

Change in Quality of Life of Disabled Patients after Intensive Inpatient Rehabilitation at Siriraj Hospital

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Objective: To compare the quality of life (QOL) before and after intensive rehabilitation of disabled patients and to examine the factors associated with the change in QOL.

Material and Method: A retrospective chart review of 200 disabled patients who were admitted for intensive rehabilitation between 2006 and 2009. The Thai abbreviated version of World Health Organization quality of life (WHOQOL-BREF-THAI) was used to assess QOL. Demographic data, physical and psychosocial status, Modified Barthel ADL Index (BAI) were collected and analyzed for the association with WHOQOL-BREF-THAI score changes.

Results: One hundred seventeen (58.5%) males and 83 (41.5%) females with mean age 55.6 (SD17.9) years old participated in this study. Various principal diagnoses were included; 112 (56%) stroke, 54 (27%) spinal cord injury and 34 (17%) other diagnoses. After the intensive rehabilitation, quality of life perception was improved in 164 (82%) disabled patients. There was significant difference in mean WHOQOL-BREF-THAI scores on admission and at discharge which were 81.3 (SD 11.2) and 85.5 (SD 11.0) respectively with the p -value < 0.001 . The mean changed score was 4.2 (SD 8.0). However, four domains of QOL were improved except the social domain. The factors associated with the disabled patients who were non-improved in WHOQOL-BREF-THAI score after rehabilitation were having non-familial caregiver (OR 5.8, 95% CI 2.1 to 16.0) and joint stiffness (OR 4.1, 95% CI 1.7 to 9.9).

Conclusion: Intensive inpatient rehabilitation can significantly improve quality of life in the disabled patients with various primary diagnoses. Having joint stiffness prior to rehabilitation and non-availability of familial members for taking care are the factors associated with the poor outcome in QOL perception.

Keywords: Disability, Intensive inpatient rehabilitation, Quality of life, WHOQOL-BREF-THAI

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As the definition of 'Health' by WHO is 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity'. Even though some of patients present with chronic diseases resulting in physical impairment and long-term disability, a rehabilitation treatment enables these people to reach and maintain their optimal physical, sensory, intellectual, psychological, and social functional levels. Therefore, the measurement of the effects of rehabilitation is not an indication of changes in the severity of diseases but should be an estimation of physical, mental, and social well being. This can be properly assessed by measuring the improvement of the quality of life (QOL) which includes physical,

mental and social aspects. Many previous studies revealed the efficacy of rehabilitation that enabled the disabled patients in a specific disease, such as stroke⁽¹⁾, spinal cord injury⁽²⁾, coronary heart disease⁽³⁾ and multiple sclerosis⁽⁴⁾, to reach optimal functional ability and quality of life. Nonetheless, in Thailand, there is no specific rehabilitation ward for each primary disease as in developed countries. In fact, a rehabilitation ward in Thailand has treated multiple causes of disabled patients with a general rehabilitation approach and team. The purposes of the present study are, therefore, (i) to determine the change in quality of life of various disabled patients after intensive inpatient rehabilitation in a general rehabilitation ward and (ii) to determine factors associated with non-improved QOL perception. Most of all, the results could guide healthcare providers and give them the opportunity to initiate for improvement in services and policies.

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Material and Method

The present study was approved by the ethical committee of Siriraj Hospital: Siriraj Institutional Review Board (SIRB). The setting of the present study was at the Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University. This rehabilitation ward provides an individualized intensive rehabilitation program for the patients who are able to actively participate at least three hours per day. In the meantime, the patients were routinely asked to do WHOQOL-BREF-THAI questionnaires for measuring the QOL at admission and discharge to assess the efficacy of rehabilitation treatment. Nurses would explain or read the questionnaire for the patients who did not understand or could not read by themselves.

The WHOQOL-BREF-THAI is the abbreviated Thai version of WHOQOL-100 containing 26 items⁽⁵⁾. It is used for assessing a person's quality of life across four domains: physical, mental, social and environment. The numbers of questions in each domain are seven, six, three, and eight items for physical, mental, social and environment domains, respectively. The other two questions indicate general QOL perception. Each item is subjectively rated by a patient in five levels. The score ranges between 26 and 130 points, in which the lower score indicates poorer QOL perception: 26 to 60 points mean poor, 61 to 95 points mean moderate, and 96 to 130 points mean good QOL perception. In addition, Modified Barthel ADL Index (BAI) was used to measure the functional ability.

The authors reviewed retrospectively inpatient medical records between 2006 and 2009. The inclusion criterion was disabled patients who had WHOQOL-BREF-THAI scores both on admission and at discharge whether the goal of treatment could be achieved or not. The exclusion criteria were the patients who were non-cooperation, poor cognition or had an unplanned discharge. The sample size calculation is based on the ability to detect a difference in WHOQOL-BREF-THAI scores between pre and post rehabilitation. Data from a previous study⁽¹⁾ were used for sample size calculation. A sample size of 171 will have 90% power to detect a minimum of difference in WHOQOL-BREF-THAI means of 3.0, a standard deviation of differences of 12.0, using 0.05 two-sided significance level. However, 200 charts were reviewed to reserve about 20% in case that there was missing data. The authors collected eligible inpatient medical records starting from mid-2009 back to the past until 200 charts were achieved. Furthermore, demographic, socioeconomic, hospital course and disease data were also collected.

Statistical analysis

Data was analyzed using SPSS version 13.0. It was presented as mean \pm standard variation (SD) for continuous variables and as percentage (%) for categorical variables. Paired samples t-test was used to assess the change in QOL perception and functional ability, by comparing mean of WHOQOL-BREF-THAI and BAI scores at admission and discharge. An improvement in the QOL perception after the inpatient intensive rehabilitation was defined by the WHOQOL-BREF-THAI score at discharge being more than the score on admission. The comparison of the improved and non-improved QOL groups was performed by the Chi-Square test for the qualitative data and the Independent Sample t-test for the quantitative data. The quantitative data included age, length of stay, duration of disability, BAI score and WHOQOL-BREF-THAI score on admission. The qualitative data included gender, marital status, level of education, primary diagnosis, rehabilitation problems, co-morbidities, complications, goal achievement, payment resource, and caregiver. The multiple variables analysis by stepwise logistic regression was used to explore the associated factors of the non-improved QOL among the disabled patients. For all analyses, p-value < 0.05 was considered as statistically significant difference.

Results

There were 117 (58.5%) males and 83 (41.5%) females, age 14 to 86 years old (55.6 ± 17.9). Various primary diagnoses resulting in the disability included: 112 (56%) stroke, 54 (27%) spinal cord injury and 34 (17%) other diagnoses. Most of the disabled patients had more than one rehabilitation problems including, 92.5% a mobility problem, 65.5% a basic activities of daily living problem, 41% neurogenic bladder/bowel problems, 35.5% pain, 26.5% aphasia/dysphasia, 23.5% joint stiffness and 16% dysphagia. Duration of disability at the time of admission was extremely variable from only one day to 20 years with a median of three months. The median length of stay for intensive rehabilitation was 31 (6-170) days. After the intensive inpatient rehabilitation, quality of life perception was improved in 164 (82%) disabled patients. There was significant difference in mean WHOQOL-BREF-THAI scores between at admission and discharge (p-value < 0.001). However, four domains of WHOQOL-BREF-THAI scores were improved, except for the social domain (Table 1). Among the improving patients, there were 22 (11%) disabled patients who had improvements in the grading of QOL perception from

Table 1. Four domains of the quality of life (WHOQOL-BREF-THAI) on admission and at discharge

	Admission mean (SD)	Discharge mean (SD)	Change (post-pre) mean (SD)	p-value
WHOQOL-BREF-THAI Total (26-130)	81.26 (11.22)	85.50 (11.04)	4.24 (8.05)	<0.001 [#]
Physical (7-35)	19.53 (3.80)	21.09 (3.55)	1.57 (2.86)	<0.001 [#]
Mental (6-30)	20.22 (3.72)	21.05 (3.54)	0.83 (2.66)	<0.001 [#]
Social (3-15)	9.40 (2.06)	9.50 (1.98)	0.09 (1.33)	0.313
Environment (8-40)	25.73 (4.39)	27.00 (3.93)	1.28 (3.86)	<0.001 [#]

[#] Significant at p-value < 0.05

poor to moderate and moderate to good QOL perception. The modified Barthel ADL index (BAI) scores were also significantly improved after the intensive inpatient rehabilitation (p-value < 0.001). The mean change of BAI score was 17.2 (SD 18.3) and the median was 13.0. The BAI scores at admission and discharge were 45.7 (SD 26.3) and 62 (SD 27.3), respectively.

Various factors were examined for the correlation with the change in WHOQOL-BREF-THAI score, such as demographic data, principle diagnoses, underlying diseases, rehabilitation problems, functional capacity, complications and caregivers (Table 2). Using univariate analysis, factors significantly associated with non-improved QOL perception were joint stiffness before admission, having a caregiver as a non-familial member, underlying heart disease and low WHOQOL-BREF-THAI score on admission. Then, Stepwise Logistic Regression Analysis was used with severity adjusted by age, pre WHOQOL-BREF-THAI score and primary diagnoses. Factors that associated with non-improved QOL were only joint stiffness (OR 4.1, 95%CI 1.7 to 9.9) and having non-familial caregiver (OR 5.8, 95% CI 2.1 to 16.0) (Table 3).

Discussion

The present study showed the positive outcome of the intensive inpatient rehabilitation in a general rehabilitation ward. It could improve significantly both quality of life perception and functional capacity. The QOL perception at discharge was better than on admission in physical, mental, and environment domains, but it did not change significantly in social domain. The same as some previous studies, though QOL was improved at discharge, the patients rated lowest in the social dimension^(1,6). Since the WHOQOL-BREF-THAI is a

generic health-related quality of life that can be used in various diseases, it has low responsiveness to detect change⁽⁷⁾. Furthermore, there are only three out of 26 questions for the social domain: how satisfied are you with your personal relationships, how satisfied are you with your sex life, and how satisfied are you with the support you get from your friends. The range and number of social questions might not cover all of the social problems, which are related to the QOL. Actually, the cultural and social status in a developing country is quite different when compared with developed countries. For example, Rukwong P et al reported that income balance was a crucial socioeconomic factor in Thailand and associated with the change in QOL⁽⁸⁾; nevertheless, it is not included in the WHOQOL-BREF-THAI questionnaire. Moreover, the present study did not have income data due to the limitation of being a retrospective study. Even though previous studies used other general tools for assessing QOL, such as the 36 items short form (SF-36) after hospital rehabilitation, there were contradictory results for the social dimension^(9,10). However, the inpatient rehabilitation had certainly a positive impact on the physical functioning domain, which resulted in increased QOL score. Non-improved social score possibly means that patient's social, problem cannot be solved adequately by the intensive inpatient rehabilitation program. Though the holistic principle, which consists of physical, mental, social and spiritual approaches, is used in all cases, the inpatient rehabilitation programs are actually confined within the hospital. Discharged patients still live in their previous circumstances where they deal with ongoing social problems and the lack of resources in their community. The present study pointed out that social support, like community rehabilitation, should be promoted. For example, a study in Japan by

Table 2. The comparison of the disabled patients that were improved and non-improved WHOQOL-BREF-THAI scores after the inpatient intensive rehabilitation

Variables	Improved QOL (n = 164)	Non-improved (n = 36)	p-value
Demographic related			
Age (yrs)*	55.7 (17.5)	55.6 (20.1)	0.983
Male gender	94 (57.3%)	23 (63.9%)	0.591
Marital status***			
Single	66 (40.5%)	12 (34.3%)	0.586
Married	97 (59.5%)	23 (65.7%)	
Education***			
Primary school	72 (48.0%)	15 (48.4%)	0.791
Secondary school	44 (29.3%)	7 (22.6%)	
Bachelor degree and higher	34 (22.7%)	9 (29.0%)	
Disease related			
Rehabilitation problems****			
Joint stiffness	32 (19.5%)	15 (41.7%)	0.009##
Mobility	151 (92.1%)	34 (94.4%)	1.000
ADL	108 (65.9%)	23 (63.9%)	0.975
Incontinence	71 (43.3%)	12 (33.3%)	0.362
Pain	59 (36.0%)	12 (33.3%)	0.914
Aphasia	42 (25.6%)	11 (30.6%)	0.689
Dysphagia	25 (15.2%)	7 (19.4%)	0.710
Co morbidities****			
Heart disease	17 (10.4%)	9 (25.0%)	0.027##
Hypertension	96 (58.5%)	24 (66.7%)	0.475
Dyslipidemia	83 (50.6%)	15 (41.7%)	0.431
Diabetes	40 (24.4%)	9 (25.0%)	1.000
Lung disease	7 (4.3%)	3 (8.3%)	0.554
Primary diagnosis			
Stroke	94 (57.3%)	18 (50.0%)	0.161
Spinal cord injury	46 (28.0%)	8 (22.2%)	
Other	24 (14.0%)	10 (27.8%)	
Duration of disability (days)**	90 (1,7300)	105 (7,1825)	0.628
Hospital related			
Complications			
Absent	67 (40.9%)	11 (30.6%)	0.338
Present	97 (59.1%)	25 (69.4%)	
Goal achievement			
Yes	141 (86.5%)	29 (80.6%)	0.512
No	22 (13.5%)	7 (19.4%)	
Length of stay (days)**	31 (6,170)	31 (9, 154)	0.766
Social related			
Payment resource			
Government	53 (32.3%)	11 (30.6%)	0.874
Own pay	51 (31.1%)	13 (36.1%)	
Universal coverage	51 (31.1%)	11 (30.6%)	
Social security	9 (5.5%)	1 (2.8%)	
Caregiver***			
Family	130 (79.8%)	23 (63.9%)	0.014##
Non-family	22 (13.5%)	12 (33.3%)	
No	11 (6.7%)	1 (2.8%)	
Scores on admission			
Modified Barthel ADL Index*	45.5 (25.7)	48.0 (28.7)	0.621
WHOQOL-BREF-THAI*	80.2 (11.2)	85.9 (9.9)	0.005#

* Mean (SD), ** Median (min,max), *** There is missing data, **** Multiple responses

Significant at p-value < 0.05

Chi-square test

Table 3. The factors significantly associated with non-improved QOL perception after the inpatient intensive rehabilitation

	Crude OR (95% CI)	Adjusted OR (95% CI)
Caregiver		
Family	1.0	1.0
Non-family	3.1 (1.3-7.1)	5.8 (2.1-16.0)
No	0.5 (0.1-4.2)	0.4 (0.1-3.7)
Joint stiffness		
No	1.0	1.0
Yes	2.95 (1.4-6.3)	4.1 (1.7-9.9)
Underlying heart disease		
No	1.0	*
Yes	2.9 (1.2 - 7.1)	*

Stepwise Logistic Regression Analysis Adjusted by Age, pre QoL, Diagnosis

CI = confidence interval

* Underlying heart disease was excluded after Stepwise Logistic Regression Analysis ($p = 0.299$), so there was no adjusted OR

Shem K et al demonstrated positive outcomes of the community rehabilitation, mentoring programs to provide psychosocial support to individuals with spinal cord injury, which resulted in improved community integration, employment, independent living, and better QOL⁽¹¹⁾.

There are many factors influencing the QOL perception such as age⁽¹²⁾, functional independency, financial sufficiency⁽⁸⁾, anxiety and depressive symptoms⁽¹³⁾. In addition, the present study revealed types of caregiver correlated with the change in the QOL perception. The disabled patients, who were taken care of by employees, had poor QOL outcome. In other words, lack of familial members for taking care resulted in poor QOL outcome. It is not surprising that social issues emerged as a major determinant of QOL for disabled patients. The result is consistent with Lynch EB et al, that lack of social support especially from significant others such as a spouse and familial members influenced QOL perception⁽¹⁴⁾. They asked stroke patients to describe how QOL was affected by stroke, and the change in social relationships was of most concern among them. On the other hand, whoever needs to hire an employee as caretaker may mean that his/her disability is too severe to be taken care of by family. For the functional ability correlated with the QOL perception^(8,15,16), QOL score in these patients was low.

Having joint stiffness before admission was another factor that was associated with worse QOL outcome. It is one of the most common complications in the disabled patients who did not receive an appropriate rehabilitation program. This is known as immobilization syndrome⁽¹⁷⁾. Therefore, early rehabilitation is favorable for minimizing the complications and better outcome. This result confirms a previous study of Musicco et al that revealed the presence of pressure ulcer, one of the effects of immobility, and late initiation of rehabilitation. Those were associated with worse outcome⁽¹⁸⁾. Unfortunately, there are only 14 rehabilitation wards that have to cover all of the disabled patients in Thailand. Even if the disabled patients are not admitted early for intensive rehabilitation due to limitation of resources, they and their family have to be well instructed about home programs to prevent any complications. In addition, primary doctors who deal with primary diseases resulting in disabilities should emphasize the importance of immobilization syndrome prevention. Finally, for national rehabilitation policy, providing adequate beds in rehabilitation wards for early admission to prevent complications should be considered.

Limitation

Even though QOL perception scores increased with statistical significance after the intensive inpatient rehabilitation, the changed QOL scores were small and there might be questions about their clinical significance. Furthermore, the authors included disabled patients with various primary diagnoses and wide range of duration of disability, resulting in diversity of the severity and the nature of their prognosis. Therefore, the results were too wide variance as from high standard deviation. Finally, since this is a retrospective study, some data that should have been collected to examine the correlation with the QOL, such as income balance, were not available.

Conclusion

Intensive inpatient rehabilitation can significantly improve quality of life and functional capacity in disabled patients. Having joint stiffness prior to rehabilitation and non-familial members for taking care are the factors that lessen improvement of the quality of life after rehabilitation.

Potential conflicts of interest

None.

References

1. Kuptniratsaikul V, Kovindha A, Dajpratham P, Piravej K. Main outcomes of stroke rehabilitation: a multi-centre study in Thailand. *J Rehabil Med* 2009; 41: 54-8.
2. Devillard X, Rimaud D, Roche F, Calmels P. Effects of training programs for spinal cord injury. *Ann Readapt Med Phys* 2007; 50: 490-9.
3. Jegier A, Jegier A, Szmigielska K, Bilinska M, Brodowski L, Galaszek M, et al. Health-related quality of life in patients with coronary heart disease after residential vs ambulatory cardiac rehabilitation. *Circ J* 2009; 73: 476-83.
4. Kesselring J. Neurorehabilitation in multiple sclerosis—what is the evidence-base? *J Neurol* 2004; 251 (Suppl 4): IV25-9.
5. Mahatnirunkul S, Tuntipivatanakul W, Pumpsanchai W, Wongsuwan K, Pornmanajirankul R. Comparison of the WHOQOL-100 and the WHOQOL-BREF (26 items). *J Ment Health Thai* 1998; 5: 4-15.
6. Bolsche F, Hasenbein U, Reissberg H, Schlote A, Wallesch CW. Results of in- vs outpatient post-stroke rehabilitation over 6 months. *Fortschr Neurol Psychiatr* 2003; 71: 458-68.
7. Sakthong P. Health-related quality of life. *Thai Pharm Health Sci J* 2007; 2: 327-37.
8. Rukwong P, Chirawatkul S, Markovic M. Quality of life perceptions of middle-aged women living with a disability in Muang district, Khon Kaen, Thailand: WHOQOL perspective. *J Med Assoc Thai* 2007; 90: 1640-6.
9. Aprile I, Di Stasio E, Romitelli F, Lancellotti S, Caliendo P, Tonali P, et al. Effects of rehabilitation on quality of life in patients with chronic stroke. *Brain Inj* 2008; 22: 451-6.
10. Hopman WM, Verner J. Quality of life during and after inpatient stroke rehabilitation. *Stroke* 2003; 34: 801-5.
11. Shem K, Medel R, Wright J, Kolakowsky-Hayner SA, Duong T. Return to work and school: a model mentoring program for youth and young adults with spinal cord injury. *Spinal Cord* 2011; 49: 544-8.
12. Manimmanakorn N, Arrayawichanon P, Wattanapun P, Nuntharuksa C, Kuptniratsaikul V. Age-related rehabilitation outcome in stroke patients. *J Med Assoc Thai* 2008; 91: 388-93.
13. Masskulpan P, Riewthong K, Dajpratham P, Kuptniratsaikul V. Anxiety and depressive symptoms after stroke in 9 rehabilitation centers. *J Med Assoc Thai* 2008; 91: 1595-602.
14. Lynch EB, Butt Z, Heinemann A, Victorson D, Nowinski CJ, Perez L, et al. A qualitative study of quality of life after stroke: the importance of social relationships. *J Rehabil Med* 2008; 40: 518-23.
15. King RB. Quality of life after stroke. *Stroke* 1996; 27: 1467-72.
16. Samsa GP, Matchar DB. How strong is the relationship between functional status and quality of life among persons with stroke? *J Rehabil Res Dev* 2004; 41: 279-82.
17. Dittmer DK, Teasell R. Complications of immobilization and bed rest. Part 1: Musculoskeletal and cardiovascular complications. *Can Fam Physician* 1993; 39: 1428-7.
18. Musicco M, Emberti L, Nappi G, Caltagirone C. Early and long-term outcome of rehabilitation in stroke patients: the role of patient characteristics, time of initiation, and duration of interventions. *Arch Phys Med Rehabil* 2003; 84: 551-8.

การเปลี่ยนแปลงระดับคุณภาพชีวิตของผู้พิการหลังได้รับการฟื้นฟูสมรรถภาพในโรงพยาบาลศิริราช

ธีรดา พลอยเพชร, ปิยะภัทร เดชพระธรรม

วัตถุประสงค์: เพื่อเปรียบเทียบคุณภาพชีวิตของผู้พิการ ก่อนและหลังได้รับการฟื้นฟูสมรรถภาพในโรงพยาบาล และหาปัจจัยที่มีผลกับการเปลี่ยนแปลงระดับคุณภาพชีวิต

วัสดุและวิธีการ: ศึกษาข้อมูลย้อนหลังจากเวชระเบียนของผู้ป่วย 200 ราย ที่เข้ารับการรักษาในหอผู้ป่วยเวชศาสตร์ฟื้นฟู โรงพยาบาลศิริราช ในช่วงปี พ.ศ. 2549 ถึง 2552 โดยเก็บข้อมูลพื้นฐาน ระดับความสามารถประเมินด้วย Modified Barthel Index ระดับคุณภาพชีวิตประเมินด้วยเครื่องชี้วัดคุณภาพชีวิตขององค์การอนามัยโลกชุดย่อ ฉบับภาษาไทย (26 หัวข้อ) (WHOQOL-BREF-THAI) และนำมาวิเคราะห์หาความสัมพันธ์กับการเปลี่ยนแปลงของระดับคุณภาพชีวิต ก่อนและหลังได้รับการฟื้นฟูสมรรถภาพ

ผลการศึกษา: ผู้ป่วยเพศชาย 117 คน (ร้อยละ 58.5) หญิง 83 คน (ร้อยละ 41.5) อายุเฉลี่ย 55.6 ± 17.9 ปี โดยสาเหตุของความพิการ ได้แก่ โรคหลอดเลือดสมอง 112 ราย (ร้อยละ 56) ไช้สันหลังบาดเจ็บ 54 ราย (ร้อยละ 27) และสาเหตุอื่น ๆ 34 ราย (ร้อยละ 17) ภายหลังได้รับการฟื้นฟูสมรรถภาพในโรงพยาบาล ผู้ป่วย 164 ราย (ร้อยละ 82) มีระดับคุณภาพชีวิตดีขึ้นอย่างมีนัยสำคัญทางสถิติ ($p < 0.001$) จากคะแนน WHOQOL-BREF-THAI ก่อนเข้ารักษา 81.3 ± 11.2 และหลังการรักษา 85.5 ± 11 คือคะแนนเพิ่มขึ้น 4.2 ± 8 โดยพบว่าคุณภาพชีวิตด้านกาย ใจ และสิ่งแวดล้อมดีขึ้น แต่ด้านสังคมไม่พบความแตกต่างอย่างมีนัยสำคัญทางสถิติ ปัจจัยที่สัมพันธ์กับการไม่เพิ่มขึ้นของระดับคุณภาพชีวิตหลังการฟื้นฟูสมรรถภาพ ได้แก่ การไม่มีญาติเป็นผู้ดูแลหลัก (OR 5.8, 95% CI 2.1-16) และการมีข้อยึดติดก่อนเข้านอนโรงพยาบาล (OR 4.1, 95% CI 1.7-9.9)

สรุป: การฟื้นฟูสมรรถภาพในโรงพยาบาลช่วยเพิ่มระดับคุณภาพชีวิตในผู้พิการจากเหตุต่าง ๆ ได้ โดยการมีข้อยึดติดก่อนเข้านอนโรงพยาบาล และการไม่มีญาติเป็นผู้ดูแลหลัก สัมพันธ์กับการไม่เพิ่มขึ้นของระดับคุณภาพชีวิต
