

# The Effectiveness Of Bowel And Bladder Care Program On Knowledge And Practice Among Care Givers Of Patients With Spinal Cord Injury In Selected Hospitals, Kolkata, West Bengal

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## Abstract

**Introduction:** Spinal cord injury (SCI) disrupts physical, psychological, and social well-being, impacting bladder and bowel functions. Effective management through education and routine care is crucial for improving quality of life and reducing complications.

**Methodology:** The study aimed to assess the effectiveness of a bowel and bladder care program for caregivers of spinal cord injury (SCI) patients, utilizing a one-group pre-test-post-test design. Conducted from February to March 2021 at National Institute for Locomotor Disabilities (Divyangjan), R.G. Kar Medical College and Hospital, and S.S.K.M. Medical College and Hospital (IPGME&R) in Kolkata, it involved 40 caregivers selected via non-probability convenience sampling. Objectives included developing and validating the program, evaluating caregivers' knowledge and practices before and after its implementation, and examining the program's impact by comparing pre-test and post-test scores. Tools used were an interview schedule, structured knowledge questionnaire, and observation checklists, with the questionnaire's reliability confirmed at 0.84.

**Result:** Initially, 70% of caregivers scored below the median on knowledge, but post-test results showed a dramatic shift, with 90% scoring above the median. The mean post-test knowledge score increased from 7.7 to 15.3, with a statistically significant difference ( $t(39) = 18.22, p < 0.05$ ). Similarly, practice scores improved markedly, with 95% scoring at or below the median pre-test and 87.5% scoring above the median post-test. The mean practice score rose from 15.07 to 31.32, also with significant statistical support ( $t(39) = 15.61, p < 0.05$ ).

**Conclusion:** The results underscore the effectiveness of the bowel and bladder care program in enhancing caregivers' knowledge and practices, particularly in bowel care, thereby affirming the program's impact in improving the care provided to SCI patients.

**Keywords:** Bowel and Bladder Care Program, Spinal Cord Injury Caregivers, Knowledge Improvement, Practice Enhancement, Effectiveness Evaluation

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## I. Introduction

Spinal cord injury (SCI) is a significant health issue often caused by trauma, leading to disruption in the spinal cord's function, affecting a patient's physical, psychological, and social well-being. It predominantly impacts young adult men aged 16 to 30, causing disruptions in their growth, family dynamics, and financial stability. SCI can lead to neurogenic bladder and bowel dysfunction, significantly reducing the quality of life for affected individuals.<sup>1</sup> Bladder dysfunction, present in approximately 80% of SCI patients within a year post-injury, often requires catheterization to manage urinary elimination and prevent complications like urinary tract infections, bladder stones, and renal insufficiency. Similarly, bowel dysfunction, marked by conditions such as constipation and fecal incontinence, is prevalent in SCI patients, affecting up to 79% of individuals.<sup>2</sup>

Management of these dysfunctions is crucial for maintaining renal function and ensuring the patient's social and vocational adaptability. A consistent bowel management routine, including a high-fiber diet, adequate fluid intake, and the use of medications or mechanical stimulation, is essential for managing bowel dysfunction. For bladder management, clean intermittent catheterization is often preferred, while indwelling catheterization may be necessary for patients with high fluid intake or elevated detrusor pressures.<sup>3</sup>

Caregivers play a pivotal role in managing these complications at home, applying knowledge gained during the patient's hospital stay to reduce treatment costs and improve the patient's quality of life. Proper education on catheter care, digital removal of feces, and other

management techniques is vital to ensure the safe and effective care of SCI patients, minimizing the recurrence of complications and supporting the rehabilitation process.<sup>4</sup>

## **II. Need Of The Study**

Globally, spinal cord injury (SCI) affects between 8.0 to 246.0 people per million annually, with a prevalence of 236.0 to 1,298.0 cases per million inhabitants. SCI is among the most debilitating conditions, presenting significant rehabilitation challenges. Caregivers, often referred to as "hidden patients," face considerable physical and emotional strain. Effective interventions should focus on two key areas: supporting the caregiver's health and well-being, and enhancing their competence in providing care. The first approach directly benefits the caregiver, reducing distress and improving overall health, which in turn indirectly benefits the patient. The second approach aims to equip caregivers with the skills and confidence needed to deliver safe and effective care, thereby reducing their burden and enhancing their sense of control.<sup>5</sup>

However, research and support initiatives for caregivers lag significantly behind those for patients. The integration of family care into the patient's rehabilitation plan is often overlooked in clinical practice and interventional studies. Few randomized clinical trials have addressed educational interventions for family caregivers, and there is limited research on training caregivers to prevent injuries and manage potential risks associated with their role. Expanding support and training for caregivers is crucial for improving outcomes for both patients and their families.<sup>6</sup>

Nogueira, Paula Cristina, Rabeh, Soraia A. N. et al. (2016) conducted a cross-sectional observational study on health-related quality of life among care givers of individuals with spinal cord injury. For assessing health related quality of life (HRQOL) researcher used short Form-36 scale. Result shows that HRQOL were physical aspect, pain, vitality and emotional aspects. No statistically significant associations were found between HRQOL and the variables gender, hours per day spent on care, and length of activity as care giver. It was concluded that, planning of nursing interventions from the angle of factors of the care demands, that can have an effect on the caregivers HRQOL.<sup>7</sup>

## **III. Aim Of The Study**

To evaluate the effectiveness of a bowel and bladder care program on the knowledge and practice among caregivers of patients with spinal cord injury in selected hospitals in Kolkata, West Bengal.

## **IV. Methodology**

The study aimed to evaluate the effectiveness of a bowel and bladder care program for caregivers of spinal cord injury (SCI) patients, using a quantitative one-group pre-test-post-test design. Conducted from February to March 2021 across three hospitals in Kolkata—National Institute for Locomotor Disabilities (Divyangjan), R.G. Kar Medical College and Hospital, and S.S.K.M. Medical College and Hospital (IPGME&R)—the research involved 40 caregivers selected through non-probability convenience sampling. The objectives were to develop and validate the care program, assess caregivers' knowledge and practices before and after the program, and determine the program's effectiveness by comparing pretest and posttest scores. Additionally, the study sought to explore associations between caregivers' pretest scores and their demographic variables. Data collection tools included an interview schedule for caregiver and patient demographics, a structured knowledge questionnaire, and observation checklists for practice assessment. The knowledge questionnaire was pre-tested on 15 caregivers at SSKM Hospital, achieving a reliability coefficient of 0.84 through split-half correlation, confirming the tool's effectiveness in measuring changes in caregiver knowledge and practices.

## **V. Result**

**Section I:** Development and validation of bowel and bladder care program on bowel and bladder care of spinal cord injury patients:

The development and validation of the bowel and bladder care program for spinal cord injury patients received overwhelmingly positive feedback from experts. There was unanimous agreement (100%) on the appropriateness of the program's title, objectives, and content selection. Additionally, 87.5% of experts felt that the program adequately met organizational and linguistic criteria, with all agreeing that the language used was clear and accessible. The program was also praised for its illustrations, with 100% of experts finding them engaging and effective. However, 90% of the experts noted that while the program generally met the length criteria, there was room for improvement in this aspect.

**Section II A:** Findings related to demographic variables of care givers of spinal cord injury patients.

The demographic analysis of caregivers for spinal cord injury patients revealed several key findings. A significant portion of caregivers (60%) were aged 30 years or older, while the remaining 40% were under 30. The majority of caregivers were male (82.5%), with females constituting 17.5%. Educationally, 12.5% of caregivers were illiterate, 30% had below secondary education, 35% had secondary education, 15% had completed higher secondary education, and 7.5% were graduates. In terms of occupation, 45% were engaged in business, 22.5% worked as laborers, 12.5% were in service roles, and 20% were unemployed. Regarding familial relationships, most caregivers were fathers of the patients (37.5%), followed by brothers (30%), mothers (12.5%), sons (15%), and wives (5%). Additionally, 77.5% of caregivers had no prior experience with spinal cord injury care, while 22.5% had previous experience.

**Section IIB:** Findings related to demographic variables of patients with spinal cord injury.

The demographic data on spinal cord injury patients showed that 37.5% of the 40 patients were under 20 years old, while 62.5% were 20 years or older. Regarding the duration since injury, 35% of patients had sustained their injuries within the last 6 months, whereas 65% had injuries older than 6 months. The majority of injuries were due to road traffic accidents (57.5%), compared to falls from height (42.5%). In terms of injury location, 60% of patients had thoracic spinal cord injuries, and 40% had lumbar injuries. Additionally, 65% of the patients had undergone surgical repair, while 35% had not.

**Section III:** Findings related to the knowledge of the caregivers of spinal cord injury patients.

The findings related to caregivers' knowledge of bowel and bladder care for spinal cord injury patients showed a significant improvement following the administration of the care program. In the pre-test, 70% of respondents scored below the median, while only 30% scored above it. In contrast, the post-test results revealed that 90% of respondents scored above the median, with just 10% scoring below it. This improvement is reflected in the mean scores: the mean post-test score (15.3) was notably higher than the mean pre-test score (7.7). Additionally, the median post-test score (16) exceeded the median pre-test score (8). The standard deviations for the pre-test and post-test were 2.5 and 2.8, respectively, indicating a broader spread in post-test scores. These results demonstrate that the bowel and bladder care program was effective in enhancing caregivers' knowledge.

**Comparison of pre-test and post-test knowledge score of the caregivers of spinal cord injury patients in specific area:**

**Table 1:** Area wise mean percentages of pre test and post test knowledge score, actual gain score and modified gain score of caregivers of spinal cord injury patients

Area	Maximum Possible Score	Pretest Mean	Mean %	Post test Mean	Mean %	Actual Gain (%)	Modified Gain (%)
Knowledge on bowel Care	12	5.6	46.6	9.8	81.6	35	0.65
Knowledge on bladder care	8	2	25	5.4	67.5	42.5	0.56

The comparison of pre-test and post-test knowledge scores among caregivers of spinal cord injury patients revealed that the post-test mean percentages for both bowel and bladder care were higher than the pre-test mean percentages. Notably, the greatest improvement was observed in knowledge related to bowel care, with a modified gain of 0.65, compared to a gain of 0.56 for bladder care. These results highlight the effectiveness of the bowel and bladder care program in significantly enhancing caregivers' knowledge, particularly in the area of bowel care.

**Section IV:** Findings related to the practice of the caregivers of spinal cord injury patients.

The findings on caregiver practices regarding spinal cord injury patients showed significant improvements after the intervention. Initially, 95% of respondents scored at or below the median in the pre-test, while only 5% scored above the median. In contrast, post-test results demonstrated that 87.5% of respondents achieved scores above the median, with 12.5% scoring at or below the median. This indicates that the bowel and bladder care program effectively enhanced caregivers' practices related to bowel and bladder care. The mean post-test practice score was 31.32, notably higher than the pre-test mean score of 15.07. Additionally, the median post-test practice score was 32, compared to the median pre-test score of 15. The standard deviations were 4.02 for the pre-test and 5.13 for the post-test, reflecting increased variability in practice scores following the program.

**Comparison of pre-test and post-test practice score of caregivers of spinal cord injury patients in special area**

**Table 2:** Area wise mean percentage of pre test and post test practice score, actual gain score and modified gain score of caregivers of spinal cord injury patients

Area	Maximum possible Score	Pretest Mean Score	Mean Score %	Posttest Mean Score	Mean Score %	Actual gain %	Modified gain %
Practice on bowel care	21	7.2	34.28	15.2	72.38	38.1	0.57
Practice on bladder care	24	7.8	32.5	16.1	67.08	34.58	0.51

The post-test mean percentages for caregiver practices related to both bowel and bladder care were significantly higher compared to the pre-test mean percentages. The modified gain was greater for practices related to "bowel care" (0.57) than for "bladder care" (0.51). These results highlight the effectiveness of the bowel and bladder care program in enhancing the practical skills of caregivers for spinal cord injury patients.

**Section V:** Findings related to the effectiveness of bowel and bladder care program.

The effectiveness of the bowel and bladder care program was demonstrated by significant improvements in both knowledge and practice among caregivers of spinal cord injury (SCI) patients. The mean post-test knowledge score was 15.3, compared to a mean pre-test score of 7.7, with a mean difference of 7.6. This difference was statistically significant ( $t(39) = 18.22, p < 0.05$ ), indicating a true effect of the intervention rather than random chance. Similarly, the mean post-test practice score was 31.32, up from 15.07 in the pre-test, with a mean difference of 16.25. This change was also statistically significant ( $t(39) = 15.61, p < 0.05$ ), confirming that the observed improvement in practice was a genuine effect of the program. Consequently, the null hypotheses were rejected, and the research hypotheses were accepted, affirming that the bowel and bladder care program effectively enhanced both the knowledge and practices of caregivers in managing SCI patients.

**Section VI: Association Between Pre-Test Knowledge Scores and Demographic Variables**

The study examined the relationship between caregivers' knowledge scores and several demographic variables. Age did not show a significant association, with a  $\chi^2$  value of 1.07 ( $p > 0.05$ ), indicating that knowledge scores were independent of age. Gender also had no significant impact, as evidenced by a  $\chi^2$  value of 0.32 ( $p > 0.05$ ). Similarly, educational level did not significantly affect knowledge scores, with a  $\chi^2$  value of 1.52 ( $p > 0.05$ ). Occupation was also not a significant factor, as shown by a  $\chi^2$  value of 0.04 ( $p > 0.05$ ). Finally, previous caregiving experience did not correlate significantly with knowledge scores, with a  $\chi^2$  value of 0.23 ( $p > 0.05$ ). These findings suggest that the caregivers' knowledge scores were not influenced by age, gender, education, occupation, or previous experience.

**Section VII:** Findings related to the association between pre-test practice score of the care givers and the selected demographic variables.

The analysis of pre-test practice scores revealed that among employed caregivers, 15 scored below the median and 16 scored at or above the median, while among unemployed caregivers, 4 scored below the median and 5 scored at or above the median. For caregivers with previous experience in caring for spinal cord injury patients, 1 scored below the median and 8 scored at or above the median, whereas 18 caregivers without previous experience scored below the median and 13 scored at or above the median. The  $\chi^2$  values computed for the associations between pre-test practice scores and factors such as occupation, relationship with the patient, and previous caregiving experience were not significant at the 0.05 level. This indicates that the practice scores of caregivers are not influenced by their occupation or previous caregiving experience.

**VI. Discussion**

The study demonstrated that the bowel and bladder care program significantly improved both knowledge and practice among caregivers of spinal cord injury (SCI) patients. The mean post-test knowledge score increased to 15.3 from a pre-test score of 7.7, with a statistically significant mean difference of 7.6 ( $t(39) = 18.22, p < 0.05$ ), indicating the program's effectiveness in enhancing caregivers' understanding. Similarly, the mean post-test practice score rose to 31.32 from 15.07, with a mean difference of 16.25 ( $t(39) = 15.61, p < 0.05$ ), confirming improved caregiving practices. These findings align with previous research, such as Kurvatteppa Halemani et al. (2021), which highlighted the effectiveness of video-assisted teaching modules in improving knowledge and practice regarding bowel care, showing significant results in both areas ( $t = 19.607, p < 0.05$  for knowledge;  $z = 4.716, p < 0.01$  for practice). The present study's results were similarly robust, with significant increases in both knowledge and practice scores post-intervention.<sup>8</sup>

KM Nila et al. (2019) also reported significant improvements in knowledge following an educational intervention, with pre-test scores of 12.20 and post-test scores of 30 ( $t = 34.61$ ,  $p < 0.001$ ), paralleling the present study where the pre-test score was 7.7 and the post-test score was ( $t = 18.22$ ,  $p < 0.05$ ). This consistency reinforces the effectiveness of structured educational programs.<sup>9</sup> Furthermore, Arun Kadam and Mahadeo B. Shinde (2004) found similar effectiveness in structured education on caregivers' knowledge, emphasizing the impact of such programs on improving care practices. The current study supports these findings, demonstrating that the bowel and bladder care programs significantly enhance caregivers' knowledge and practices related to SCI patients' care.<sup>10</sup>

## VII. Conclusion

The study confirmed the effectiveness of the bowel and bladder care program for caregivers of spinal cord injury (SCI) patients. This program significantly enhanced both knowledge and practices related to bowel and bladder care. The intervention demonstrated substantial improvements in caregivers' understanding and implementation of care practices, reflecting its practical value in supporting SCI patients. This conclusion is consistent with previous research that highlights the efficacy of educational interventions in healthcare settings. Studies such as those by Kurvatteppa Halemani et al. (2021) and KM Nila et al. (2019) underscore the positive impact of structured educational programs on caregivers' knowledge and practices. Similarly, the current findings align with established evidence of the benefits of targeted education in improving caregiving skills. Overall, the bowel and bladder care program represents a valuable tool for enhancing caregiver competence and confidence in managing SCI patients. This reinforces the need for ongoing education and training programs to support caregivers effectively and improve patient care outcomes.

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