



Veterans International Cambodia →
The Project of The International Center

Vision: To increase the capacity of Persons with Disabilities (PWDs) and their families to lead active, productive fulfilling lives.

RESEARCH REPORT

**IMPACT OF REHABILITATION SERVICES ON
QUALITY OF LIFE OF PERSONS WITH DISABILITIES
IN CAMBODIA**



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Table of Contents

Abstract.....	3
Introduction.....	4
Methods	6
Study Participants	6
Inclusion Criteria.....	6
Exclusion Criteria	6
Sampling Strategy	7
Measurement of the QoL	7
Data Collection	10
Statistical Analysis	10
Results	11
Adults with disabilities (aged 18 years and above).....	11
Socio-Demographic Characteristics:.....	11
Score of Objective and Subjective Measurement for QoL:.....	12
Maximum Objective Scores and Type of Disabilities:.....	14
Factors associated with the improvement of the quality of life among adult PWD on Overall Objective Score Maximum.....	17
Factors associated with the improvement of the quality of life of adult PWDs on Overall Subjective Score Maximum	18
QoL among Children with Disabilities	21
Overall Score Measurement for QoL of Children:.....	21
The need of Rehabilitation services	23
Discussions	23
Limitations	25
Conclusions & Recommendations.....	26
Acknowledgements.....	26
Declaration of Interest	26
References.....	27

Impact of Rehabilitation Services on Quality of Life of Persons with Disabilities in Cambodia

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Abstract

Objective: To assess the quality of life (QoL) of person with disability (PWD) before and after receiving rehabilitation services and/or Community Based Rehabilitation (CBR) services from Veterans International Cambodia (VIC) and to determine factors associated with the improvement of the QoL of PWD other than the rehabilitation services and/or CBR services.

Design: A cross-sectional study was conducted amongst PWDs from three physical rehabilitation centers in Cambodia. ComQoL-A5 was used to measure the QoL of adults with disabilities (age 18 years and above) and KIDSCREEN-27 for children with disabilities aged from 10 to 18 years-old. Comparisons of the means percentage score before and after receiving the services were conducted. Multivariate analysis was performed to identify factors associated with the improvement of the quality of life.

Result: The QoL of PWDs was significantly improved after receiving rehabilitation services. Within each stratum of disability, improvement was observed when comparing before and after scores. However, no significant differences across different types of disability were seen. Gender, age, education and income were found to be significantly associated with the improvement of QoL of adults with disabilities.

Conclusion: The services offered by the Veterans International significantly improve the QoL of PWDs. People with different types of disability could benefit equally from the services, except those with Cerebral Palsy. Consequently, rehabilitation services (community or center based) are strongly required by PWDs. Therefore, local and international non-government organizations (INGO/LNGO), donors, government and other stakeholders should continue to support the establishment of rehabilitation services so that the QoL of PWD can be improved.

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Introduction

Persons with disabilities often experience lower quality of life (QoL) than people without disabilities. This is due to the fact that many people with disabilities have been facing with challenges in everyday life such as: accessing health care, education; and other disability-related services that they require.¹

The *World Bank* estimates that, currently, 10%-12% of the global population lives with a disability and that about 2% -3% of these live with severe impairment. It also estimates that more than one-quarter of all households has a disabled family member. These people's disabilities often limit their ability to find jobs, attend school, build a family and fully participate in civic activities.² *The World Health Survey* found that around 785 million (15.6% of the population) people aged 15 years or older live with a disability and lower income countries tend to have higher disability rates than higher income countries.¹

The number of people with disabilities is increasing due to the global aging of the population. Evidence shows that older people are at higher risk of having a disability because of the increase of the prevalence of chronic health conditions such as diabetes, cardiovascular disease, and mental illness.¹ This evidence also suggests that as time goes on, more people are going to be living with disabilities, so it is very important that we implement strategies to maintain high standards of care for these people so that they can continue to lead fulfilling lives.

The QoL of PWDs had been a major concern for the *Council of Europe* in 2006, and 46 member states discussed how to improve the quality of life of people with disabilities.³ Providing both center-based and community-based rehabilitation to PWD's was strongly recommended by *The World Health Organization* in order to enable PWD's to attain and maintain their maximum independence, as well as achieving full physical, mental, social and vocational ability. It also suggests that rehabilitation assists with attaining full inclusion and participation in all aspects of life; bringing significant support to people with disabilities and caregivers; and ensuring greater self-determination for people with disabilities.¹

Many studies have shown the impact of rehabilitation on assisting PWD's to achieve optimal quality of life. Some of these specific disabilities include: stroke⁴, spinal cord injury⁵, coronary heart disease⁶ and multiple sclerosis⁷. In addition, recent research in Thailand suggests that after a period of intensive inpatient rehabilitation the QoL and functional capacity of PWDs is significantly improved.⁸

Cambodia is a developing country. In 2008, the prevalence of disability was 1.4%. About 32% and 68.2% of the disabilities occurred before birth and after birth, respectively. In response, the Cambodian Government (through The Ministry of Social Affairs Veterans and Youth Rehabilitation) has taken action to improve the quality of life of PWD's, particularly through the eleven physical rehabilitation centers across the country.⁹

The Veteran International Cambodia has been providing rehabilitation services to PWDs since 1991.¹⁰ After many years in operation, VIC is interested in assessing the contribution of the rehabilitation services (center-based rehabilitation services and community-based rehabilitation [CBR] services) on the quality of life of PWDs.¹⁰ One study on the QoL of Cambodian people with disabilities in 2002 found that those who received a rehabilitation service reported having higher QoL scores than those who did not receive any rehabilitation service.¹⁰ It also found that those who received a combination of rehabilitation services (physical rehabilitation [prosthetics/orthotics with physiotherapy]; community-based rehabilitation; and labor market assistance) showed further improvement of their quality of life.¹¹ However, the study did not find any significant differences in the quality of life scores of the PWD's before and after they received the rehabilitation services. Therefore, this study aims to explore the associations between receiving rehabilitation services (center-based rehabilitation services and community-based rehabilitation [CBR] services) and the improvement of the quality of life among PWD's receiving rehabilitation services from Veterans International Cambodia.

Methods

Study Participants

The study was conducted in the main catchment areas of VIC (Phnom Penh, Kandal, Prey Veng, Svay Rieng and Kratie provinces). In each site persons with any of the following types of disabilities were selected for the study:

- Lower limb Amputation;
- Hemiplegic;
- Cerebral Palsy;
- Spinal Cord Injuries;
- Polio; and
- Congenital Deformities

The participants were categorized into two groups:

- The first group was adults aged 18 years and older.
- The second group was children and adolescents aged from 10 to 18 years-old.

Adults were interviewed with ComQoL-A5 questionnaire, while children and adolescents were interviewed with KIDSCREED-27. During the interview, participants were asked to recall the quality of life before and after receiving services from VIC.

Inclusion Criteria

- PWD with any one of the above six types of disabilities, who have already received rehabilitation services from one of the three rehabilitation centers of VIC (Kien Khelang, Prey Veng and Kratie).
- PWD aged 10 years and older
- PWD who agreed to participate in the research
- Participants with the ability to talk and understand the questions
- If the participants could not communicate, caregivers were interviewed.

Exclusion Criteria

- Persons with multiple disabilities
- Persons with the following conditions:
 - Severe or chronic medical conditions (e.g. Stroke, Diabetes Mellitus).

- History of having a severe or chronic psychological disorder with onset before and/or after giving birth to a child with CP.
- Presentation to an inpatient and/or outpatient clinic for any kind of medical support within the three-month period prior to the study's commencement date.

Sampling Strategy

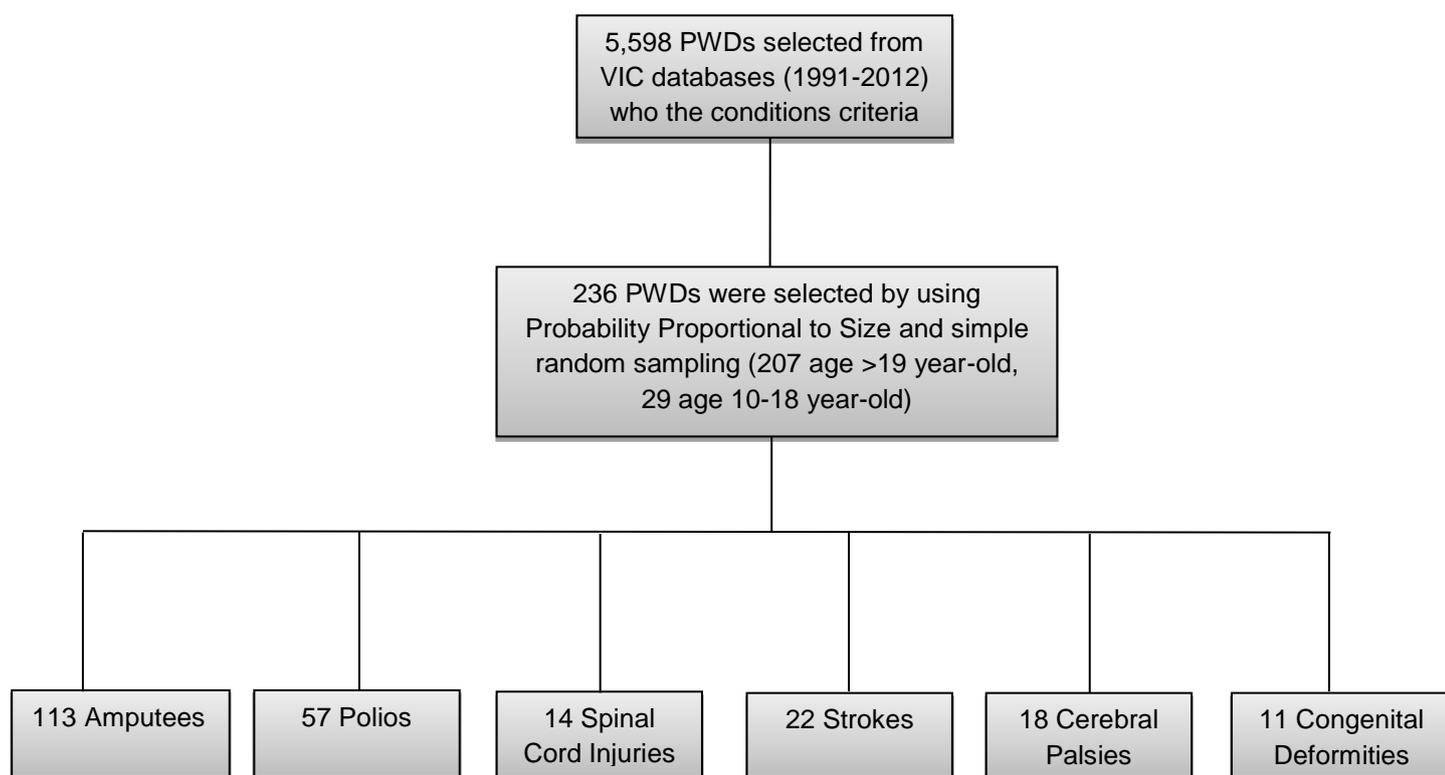


Figure 1. Flowchart showing the sampling strategy used to select the subjects for this study.

Measurement of the QoL

The QoL of adults composed of objective and subjective components. To measure the objective components of QoL for adults with disabilities, ComQOL-A5 was used. The questionnaire was found to have good validity and reliability for examining QoL among adults.¹² The questionnaire was officially translated into the Cambodian language (Khmer)¹¹ and was used to measure the QoL of PWD's¹¹ and caregivers of PWD's in Cambodia¹³. The questionnaire is divided into 7 domains, namely Material Well-Being, Health, Productivity, Intimacy, Safety, Place in Community, and Emotional Well-Being. There were a total of 21 items in the objective section.

Here the seven domains of the objective measurement are explained:

- Material well-being: type of housing, living arrangements, quantity of possessions owned in comparison to others in respondent's community and average monthly household income.
- Health: the number of times medical treatment has been sought in the past three months (including treatment from formal and informal health practitioners); whether they are affected by a disability or medical condition requiring ongoing treatment, dependence on medication (including pharmaceutical and traditional or herbal medications).
- Productivity: number of hours per day spent at work, studying, childcare or other family or household duties; frequency of having something to do in free time; use of free time (for example, hours spent watching TV).
- Intimacy: the number of times per week the person talks with a close friend; how often does someone show they care when the person is feeling sad or depressed; and the frequency that someone else wants to share doing something special with the person.
- Safety: how often does the person feel they have had a good night sleep, do they feel safe at home; do they often feel worried or anxious.
- Place in community: how often does the person partake in leisure activities; unpaid involvement in local committees, associations or community groups; and how often does the person seek advice from others outside the family.
- Emotional well-being: how often does the person feel they achieve what they want, how often do they feel depressed or hopeless; or having wishes that cannot come true.

There are also seven domains in the subjective section, and each section comprises of two different parts (importance and satisfaction). The seven domains are as follows: *(See table 1 Summary of CoMQOL-A5 questionnaire)*

- Health: measures the importance of and satisfaction with their own health.
- Productivity: measures the importance of and satisfaction with achievement in their life.
- Intimacy: measures the importance of and satisfaction with close relationships with family and friends.
- Safety: measures the importance of and satisfaction with their level of personal safety.

- Place in community: measures the importance of and satisfaction with the level of engagement within their community.
- Emotional well-being: measures the importance of and satisfaction with their own happiness.

The quality of life was calculated based on CoMQoL-A5 using the instruction from Cummins in 1997 for calculating percentage of subjective and objective score.¹²

Table1: Summary of CoMQOL-A5 Questionnaire

Objective Score	Subjective Score	
	Importance	Satisfaction
1. Material Well-Being (3 items)	1. Material Well-Being (1item)	1. Material Well-Being (1item)
2. Health (3 items)	2. Health (1 item)	2. Health (1 item)
3. Productivity (3 items)	3. Productivity (1 item)	3. Productivity (1 item)
4. Intimacy (3 items)	4. Intimacy (1 item)	4. Intimacy (1 item)
5. Safety (3 items)	5. Safety (1 item)	5. Safety (1 item)
6. Place in Community (3 items)	6. Place in Community (1 item)	6. Place in Community (1item)
7. Emotional Well-Being (3 items)	7. Emotional Well-Being (1 item)	7. Emotional Well-Being (1item)

Another questionnaire that was also used in this research was KIDSCREEN-27. This is a modified, shortened version derived from the KIDSCREEN-52 questionnaire. The KIDSCREEN-27 was found to be a valid measurement of Health Related Quality of Life(HRQOL)¹⁴ and has been used internationally among children and adolescents.¹⁵ In this research the questionnaire was used to examine the HRQOL of children and adolescents between the age of 10 and 18 years old. The KIDSCREEN-27 has 5 dimensions, and these are outlined below:

- Physical Well-Being(5 items) explores the level of the child's/adolescent's physical activity, energy and fitness;
- Psychological Well-Being (7items) includes questions relating to positive emotions, satisfaction with life, and feeling emotionally balanced;
- Parent Relations & Autonomy(7 items) assesses relationships with parents, the atmosphere at home, and feelings of having enough (age-appropriate) freedom, as well as the degree of satisfaction with financial resources;
- Social Support & Peers(4 items) assesses the nature of the child's relationships with other children/adolescents; and
- School Environment (4 items) explores the child's/adolescent's perception of his/her cognitive capacity, learning and concentration, and his/her feelings about school.¹⁵

This questionnaire has been translated by the Clinical Mentor of VIC into Khmer and in association with three site managers of the three rehabilitation centers of VIC.

KIDSCREEN-27 was used to measure the mean percentage of the overall score before and after receiving rehabilitation services.

Data Collection

Face to face interview was collected by trained interviewers using the questionnaires outlined above. Informed consent was sought from each potential participant and, the confidentiality and privacy of the participants were rigorously maintained. Caregivers were invited to participate in the interview when the PWD was too young or not able to provide appropriate answers to the questions. The questionnaires were administered by the interviewers once informed consent was obtained. The time required for completing the questionnaires was 25 minutes for KIDSCREEN-27, and 45 minutes for ComQoL-A5.

Statistical Analysis

The student t-test was used to compare the means percentage score of both questionnaires (ComQoL-A5 and KIDSCREEN-27). This was done in order to see if there was any difference in scores before and after receiving services. Univariate analysis was used to test the association between the outcome variable (defined as a score showing a 50% improvement and above in the quality of life of adults with disabilities) and other factors such as socio-demographics. Logistic regression was used to estimate crude odds ratios(OR) and a confidence interval of all investigated associations, while controlling potential confounding variables such as age, sex,

income, marital status, services received, education, support from other organizations, relatives or friends.

Results

Adults with disabilities (aged 18 years and above)

Socio-Demographic Characteristics:

There were 236 participants recruited in this research. 207 of them aged over 18 years-old and 29 aged between 10 and 18 years old. Table 2 showed socio-demographic characteristics of adults with disabilities aged older than 18 years. The mean age among adult was 43.8 years old. About 77 % were male. The percentage of having no education was as low as 14% and 53%, 18% and 15% attended primary, secondary and high school or higher respectively. The majority of the adults were married (68%). One third of participants were farmers (31%) followed by motor repairers (17%) and housewives (8%). 64% of the participants were the breadwinners.

Table 2: Socio-demographic of adult participants

Characteristics	(N=207)	
	n	%
Mean age in year (SD)	43.8 (±13.49)	
Sex		
Male	159	77
Female	48	23
Education		
No school	29	14
Primary School	110	53
Secondary School	38	18
High School or higher	30	15
Marital Status		
Single	49	24
Married	141	68
Widow/Widower	17	8
Breadwinner		
Yes	132	64
No	75	36
Occupation		
Housewife	8	4
Farmer	63	31
Gov't staff	4	2
Seller	7	4
Motor repairing maker	17	8
Hair Cutter	5	2
Tailor	6	3
Face maker	1	1
Others	91	45
Services Received from VIC		
Services in the center	207	100
Services in center and CBR	75	36
Type of disabilities		
Amputee	110	53
Polio	53	26
Stroke	22	11
SCI	13	6
Cerebral Palsy	3	1
Congenital Deformities	5	3

Score of Objective and Subjective Measurement for QoL:

The result showed a significant improvement in the overall maximum score of objective measurement on the quality of life among adults with disabilities when comparing between before and after receiving services from VIC. The differences were also found in each domain (Table 3). Similar to the objective score, there were also significant differences in the overall subjective scores in each domain when comparing before and after receiving rehabilitation services (Table 4).

Table 3: Means of Objective Score Maximum by Domains

Variables	Mean % Score Maximum (SD)		P-Value
	Before Services	After Services	
Overall Objective (7 domains)	38.2 (±8.84)	59.24(± 8.3)	<0.001
Domains			
Well-Being	18.44 (±19.18)	41.26 (±21.53)	<0.001
Health	69.6 (±12.71)	87.58 (±8.13)	<0.001
Productivity	36.22 (±14.22)	53.41(±13.77)	<0.001
Intimacy	47.52 (±20.08)	66.38 (±16.61)	<0.001
Safety	39.17 (±17.77)	61.57 (±15.03)	<0.001
Place in Community	15.77 (±9.58)	35.81 (±17.82)	<0.001
Emotional Well-Being	40.93 (±19.39)	69.94 (±15.14)	<0.001

Table 4: Mean of Subjective Score Maximum by domains

Variables	Mean of %SM (SD)		P-Value
	Before Services	After Services	
Overall (7 domains)	55.58 (±11.33)	78.49 (±9.98)	<0.001
Domains			
Well-Being	54.1(±13.53)	77.83 (±14.7)	<0.001
Health	53.48 (±19.32)	79.78 (±15.37)	<0.001
Productivity	54.73(± 20.55)	79.35(±14.49)	<0.001
Intimacy	47.52 (±20.1)	66.38 (±16.61)	<0.001
Safety	39.17 (±17.77)	61.57 (±15.03)	<0.001
Place in Community	15.77 (±9.58)	35.81(±17.82)	<0.001
Emotional Well-Being	40.94 (±19.39)	69.94 (±15.14)	<0.001

Maximum Objective Scores and Type of Disabilities:

Among 6 types of disabilities selected for the study (amputee, polio, stroke, spinal cord injury, cerebral palsy and congenital deformities), there was no statistical difference when comparing across the types. These indifferences were found both on the measurement before and after receiving rehabilitation services, as well as on objective and subjective score (See table 5 & 6)

Table 5: Mean percentage of Overall Objective scores before and after receiving services

Variables	Mean (SD) Before Revived Services	P- value	Mean (SD) After Received Services	P-value
Type of disabilities		0.162		0.104
Amputee	37.62 (±9.05)		61.30 (±8.86)	
Polio	40.04 (±8.61)		57.56 (±6.55)	
Stroke	38.8 (±9.3)		56.00 (±8.95)	
Spinal Cord				
Injury	33.24 (±6.91)		54.48 (±7.77)	
Cerebral Palsy	42.06(±4.18)		55.15 (±2.99)	
Congenital				
Deformities	36.43 (±2.86)		57.85 (±5.36)	

Table 6: Mean Percentage of overall subjective scores before and after receiving services, by types of disability

Variables	Mean (SD) Before Revived Services	P- value	Mean (SD) After Received Services	P-value
Type of disabilities		0.48		0.72
Amputee	54.85 (±10.74)		79.88 (±9.60)	
Polio	58.44 (±11.33)		80.34 (±9.64)	
Stroke	56.10 (±12.57)		72.74 (±9.93)	
Spinal Cord Injury	47.42 (11.53)		69.20 (9.26)	
Cerebral Palsy	67.29 (±1.06)		75.06 (±5.47)	
Congenital Deformities	55.71 (±9.56)		80.07 (±5.20)	

Within the same type of disability, when comparing the score of QoL before with after receiving services, there was a significant difference in the overall objective score maximum (p-value <0.05), except in Cerebral Palsy (p-value=0.067). Similarly, when comparing the subjective scores before and after receiving services with the same type of disability, there was also significant improvement in all type of disabilities, except Cerebral Palsy (p-value=0.35) (See Table 7 & 8).

Table 7: The mean percentage of overall objective scores maximum before and after receiving services, according to the type of disability

Variables	N	Mean of %SM(SD)		P-value
		Before Services	After Services	
Type of disability				
Amputee	110	54.85 (± 10.74)	79.88 (± 9.60)	<0.001
Polio	52	58.44 (±11.33)	80.34 (± 9.64)	<0.001
Stroke	22	56.10 (± 12.57)	72.74 (± 9.93)	<0.001
Spinal Cord Injury	13	47.42 (± 11.53)	69.20 (± 9.26)	<0.001
Cerebral Palsy	2	67.29 (± 1.06)	73.12 (± 6.11)	0.35
Congenital Deformities	5	55.71 (± 9.56)	80.07 (± 5.20)	0.015

Table 8: Mean percentage of the overall subjective scores before and after

Variables	n	Mean of %SM(SD)		P-value
		Before Services	After Services	
Type of Disabilities				
Amputee	111	37.62 (±9.05)	61.30 (±8.86)	<0.001
Polio	53	40.04 (±8.61)	57.56 (±6.55)	<0.001
Stroke	22	38.8 (±9.3)	56.00 (±8.95)	<0.001
Spinal Cord Injury	13	33.24 (±6.91)	54.48 (±7.77)	<0.001
Cerebral Palsy	3	42.06(±4.18)	55.15 (±2.99)	0.067
Congenital Deformities	5	36.43 (±2.86)	57.85 (±5.36)	0.0014

receiving services.

Factors associated with the improvement of the quality of life among adult PWD on Overall Objective Score Maximum

The improvement of the quality of life on overall objective score maximum was significantly associated with age. That is, the improvement of QoL among adults aged 47 or older was 0.80 (95%CI=0.46-1.39) times less likely compared to those aged less than 47. Similarly, those with a higher income was 0.48 (95% CI=0.26-0.88) times less likely to improve QoL compared to those who earned an income less than 100,000 riels.

After controlling for the potential confounders, the improvement was significantly lower among those aged 47 and older and who earned an income of 10,000 riels per month and above. Adult males and participants who were married were 2.27 times (CI 95%=1.17-4.40) and 1.97 times (CI 95%= 1.02-3.82) more likely to improve their QoL compared to those who were female and single, respectively. This association remained strongly significant after controlling for other potential confounders (See *Table 9*).

Factors associated with the improvement of the quality of life of adult PWDs on Overall Subjective Score Maximum

Similar findings to the objective score maximum were found for the overall subjective maximum score. In univariate analysis, the improvement was significant less in the subjective score among those aged 47 years and older (OR=0.54 95% CI=0.31-0.95) and after controlling other confounders, this association remained strongly significant (p-value=0.004). Those who were married, were 1.59 times more likely to improve their QoL in the subjective score than those who were single (OR=1.59, 95% CI=0.81-3.11) and it was still significant (p-value=0.033) after controlling for other confounding variables (See *Table 10*).

Table 9 Factors associated with 50% improvement of Overall Objective Score (N=207)

Variables	n(%)	Unadjusted		Adjusted		P-Value
		OR	95% CI	OR	95% CI	
Sex						
Female	19 (39.58)	1.00	--	1.00	--	--
Male	94(59.87)	2.27	1.17 - 4.40	2.22	1.06 - 4.62	0.032
Age						
<47	59 (57.84)	1.00	--	1.00	--	--
≥47	54 (52.43)	.80	0.46-1.39	0.46	0.23- 0.91	0.027
Level of Education						
No School	21 (72.41)	1.00	--	1.00	--	--
School	92 (52.27)	0.41	0.17-0.99	0.30	0.12- 0.78	0.014
Income						
<100,000r	85 (60.71)	1.00	--	1.00	--	--
≥100,000r	28 (43.08)	0.48	0.26-0.88	0.48	0.25-0.92	0.028
Marital Status						
Single	21 (43.07)	1.00	--	1.00	--	--
Married	83 (59.71)	1.97	1.02-3.82	2.51	1.10-5.71	0.027
Widow/widower	9 (52.94)	1.5	0.49-4.54	1.51	0.43-5.28	0.515
Supported from NGO						
No	92 (53.80)	1.00	--	1.00	--	--
Yes	21(61.76)	1.38	0.65-2.94	1.50	0.67-3.38	0.318
Supported from relatives						
No	76 (55.88)	1.00	--	1.00	--	--
Yes	37 (53.62)	0.91	0.51-1.63	1.20	0.61-2.34	0.585

Table 10 Factors associated with 50% improvement of Overall Subjective Score (N=207)

Variables	n (%)	Unadjusted		Adjusted		
		OR	95% CI	OR	95% CI	P-Value
Sex						
Female	17 (35.42)	1.00	--	1.00	--	--
Male	78(50.65)	1.87	0.95-3.65	1.80	0.86-3.76	0.11
Age						
<47	55 (54.46)	1.00	--	1.00	--	--
≥47	40 (39.60)	0.54	0.31-0.95	0.37	0.18-0.73	0.004
Level of Education						
No School	14 (48.28)	1.00	--	1.00	--	--
School	81 (46.82)	0.94	0.42-2.07	0.69	0.29-1.61	0.397
Income						
<100,000r	70 (50.36)	1.00	--	1.00	---	--
≥100,000r	25 (39.68)	0.64	0.35-1.18	0.61	0.31-1.17	0.141
Marital Status						
Single	19 (39.58)	1.00	--	1.00	--	--
Married	70 (51.09)	1.59	0.81-3.11	2.42	1.07-5.48	0.033
Widow/widower	6 (35.29)	0.83	0.26-2.63	0.95	0.27-3.36	0.94
Supported from NGO						
No	81 (47.93)	1.00	--	1.00	--	--
Yes	14(42.42)	0.80	0.37-1.70	0.76	0.34-1.68	0.509
Supported from relatives						
No	61 (45.52)	1.00	--	1.00	--	--
Yes	34 (50.00)	0.74	0.25-2.18	1.46	0.31-1.17	0.263

QoL among Children with Disabilities

Table 11 showed the socio-demographic of children aged from 10-18 years. The mean age was 14.34 years old and the mean education (SD) was 4.72 (± 3.78). 45% of the children were male. 17% did not attend school and 62% received services both at the centre and in the community.

Table 11 Socio-demography of children (age from 10-18 years)

Characteristics	(N=29)	
	n	%
Mean age in year (SD)	14.34 (± 3.09)	
Education (SD)	4.72 (± 3.78)	
Sex		
Male	13	45
Female	16	55
Education		
No school	5	17
School	24	83
Services Received from VIC		
Services in the center	29	100
Services in the center and CBR	18	62
Type of disabilities		
Amputee	3	10
Polio	4	14
SCI	1	3
Cerebral Palsy	15	52
Congenital Deformities	6	21

Overall Score Measurement for QoL of Children:

The result showed a significant improvement in the overall score of KIDSCREEN-27 measurement on the quality of life among children with disabilities when comparing between before and after receiving services from VIC. The differences were also found in each domain (*Table 12*).

Table 12 Means of Overall Score by Domains (KIDSCREEN-27)

Variables	Mean % Score Maximum (SD)		P-Value
	Before Services	After Services	
Overall Score (5 domains)	20.34 (±10.20)	46.39 (±10.43)	<0.001
Physical Well-Being	12.13 (±12.16)	49.79 (±11.64)	<0.001
Psychological Well-Being	26.50 (±10.87)	49.79(±11.64)	<0.001
Parent Relations & Autonomy	29.85 (±12.72)	49.55 (±11.51)	<0.001
Social Support & Peers	18.03 (±17.81)	48.21(±17.75)	<0.001
School Environment	15.76 (±20.28)	46.73 (±24.65)	<0.001

Across the 4 types of disabilities, the overall score on KIDSCREEN-27 was not significantly different before or after receiving the rehabilitation services (See Table 13).

Within the same type of disability, when comparing before with after receiving rehabilitation services, there was a significant difference in the overall mean KIDSCREEN-27 score after receiving the services (p-value <0.05) (See Table 14).

Table13 Mean of % Overall Score (KIDSCREEN-27) before and after services, by type of disabilities (Age 10-18ys)

Variables	Mean (SD) Before Revived Services	P-value	Mean (SD) After Received Services	P-value
Type of disabilities		0.067		0.688
Amputee	30.05 (±8.61)		47.57 (±13.50)	
Polio	22.39 (±7.37)		56.61 (±6.11)	
Cerebral Palsy	15.14 (±5.40)		41.92 (±8.92)	
Congenital Deformities	52.81 (±15.29)		52.81 (±7.92)	

Table 14 Mean of % Overall Score (KIDSCREEN-27) before and after services, by type of disabilities

Variables	n	Mean of %SM(SD)	Mean of %SM(SD)	P-value
		Before Services	After Services	
Type of disabilities				
Amputee	3	30.05 (±8.61)	47.57 (±13.50)	0.0577
Polio	4	22.39 (±7.37)	56.61(±6.11)	<0.001
Cerebral Palsy	13	15.14(±5.40)	41.92(±8.92)	<0.001

The need of Rehabilitation services

A total of 93%of adults and 89%of children with disabilities requested to continue with the rehabilitation services offered by VIC. For adults with disabilities, there were 47%, 25% and 22% requested for a grant for support on their skill training, building their house and stopping discrimination respectively. For the children with disability, there were 64%, 59%, and 48% who requested for university integration, stopping discrimination and making PWDs right awareness, respectively.

Discussions

The study showed a significant improvement of QoL (both adult and children with disabilities) when comparing before and after receiving rehabilitation services from VIC. This improvement seems consistent with Powell PA's finding in 2002. That is; PWDs who did not receive rehab services had a significantly lower quality of life than those who received any single rehab services in Cambodia.¹¹

For the objective score and subjective score of ComQoL-A5, after receiving the rehabilitation services, adults with disabilities who got married were significantly improved in their QoL more (defined as having more than 50% improvement) than those who were single after controlling for other confounders. This finding is also supported by Powell BA (2002) findings that showed PWDs in Cambodia who got married had the highest mean of objective score maximum (52.5%) compared to those with other status.¹¹ Powell BA (2002) also reported that the improvement of the

objective score of ComQoL-A5 was better among males when compared to females.¹¹

Powell (2002) described that PWDs who were over 45 years had the lowest mean of objective score (44.8%) than those below 45 years.¹¹ The results from this study supported this by showing that those aged equal and older than 47 years were less likely to improve their QoL when compared to those who were aged below 47 years (p-value<0.005 both objective and subjective scores).

In contrast to Powell's findings¹¹, this study found that those who attended school or received a higher income (equal and more than 100,000riels) were less likely to improve their QoL when compared to those who did not attend school or received a low income (less than 100,000riels) (p-value=0.014, p-value=0.028 respectively). It is important to consider that with those participants who reported higher income or schooling, their QoL may have been high before receiving services or the expectation of the quality of life may have increased while receiving services. Consequently, the self-reported improvement of QoL among this group would not be significant after receiving services. Elsewhere, having no education and low income may not always prove to have a link to a low quality of life as it depends on the social and environmental context that they are living in. Regidor reported that the effect of education and income probably depends on the historical and social context.¹⁶

Within each type of disabilities, there was a significant improvement in the QoL among adult PWDs after receiving rehabilitation service, except with adults with cerebral palsy. This might be because they had severe disability and therefore the rehabilitation services had little effect on improvement in QoL among this extreme group. The survival rate of adults with cerebral palsy is reported to be very poor.¹⁷ Therefore, intervention on children with cerebral palsy should be implemented as soon as possible.¹⁷ This study found that children with cerebral palsy significantly improved their QoL on KIDSCREEN-27 after receiving the rehabilitation services.

The study also showed the need for continuing rehabilitation services for both children and adults with disability included in the study since rehabilitation services have been found to significantly improve their QoL.¹ The grant for skill training, university integration, house building, stopping discrimination and raising disability awareness are found to be the second priority after rehabilitation service to lead PWDs to enable them to earn their daily income and fully participate in their

community. WHO recommended that a community rehabilitation program such as assisting PWDs in income generation, school integration, promote the right of PWDs and disability inclusive development should be implemented in the countries which had the vulnerable PWDs like Cambodia to improve their QoL and community development.¹

Limitations

The interpretation of the results from this study should be completed with the consideration of the following limitations. The measurement of QoL using ComQoL-A5 might not appropriate for the real situation in Cambodia because the ComQoL-A5 was originally developed for and based on a Western region. However, Powell (2002) found that the ComQoL-A5 was a useful and comprehensive instrument for using in rehabilitation services in developing countries.¹¹

This study might suffer from information bias on the measurement of the QoL since the study asked the participants to answer both the pre and post intervention QoL questionnaire after receiving intervention. This may present bias as some PWDs may respond to this with positive answers. To reduce this bias, the principal investigator trained and used PWDs who already also received the services from VIC to conduct the interview, hoping that these study participants would be more willing to reveal their real situations.

The cross sectional nature of the study may not be the best way to study the factors associated with the improvement of the QoL due to temporal ambiguity issue. Furthermore, potential confounders such as length of disabilities, level expectation of the benefit of services and duration of receiving services were not available for analysis.

The number of study participants without QoL improvement was low, resulting in small sample issues when performing multivariate analysis. However, after selecting only those with 50% or more increase of the QoL as having improvement, the precision of the estimate could be improved. Again, due to the fact that only small sample size for children with disabilities (age 10-18 year) were included in the study, only descriptive statistics were performed for this group.

Conclusions & Recommendations

This research reports a significant improvement in QoL among PWDs after receiving the rehabilitation services from VIC. This improvement is not significantly different across different types of disabilities after receiving rehabilitation services. It also found that offering early rehabilitation intervention to children with Cerebral Palsy could improve their QoL, although this intervention may not have an effect among adults with cerebral palsy. Rehabilitation services should aim to offer services as soon as possible since receiving rehabilitation services at younger age may have a significant improvement on the quality of life of recipients. Having a spouse or strong support or care from family members (both mental and physical) may have a strong effect on the improvement of QoL of PWDs. Future research aimed at measuring the impact of rehabilitation services should be planned at the start of the services so that the baseline data can be collected prior to the start of the services. Rehabilitation services (center and community based) and other services are strongly recommended for PWDs. VIC should advocate for the continuation of offering rehabilitation services to those in need by convincing relevant local and international NGOs, donors and the government to be involved in the development of an effective strategic plan to address disability issue and to ensure having enough financial support to implement those strategies.

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Declaration of Interest

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Veterans International Cambodia → **The Project of The International Center**

Veterans International Cambodia (VIC) is a non-profit international NGO. VIC began its programs in Cambodia in late 1991 to provide rehabilitation services for persons with disabilities (PWDs). VIC is currently supporting the operation of the three rehabilitation centers, including Kien Khleang, Prey Veng and Kratie both Center Based Rehabilitation and Community Based Rehabilitation (CBR) program. VIC receives finding from The Handa Foundation (THF) to open a new center, the Handa Rehabilitation Center (HRC) since 31st January 2013. The purpose of establishing HRC is to provide rehabilitation services for persons with disabilities (PWDs) and patients who are able to pay for all of their care, with the understanding that all surplus revenues will be donated in full to VIC and the Persons with Disabilities Foundation for providing rehabilitation services to the poor and needy.

Vision

To increase the capacity of PWDs and their families to lead active, productive and fulfilling lives

Mission

To support PWDs in Cambodia, who are victims of war and are among the poorest of the poor and marginalized in society. We aim to empower them to build better lives for themselves and their families through Community Based Rehabilitation (CBR)

Values

**Integrity
Humanity
Quality
Equity
Independence
Partnership**



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