

## **DISABILITY AMONG CLIENTS ATTENDING TAIF REHABILITATION CENTRE, SAUDI ARABIA**

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### **ABSTRACT**

*This is a cross-sectional study of hospital records of people who were admitted to Rehab Armed Forces Rehabilitation Center, Taif, Saudi Arabia from 1999–2005. Eight hundred and fifty records were reviewed. Data were collected on age, sex, nationality, data of admission and discharge and type of disability. Univariate and multivariate logistic regression analysis were performed to determine predictors of long stay at the hospital. Trauma as an etiology of disability was more common than non-traumatic incidents among male and middle aged clients (16-45 years). Traumatic accidents mostly result in quadriplegia (72.8%). Male, single, less than 45 years old, people with traumatic accidents and people with paralytic types of disability were significantly more likely to stay longer at the hospital. Home care programme should be expanded to minimize duration of stay at the rehabilitation centres. Health education of the public would help in encouraging disabled people to adapt to daily life activities.*

### **INTRODUCTION**

Chronic disabling conditions are an emerging challenge facing developing and industrialized nations(1). Despite the growing awareness of the public, the health and education professionals about the economic, psychological and medical impact of disability, limited research has been carried out to determine pattern of disabilities in Saudi Arabia(2).

There are number of difficulties associated with conducting research on disability related issues in Saudi Arabia. Some of these difficulties are associated with the characteristics of the Saudi society such as the fact that some families feel ashamed about having a person with a disability and as a result, tend to avoid participation in such research (3). Saudi society's view of people with disabilities is based on a simple notion of disability, and

comprises helplessness, continuing dependence, being home-bound, low quality of life and lack of productivity(3). Perhaps the most important obstacle is the complete lack of appropriate epidemiological research on the general population where most disability researches done in Saudi Arabia were on disabled children(1,4,5).

Moreover, the appropriateness of the official disability statistics for determining the amount of care needed by disabled persons is a controversial issue and therefore need to be more emphasized and ascertained(6).

In addition, many disabled people require a continuous health care system, home help and other supportive services, which makes care programmes very costly. The management of disabilities requires substantial medical, educational, social and rehabilitative care(1,7,8). The cost of preventive efforts is substantially lower and thus cost-effectiveness favors the prevention approach(9).

Hospital and community-based research that determine pattern of disability among Saudi population could contribute to information about prevalence, type and distribution of disability in Saudi Arabia(4,5,10). It will also provide information for health planning and policies addressing the needs of such special group of people(10).

The present study, therefore, was conducted to identify pattern of disability among Saudi people in Taif region and to determine factors associated with long stay at the rehabilitation hospital.

## **METHOD**

This is a cross-sectional study of hospital records of people who were admitted at Rehab Armed Forces Rehabilitation center, Taif, western region of Saudi Arabia. This center includes 100 beds and belongs to Al-Hada Armed Forces Hospitals. It is the only Rehabilitation Center that belongs to Ministry of Defense. People are referred to this center from all over the Kingdom. The centre accepts people with all disabilities due to different causes (e.g., neurological, neuromuscular, muscular, traumatic, infectious or post-orthopedic surgery).

Eight hundred and fifty patient records were reviewed to determine pattern of disability among people who were admitted at the Hospital during the period from 1999 – 2005. Fifty-

four records (6.4%) were excluded either because some data were absent or the person stayed for few hours in the hospital and was then discharged either because of death or upon request of the family.

Data were collected on age, sex, nationality, date of admission, date of discharge, cause and type of disability.

At admission, family counseling is administered to discuss the expected progress of the case and duration of stay. Regular family meetings are planned. However, some people may be discharged upon request of the family.

### **Statistical Analysis**

Data were analyzed using SPSS Version 13 (Chicago, IL). Chi-square test was used to compare 2 or more qualitative variables.

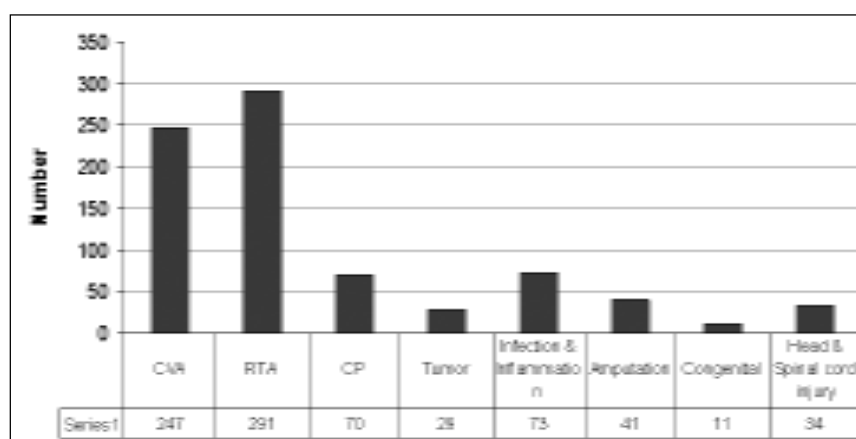
Stay at the hospital for more than 6 months was treated as the dependent variable in both univariate and logistic regression analysis. Age, gender, marital status, etiology of disability and type of disability were treated as independent categorical variables. Univariate data analysis was performed and expressed as crude odds ratios (ORs) and their confidence intervals (95% CI). Multiple associations were evaluated in multiple logistic regression model based on the backward stepwise selection, where significant variables from the univariate analysis were included. This procedure allowed the estimation of the strength of the association between each independent variable while taking into account the potential confounding effects of the other independent variables. The covariates were removed from the model if the likelihood ratio statistic based on the maximum likelihood estimates had a probability of  $> 0.10$ . Each category of the predictor variables was contrasted with the initial category (reference category). The adjusted measure of association between risk factors and job satisfaction was expressed as the odds ratio (OR) with 95% Confidence Interval (95% CI). Adjusted or crude ORs with 95% CI that did not include 1.0 were considered significant.

### **RESULTS**

About 36% of the people whose records were reviewed were 16-45 years old followed by those more than 65 years old (25.1%). There were 546 males (68.6%) compared to 250

females (31.4%). All the persons were Saudi. Regarding type of disability, 21.7% were quadriplegic, 14.4% were paraplegic, 39.2% were hemiplegic and 24.6% were complaining of other non-paralytic types of disability (e.g., LL amputation, disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed). Most of them stayed for less than 6 months (90.2%). However, about 26% stayed for less than one month compared to 68.6% who stayed for 1-12 months. On the other hand, 12 persons (1.5%) stayed for 1-2 years and 32 (4.0%) stayed for more than 5 years); and no cases were reported to stay between 2-5 years (Table 1). More than one-third of disability cases were due to Road Traffic Accidents (RTA) (36.6%), followed by Cerebrovascular Attacks (CVA) (31.0%) (Figure 1).

**Figure (1) Distribution of cases according to the specific cause of disability.**



RTA= Road Traffic Accidents  
CVA= Cerebrovascular Attacks  
CP= Cerebral Palsy

Table (1) shows the profile according to etiology of disability. Trauma as an etiology of disability was more common than non-traumatic incidents among persons aged between 16 – 45 years old (73.6%), followed by those less than 15 years old (36.2%). On the other hand, 84% of those who were more than 65 years old were disabled due to some non-traumatic events, followed by 76.5% among those between 46 – 65 years old.

**Table 1. General profile of participants according to etiology of disability**

Variables	Etiology		Total N=796	p- value
	Traumatic (n=329) N (%)	Non-Traumatic (n=467) N (%)		
Age;				
15 years	42 (36.2)	74 (63.8)	116	
16-45 years	209 (73.6)	75 (26.4)	284	
46-65 years	46 (23.5)	150 (76.5)	196	
>65 years	32 (16.0)	168 (84.0)	200	0.001
Sex;				
Male	271 (49.6)	275 (50.4)	546	
Female	58 (23.2)	192 (76.8)	250	0.001
Type of Disability;				
Quadriplegia / paresis	126 (72.8)	47 (27.2)	173	
Paraplegia / paresis	47 (40.9)	68 (59.1)	115	
Hemiplegia / paresis	70 (22.4)	242 (77.6)	312	
Others†	86 (43.9)	110 (56.1)	196	0.001
Length of stay at hospital;				
1 month	38 (18.4)	168 (81.6)	206	
> 1 month-1 year	259 (47.4)	287 (52.6)	546	
1-2 years	8 (66.7)	4 (33.3)	12	
> 5 years‡	24 (75.0)	8 (25.0)	32	0.001

† others include: LL amputation, Disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed.

‡ no cases reported between 2 -5 years.

Among females, disability due to non-traumatic events was significantly higher as compared to traumatic accidents (76.8% vs. 23.2 %; respectively), however, traumatic and non-traumatic events were almost equal among males (50.5% vs. 49.5%; respectively).

Traumatic accidents mostly result in quadriplegia as a complication (72.8%), while, non-traumatic events are mostly complicated with paraplegia, hemiplegia and other non-paralytic types of disability (59.1%, 77.6%, 56.1%; respectively).

Long stay (i.e.,  $\geq$  6 months) at the hospital was significantly associated with traumatic accidents. About 67% and 75% of those who stayed for 1-2 years or more than 5 years; respectively were due to traumatic accidents, while those who stayed either for less than 1 month or 1- 12 months were because of non-traumatic events (81.6%, 52.7%; respectively).

**Table 2. Distribution according to type of disability (n= 796).**

Variables	Type of disability				P- value
	Quadriplegia/ paresis (n=173) N (%)	Paraplegia/ paresis (n=115) N (%)	Hemiplegia/ paresis (n=312) N (%)	Others <sup>†</sup> (n=196) N (%)	
Age;					
15 years	48 (41.4)	28 (24.1)	31 (26.7)	9 (7.8)	0.001
16-45 years	75 (26.4)	59 (20.8)	56 (19.7)	94(33.1)	
46-65 years	34 (17.3)	10 (5.1)	110 (56.1)	42 (21.5)	
>65 years	16 (8.0)	18 (9.0)	115 (57.5)	51 (25.5)	
Sex;					
Male	153 (28.0)	71 (13.0)	205 (37.6)	117 (21.4)	0.001
Female	20 (8.0)	44 (17.6)	107 (42.8)	79 (31.6)	
Length of stay at hospital;					
1 month	32 (15.5)	30 (14.6)	83 (40.3)	61 (29.6)	0.001
> 1 month-1 year	110 (20.1)	80 (14.7)	221 (40.5)	135 (24.7)	
1-2 years	7 (58.4)	1 (8.3)	4 (33.3)	0 (0.0)	
> 5 years <sup>‡</sup>	24 (75.0)	4 (12.5)	4 (12.5)	0 (0.0)	

<sup>†</sup> LL amputation, Disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed.

<sup>‡</sup> No cases reported between 2 -5 years.

Table (2) shows the distribution according to type of disability. Quadriplegia was more common among those less than 15 years old (41.4%); in contrary to other non-paralytic types of disability which affected 33.1% of persons between 16 – 45 years old. On the other hand, hemiplegia was more common in older age groups. It has occurred in 56.1% and 57.5% of those aged 46-65 years old and more than 65 years old; respectively. However, hemiplegia was the most common reported type of disability among both males and females (37.5%, 42.8%; respectively).

Persons who stayed for longer periods at the hospital (e.g., 1-2 years or more than 5 years) had quadriplegia (58.3%, 75.0%; respectively), however, those who stayed for shorter periods (e.g., less than 1 month or 1-12 months) had hemiplegia (40.3%, 40.5%; respectively).

**Table 3. Distribution of type of disability according to the specific causes.**

Causes	Type of disability				Total (n=796)
	Quadriplegia/ paresis (n=173) N (%)	Paraplegia/ paresis (n=115) N (%)	Hemiplegia/ paresis (n=312) N (%)	Others† (n=196) N (%)	
CVA‡	5 (2.0)	9 (3.6)	220 (89.1)	13 (5.3)	247
RTA‡	107 (36.7)	45 (15.5)	61 (21.0)	78 (26.8)	291
CP‡	33 (47.1)	25 (35.7)	9 (12.9)	3 (4.3)	70
Tumor	6 (20.7)	15 (51.7)	6 (20.7)	2 (6.9)	29
Infection & Inflammation	7 (9.6)	13 (17.8)	6 (8.2)	47 (64.4)	73
Amputation	0 (0.0)	1 (2.4)	0 (0.0)	40 (97.6)	41
Congenital	2 (18.2)	2 (18.2)	0 (0.0)	7 (63.6)	11
Head & Spinal cord injury	13 (38.2)	5 (14.7)	10 (29.4)	6 (17.7)	34

† LL amputation, Disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed.

‡ RTA= Road Traffic Accidents; CVA= Cerebrovascular Attacks; CP= Cerebral Palsy.

Table 3 shows the distribution of disability according to the specific causes. Most of CVA cases were associated with hemiplegia (89.1%), however, most of RTA and head and spinal

cord injuries (because of traumatic injuries other than RTA) were associated with quadriplegia (36.8% and 38.2%; respectively). On the other hand, 51.7% of persons with tumors had paraplegia. Other specific causes (e.g., infection and inflammation, amputation, congenital) were mostly associated with other non-paralytic types of disability (64.4%, 97.6%, 63.6%; respectively).

Multivariate logistic regression analysis was performed to predict independent variables associated with the length of stay at the hospital. Age in years (< 45 vs. e" 45 years old), sex (male vs. female), marital status (single vs. married), etiology (traumatic vs. non traumatic) and type of disability (quadriplegia, paraplegia, hemiplegia vs. others) were included in the univariate and multivariate regression analyses.

In the univariate analysis, male, single and less than 45 years old persons were significantly more likely to stay for longer periods at the hospital than female, married and more than 45 years old persons [(crude OR= 3.41, 95%CI= 1.67-7.19; adjusted OR= 2.15, 95%CI= 1.05-4.39); (crude OR= 1.78, 95%CI= 1.08-2.92; adjusted OR= 0.66, 95%CI= 0.34-1.27); (crude OR= 2.42, 95%CI= 1.43-4.13; adjusted OR= 1.53, 95%CI= 0.87-2.71); respectively]. On the other hand, those with traumatic accidents were significantly more likely to stay for longer periods than non-traumatic cases (crude OR= 2.93, 95%CI= 1.75-4.94; adjusted OR= 1.86, 95%CI= 1.07-3.24). Regarding type of disability, persons with paralytic types of disability (i.e., quadriplegia, paraplegia, hemiplegia) were significantly more likely to stay for longer periods as compared to those with other non-paralytic types of disability (i.e., LL amputation, disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed) (Table 4).

**Table 4. Predictors for long hospital stay (Univariate and multivariate logistic regression analyses).**

Dependent Variables	Length of stay		Crude OR (95% CI)	Adjusted OR (95% CI)
	6 m N (%)	> 6 m N (%)		
Age;				
45 years	372 (93.9)	24 (6.1)	1	1
<45 years	346 (86.5)	54 (13.5)	2.42 (1.43 – 4.13)*	1.53 (0.87 – 2.71)

Dependent Variables	Length of stay		Crude OR (95% CI)	Adjusted OR (95% CI)
	6 m N (%)	> 6 m N (%)		
<b>Sex;</b>				
Female	240 (96.0)	10 (4.0)	1	1
Male	478 (87.5)	68 (12.5)	3.41 (1.67 – 7.19)*	2.15 (1.05 – 4.39)*
<b>Marital status;</b>				
Married	451 (92.2)	38 (7.8)	1	1
Single	267 (87.0)	40 (13.0)	1.78 (1.08 – 2.92)*	0.66 (0.34 – 1.27)
<b>Etiology;</b>				
Non-traumatic	440 (94.2)	27 (5.8)	1	1
Traumatic	278 (84.5)	50 (15.5)	2.93 (1.75 – 4.94)*	1.86 (1.07 – 3.24)*
<b>Type of disability;</b>				
Others†	191 (97.4)	5 (2.6)	1	1
Hemiplegia/ paresis	293 (93.9)	19 (6.1)	2.48 (0.85 – 7.71)	2.89 (1.04 – 8.02)*
Paraplegia/ paresis	102 (88.7)	13 (11.3)	4.87 (1.56 – 16.14)*	5.07 (1.75 – 14.74)*
Quadriplegia/paresis	132 (76.3)	41 (23.7)	11.87 (4.34 – 35.12)*	8.91 (3.39 – 23.38)*

† LL amputation, disturbed or loss of consciousness, abnormal urination or defecation, abnormal speech and long term staying in bed.

\* p d" 0.05

## DISCUSSION

Disability is one of the most important social and economical medical issues in the community. In contrast to the developed countries, sufficient records on the current issues of disability such as the incidence and prevalence of impairment and disability and their socio-demographic properties are unfortunately unavailable due to the lack of appropriate studies in the specified area (11).

Although estimates of disability prevalence and its pattern in Saudi Arabia are very few, there are number of centres of excellence in Saudi Arabia which provide various services for disabled people (12). However, Rehab center is the only rehabilitation centre that belongs

to the Armed Medical services. It provides services to military people and their families, so all the persons included in this study were Saudi.

During the study period from 1999-2005, traumatic injuries were more common than non-traumatic incidents among persons between 16 – 45 years old. While in the other age groups (viz., < 15 years; 46-65 years; > 65 years), non-traumatic incidents were higher. This may be attributed to the specific cause of the incident, where RTA represents 88.45% of all traumatic accidents and it is more common in the middle aged people (16-48 years) (66.7%). In England, the department of transport reported that most cases of RTA (77%) during 2004-2005 were between 15-59 years old<sup>13</sup>. On the other hand, CVA which occurs in old age groups (> 45 years) (89.47%) represents 52.89% of all non-traumatic incidents.

Traumatic and non-traumatic incidents in the current study were almost equal among males. In contrast, non-traumatic incidents were much higher among females. This can be explained by the fact that only 17.2% of RTA had occurred among females compared to 82.2% among males. Meanwhile, Most of CVA affected persons were males (62.3%). Similar findings have been reported in different studies (14, 15).

RTAs and CVA have been reported in many studies to be complicated with different paralytic types of disability (16, 17). In the current study, RTAs and CVA were responsible for 67.6% of all admitted cases. This can explain there finding that paralytic types of disability represented 75.4% (600 persons) as compared to non-paralytic types (24.6%).

Christie et al (2004) and Katzenellenbogen (1995) reported that quadriplegia is the most common complication of RTAs especially in middle aged people mostly due to cervical cord injury. In the current study, most cases of quadriplegia were due to traumatic incidents, while other types of disability (viz., paraplegia, hemiplegia and others) were mainly due to non-traumatic incidents.

Traumatic injuries occur more among young males who are usually single and may find difficultly in facing the community and coping with their new life (1). Although psychological support is provided to all disabled people who attend Rehab center, some of them especially young males, may prefer to stay at the hospital. Moreover, quadriplegia as a consequence of traumatic injuries is more common among younger age group who

may require long-term care. On the other hand, hemiplegia occurred more in the older age group, so once the critical period is overcome, most hemiplegic persons are discharged upon request of their families. This is a culture-related attitude where Saudi families usually do not allow female and/or the elderly to stay in the hospital for longer periods.

The first 3 months following trauma or injury-causing disability are the most critical period when greatest recovery is thought to occur (19). Persons admitted to the Rehab hospital are expected to stay maximally for 6 months (following the Scottish Intercollegiate Guidelines, 1998) (20), before discharge, however, in the current study, 9.8% of the patients admitted during the period of the study stayed for more than 6 months, among them, 5.5% stayed for more than 1 year. Males, single, less than 45 years old and with paralytic-type of disability are more likely to stay at the hospital for longer periods. Consequently, an efficient programme for psychological support and counseling should be implemented to help this group to overcome their problems and to adapt to everyday life. Community-based educational programmes should also be provided to increase awareness of the community to deal with disabled people.

In this study, an estimate was made of the cost of care that was provided to persons who attended the Rehab center during the period of study whether through hospital care or home care programme. Each person admitted to the Rehabilitation hospital incurs a cost of about 680 Saudi Riyals (SAR) per day and on average 122,400 SAR for 6 months. Estimated costs for people who stayed for more than 6 months in this study was 82,548,600. All costs are paid by the Saudi Government.

On the other hand, during 2006, there were 128 persons in Taif region receiving home healthcare service. This service is provided to those who are discharged from the hospital and are in need for home care. A physician evaluates them before discharge for admission to the service, then a monthly visit by the physician is provided as recommended by the home healthcare team (viz., nurse, physiotherapist) who provide a weekly visit. The cost of providing home care to this group was estimated. Although this estimate is not accurate because data are not complete, a rough estimate comes to 2000 SAR per month which is equal to 12,000 SAR for 6 months. This is much less when compared to hospital care. Moreover, home healthcare would allow more people who are in need of hospital admission, to benefit.

## CONCLUSION

There are great opportunities in Saudi Arabia to develop new information about disabilities, particularly their nature, incidence, and impact on society. These research efforts could be conducted to the betterment of science and society as well as to contribute to the development of new and better services and supports for persons with disabilities and their families. Short-term experience of home care service in Rehab center is promising and its expansion to include more people in different regions of Saudi Arabia as well as implementation of health education programmes for the public would help in providing quality care and minimizing burden of road traffic accidents as a major cause of disability in Saudi Arabia.

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