The Present Conditions of Patients with Spinal Cord Injury at Rehabilitation Center in Bangladesh

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Abstract:

Spinal Cord Injury (SCI) is one of the major cause of disability in developing country like Bangladesh. The study aims to identify present conditions of Patients with Spinal Cord Injury at Rehabilitation Center in Bangladesh. A quantitative cross-sectional study was conducted among 61 participants (47 from rural areas and 14 from urban areas) who were recruited through purposive sampling. A self-developed questionnaire was used to collect the data. Data were analyzed by SPSS version 20.0. There were 61 patients involved in the research: 83.6% - male, 16.4% female. Average age: 18-35 years. 37.7% patients were tetraplegic whereas 62.3% were paraplegic, employment of participants in this study was 77.0%. Most common complication was: pressure sore 55.70%, decrease joint range of motion 67.20%, joint stiffness 34.40%, spasticity developed 83.6%, urinary tract infection 63.9%, autonomic dysreflexia 36.1%, leg swelling 47.5%, postural hypotension 42.6%, sexual problem 34.4%, mentally and psychologically change 100.0%, respiratory complication 37.7%. Finally, the study explained their current status after SCI the maximum patient were dependent and their pattern of working is long sitting. Moreover, most of they are interested to involve in non-bed exercise like group exercise and play activities in outdoor settings. So it is necessary to raise awareness in local community about post SCI healthy lifestyle.

Keywords: *Conditions, Spinal Cord Injury, Rehabilitation Center, Bangladesh.*

Introduction

Spinal cord injury (SCI) is a traumatic or non-traumatic injury that typically happens suddenly and unexpectedly. SCI is an occupational disrupting condition over the lifespan which brings life changes at a sudden and profound level that create impacts globally (Somers, 1992). Long-term, and secondary medical complications play an important role in the continuum of care and its very common for patients with SCI (Piatt et al., 2016).

Worldwide, information on the prevalence of people living with SCI as well as the incidence of yearly new cases is slight in number and particularly in rising countries, the injury prevention, proper health care and other social planning is delaying (Lee et al., 2012). It is undecided about how many people are currently living along with SCI in the world yet, but the international data shows of 40 to 80 new cases per million populations in per year that recommend as every year between 250 000 and 500 000 people becoming spinal cord injured (Adriaansen et al., 2016). The majority of these cases are traumatic spinal cord injuries and the leading causes are road traffic injuries, falls and violence (Adriaansen et al., 2016).

In low- and middle-income countries, afterward release from hospital people who primarily living with spinal cord injury faces the significant challenges of living in the community (Hossain et al., 2016). The complications are responsible as a consistent leading cause that gradually upgraded the rates of re-hospitalization, loss of employability and it's also the cause of morbidity and mortality even after reducing quality of life (Sezer et al., 2015). The re-hospitalization is an extra financial burden among individuals with SCI that can also be troublesome to participation in one's daily life (Piatt et al., 2016). Otherwise, Surviving with a spinal cord injury (SCI) also the companions of increased premature death and liability for morbidity (Sezer et al., 2015). So early identification, treatment for secondary complications and regular medical follow-up are essential to prevent the mortality rate (Löfvenmark et al., 2017).

Materials and Methods

In this study, Researcher used a quantitative study design with a cross-sectional study to find out the present conditions of Patients with Spinal Cord Injury at Rehabilitation Center. Researcher finds out the percentages of different variable that was related to the SCI patient's conditions through self-administrated questionnaires & collected the data at a specific point in a short period (within 6 months). Quantitative study contracting the number of responses, collecting numerical data, analyzing the data in how many or how much, so it was the best study design for the researcher to collect data (Madisha, 2018). On the other hand, a cross-sectional study involves collecting data from populations at a specific point in a time, so this study design was also the best study design of this research (Cherry, 2019). Researcher took permission from the Asian Institute of Disability and Development (AIDD) Research Committee and CRP for data collection. The period of this study was from September 2021 to February 2022. All people with spinal cord injury were admitted to the SCI unit of the Centre for the Rehabilitation of the Paralyzed (CRP). Researcher used the purposive sampling method for collecting the sample in this study; it is one kind of non-probability sampling. Purposive sampling helps the researcher to reach the selected sample which mainly fulfills the requirement of the researcher and is related to the objective of the study (Crossman, 2020). Purposive sampling is also the most time-effective and cost-effective technique (Etikan, 2016).

The inclusion criteria were both male and female SCI patients with all age group who were admitted to CRP with both paraplegic, tetraplegic and with AISA- A, B, C, D or E. The exclusion criteria were medically unstable patients and who are not interested to participate. All participants were taken the consent. The data was collected through a close-ended questionnaire from the participants by face-to-face conversation (10-15 minutes for one interview). A self-developed questionnaire

was used to collect the data. It was descriptive statistical analysis and used SPSS software version 20.0.

Results

Table 1 shows the demographic data of the participants. Among all of the 61 participants there 16.4% (n=10) female and 83.6% (n=51) male were injured. The majority age range 62.3% (n=38) were between 18-35 years, 32.8% (n=20) were between 36-53 years, 4.9% (n=03) were between 54 years to above and 00% (n=00) were below 18 years. Educational background before injury, 13.1% (n=08) were illiterate, 21.3% (n=13) completed primary education, 39.3% (n=24) completed their secondary level, 13.1% (n=08) completed their higher secondary level, 13.1% (n=08) participants completed their bachelor and others higher degree.

Table 1. Demographic information of the participants

Socio-Demographic Characteristics	Frequency (N=61)	Percentage (%)
Gender		
Male	51	83.6%
Female	10	16.4%
Age		
Below 18 years	00	00%
18-35 years	38	62.3%
36-53 years	20	32.8%
54 years and above	03	4.9%
Educational Background		
Illiterate	08	13.1%
Primary	13	21.3%
Secondary	24	39.3%
Higher secondary	08	13.1%
Bachelor and above	08	13.1%
Occupation		
House wife	08	13.1%
Worker/Day Labor	25	41.0%
Government Job	04	6.6%
NGO	04	6.6%
Business	10	16.4%
Student	10	16.4%
Living Area		
Rural	47	77.0%
Urban	14	23.0%
Monthly Income		
10000-20000 taka	04	6.6%
21000-30000 taka	47	77.0%
Above 30000 taka	10	16.4%
Types of family		
Nuclear family	28	45.9%
Extended family	33	54.1%

Occupation of the participants 13.1% (n=08) were housewife, 17.7% (n=23) were day labor/worker, 6.6% (n=04) were involved in Government jobs, 16.4% (n=10) were involved in business, and 16.4% (n=10) were student, they were continuing their study before injury. Among all of the participants, most of the participants 77.0% (n=47) were from rural areas and 23.0% (n=14) participants were from urban areas. Most of the participants' income were 21000-30000 take and this number were 77.0% (n=47), others 16.4% (n=10) participants income were above 30000 Taka, and only 6.6% (n=04) participants income were 10000-20000 Tk. Family types of the participants 45.9% (n=28) were from nuclear family and 54.1% (n=33) were from extended family.

In this study, Fsxigure 1 shows that the most of the participant's residential living area 36.1% (n=22) in Dhaka, 16.4% (n=10) in Khulna, 9.8% (n=06) in Rajshahi, 9.8% (n=06) in Chattogram, 8.2% (n=05) in Rangpur, 8.2% (n=05) in Mymensingh, 6.6% (n=04) in Barisal, 4.9% (n=03) in Sylhet.
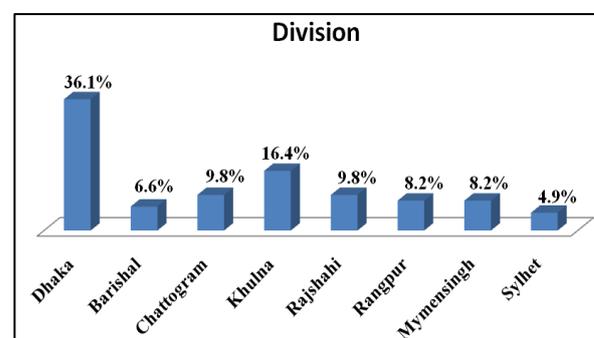
Figure 1. Residential Living Area

In Table 2 Characteristics of Injury show that, among the participants 91.8% (n=56) were Traumatic Injury, and 8.2% (n=05) were Non-Traumatic Injury. After injury their neurological levels 37.7% (n=23) were T7-T12: Paraplegia, 32.8% (n=20) were C1-C4: High Tetraplegia, 16.4% (n=10) were L1-S5: Low Paraplegia, 8.2% (n=5) were T2-T6: High Paraplegia, and 4.9% (n=3) were C5-T1: Tetraplegia. Among 61 participants 60.2% (n=41) were A-complete, 18% (n=11) were B-incomplete, 13.1% (n=8) were D-incomplete; 1.6% (n=1) were C-incomplete and 0% (n=0) were normal-E.

Table 2. Characteristics of Injury

Characteristics of Injury	Frequency (N=61)	Percentage (%)
Types of Injury		
Traumatic Injury	56	91.8%
Non-Traumatic Injury	08	8.2%
Neurological Level		
C1-C4: High Tetraplegia	20	32.8%
C5-T1: Tetraplegia	03	4.9%
T2-T6: High Paraplegia	05	8.2%
T7-T12: Paraplegia	23	37.7%
L1-S5: Low Paraplegia	10	16.4%
ASIA Impairment Scale		
A-Complete	41	67.2%
B-Incomplete	11	18.0%
C-Incomplete	01	1.6%
D-Incomplete	08	13.1%
E-Normal	00	00%
Caregiver		
Family members (parents, better half, son, daughter)	46	75.4%
Paid Career	04	6.6%
Other Relatives	08	13.1%
No Career	03	4.9%

Participants of this study were from both rural and urban areas and their caregivers were different. 75.4% (n=46) of caregivers were family members (parents, better half, son, daughter), 13.1% (n=8) were others relatives, 6.6% (n=4) were paid career, and 4.9% (n=3) no needed career.
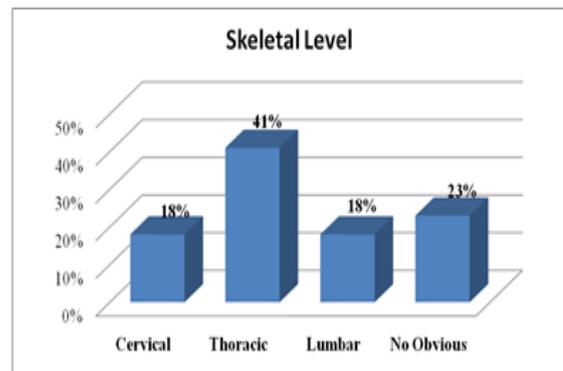
Figure 2. Skeletal Level

This Figure 2 shows that 41% (n=25) occurred in thoracic, 18 % (n=11) in cervical, 18 % (n=11) in lumbar region and other 23% (n=14) no obvious.
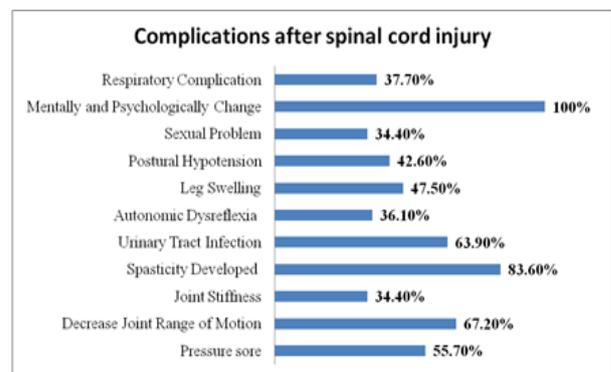
Figure 3. Complication after SCI

In Figure 3 most of the patients referred from different hospitals and their most common complications detected at admission were pressure sore 55.70% (27.8% have a single sore, 27.9% have multiple sore and 44.3% have no sore), decrease joint range of motion 67.20% (n= 41), joint stiffness 34.40% (4.9% right side, 1.6% left side, 27.9% both side, and 65.6% no developed join stiffness, and stiffness areas were 4.9% in wrist, 1.6% in hip, 14.8% in knee, 4.9% in ankle, 4.9% in knee and ankle, 1.6% in knee and wrist, 1.6% in knee and hip, and 65.6% joint stiffness not in any area), spasticity developed 83.6% (n= 51), urinary tract infection 63.9% (n= 39), autonomic dysreflexia 36.1% (9.8% 1-

time, 9.8% 2-times, 4.9% 3-times, 6.6% 4-times, 4.9% 5-times, and 63.9% no any times), leg swelling 47.5% (n= 29), postural hypotension 42.6% (3.3% very often, 39.3% 1-2 times in a month, and 59.0% not any this kind of problem), sexual problem 34.4% (26.2% have erectile dysfunction, 8.2% have ejaculation failure, and 65.6% have no sexual problem), mentally and psychologically change 100.0% (60.7% have depression, 31.1% have anxiety, 3.3% have behavioral change, and 4.9% have change their personality), respiratory complication 37.7%

(31.1% faced difficulty in breathing, 6.6% experienced cough (very often), and 62.3% have no respiratory problem).

Every patients injury level were different, Table 3 show the participants current status were Pattern of working {Long sitting 85.2 % (n=52), Long standing 14.8 % (n=09)}, Functional status {Independent 19.7 % (n=12), Dependent 80.3 % (n=49)}, and Pattern of strengthening exercise {Bed bounded exercises 42.6 % (n=26), Non bed exercises 57.4 % (n=35).

Table 3. The Participants' Current Status after SCI

Statements	Characteristics	Frequency (N=61)	Percentage (%)
Pattern of working	Long sitting	52	85.2 %
	Long-standing	09	14.8 %
Functional status	Independent	12	19.7 %
	Dependent	49	80.3 %
Pattern of strengthening exercise	Bed bounded exercises	26	42.6 %
	Non bed exercises (Outside)	35	57.4 %

Discussion

The aim of the study was to find the socio-demographic information, injury-related information and complications among the spinal cord injured patients at the rehabilitation centre. Currently, there is a lack of information on spinal cord injury in Bangladesh. In this study, 61 participants were taken who had spinal cord injuries where males were 83.6% (n=51) and females were 16.4% (n=10). In an epidemiological study, it has been found that

41% of SCI patients were males while 15.5% were female (Karamehmetog et al., 1997). In Bangladesh, there is a research had been conducted on Spinal Cord Injury and the result said that male, female ratio was 7.5:1 (Hoque, Grangeon, & Reed, 1999). In Jordan male and the female ratio was 5.8:1 (Otom et al., 1997).

The majority age range 62.3% (n=38) were between 18-35 years, 32.8% (n=20) were between 36-53 years, 4.9% (n=03) were between

54 years to above and 00% (n=00) were below 18 years. So it was found that the biggest sample contains in the age range 18-35 years and the lowest sample range was 54 years to above. In Bangladesh, the most common age group is between 25-29 years in patients with spinal cord injury (Islam et al., 2011).

Among 100% (n=61) participants in the study about 13.1% (n=08) illiterate, 21.3% (n=13) took primary education, 39.3% (n=24) took secondary education, 13.1% (n=08) took higher secondary education, and 13.1% (n=08) were completed their bachelor and others higher degree. So, the result shows that most participants are in the secondary level. A study in India showed that almost 60-70% were illiterate. A Brazilian study stated that among 60 patients, 38 (63.3%) had complete or incomplete primary education, 19 (31.7%) had complete or incomplete secondary education and 3 (5%) had college education (Blanes et al., 2009).

About 61 participants were involved as the sample in this study. Among them 77.0% (n=47) were from rural areas and 23.0% (n=14) participants were from urban areas. Among the employed participants most of the patients had a monthly family income within 21,000-30,000tk and 41.0% (n=25) were day laborers/workers. So, this study had also shown the views on the economic status of the SCI patients in our country, and 45.9% (n=28) were from nuclear family and 54.1% (n=33) were from extended families. Among the participants almost 62.3% (n=38) were paraplegia and 37.7% (n=23) were tetraplegia. In Canadian study had publicized that paraplegia was more prone rather than tetraplegia and it also showed that 58% were paraplegia, whereas 42% were tetraplegia (Rouleau, Ayoub & Guertin, 2011). In this study, most of the injuries were caused by traumatic 91.8% (n=56) and 8.2% (n=05) were the non-traumatic causes (Rouleau, Ayoub & Guertin, 2011). In a developed country, a road traffic accident is the leading cause of SCI by falls and then sports injury (Rathore et al., 2008).

In this study, 60.2% (n=41) were A-complete, 18% (n=11) were B-incomplete, 13.1% (n=8) were D-incomplete; 1.6% (n=1) were C-incomplete and 0% (n=0) were normal-E. A study in Gaza showed that (49.4%) have complete SCI ASIA (A), (1.2%) have incomplete SCI ASIA (B), (4.9%) have incomplete SCI ASIA (C), (4.9%) have incomplete SCI ASIA (D) (Zeyada, 2009). Other findings found that 75.4% (n=46) of caregivers were family members (parents, better half, son, daughter), 13.1% (n=8) were other relatives, 6.6% (n=4) were paid careers, & 4.9% (n=3) were no needed career for their treatment purpose (Zeyada, 2009). Glajchen (2012) also reported that the involvement of family caregivers is essential for proper treatment of patients to ensure treatment compliance, continuity of care and social support.

During admission at CRP the skeletal level of injury 41% (n=25) occurred in thoracic, 18% (n=11) in cervical, 18% (n=11) in lumbar region and other 23% (n=14) no obvious. A research 'Epidemiology of spinal cord injuries in Novosibirsk, Russia' showed that SCI was distributed as cervical 96 patients (49%), thoracic 54 (27.5%) and lumbar 46 (23.5%) (Silberstein & Rabinovich, 1995).

In this study, all of the participants have at least one secondary health complication and most of the patients were referred from different hospitals their most common complications detected at admission were Pressure sores 55.70%. A similar type of study by Quadir et al. (2017) had a 22.7% of prevalence of pressure ulcers. The South African researcher Joseph & Nilsson Wikmar, (2016) showed most common complication is pressure ulcers (29.8%). Löfvenmark and other (2017) found that 48% of the prevalence of pressure ulcers in his study.

The prevalence of spasticity was 83.6% (n= 51) rest of them i.e. 16.4% (n= 10) were not affected from this factor. Based on a review work McKay and other (2018) indicated that experience spasticity around 70% of the SCI cases.

The prevalence of Urinary tract infection (UTI) was 63.9% (n= 39) and 36.1% (n= 22) were not affected by this condition. A study by Adriaansen et al. (2016) established the same result 33.3% were affected by the urinary tract infection. There was a little difficulty in observing the sexual dysfunction as patients hesitated to share the condition. However, the finding was, 34.4% (n= 21) experienced problems and 65.6% (n= 40) did not experience problems. The study done by Park et al. in 2017 in Canada has a related type of finding according to this study. They also have found 58.8% bladder incontinence, 54.0% bowel incontinence, 60.8% sexual dysfunction and 29.4% had bowel, bladder & sexual problem.

Autonomic dysreflexia (AD) had a prevalence of 36.1% (n= 22) and rest 63.9% (n= 39) were free from this condition and the study was done by Sezer, Akkuş, & Uğurlu (2015). A literature review on complications following SCI and had found that the frequency of AD is between 19-70% which also matches our findings. Postural hypotension is another condition which has a great impact on SCI patient's life. Another result supports our findings that the prevalence of postural hypotension was found to be 42.6% (n= 26) and 57.4% (n= 35) were not affected by

the postural hypotension. The literature review by Sezzer et al. (2015) found that 21% of SCI patients get postural hypotension.

The study shows that 37.7% (n= 23) of the patients were affected by respiratory problems and the rest of the 62.3% (n= 38) were free from respiratory problems. South African research by Joseph & Nilsson Wikmar, (2016) showed that one of the most common complications as pulmonary complications with a prevalence of 23.4%. Hagen (2015) stated that 65% of acute phase SCI patients suffer from respiratory conditions that match with our findings. Others complications were Joint Stiffness 34.40% (n=21), Leg Swelling 47.5% (n= 29), Mentally and Psychologically Change 100.0% (n= 61). Lack of awareness among 52.5% of patients and other lower economic status, and inaccessibility of definitive hospital (16.4%) acts as a predisposing factor to increase the incidence of complications (Chhabra & Arora, 2013). Most often the complications were reported as pain, spasticity and pressure ulcers and also complications associated with the bladder, bowel and sexual dysfunction (Hossain et al., 2016). Depression may be included higher repetition rates, inadequate recognition, and barriers to treatment when depression was recognized and factors that may contribute to the low rate of mental health care for persons with SCI (Fann et al., 2011). Krause et al. (2008) had found that possible major depression predicted as cause of mortality after SCI. Anxiety was one of the most common conditions associated with depression in persons with SCI. (Kroenke et al., 2007).The support and function of the upper extremities may impact on balance during long sitting in the patients with SCI (Shirado et al., 2004). Another study found that 38 respondents (30%) reported that they engaged in prolonged standing for an average of 40 minutes per session, 3 to 4 times a week as a method to improve and maintain their health (Eng et al., 2001). Another result, Pattern of strengthening exercise (Bed bounded exercises 42.6%, Non-bed exercises 57.4%), the study found that Exercise has the demonstrated ability to enhance the activity, life satisfaction and health of SCI patients (Jacobs & Nash, 2004).

Conclusion

Spinal cord lesion is one of the most distressing condition in human life. Millions of people in every year faces the problem due to lack of information and proper data about spinal cord injury. In Bangladesh, there is also lack of awareness about injury especially caused by spinal cord injury. The researcher explored the present conditions of Patients with Spinal Cord Injury at Rehabilitation Center. It shows that male is most vulnerable than female and the most vulnerable age range were 18-35 years who were less educated. The study found that, the complications which commonly develop within the SCI patient are pressure sore, decrease joint range of motion, joint stiffness, spasticity developed, urinary tract infection, autonomic dysreflexia, leg swelling, postural hypotension, sexual problem, mentally and psychologically change, respiratory complication. Finally, the study explained their current status after SCI the maximum patient were dependent and their pattern of working is long sitting. Moreover, most of they are interested to involve in non-bed exercise like group exercise and play activities in outdoor settings. Even the complications mentioned above repeat more and more among the SCI patients. So it is necessary to raise awareness in local community about post SCI healthy lifestyle.

Conflict of interests

No potential conflict of interest relevant to this article was reported.

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