Knowledge, Attitude and Practice Among Caregivers Towards Pressure Ulcer in Spinal Cord Injury at Rehabilitation Center in Bangladesh

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Abstract

Study design:

A quantitative cross-sectional survey study.

Objective

To determine the knowledge, attitude and practice (KAP) among caregivers regarding prevention and care of pressure ulcer in patients with spinal cord injury and relationship between KAP.

Setting:

Centre for Rehabilitation of Paralysed, Dhaka, Bangladesh.

Methods

A descriptive correlational design with modified semi-structured questionnaire implemented through convenient sampling procedure. McDonald’s standard of learning outcome measured criteria was used to categorize caregivers’ level of knowledge and practice while, the total scores of attitude were categorized into three levels based on mean percentage and standard deviation: negative attitude below (mean ± 1 SD), neutral level (mean ± 1 SD), and positive attitude above (mean ± 1 SD). The pearson product-moment correlation coefficient (r) was used to examine the relationships between caregivers’ KAP and p-value of 0.05 or less was considered as statistically significant.

Results

Our results suggest that caregivers had a moderate level of knowledge (M = 73.68%, SD = 6.43), neutral level of attitude (M = 70.32%, SD = 6.89), and moderate level of practice (M = 74.77%, SD = 9.08). There was a positive correlation between caregivers’ knowledge and attitude (r = 0.30, p < 0.01), and between knowledge and practice (r = 0.37, p < 0.01). However, no correlation existed between attitude and practice (r = 0.12, p > 0.05).

Conclusion

The study findings suggests that caregivers need to develop a positive attitude and increase their knowledge in order to improve their practice.

Introduction
Spinal cord injury (SCI) is a neural destruction causing motor and sensory disturbances with difficulties in day to day living tasks [1]. The global incidence of SCI (8.0 – 246.0) whereas, prevalence (236.0 – 1298.0) per million peoples each year. Though, looking through the data of last 10 years, dramatic rise has been observed [2]. The peoples with SCI are more prone to secondary complications that demands enormous health facilities [3]. The peoples with SCI deal with immobility and require external support for daily tasks, where reduced mobility is commonest reason of pressure ulcer (PU) [4]. The persons with SCI are highly susceptible for PU due to restricted movement and impaired senses during their entire survival period [5]. PU is a common problem in SCI and its therapeutic expenditures seems 2.5 times higher than the controlling measures and extends the infection period demanding prolong treatment which may also lead to death [6]. Approximately, 30-85% of SCI individuals experience PU at the onset while, 85% develop PU during some period of time [7]. The SCI individuals experience many complications even after discharge from hospital and PU seems to be one of the commonest [8]. The life expectancy of SCI in Bangladesh once completion of rehabilitation demonstrated that 56.4% die in five years whereas, about 16.4% lived above 10 years and the majority of deaths were reported at home [9]. It is reported that one in every five SCI sufferers bounded on wheelchair expired during the period of two years after released from the hospital being the PU main reason of demise [10]. The knowledge and attitude of the caregivers plays a significant role for controlling and decreasing the risk of PU [5]. Caregivers provide primary assistance to SCI individuals to perform everyday tasks that showed having appropriate knowledge on PU management assists speedy recovery of the patient [4]. The management of PU is very problematic even for health expertise instead of having knowledge about PU and its prevention, they are struggling to reduce the rate of developing PU [11,12]. The caregiver's involvement in patient care helps for reducing secondary complications and maintaining physical health of the SCI individuals [13]. The time and effort contributed to complete the daily life activities of peoples with SCI had adverse impact on the life of caregivers [14]. The caregivers engaged in a long-term care demonstrated negative attitude towards the disability [15], because people with tetraplegia require precise care that effected caregiver's attitude leading to decrease in quality of care [14]. The evaluation of bed sore practices presented with 12% of caregivers have had improper techniques on bed mobility that further deteriorated the PU [4] and also had inappropriate knowledge and practice about preventive care of PU on immobilized patients [16]. Approximately, 95.1% of PU are preventable with appropriate knowledge whereas insufficient skills may degrade the situation of PU [17].

**Methods**

This is a quantitative cross-sectional survey where descriptive correlational design was used to explore the caregiver's knowledge, attitude and practice (KAP) regarding prevention and care of PU of the SCI individuals admitted for rehabilitation at Centre for Rehabilitation of Paralysed (CRP) in Bangladesh also relationship between KAP were analyzed. The caregivers of all the SCI sufferers i.e. people with paraplegia and tetraplegia with a recent spinal injury were involved in the study including cases of PU. The caregiver of people with tetraplegia with a minimum of one month of stay with the SCI individual as a primary caretaker whereas, for paraplegia having two weeks of stay at halfway hostel (discharge
phase) were interviewed. The total of 127 participants were included in the study by convenience sampling method. The questions were adopted from National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance based on Prevention and Treatment of Pressure Ulcers, published in 2014 (NPUAP/EPUAP/PPPIA, 2014) and Pressure Ulcer Attitude Questionnaire [18]. The questionnaire was designed on English-Bengali version to maintain the quality of the data. Before actual data collection time, the questionnaire was checked for clarity, comprehensiveness, and content validity by an expert and pretested for reliability through pilot study on 10 caregivers in different units of SCI department at CRP. The caregivers who had the primary responsibility in patient care with minimum age of 18 years were included in the study whereas, the caregivers whose family member with SCI were admitted for rehabilitation after more than a year of SCI were excluded.

The structured modified questionnaire was based on perspectives of SCI in Bangladesh, which was divided into 4 sections: socio-demographic questionnaire, caregivers' knowledge, attitude and practice respectively regarding prevention and care of PU. The socio-demographic questionnaire consisted of 8 items to assess the respondent's socio-demographic data including age, gender, educational status, marital status, occupational status, residence status, living area and relationship between caregiver and patient. Similarly, the caregiver's knowledge was assessed using an 18-item structured questionnaire where respondents were asked to answer the questions as correct, partially correct and incorrect. The questionnaire included positive and negative item questions and scores of negative items were reversed. Similarly, a 16-item structured questionnaire was adopted to assess the level of practice where respondents were asked to indicate the frequency of their practice as always practice, sometimes practice and never practice. 3-Likert scale was applied for both knowledge and practice and the possible total score was then converted into percentage where higher scores indicated the higher level of knowledge as well as practice. The mean (M) and standard deviation (SD) was calculated for categorization. A p-value of 0.05 or less was considered as statistically significant. McDonald's standard of learning outcome measured criteria was used to categorize caregiver's level of knowledge and practice regarding prevention and care of PU [19]. The criterion was categorized into five groups: Very low (< 60%), Low (60% - 69.99%), Moderate (70% - 79.99%), High (80% - 89.99%) and Very high (90% - 100%). Again, the caregivers attitude was measured using 12-item structured questionnaire where respondents were asked to rate the 5 level of attitude ranged from strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. There were both positive and negative item questions and scores of negative items were reversed. The total score of attitude was categorized into three levels based on mean percentage and standard deviation: negative attitude below (mean ±1 SD), neutral level (mean ± 1 SD), and positive attitude above (mean ± 1 SD). Simultaneously, the Pearson product-moment correlation coefficient (r) was used to examine the relationships among the level of caregivers knowledge, attitude, and practice.

Results

The mean age of the caregivers (Table 1) was 38.21 years (SD = 11.95) with a minimum and maximum age with 18 and 72 years. Majority of the caregivers (29.1%) were between 38 to 47 years while the least
age group of the caregivers (4.7%) fall in the category of 57 years and above. Most of them were female (76.4%) and the caregivers with no formal education occupied the highest proportion (37.0%) who were engaged in taking care of the SCI individuals while the caregivers with higher educational status as graduates and above were only (5.5%). Many of the caregivers were married (86.6%), among them near to two third of the caregivers were housewife (69.3%). The caregiver's residence status presented that (82.7%) of the caregivers were living together with the SCI individual in the same house and (81.9%) belonged from the rural area where the wife (40.9%) and mother (19.7%) were the primary caregiver. The caregiver’s knowledge regarding prevention and care of PU was at a moderate level (M = 73.68%, SD = 6.43) with minimum and maximum scores of 55.56% and 87.04%, respectively. As shown in (Fig. 1: a), it was found that 26.8% of caregivers possessed very low (2.4%) to low (24.4%) level of knowledge. Majority of caregivers (54.3%) had a moderate level of knowledge whereas (18.9%) scored a high level of knowledge and no caregivers had a very high level of knowledge regarding prevention and care of PU. The (Fig. 1: c) showed the caregivers attitude regarding prevention and care of PU was at neutral level (M = 70.32%, SD = 6.89) with minimum and maximum scores of 51.67% and 93.33%, respectively. The scoring criteria based on mean and SD categorized as: negative (<63.43%), neutral (63.43% - 77.21%) and positive (>77.21%). Most of the caregivers (69.3%) achieved neutral level of overall attitude towards prevention and care of PU. 15.0% of the caregivers showed negative attitude. Simultaneously, (15.7%) of the caregivers had an overall positive attitude towards prevention and care of PU. The caregiver’s practice regarding prevention and care of PU was at a moderate level (M = 74.77%, SD = 9.08) with minimum and maximum scores of 54.17% and 93.75%, respectively. As shown on (Fig. 1: b), it was found that less than half (45.7%) of the caregivers scored moderate level and (18.9%) of the caregivers had high levels practice regarding prevention and care of PU. However, it was observed that 29.1% of caregivers possessed very low (7.1%) to low (22.0%) level of practice. The relationship between KAP (Table 2) was calculated using correlational analysis that revealed a positive correlation between caregivers’ knowledge and attitude (r = 0.30, p < 0.01), and between knowledge and practice (r = 0.37, p < 0.01). However, there was no correlation existed between attitude and practice (r= 0.12, p > 0.05) regarding prevention and care of PU.

Discussion

Socio-demographic characteristics

The study results indicated that higher proportion of the caregivers were females and from middle-aged group (38-47) years. It specified that the females are mostly in priority for the caretaking of anyone in the family in developing country like Bangladesh. A study in Brazil reported that care of the person with disabilities is usually assigned to women as a result of their traditional role as caretaker for the home and family [20]. There was decline in the percentage of caregivers with the increasing educational status. This is a clear indication that the caregivers who are educated were not interested for the role of caregiver. Regarding occupational status, it was noticed that most of the caregivers were housewife. Men are mostly exposed to the work or activities that make them vulnerable to SCI, while women generally do not go out to work and remain indoors [9]. The relatives (kins/cousins) were also found to be involved as
primary caregiver and wife of the male SCI individuals as well as mother of females were mostly engaged in caretaking amongst a family member, if the person were married.

**Level of knowledge**

The study findings demonstrated moderate level of knowledge among caregivers i.e. neither high nor low knowledge which showed insufficient information on prevention and care of PU. It is reported that the knowledge of caregivers regarding bedsore care was inadequate and practices were found to be incorrect [21]. The caregivers had inappropriate information about prevention of complications resulting due to immobility [16]. It is assumed that age group and educational background may be a factor related to this moderate level of knowledge while, the results showed that age and level of education had a highly significant relation. Supporting this explanation, a study on caregivers illustrated having higher level of education, had higher knowledge than those having lower levels of education [4]. Furthermore, more than three quarter of the respondents are in age group (18-27) and (28-37). Since, this is the age of education and learning, thus might be the reason for the moderate level of knowledge. A study showed that age had a significant effect on knowledge score, the old age exhibited an excellent knowledge [22]. Majority of the caregivers were housewife (69.3%), and they have some idea of the general care except specific knowledge on transfer and positioning. It seems they had more information on other aspects of general care rather than pressure ulcer care. A significant relation was observed between level of knowledge, age, sex, marital status and kin relationship respectively [4]. Regarding relationship between caregiver and patient, it is predicted that if the patient were married, wife and mother were the primary caregiver and other family members were rarely involved in the caretaking. The related result was noticed where level of knowledge is statistically significant with area of residence, marital status and educational status of respondents [16].

**Level of attitude**

The results showed that greater quantity of caregivers had neutral level of attitude regarding the prevention and care of PU which indicates that caregivers were unaware of PU prevention and care, or they had no idea about preventing PU development. It is predicted that there might be relation between age and attitude. In contrast, additional analysis supported this statement. There was significant correlation between age and attitude. The female showed more positive attitude than male, while the house wife had positive attitude more than the other occupation [22]. It was observed that large number of caregivers were of age group (38-47) years, being from middle age group it is possible that they understood the fact about the disability and were ready to compromise with the situation. Therefore, they might have had showed neutral attitude towards prevention and care of PU. Likewise, high proportion of the house wife (77.3%) presented with neutral attitude towards prevention and care of PU compared to other occupations. The possible reason behind this might be they did not have had other responsibilities rather than as a caregiver such as office work and family responsibilities. And being a house wife, they perform daily tasks in their houses which are also quite similar to the activities as a caregiver. The family members are the primary caregivers in most of the times during need of patient care [21]. Regarding
relationship between caregiver and patient, it also showed relation with attitude score. The wife of the SCI individuals showed higher neutral attitude (46.6%) regarding prevention and care of PU than others. This might be due to their relationship as it was observed that wife and mother were in priority of caregiving for married peoples with SCI. This may be the reason of showing neutral attitude rather than negative. The relationship and bonding between caregiver and the person with SCI reflect their interest in caregiving [22].

**Level of practice**

It was found that the caregiver’s practice regarding prevention and care of PU was at a moderate level. The level of knowledge and practice were equivalent to each other. In this study, caregivers’ practice was reflected by their knowledge. 95.1 % of PU can be controlled by having information on its preventive factors [17]. The gender presented significant relationship with the practice level. A possible reason for explaining this moderate level of practice among gender may be because the females are mostly engaged in household chores as it was found that majority of the caregivers were housewife. This helps them to deliver moderate level of practice to the sufferers than the male caregivers. Educational status is a related factor for the moderate level of practice. It was observed that the caregivers with higher level of education showed higher practice. The similar significant relation was reported between level of practice, age, sex, marital status and kin relationship respectively [4]. The academic status of caregivers had its effect on the quality of care [22].

**Relationships between knowledge, attitude and practice**

The study presented moderately positive significant relationship between knowledge and attitude regarding prevention and care of PU. Based on KAP model, the factor that could affect attitude is specific based knowledge. Subsequently, the findings of this study support the KAP model. This may be because caregivers’ attitude was influenced by age group, educational status and relationship between caregiver and patient. A study conducted in Pakistan, demonstrated that poor or appropriate knowledge was significantly associated with development of PU where level of knowledge was based on the training and occupation of the participants. Meanwhile, attitude and practice were also significantly associated with the increased level of knowledge [12]. It showed that the caregivers who were wife of the SCI individual and in the active phase of life along with higher education demonstrated positive attitude. Therefore, knowledge in itself is related to caregiver’s development of attitude. According to the KAP model, changes in the knowledge and attitude of individuals can affect practice. In this regard, caregivers need further continuing education and training programs regarding prevention and care of PU that could influence positive attitude ultimately, leading to effective practice towards prevention and care of PU. Previous studies showed relationship between knowledge and attitude but not with the practice. The high level of knowledge shows a positive attitude, while there was no relation between the knowledge and practice.
score [23]. There was a moderate, significant positive correlation between knowledge and practice regarding prevention and care of PU among the caregivers. These findings support the KAP model in which practice is influenced by knowledge. A study revealed that caregivers had unsatisfactory knowledge and inadequate performance, where training and educational program enhances knowledge and practice of caregivers [4]. However, there was a little and non-significant relationship between attitude and practice regarding prevention and care of PU. The KAP model suggests that if attitude developed, they would reflect on practice. Hence, in this study, caregivers’ practice was not reflected by their attitude.

It is recommended that caregivers need up-dated knowledge and information about prevention and care of PU in order to improve their practice. It needs special attention for improving the support systems for persons with SCI during the acute rehabilitation and reintegration phases in Bangladesh. If adequate knowledge is provided to caregivers, then it will assist them to cope with the stress and develop positive attitude towards PU care which enhance the quality of life of themselves and the sufferer. The study presents the findings of KAP of caregivers towards prevention and care of PU in a rehabilitation setting. However, after discharged from the rehabilitation center the maximum number of deaths due to PU have occurred in home. In community settings, the KAP of the caregivers towards PU may be different. Therefore, it is suggested to conduct the study of KAP among caregivers towards prevention and care of PU in spinal cord injury patients, in the community to reveal the findings related to the prevention and care of PU at both levels.

**Conclusion**

The caregivers knowledge and practice was at moderate level whereas attitude was neutral regarding prevention and care of PU. This indicated that caregivers lack sufficient knowledge and are compelled for patient care against their interest also, their practice was not very satisfactory. There was a positive correlation between caregivers’ knowledge and attitude ($r = 0.30, p < 0.01$), and between knowledge and practice ($r = 0.37, p < 0.01$) regarding prevention and care of PU. In contrast, no correlation existed between caregivers’ attitude and practice ($r = 0.12, p > 0.05$) regarding prevention and care of PU.

**Declarations**

**Data Archiving**

The data of this article is available in the DSpace repository of CRP library under MSc in Rehabilitation Science which is publicly available:


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**Statement of Ethics**

The Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) approved this study with the reference number Ref. CRP-BHPI/IRB/12/17/182. The study involved human volunteers and all the ethical regulations were followed during the course of this research.

**Conflicts of Interest**

The authors declare that there is no conflict of interests regarding the publication of this paper.

**Authors Contributions**

N.S.T. designed the study and prepared the questionnaire. N.S.T. and S.B. collected the data and performed data entry. N.S.T. and M.A.K. contributed to the interpretation of results and statistical analysis. M.A.K supervised the project. N.S.T. and M.A. wrote the manuscript. All authors provided critical feedback and discussed the results.

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**References**


Tables

Table 1: Socio-demographic characteristics of the respondents (n=127)
<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>Variables</th>
<th>n (%)</th>
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</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td><strong>Occupational status</strong></td>
<td></td>
</tr>
<tr>
<td>18 - 27</td>
<td>31 (24.4)</td>
<td>Housewife</td>
<td>88 (69.3)</td>
</tr>
<tr>
<td>28 - 37</td>
<td>30 (23.6)</td>
<td>Agriculture</td>
<td>13 (10.2)</td>
</tr>
<tr>
<td>38 - 47</td>
<td>37 (29.1)</td>
<td>Service</td>
<td>8 (6.3)</td>
</tr>
<tr>
<td>48 - 57</td>
<td>23 (18.1)</td>
<td>Business</td>
<td>2 (1.6)</td>
</tr>
<tr>
<td>57 years and Above</td>
<td>6 (4.7)</td>
<td>Student</td>
<td>8 (6.3)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td><strong>Factory worker</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>30 (23.6)</td>
<td>Others</td>
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<tr>
<td>Female</td>
<td>97 (76.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educational status</strong></td>
<td></td>
<td><strong>Living area</strong></td>
<td></td>
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<tr>
<td>No formal education</td>
<td>47 (37.0)</td>
<td>Rural</td>
<td>104 (81.9)</td>
</tr>
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<td>Primary education</td>
<td>32 (25.2)</td>
<td>Semi-urban</td>
<td>2 (1.6)</td>
</tr>
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<td>Secondary education</td>
<td>24 (18.9)</td>
<td>Urban</td>
<td>21 (16.5)</td>
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<td>Higher secondary education</td>
<td>17 (13.4)</td>
<td>Relationship between caregiver and patient</td>
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<tr>
<td>Graduate and Above</td>
<td>7 (5.5)</td>
<td>Mother</td>
<td>25 (19.7)</td>
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<tr>
<td><strong>Marital status</strong></td>
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<td>Father</td>
<td>7 (5.5)</td>
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<tr>
<td>Unmarried</td>
<td>15 (11.8)</td>
<td>Wife</td>
<td>52 (40.9)</td>
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<td>Married</td>
<td>110 (86.6)</td>
<td>Husband</td>
<td>2 (1.6)</td>
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<td>Widowed</td>
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<td>Sister</td>
<td>8 (6.3)</td>
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<tr>
<td>Separated</td>
<td>0 (0.0)</td>
<td>Brother</td>
<td>15 (11.8)</td>
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<tr>
<td><strong>Caregiver residence status</strong></td>
<td></td>
<td>Others</td>
<td>18 (14.2)</td>
</tr>
<tr>
<td>Lives together with patient</td>
<td>105 (82.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives separately from patient</td>
<td>22 (17.3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(M=38.21, SD=11.95, Min=18, Max=72)

(n = No. of respondents)
Table 2: Pearson correlation coefficients showing the relationship between caregivers KAP regarding prevention and care of PU

<table>
<thead>
<tr>
<th></th>
<th>Knowledge</th>
<th>Attitude</th>
<th>Practice</th>
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</thead>
<tbody>
<tr>
<td>Knowledge</td>
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<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.30*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td>0.37**</td>
<td>0.12</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001 (p ≤ 0.05, considered as statistically significant)