Kufa Journal for Nursing Sciences
Open Access Full Text Article

Publisher
University of Kufa, Faculty of Nursing

Received: 05 June, 2024
Accepted: 13 August, 2024
Published: 04 October, 2024
Vol. 14(2), 2024: 21 – 29

https://doi.org/10.36321/kjns.vi20242.16448

ORIGINAL RESEARCH

Caregivers' Performance towards Pressure Ulcer Preventive Measures for Spinal Cord Injury Patients

Ahmed Thamer Saud [1], Alaa Jawad Kadhim [2].

[1] *Department of Adult Nursing, College of Nursing, University of Baghdad, Baghdad, Iraq.*
[2] *Department of Adult Nursing, College of Nursing, University of Baghdad, Baghdad, Iraq.*

CORRESPONDING AUTHOR: Ahmed Thamer Saud, Department of Adult Nursing, College of Nursing, University of Baghdad, Baghdad, Iraq. Email: **ahmedthamer93a.t.a@gmail.com**

ABSTRACT

Objectives: The present study aimed to evaluate caregivers' performance concerning pressure ulcer preventive measures for spinal cord injury patients.

Methodology: This is a pre--experimental design study carried out on 25 caregivers. A Purposive sampling technique was used to recruit the participants, This study starts from 21th, May 2021 to 31th January, 2024. A questionnaire was used after obtaining an official approval. The first part of the questionnaire measured the participants' demographic variables and the second part measured their performance towards pressure ulcer preventive measures. The data were analyzed in SPSS 26.0.

Results: The findings revealed that the majority of the study respondents were at age (28–37 year) and male caregivers, most of them married and living together with the patient. The present findings showed that caregivers had a low level of performance in the pretest. Yet, they showed promote their performance to the good level in the post-test at p-value=0.001.

Conclusion: The present study concluded that the educational program was highly effective in caregivers' performance. This study recommended that caregivers needed to develop and expand their knowledge of pressure ulcer prevention through media and brochures in order to improve their performance.

Keywords: Caregivers, Performance, Preventive Measures, Pressure Ulcer, Spinal Cord Injury.

INTRODUCTION

Spinal cord injury (SCI) is a life-threatening and debilitating injury with tremendous immediate and long-term extensive impact on the medical, social, psychological and economic aspects of patients' lives, their caregivers and the society [1, 2]. Spinal cord injured patients have a high risk of developing pressure ulcers due to motor and sensory impairments, immobility, changes in skin composition, and prolonged hospital stays [3, 4, and 5]. PUs are a serious, costly, and lifelong complication of SCI. Around, 30–40% of patients with spinal cord injuries develop pressure ulcers during the acute and rehabilitation phases [6, 7].

Pressure ulcers (PUs), a common secondary complication in individuals with SCI, are characterized by damage to the skin and/or underlying tissue due to unrelieved pressure or pressure in combination with shear forces [8, 9]. PUs develop after a prolonged period of compression and usually occur over bony prominences [10, 11].

How to Cite: Saud, A. T., & Kadhim, A. J. (2024). Caregivers' performance towards pressure ulcer preventive measures for spinal cord injury patients. *Kufa Journal for Nursing Sciences, 14*(2), 21–29. https://doi.org/10.36321/kjns.vi20242.16448

Individuals with SCI are at an increased risk of developing PUs due to factors such as reduced mobility, inability to adequately release pressure, atrophy of the paralyzed muscles, a disturbed leg muscle pump function, reduced microcirculation and impaired sympathetic function [12, 13].

Each year, the worldwide incidence of SCI ranges from 8.0 to 246.0, whereas the prevalence ranges between 236.0 and 1298.0 per million people. However, when revisiting facts and figures of the last decade, a significant increase can be noticed [14,15, and 16].

Over 2.5 million Americans are at high risk of developing PUs each year. Among them, 60,000 succumb to complications like sepsis and osteomyelitis [17, 18]. In Iraq, the prevalence of pressure ulcers is estimated to vary from one place to another, range from 4.7% to 32.1% for hospital populations [24]. PUs can also adversely affect communities, health facilities, and service providers. They can also put a therapeutic strain on families and medical facilities. In America, treating them costs the health system 18.5 billion dollars, of which $129,00 is spent on treating people whose ulcer has damaged their full thickness of skin [19, 20, and 21].

Regular repositioning is one of the most cost-effective prophylactic measures for pressure alleviation. During the rehabilitation process, repositioning exercises are taught and encouraged for those with SCI to help disperse the pressure around the sacrum and ischial tuberosity [22, 23]. These repositioning exercises consist of forward, lateral, and vertical push-ups. It is advised to do so every 15 to 30 minutes [25].

Globally, caregiving is estimated to rise in demand as people live longer mostly with chronic diseases. Nowadays, caregivers offer a variety of patient care services that were formerly provided by healthcare experts in the past, making a significant contribution to the patients' lives, even at the expense of their own health and wellbeing [26, 27]. Caregivers offer primary assistance to SCI individuals in doing everyday activities [28, 29].

Caregivers' attitude and performance are critical to the management and reduction of the risk of PU. Research on pressure ulcer treatment (PU) management has shown to expedite patients' recovery, and caregivers provide SCI patients with the vital assistance they require to accomplish everyday tasks [30, 31]. Though medical specialists attempt to control post-traumatic stress disorder (PU), they not only fail to prevent PU but also fail to reduce its incidence. Through involvement in the patient's care, the caregiver helps prevent secondary issues and maintain the patient's physical health [32].

A high rate of developing pressure injuries among patients who need care is lack of proper education and care in the nursing staff. Therefore, it is necessary for the nurses of these patients to have sufficient knowledge about pressure injuries prevention and treatment [33].

Collaboration of the government, the patient, the family, and interdisciplinary healthcare professionals—especially nurses—is required to prevent pressure ulcer injuries [34]. Therefore, the present study aimed to evaluate caregivers' performance of pressure ulcer preventive measures for patients with spinal cord injury. It also aimed to test the effect of an educational program on caregivers' knowledge and performance of pressure ulcer preventive measure for patients with spinal cord injury.

AIMS OF THE STUDY

The present study aimed to evaluate caregivers' performance concerning pressure ulcer preventive measures for spinal cord injury patients.

METHODOLOGY

Design of Study

A pre-experimental design without control group guided the present study. It used a pretest and

posttest design and was conducted from May 21st, 2023 to January 31st, 2024.

Participants and Sampling

A purposive sample was used, with 25 male and female caregivers of recumbent patients with spinal cord damage chosen at random. It took two months to sample from a single group. The sample size was determined using the G power analysis.

Data Collection and Instruments

The data were collected from participants through observation of their performance, the data collection was questionnaire-based. The questionnaire was an international scale that was used after obtaining official approval from the original researcher (Tharu, 2021). The questionnaire was translated from English to Arabic in back-to-back translation. There were two parts in the instruments, as introduced below.

First part: Self-Administered Questionnaire on Caregivers' Demographic Information

It was concerned with the caregiver's demographic information including age group, sex, and level of education, marital status, whom he lives with, occupational status, residency, and kinship with patient.

Second part: Observational Checklist on Pressure Ulcer Prevention

This part evaluated the caregiver's performance of pressure ulcer prevention to check for correct or incorrect practices. The observational checklist consisted of 16 items and were rated as Always (3), sometimes (2), or Never (1).

Cronbach's Alpha coefficient was used to assess the reliability of instruments. The estimated alpha value showed very good internal consistency of performance scales it's 0.820, which means the questionnaires had acceptable levels of internal consistency and equivalence measurability. The tool was scrutinized by experts in the field of nursing, to ascertain the content validity, before the actual data collection.

The program was implemented as two lectures provided to the caregivers, who in turn were divided into two groups according to the length of their hospital stay. The first group consisted of 13 caregivers and the second group consists of 12 caregivers, comprising a total sample of 25 caregivers. Each group was given the same lectures. The first lecture was given on the first day, and the second lecture was given during the caregiver's stay in hospital. The first lecture consisted of the definition of spinal cord injury and types, risk factors, and causes of pressure ulcer, and stages of pressure ulcers and treatment, which were provided at a lecture hall at nine o'clock in the morning. Each lecture took 45-60 minutes' long. The second lecture was on the pressure ulcer preventive measures after spinal cord injury and included skin care strategies, repositioning patients in bed, support surfaces (mattresses/overlays) and types, and nutrition and nutritional requirements. In both lectures, several means of clarification were used such as blackboard, computer, illustrative pictures, and group discussion.

Ethical Considerations

The ethical permission (8,3/5/ 2023) came from the University of baghdad, College of Nursing, Clinical Research Ethics Committee, institutional permission from the Faculty of Nursing, and from the selected hospitals' ethical boards before data collection began. Participation was completely voluntary, with written informed consent from caregivers, who were assured that their responses would be confidential.

Data Analysis

The data were analyzed and interpreted in SPSS 26.0. Descriptive statistics including mean, standard deviation, and frequency distribution were used. Also, in the inferential part, the dependent t-test was used to compare the performance score before and after the intervention and Wilcoxon Signed Rank.

RESULTS

Table1: shows that the highest percentage of caregivers in age groups was 40% in 28-37-year group. As for caregiver's sex, 64% were male and 36% female. Concerning the level of education, 36% of caregivers held an intermediate school degree. Regarding, the marital status, 64% of caregivers were married and the rest were single. Concerning the living status, 72% of caregivers lived together with their patients. As for the occupational status, 44% of caregivers were freelancers and 40% were housewives. Regarding residency, 60% of caregivers were urban residents while 40% were rural residents. Finally, concerning the kinship, 32% caregivers were fathers and 28% were mothers.

Table 2: summarizes the status of caregivers' performance of pressure ulcer preventive measures for patients. The mean scores show a poor level of performance during the pre-test for all items except 5 and 6 that show a fair level. Caregivers' performance increased during the post-test in which the mean scores are fair among all items except items 1 and 6 that show good and item 13 that is still poor.

DISCUSSION:

The sample consisted of 25 caregivers made up the study's sample, and the findings indicated that 40% of the caregivers whom were between the ages of 28 and 37 years of age. This finding is consistent with another study by [11] that found that the participants in that study were (younger than 30 years). The early age really made it easier to comprehend and implement the educational program, which improved pressure ulcer management and prevention. According to other research by [28], younger caregivers are physically stronger and more resilient, which may help them with activities like turning bedridden patients to avoid bedsores or helping them move around. This may make it easier to turn, change, and care for bedridden patients who are bedridden when caregivers are younger. Regarding caregiver's sex, more than half (64%) were male and 36% were female, this study which agrees with another research In Iran done by [22], In Iran, that showed most family caregivers of patients (n=176, 54.5%%) were male. The researcher reckons that SCIs and inability to move require assistance and certain measures; thus, men are stronger than women are in this regard.

Regarding educational attainment, almost one-third of the subjects in this research had an intermediate school certificate. In terms of marital status, almost 72% of caregivers lived with the patients, whereas nearly two-third of the sample (64%) were married. The researcher hypothesizes that problems, particularly bed sores, can emerge quickly in SCI patients. A study titled as "Effect of an educational program on a family caregiver's prevention and management of pressure ulcers in bedridden patients after discharge from hospitals" by [15] showed that spouses were more likely to take on primary caregiving roles compared to non-spouses. Therefore, the closer the caregiver to the patient, the fewer the complications. This study showed that 44% of caregivers worked freelance and 40% were housewives. More than half of the participants (60%) lived in urban areas. According to this study, fathers accounted for the highest proportion of caregivers' kinship with patients (32%). In contrast to the another study by [12], which showed an equal ratio (22.2%) between the sister and daughter with regard to the type of relationship between the caregiver and the patient, the mother made up a lower percentage (28%) of the sample. The father's presence next to the patient can represent his strength and assist the patient in completing challenging activities. The examples include adjusting his clothing, shifting positions in bed, or managing the patient during diaper changes.

The results showed that caregivers' performance on the pre-test was below average. However, their performance on the post-test was above average. These indicate significant changes in their performance, which is consistent with another

study [21], which showed after the program was put into place, informal caregivers' poor behaviors for pressure injury avoidance improved. The researcher believes that bedsores are a global concern. Unfortunately, the majority of people, particularly those in Iraq, are unaware of this problem because of a lack of understanding or the prevailing culture at medical facilities or on social media.

Limitations of study: One limitation of this study was the small number of participants due to limited time and difficulty of tracing caregivers after the program as a result of the discharge of some patients from the hospital.

CONCLUSIONS:

This study concluded that caregivers had a low level of performance during the pre-test. Yet, they showed a good level during the post-test. It can also be concluded that the educational program was highly effective in caregivers' performance. This can be due to the simplicity of the program and caregivers' level of education.

RECOMMENDATIONS:

The study recommends that caregivers develop and increase their knowledge of pressure ulcer prevention through media and brochure to improve their practice. Due to the importance of pressure injury prevention for patients, their families and healthcare systems, it is crucial that healthcare systems plan interventions and educational programs to educate and empower family caregivers.

Acknowledgements

We would like to thank all the caregivers and patients who participated in the study.

Funding:

No funding was included.

REFERENCES:

1. Shiferaw, W. S., Akalu, T. Y., Mulugeta, H., & Aynalem, Y. A. (2020). The global burden of pressure ulcers among patients with spinal cord injury: a systematic review and meta-analysis. *BMC Musculoskeletal Disorders*, 21(1). https://doi.org/10.1186/s12891-020-03369-0.
2. Wijker, B. J., de Groot, S., van Dongen, J. M., van Nassau, F., Adriaansen, J. J. E., Achterberg-Warmer, W. J., Anema, J. R., Riedstra, A. T., van Tulder, M. W., & Janssen, T. W. J. (2022). Electrical stimulation to prevent recurring pressure ulcers in individuals with a spinal cord injury compared to usual care: the Spinal Cord Injury PREssure VOLTage (SCI PREVOLT) study protocol. *Trials*, 23(1). https://doi.org/10.1186/s13063-022-06088-0.
3. Ingwu, J., Nwaordu, A., Opara, H., Israel, O., & Ogbogu, C. (2019). Caregivers' knowledge and practice toward pressure ulcer prevention in national orthopedic hospital, Enugu, Nigeria. *Nigerian Journal of Clinical Practice*, 22(7), 1014. https://doi.org/10.4103/njcp.njcp_413_17.
4. Tharu, N., Alam, M., Bajracharya, S., & Kabir, M. (2021). *Knowledge, Attitude and Practice Among Caregivers Towards Pressure Ulcer in Spinal Cord Injury at Rehabilitation Center in Bangladesh*. https://doi.org/10.21203/rs.3.rs-225668/v1.
5. Lee, S.-B., & Lee, H.-Y. (2022). Impact of pressure ulcer prevention knowledge and attitude on the care performance of long-term care facility care workers: a cross-sectional multicenter study. *BMC Geriatrics*, 22(1). https://doi.org/10.1186/s12877-022-03702-3.
6. Stinson, M., Schofield, R., Gillan, C., Morton, J., Gardner, E., Sprigle, S., & Porter-Armstrong, A. (2013). Spinal Cord Injury and Pressure Ulcer Prevention: Using Functional Activity in Pressure Relief. *Nursing Research and Practice*, 2013, 1–8. https://doi.org/10.1155/2013/860396.
7. Farzan, R., Yarali, M., Mollaei, A., Ghaderi, A., Takasi, P., Sarafi, M., Samidoust, P., Mahdiabadi, M. Z., Firooz, M., Hosseini, S. J., Vajargah, P. G., & Karkhah, S. (2023). A systematic review of caregivers' knowledge and related factors towards pressure ulcer prevention. *International Wound Journal*, 20(8). https://doi.org/10.1111/iwj.14168.

8. Edsberg, L. E., Black, J. M., Goldberg, M., McNichol, L., Moore, L., & Sieggreen, M. (2016). Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System. *Journal of Wound, Ostomy and Continence Nursing*, 43(6), 585–597. https://doi.org/10.1097/won.0000000000000281.
9. BaniHani, H., Alnaeem, M. M., Saleh, M., & Nashwan, A. J. (2023). Knowledge and practice of informal caregivers on pressure injury prevention and treatment among patients need palliative care: *a cross-sectional study*.
10. Ahmed Mersal, F., Ahmed Mersal, N., & Ahmed Hussein, H. (2017). Effect of Educational Guidelines for Prevention of Immobilization Complications on Caregivers' Performance and Patients' Functional Condition. *American Journal of Nursing Research*, 5(2), 32–41. https://doi.org/10.12691/ajnr-5-2-1.
11. Ferris, A., Price, A., & Harding, K. (2019). Pressure ulcers in patients receiving palliative care: A systematic review. *Palliative Medicine*, 33(7), 770–782. https://doi.org/10.1177/0269216319846023.
12. Njau, S. K., Gitonga, L. K., Karani, A. K., & Nyamu, H. M. (2023). Post training pressure injury knowledge and prevention practice among primary home caregivers of patients discharged from a Level 5 Hospital in Kenya.
13. Eljedi, A., ElDaharja, T., & Dukhan, N. (2015). Effect of an educational program on a family caregiver's prevention and management of pressure ulcers in bedridden patients after discharge from hospitals in Palestine. *International Journal of Medical Science and Public Health*, 4(5), 600. https://doi.org/10.5455/ijmsph.2015.20012015120.
14. Chen, G., Wang, T., Zhong, L., He, X., Huang, C., Wang, Y., & Li, K. (2022). Telemedicine for Preventing and Treating Pressure Injury after Spinal Cord Injury: A Systematic Review and Meta-analysis (Preprint). *Journal of Medical Internet Research*. https://doi.org/10.2196/37618.
15. Chen, H.-L., Cai, J.-Y., Du, L., Shen, H.-W., Yu, H.-R., Song, Y.-P., & Zha, M.-L. (2020). Incidence of Pressure Injury in Individuals With Spinal Cord Injury. *Journal of Wound, Ostomy & Continence Nursing*, 47(3), 215–223. https://doi.org/10.1097/won.0000000000000633.
16. Demarré, L., Van Lancker, A., Van Hecke, A., Verhaeghe, S., Grypdonck, M., Lemey, J., Annemans, L., & Beeckman, D. (2015). The cost of prevention and treatment of pressure ulcers: A systematic review. *International Journal of Nursing Studies*, 52(11), 1754–1774. https://doi.org/10.1016/j.ijnurstu.2015.06.006.
17. Arora, M., Harvey, L. A., Glinsky, J. V., Chhabra, H. S., Hossain, S., Arumugam, N., Bedi, P. K., Lavrencic, L., Hayes, A. J., & Cameron, I. D. (2016). Telephone-based management of pressure ulcers in people with spinal cord injury in low- and middle-income countries: a randomised controlled trial. *Spinal Cord*, 55(2), 141–147. https://doi.org/10.1038/sc.2016.163.
18. Clark, F., Blanchard, J., Vigen, C., & Carlson, M. (2017). Lifestyle Intervention for Adults With Spinal Cord Injury: The USC–RLANRC Pressure Ulcer Prevention Study. *American Journal of Occupational Therapy*, 71(4_Supplement_1), 7111515212p1. https://doi.org/10.5014/ajot.2017.71s1-rp302c.
19. Jafari, M., Nassehi, A., Rafiei, H., Taqavi, S., Karimi, Y., Bardsiri, T. I., & Bellón, J. A. (2021). Pressure Injury Prevention Knowledge Among Family Caregivers of Patients Needing Home Care. *Home Healthcare Now*, 39(4), 203–210. https://doi.org/10.1097/nhh.0000000000000975.
20. Lee, S.-B., & Lee, H.-Y. (2022). Impact of pressure ulcer prevention knowledge and attitude on the care performance of long-term care facility care workers: a cross-sectional multicenter study. *BMC Geriatrics*, 22(1). https://doi.org/10.1186/s12877-022-03702-3.
21. Farzan, R., Yarali, M., Mollaei, A., Ghaderi, A., Takasi, P., Sarafi, M., Samidoust, P., Mahdiabadi, M. Z., Firooz, M., Hosseini, S. J., Vajargah, P. G., & Karkhah, S. (2023). A systematic review of caregivers' knowledge and related factors towards pressure ulcer prevention. *International Wound Journal*, 20(8). https://doi.org/10.1111/iwj.14168.

22. Pressure Ulcers in a Sample of Iraqi Patients with Spinal Cord Injury. (2020). *Indian Journal of Public Health Research & Development*. https://doi.org/10.37506/ijphrd.v11i5.9441.

23. Majeed, H., Ahmed Fleih Hassan, Aqeel Habeeb Jasim, & Ali Hussein Al-Ganmi. (2023). Protective Health Behaviors among Critical Care Nurses Concerning Pressure Ulcer Prevention for Hospitalized Patients at Baghdad Teaching Hospitals. *˜Al-œRafidain Journal of Medical Sciences*., 5, 205–210. https://doi.org/10.54133/ajms.v5i.211.

24. AL-Barody N, Jasim A. Impact of Family Role on Patients Psychological Aspect Post Spinal Cord Injury in Ibn- Al-kuff Medical Rehabilitation Center. *Journal of Nursing and Health Science [Internet]*. 2015;4(6):2320–1940. Available from: www.iosrjournals.org.

25. Alaa Jawad Kadhim, & Khalida Mohammed Khudur. (2021). Effectiveness of an Instructional Program on Nurses' Performance toward Unconscious Patients' Personal Hygiene in Intensive Care Unit at Teaching Neurosurgical Hospital at Baghdad City. Drugs and Cell Therapies in Hematology, 10(1), 1522–1528.

26. Jeong, A., Shin, D., Park, J. H., & Park, K. (2020). Attributes of caregivers' quality of life: A perspective comparison between spousal and non-spousal caregivers of older patients with cancer. *Journal of Geriatric Oncology*, 11(1), 82–87. https://doi.org/10.1016/j.jgo.2019.05.020.

27. Majeed HM, Hassan AF, Jasim AH, Al-Ganmi AH. Protective Health Behaviors among Critical Care Nurses Concerning Pressure Ulcer Prevention for Hospitalized Patients at Baghdad Teaching Hospitals. *Al-Rafidain Journal of Medical Sciences*. 2023;5(September):205–10.

28. Atiyah H, Khudhur K, Hasan S. Evaluation of nurses' practices toward postoperative wound dressing in surgical wards. *Iraqi National Journal of Nursing Specialties*. 2012;25(1):29–39.

29. Abbas N, Mohammed W. Nurses' Knowledge toward Care of Unconscious Adult Patients at Teaching Hospitals in Al-Hilla City. *Iraqi National Journal of Nursing Specialties [Internet]*. 2019 Jun 30;32(1):90–102. Available from: https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/327.

30. Baiez Y, Mohammed W. Effectiveness of an Interventional Program on Nurses Practices regarding Removing and Cleaning Burn Dead Tissue. *Iraqi National Journal of Nursing Specialties*. 2022;35(1):110–8.

31. Rose A, Bakey S. An Instruction Program for Residents of Geriatric-Care Homes about Personal Hygiene in Al Cyelakh Geriatric Care Home. *Iraqi National Journal of Nursing Specialties [Internet]*. 2023 Jun 30;36(1):71–9. Available from: https://www.iasj.net/iasj/article/278725.

32. Jaddoue B, Ghanim A. Assessment of Nurses' Practices for Neurological Unconscious Patients in Intensive Care Units. *Iraqi National Journal of Nursing Specialties*. 2011;24(1):1–11.

33. Hussein M, Mohammed W. Assessment of Spinal Cord Injured Patients' Adherence toward Clean Intermittent Self-Catheterization in Baghdad City. *Pakistan Journal of Medical and Health Sciences*. 2021;15(5):1428–30.

34. Kadhim, A. J., Mohammadi, N., Hezbiyan, Z., Abbasinia, M., Norouzadeh, R., Taghadosi, M., & Aghaie, B. (2024). The effects of a mindfulness training intervention on fatigue and job satisfaction among emergency nurses: A quasi-experimental study.

TABLES:

Table (1): Distribution of Participants' Demographic Information

No.	Demographic variable		f	%
1	**Age group**	18 – 27 year	4	**16**
		28 – 37 year	10	**40**
		38 – 47 year	6	**24**
		48 – 57 year	5	**20**
		Total	**25**	**100**
2	**Sex**	Male	16	**64**
		Female	9	**36**
		Total	**25**	**100**
3	**Level of education**	Primary school	6	**24**
		Intermediate school	9	**36**
		Secondary school	4	**16**
		Bachelor and more	6	**24**
		Total	**25**	**100**
4	**Marital status**	Unmarried	9	**36**
		Married	16	**64**
		Total	**25**	**100**
5	**Living with**	Together with patient	18	**72**
		Separately from patient	7	**28**
		Total	**25**	**100**
6	**Occupational status**	Freelance	11	**44**
		Housewife	10	**40**
		Students	2	**8**
		Unemployed	2	**8**
		Total	**25**	**100**
7	**Residency**	Urban	15	**60**
		Rural	10	**40**
		Total	**25**	**100**
8	**Kinship with patient**	Mother	7	**28**
		Father	8	**32**
		Brother	6	**24**
		Son	2	**8**
		Daughter	2	**8**
		Total	**25**	**100**

Table (2): Caregivers' Performance of Pressure Ulcer Preventive Measures for Patients with Spinal Cord Injury

List	Performance	Scale	Pre-test			Post-test		
			f (%)	M	Ass.	f (%)	M	Ass.
1	**Encourage and assist the patient to eat well, drink sufficient fluid, and exercise several times daily.**	**Never**	13(52)	1.56	Poor	0(0)	2.48	Good
		sometime	10(40)			13(52)		
		Always	2(8)			12(48)		
2	**Use pillows and cushions to reduce pressure on existing pressure ulcers**	**Never**	19(76)	1.24	Poor	5(20)	2.16	Fair
		sometime	6(24)			11(44)		

	or risky skin areas.	Always	0(0)			9(36)		
3	Check for incontinence a minimum of every two hours.	Never	23(92)	1.08	Poor	9(36)	1.92	Fair
		sometime	2(8)			9(36)		
		Always	0(0)			7(28)		
4	Do not massage or forcefully rub skin that is at risk of pressure ulcers.	Never	18(72)	1.28	Poor	8(32)	1.88	Fair
		sometime	7(28)			12(48)		
		Always	0(0)			5(20)		
5	Clean the skin immediately after toileting.	Never	6(24)	1.76	Fair	3(12)	2.12	Fair
		sometime	19(76)			16(64)		
		Always	0(0)			6(24)		
6	Use skin moisturizers daily on dry skin.	Never	6(24)	1.76	Fair	1(4)	2.36	Good
		sometime	19(76)			14(56)		
		Always	0(0)			10(40)		
7	Consulting a therapist or a doctor noticing any changes on the skin.	Never	15(60)	1.44	Poor	4(16)	2.24	Fair
		sometime	9(36)			11(44)		
		Always	1(4)			10(40)		
8	Keep the patient bed free form crumbles and wrinkles, both of which can irritate the skin.	Never	15(60)	1.44	Poor	10(40)	1.80	Fair
		sometime	9(36)			10(40)		
		Always	1(4)			5(20)		
9	Encourage patient involvement in activities.	Never	16(64)	1.36	Poor	6(24)	2.04	Fair
		sometime	9(36)			12(48)		
		Always	0(0)			7(28)		
10	Provide clothes made of cotton that is light and soft in texture	Never	23(92)	1.08	Poor	8(32)	1.88	Fair
		sometime	2(8)			12(48)		
		Always	0(0)			5(20)		
11	Use proper transfer technique to move the patient without sliding across bed or chair surfaces.	Never	16(64)	1.36	Poor	4(16)	2.28	Fair
		sometime	9(36)			10(40)		
		Always	0(0)			11(44)		
12	Relieve pressure from the heels, when the patient is in bed by positioning pillows or cushions.	Never	24(96)	1.04	Poor	7(28)	2.04	Fair
		sometime	1(4)			10(40)		
		Always	0(0)			8(32)		
13	Consider wiping the patient skin sites by using a towel, without rubbing the skin.	Never	22(88)	1.12	Poor	15(60)	1.52	Poor
		sometime	3(12)			7(28)		
		Always	0(0)			3(12)		
14	Use a pressure redistributing chair cushion for patients sitting in wheelchair.	Never	16(64)	1.36	Poor	7(28)	2.04	Fair
		sometime	9(36)			10(40)		
		Always	0(0)			8(32)		
15	Do not massage bony prominences or reddened areas of skin.	Never	17(68)	1.32	Poor	8(32)	1.88	Fair
		sometime	8(32)			12(48)		
		Always	0(0)			5(20)		
16	Inspect the skin at least daily for signs of pressure ulcer.	Never	10(40)	1.04	Poor	8(32)	1.88	Fair
		sometime	15(60)			12(48)		
		Always	0(0)			5(20)		

Ass: Assessment, M: Mean, (Poor= 1-1.66, Fair= 1.67-2.33, Good= 2.34-3).