable alliance	14.2±1.7	12.3±1.9	<0.001	0.82 (0.48-1.39)	0.470
Guidance	14.5±1.8	12.1±2.2	<0.001	0.52 (0.28-0.97)	0.040
Opportunity for nurturance	13.5±2.1	11.5±2.0	<0.001	1.34 (0.86-2.09)	0.194
Attachment	14.6±1.5	12.7±2.0	<0.001	1.13 (0.66-1.95)	0.648
Coping strategy scores					
Acceptance	12.3±2.2	12.5±1.5	0.612	1.22 (0.79-1.89)	0.370
Fighting spirit	18.3±1.8	16.9±1.8	0.001	0.58 (0.35-0.95)	0.031
Social reliance	7.5±2.0	7.5±1.8	0.909	0.62 (0.40-0.96)	0.032

Data compared between depression and no depression are presented as number and percentage, median and range, or mean ± standard deviation

Factors with a p -value<0.1 in univariate analysis were included in multivariate analysis

A p -value<0.05 indicates statistical significance for the results of multivariate analysis

[#] p -value for chi-square test or independent t -test

^{##} p -value for multiple logistic regression

Abbreviation: CI, confidence interval

Previous studies also found the use of effective coping strategies (e.g., acceptance and fighting spirit strategies) to be associated with lower depression scores.^{11,17} Adoption of the acceptance strategy suggests an honest assessment by the patient, and a resulting recognition and/or tolerance for his/her new reality, and this leads to readjustment of goals and expectations. Alternatively, the fighting spirit strategy reflects a patient's desire for self-reliance, and it communicates the patient's desire to cope with the complexities of SCI on his/her own. This strategy promotes independence, helps individuals with spinal injury develop self-confidence, and enhances patient ability to deal with and overcome difficulties. These benefits all help to prevent or minimize depression among individuals with spinal injury after hospital discharge.

In contrast to the acceptance and fighting spirit coping strategies, we found the social reliance strategy to be positively associated with depression among SCI after hospital discharge. Similarly, previous study found the social reliance strategy to be positively associated with depression score¹¹, and depression was commonly found among those who adopted and used the social reliance strategy.¹² Reliance on social support from others may lead to dependency that ultimately leaves individuals with spinal injury feeling that they no longer have control over their own lives. This can lead to loss of self-esteem and feelings of worthlessness, discouragement, and giving up, and these feelings - alone or in combination - can result in depression.

Concerning factors related to depression, social support, and coping strategies among individuals with spinal injury after hospitalization, our multivariate analysis revealed severity of disability, the guidance provision, the fighting spirit strategy, and the social reliance strategy to be independently associated with depression. These findings are consistent with those of previous studies that found severity of disability²³, social support^{24,25,26}, and coping strategies^{11,17} to be factors that significantly influenced depression among individuals with spinal injury. Khazaepour, *et al.*²³ found a high likelihood of the development of depression among individuals with paraplegia. This is very likely due to SCI-induced physical impairment that dramatically adversely affects functional abilities. These individuals with spinal injury often develop feelings of worthlessness, discouragement, and lack of motivation - all of which are symptoms of depression. Concerning social support, previous studies found a greater amount of social support to be associated with a lower depression score.^{26,25} Social support that emphasizes problem management may influence a reduction in depression during the patient's adjustment to each

stage of physical impairment - especially social support provided by professionals and families because these types of support positively influence SCI patient well-being.²⁶ Concerning coping strategies, studies from Sweden¹¹ and Turkey¹⁷ found that effective coping strategies associated with lower depression scores. This is consistent with the current study which found that the fighting spirit strategy, the effective coping strategy, was significantly associated with individuals with spinal injury with depression. However, the previous study in Thailand¹⁵ did not find a similar relationship. This might due to the fact that the participants in that study used the three coping strategies in similar patterns; thus, significant positive or negative relationships between depression and coping strategies were not found.

The limitation of this study is its cross-sectional design, which means that the data were collected at one point in time. However, the study participants selected the answers that they felt best described their situation and state of mind, so further elicitation to extract additional information was deemed necessary. For the more benefit of clinical application, additional studies of more variety psychological evaluation in the form of experimental comparative research are recommended.

CONCLUSION

The prevalence of depression among SCI was a high 55.8%. The results of this study also revealed the types of social support received, and the coping strategies used by individuals with spinal injury after hospital discharge. Multivariate analysis showed level of impairment, the guidance provision, the fighting spirit strategy, and the social reliance strategy to be independently associated with depression. These findings will be helpful for developing targeted strategies that will improve follow-up care and patient quality of life.

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