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Depression in Spinal Cord Injury Patients: a Cross-sectional Observation with PHQ-9 in a Rehabilitation Center of Bangladesh

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ABSTRACT

Introduction: Spinal cord injury (SCI) is a chronic debilitating condition with long-term sufferings, and depression is considered as common comorbidity. Objective: It was aimed to see the depression status among the SCI patients.

Methods: This cross-sectional study was conducted at Centre for the Rehabilitation of the Paralysed, Dhaka, Bangladesh, from June 2016 to June 2017 among the patients with SCI. Data were collected with semi-structured self-reporting validated Bengali version of Patient Health Questionnaire 9 from 150 patients conveniently.

Results: Among 150 respondents, 28.67% of the respondents were aged between 30–39 years, 90% male, 96% married, 29% illiterate, 64% had complete A in American Spinal Injury Association scale, and 96.67% had traumatic SCI. Among the participants, 30% had moderately severe depression, 28% moderate depression, 25.33% mild depression, 10.66% minimal depression, and 6% had severe depression.

Conclusions: Among 150 respondents, 28.67% of the respondents were aged between 30-39 years, 90% male, 96% married, 29% illiterate, 64% had complete A in American Spinal Injury Association scale, and 96.67% had traumatic SCI. Among the participants, 30% had moderately severe depression, 28% moderate depression, 25.33% mild depression, 10.66% minimal depression, and 6% had severe depression.

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Bangladesh; Centre for the Rehabilitation of the Paralysed; depression; Patient Health Questionnaire 9; spinal cord injury

Introduction

Spinal cord injury (SCI) is a chronic devastating and debilitating condition with long-term sufferings [1,2]. Whether the cause is acute traumatic or chronic illness, the consequences have profound impact over the personal, familial, and social life of the injured person [2,3]. Globally, the incidence of SCI is increasing, and the complications of the condition are also rising [4]. The magnitude of problems linked to SCI is creating burden to the family life as well as hampering the economy of the state [2,4]. SCI can have a negative impact such as loss of sensation, autonomic dysfunctions, loss of bowel or bladder control, and other impairment [2–4]. Importantly, people with SCI often experience chronic and debilitating pain [5]. People with SCI who develop different complications such as urinary tract infection, pressure sore, pneumonia, septicemia, and cardiac problems are more prone to suffer mental health problems [1–4]. Hence, a person with SCI undergoes the stress of physical disability and loss of independence which may lead to psychological trauma [6]. While the mortality related to SCI is decreasing due to advancement of medical treatments [6], but there is a continuous rise of the psychological complications [1,6,7]. Among the multiple psychological problems associated with SCI, depression is found as the most

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common comorbidity [6–11]. The reported prevalence of depressive disorders among the patients with SCI is varied widely such as from 20% to 60% [1,8,10,11], which is significantly higher than that of general population [1,5–11]. Moreover, most of the situations are underdiagnosed and untreated following SCI [10]. Previously depression after SCI was considered as a part of adjustment process [12]. However, nowadays depression is believed to be a complication of SCI [9,10]. Physical rehabilitation process is hampered, and health-related problems are accelerated by depression [13]. Several demographic factors such as age, sex, employment, marital status, and ethnicity are found to be related with the depression [7,9,10]. Moreover, some other factors such as level of injury, chronic pain, time passed after the injury, pre-injury psychological status, substance abuse, and coping ability of the patients are also found to predict the depressive symptoms following SCI [9–11]. The prevalence of depression following SCI varies from literature-to-literature mostly due to diagnostic standards, difference in the measure of depression [10–13]. Patient Health Questionnaire-9 (PHQ-9) as reported by Bombardier et al. [14] is a diagnostic measure of depression. As PHQ-9 revealed very good psychometric properties [11], it is considered as a good tool to measure depression following SCI [15].

Bangladesh, a densely populated developing country of Southeast Asia has a large number of people suffering from SCI. Hence, the problem related to this is heavily affecting the socioeconomic condition of Bangladesh [2,3,16]. Depressive symptoms whether minor or major is poorly addressed and untreated here as evident from previous literatures. However, understanding the long-term physical and psychological consequences of SCI is essential for better rehabilitation [7]. It was aimed to see the depression status among the patients with SCI.

Methods

Study design and instrument

This cross-sectional study was conducted at Centre for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka, Bangladesh, from June 2016 to June 2017 among the patients admitted in CRP with SCI. Data were collected with semi-structured selfreporting validated Bengali version of PHQ-9 [16,17].

American Spinal Injury Association Impairment Scale (ASIA Scale) [18]

The American Spinal Injury Association Impairment Scale (ASIA Scale) describes a person's functional impairment as a result of SCI.

A = Complete: No sensory or motor function is preserved in sacral segments S4–S5.
B = Incomplete: Sensory, but not motor, function is preserved below the neurologic level and extends through sacral segments S4–S5.
C = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade of <3.
D = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade that is greater than or equal to 3.
E = Normal: Sensory and motor functions are normal.

Setting and participants

Data were collected from the admitted patients with SCI. Total 150 patients were included conveniently in the study. CRP is known as mother organization in Bangladesh for rehabilitation of the SCI patients. CRP receives referrals from different hospitals and from all over Bangladesh [2].

Analysis

After managing data properly, it was analyzed in the Statistical Package of Social Science 16 version.

Ethical Considerations

The researchers were duly concern regarding the ethical aspects of the study and formal permission was taken from the Ethical Review Committee of CRP, Savar, Dhaka, Bangladesh, for conducting this study. All information was kept secured. Confidentiality of the person and the information was maintained and observed throughout the study.

Results

Among 150 respondents, majority (28.67%) were aged between 30 and 39 years and 23.33% of the respondents were aged from 20 to 29 years. 135 patients were male and 15 were female. At the time of injury, 96 respondents were married, 49 were unmarried, 4 were separated, and 1 was widower. Most of the patients were illiterate (29.33%); 29 completed the primary education,

Table 1. Distribution of demographic variables among the respondents (*n* = 150).

Variable	Frequency (%)
Sex	
Male	135 (90)
Female	15 (10)
Age in years	
10–19	23 (15.33)
20–29	35 (23.33)
30–39	43 (28.67)
40–49	21 (14)
50–59	21 (14)
≤60	7 (4.67)
Marital status	
Unmarried	49 (32.67)
Married	96 (64)
Separated	4 (2.67)
Widower	1 (0.66)
Education	
Illiterate	44 (29.33)
Grade 5	29 (19.33)
Grade 8	26 (17.33)
Grade 10	26 (17.35)
Grade 12	15 (10)
Masters	10 (6.66)
Type of injury	
Traumatic	145 (96.66)
Nontraumatic	5 (3.33)
ASIA impairment scale	
Complete A	96 (64)
Incomplete B	26 (17.33)
Incomplete C	16 (10.67)
Incomplete D	11 (7.33)
Normal E	1 (0.67)
Total	150 (100)

and 26 completed the grade 8 (Table 1). 114 of the respondents (76%) were employed (Table 1).

The ASIA scale distribution among the respondents revealed, most of the participants 64% had complete A, 26 participants had complete B, 16 participants had incomplete C, 11 had incomplete D, and 1 had normal. Out of the 150 cases, 145 (96.67%) were traumatic and the rest were nontraumatic (*n* = 5) (Table 1).

Among 150 participants, most of the participants (30%) had moderately severe depression, 28% had moderate dpression, 25.33% had mild depression, 10.66% had minimal depression, and 6% had severe depression (Figure 1). The severity was calculated based on the PHQ-9 scale score distribution as mentioned; 0–4 minimal depression, 5–9 mild depression, 10–14 moderate depression, 15–19 moderately severe depression, and 20–27 severe depression [17,19].

Among 150 participants, 96 respondents had complete A; among them, majority of the participants had moderately severe depression (22%) and severe depression was 4%. Incomplete B were 26; among them, most of the participants were moderately severe depression 10 and severe depression (2). 16 were incomplete C; among them, 7 had moderate depression and 1 had severe depression, 11 were found to have incomplete D, where 4 had moderate depression were 4 (Table 2).

Among 150 participants, 77 were Paraplegic and among them most of the participants had mild depression 30 (Figure 2). Among 73 tetraplegics, 30 patients had moderately severe depression (Figure 2). Severity of depression was related with the severity of injury. However, the variation was not found as statistically significant.

Among 150 participants, 135 were male and among them, most of the participants (39) had moderately severe depression, and 8 had severe depression (Table 3). Among the 15 females, 6 had moderately severe depression, 6 had moderate depression, and 1 had severe depression (Table 3).

Discussion

The goal of this study was to see the status of sufferings from depression of the SCI patients. The study showed that SCI is male predominant (90%) (Table 1) which was consistent with the findings among the other available literatures [2,3,6,7]; but only Lim et al. [1] has found on the

Table 2. Cross tabulation of ASIA scale and severity of depression in persons with SCI in percentage (*n* = 150).

ASIA impairment level	Minimal depression	Mild depression	Moderate depression	Moderately severe depression	Severe depression	Total
Complete A	5.33	18	14.67	22	4	64
Incomplete B	0.67	2.67	6	6.67	1.33	17.33
Incomplete C	2.00	3.33	4.67	0	0.67	10.67
Incomplete D	2.67	0.67	2.67	1.33	0	7.33
Normal E	0	0.67	0	0	0	0.67
Total	10.67	25.33	28	30	6	100

ASIA = American Spinal Injury Association, SCI = spinal cord injury.

Table 3. Cross tabulation between sex and severity of depression of persons with SCI (n = 150).

Sex	Depression severity				
	Minimal depression	Mild depression	Moderate depression	Moderately severe depression	Severe depression
Male	16	36	36	39	8
Female	0	2	6	6	1
Total	16	38	42	45	9

SCI = spinal cord injury

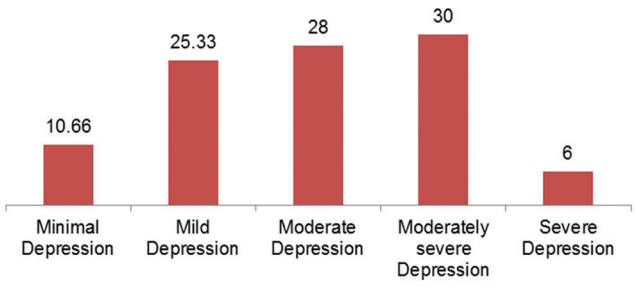

Figure 1. Distribution of depression severity among the respondents (n = 150).

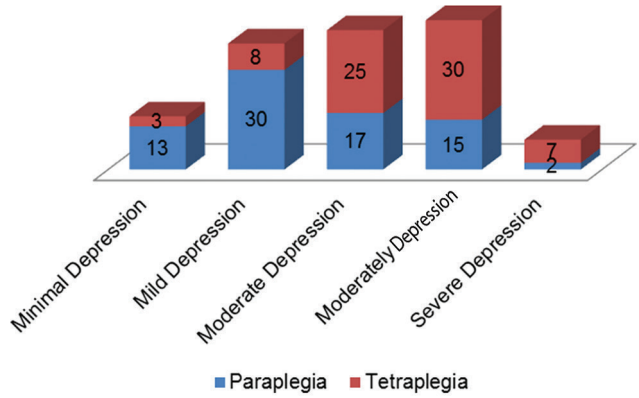

Figure 2. Cross tabulation between type of injury and severity of depression in persons with spinal cord injury.

contrary where majority of the respondents were female (53.60%). It revealed lower educational attainment in the respondents; illiterate 29.33%, primary level 19.33% (Table 1), whereas other study showed in Greece that educational status was much higher than current study such as, up to basic education 53%, further 35%, and advance 13% [20]. The difference may be explained by average educational attainment differences in the two countries as a country Bangladesh has low education rate than Greece [21]. The cause of injury was aligned with the other studies which indicate the majority of SCI were due to trauma as it was also found in Netherland 75% [22]. The severity of injury was also found to be aligned with other studies [19]. The study revealed that 64% of the patients had moderate and above severity depression and patients of complete A was found to have more depression than other classes (Table 2); whereas Shin et al. [23] found that depression was greater in Complete A and B were 8.02%. The study revealed severity of depression was found to be greater in tetraplegia than paraplegia (Figure 2) as Khazaeipour et al. [9] found that high prevalence of depression in patients with tetraplegia 62.2%. Among the respondents 30% (Figure 1) had moderately severe depression, 28% had moderate depression, whereas Wiseman et al. [24] found to have mild-moderate depression in 21%, severe-extremely severe depression 16%.

Although the study was conducted in a single rehabilitation center, in a small number of respondents, respondents were not followed up for a long time; it provides a base line data for a country like Bangladesh.

Conclusions

The study revealed a large proportion of SCI patients were found to have depression. Interestingly, the huge portions of patients are under diagnosed, under treated, and even untapped in a country like Bangladesh. From our knowledge, there is a scarcity of research specifically investigating predictors of depression and factors that influence depression over time among individuals with SCI. However, health planners and social services need to have full knowledge of the psychosocial problems of individuals with SCI and related variability based on cultural, physical, and environmental conditions and the amenities of each community. Further large-scale studies are necessary to visualize the burden more vividly.

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