ORIGINAL ARTICLE

Pressure Ulcers and Their Associated Factors in Nursing Home Inmates

Nazan Kilic Akca[1], Gökcen Aydin[2] and Kenan Gümüs[3]

ABSTRACT

Objective: To assess pressure ulcers and the associated risk factors, among the individuals who stayed at Yozgat Rehabilitation Care Center in Turkey.

Study Design: A descriptive study.

Place and Duration of Study: Yozgat Rehabilitation Care Center, Turkey, from August to September 2011.

Methodology: One hundred and seventy five individuals participated in the study who received care at the above nursing home and agreed to participate in the study. The data were collected with an information form of descriptive characteristics (the form included a total of 15 questions asked to get information about socio-demographic characteristics) and Braden risk assessment scale. For the data evaluation, Mann-Whitney U-test, Krushall-Wallis Variance analysis, Logistic Regression analysis were used. Statistical significance was defined by a probability level of $p < 0.05$.

Results: The mean score of Braden risk assessment scale of the individuals was 15.0 ± 3.3 and 16.0% were under very high risk. Nine (5.1%) had pressure ulcers. The average duration of stay was 2.17 ± 0.80 years. Participants who were underweight, had lived at the rehabilitation center for a longer time, and were fed on regime 1, had a higher risk of developing pressure ulcers ($p < 0.001$).

Conclusion: Individuals who stayed in nursing home were under very high risk of pressure ulcer. Pressure ulcers are preventable by the elimination of some risk factors and good nursing care. Such individuals should be periodically assessed in terms of risk.

Key Words: *Pressure ulcer. Braden risk assessment scale. Nursing home.*

INTRODUCTION

While the improvement in the care and rehabilitation services has prolonged life span; it had also augmented the number of the bed and chair bound people, which had caused an increase in the rate of pressure ulcer. A pressure ulcer is defined as an ischemia, dead cell and tissue necrosis caused by circulatory disorder usually over a bony prominence as a result of pressure. Three to 11% of the bed bound people experience pressure ulcer; however, 80% of pressure ulcers and risk factors are preventable.[1-3]

Though prevalence of pressure ulcer depends on the type of the patient group investigated, it varies from 1.4% and 36.4%.[4] Pressure ulcer, which can be prevented with preventive measures, are important quality indicators at nursing homes and intensive care units.[1] Pressure ulcer is a significant health problem which increases the risk for morbidity and mortality, prolongs hospital stay and augments treatment costs. Pressure ulcers not only deprive a person of his physical health but also cause such psychological problems as social isolation and loss of independency. The prevention and treatment of pressure ulcers are today significant indicators of a nursing care of high quality.[5]

Although pressure ulcer is often seen in our country, there are poor statistical data so it is impossible to estimate economical burden created by pressure ulcer on the economy and its incidence definitively. Although guide-books have been designed from the evidence-based nursing studies to prevent and to treat pressure ulcer, the guide-books are not adequately used in the clinical practices.

This study was conducted to determine the frequency and associated risk factors for pressure ulcer among the inmates of Yozgat Rehabilitation Care Center in Turkey.

METHODOLOGY

This study was conducted to assess risk factors for pressure ulcer in Yozgat Rehabilitation Care Center in Turkey. The nursing home has a 250 bed-capacity and 232 individuals who are cared for. One hundred and seventy five individuals volunteered to participate in the study. This study was completed in the August-September 2011 and included those who received care at the nursing home and who agreed to participate in the study.

Information form of descriptive characteristics and Braden risk assessment scale were used for data collection. Information form of descriptive characteristics included a total of 15 questions to get information about socio-demographic characteristics, medical diagnosis,

[1] *Department of Medicine / Surgery[2], Bozok University School of Health, Turkey.*

[3] *Department of Surgery, Ataturk Faculty of Health Sciences, Turkey.*

Correspondence: Dr. Nazan Kilic Akca, Department of Medicine, Bozok University School of Health, Turkey.
E-mail: nazanakca7@hotmail.com

Received: January 03, 2013; Accepted: October 01, 2014.

length of stay at the nursing home, BMI (the data obtained were grouped into the following criteria established by the World Health Organization), diet, skin turgor, state of bed boundness, presence of pressure ulcer and stages and location of pressure ulcer.

Braden Risk Assessment Scale (BRAS) had six subscales of sensory perception, moisture, activity, nutrition, friction, and shear.[7] Total score is obtained by adding the scores of the subscales and it varies between 6 and 23. A lower score indicates higher risk for pressure ulcer development. An individual with a score of ≤ 12 has high risk for pressure ulcer development; a score of 13 - 14 indicates moderate risk and a score between 15 and 16 demonstrates low risk.[6,8] Written official permission to undertake this study was gained from the Management of the nursing home. Informed oral consent was obtained from each participant and their relatives. Information form of descriptive characteristics was filled in using a face-to-face interview technique and then the researchers assessed the risk for pressure ulcer development of the individuals using Braden risk assessment scale.

For the analysis of the data; such descriptive statistical methods as percentages and mean values were used. For the data evaluation; Kolmogrov-Smirnov test, Shapiro-Wilk test, for the binary variable; Mann-Whitney U-test (chronic disease, mental retardation, mental status), for the triple and four variable; Kruskall-Wallis variance analysis (age, body mass index, duration at the rehabilitation center, diet) were used. Logistic regression analysis were used to determine variables effect of the risk of pressure ulcers.

Logistic regression analysis odds ratio with 95% CI for the development of Braden score scale (Braden score < 15) in association with potential confounding variables (mental status, age, body mass index, duration at the rehabilitation center, diet) were calculated on the basis of logistic-regression analysis. For all analyses, statistical significance was defined by a probability level of $p < 0.05$ and 95% confidence intervals were calculated. The statistical analysis was done through Statistical Package for Social Sciences (SPSS) version 13.

The participants were informed of the purpose of the research and informed written and verbal consents of those who agreed to participate in the study and of their relatives were obtained. Participants were assured of their right to refuse to participate or to withdraw from the study at any stage. The confidentiality of participants were guaranteed.

RESULTS

The mean age of the participants was 44.0 ± 18.6 years (18, 103 years); 96 (54.9%) were women and 133 (76.0%) were illiterate. It was determined that 133 (76.0%) of the participants were suffering from at least one chronic disease, 34 (19.4%) were underweight (BMI < 18.5 kg/m^2) and 58 (33.1%) were bedbound. It was noted that more than half (n=100, 57.1%) were disoriented in time and place and nearly half of them (n=82, 46.9%) received a sedative treatment. Seventy four (42.3%) participants had stayed at the nursing home for more than 3 years, 9 (5.1%) had pressure ulcers over patella and coccyx and 6 (3.4%) of these ulcers were stage-2. The mean BRAS score was 15.0 ± 3.3 and 28 (16.0%) were under very high risk (Table I).

Table I: According to Braden risk assessment scales dispersion of risk for pressure ulcer (n= 175).

Risk level for pressure ulcer	n (%)
Braden risk assessment scale score of average 15.0 ± 3.3	
Very high risk	28 (16.0)
High risk	62 (35.4)
Risk only modestly	35 (20.1)
Risk-Border	48 (27.4)
No risk	2 (1.1)

Table II: The distribution of Braden risk assessment scales scores according to the risk factor for pressure ulcer (n=175).

Risk factor Braden scale score	
Age *	
17 - 30[1]	54.79
31 - 45	90.19
46 - 59	114.50
60 and upper	107.06
KW = 43.36 p < 0.001	
Body mass index*	
Underweight[1]	37.54
Normal	94.94
Overweight	111.58
Obese	104.12
KW=45.183 p < 0.001	
Duration at the rehabilitation center*	
0 - 1 year	89.16
2 - 3 years	73.31
3 years and upper[1]	98.84
KW= 8.368 p=0.015	
Diet	
R1[1]	23.03
R2	121.43
R3	92.02
KW= 44.180 p < 0.001	
Chronic disease**	
Yes	14.00 (5.5)
No	15.00 (3.25)
MW-U =2701.500 p=0.748	
Mental retardation**	
Yes[1]	13.00(3)
No	17.00 (5)
MW-U =1809.500 p < 0.001	
Mental status**	
Oryante	17.00 (4)
Disoryante[1]	13.00 (3)
MW-U =1902.500 p < 0.001	

** KW = Kruskal Wallis test (mean rank).*
*** MW-U = Mann-Whitney U-test (interquartile range).*
[1] This group is differrent from the others.

Table III: The results of logistic regression analysis: the effect of the risk factors of pressure ulcer to Braden risk assessment scales scores (n=175).

Variables	B	Wald	p-value	Exp(B)	% 95.0 CI for EXP(B)	
					Lower	Upper
Duration at the rehabilitation (Ref.1 and lower)	0.79	0.041	0.840	1.082	0.502	0.2334
Age (Ref.31 and lower)	-1.965	26.952	< 0.001	0.140	0.067	0.294
Diet (Ref.Rejim 3)	0.396	0.008	0.315	0.673	0.311	0.1458
Mental status (Ref. Disoryante)	-1.467	16.610	< 0.001	0.231	0.114	467
Body mass index (Ref. obese)	1.335	11.852	< 0.001	3.79	1.777	8.121
Fix	-0.286	0.231	0.681	0.751	-	-

When distribution of scores of Braden risk assessment scale of the participants, who stayed at the nursing home was examined in terms of age groups, it was seen that the statistical difference between the groups was highly significant ($p < 0.001$, Table II). In the advanced analysis, it was determined that 17 - 30 years age group was under the highest risk for pressure ulcers.

It was determined that in low BMI individuals, BRAS scores were lower than those of the other groups. This means that the underweight group (BMI < 18.5) was the group at risk for pressure ulcer ($p < 0.001$, Table II). It was noted that these people were 3.79 times likely to develop pressure ulcer as compared with the obese group (BMI > 25.0), ($p < 0.001$, Table III).

It was found out that risk level of pressure ulcer increased among those who got Regime I diet (liquid foods like tea, fruit juice), were disoriented and stayed at the nursing home longer. The difference between the groups was statistically and highly significant ($p < 0.001$, Table II). As shown in Table III, it was noted that disoriented people were under bigger risk and were 0.23 times likely to develop pressure ulcer as compared with oriented people ($p < 0.001$).

DISCUSSION

Pressure ulcers is a common health problem seen in nursing home. It was found in this study that 5.1% of the individuals who stayed at the nursing home had pressure ulcer and 28.0% were under high risk. The relevant studies indicated that prevalence of pressure ulcer of individuals who received care at the nursing homes ranged from 2.0 - 33.3.0%.[1,9-11] In a study by Lahman *et al*., it was reported that two-third of the individuals who stayed at the nursing homes were under risk.[9] The study findings were in agreement with other studies.

It was established that those who belonged to 17 - 30 age group were subjected to more risk for pressure ulcer ($p < 0.001$). That the risk of this group was higher resulted from the fact that the number of the disabled people and bedbound people was larger. Aydin and Mucuk (2014) found that individuals who were dependent according to activities of daily living scale and instrumental activities of daily living scale were at increased risk for the development of pressure ulcers.[12] It was also found out in other studies that there was a significant correlation between dependency and pressure ulcer.[13,14] Since development of pressure ulcer is correlated with length of pressure, immobility is an important risk factor. The degree of the immobility of the individuals is also vital. Physical limitations on chair or bed deteriorate movements and may at the same time cause pressure.

In this study, it was noted that risk for pressure ulcer among the underweight individuals (BMI < 18.5) was significantly higher than other groups. In the underweight individuals, risk for pressure ulcer development increases because of friction and pressure caused by the less tissue density that serves as a layer between skin and bone edges is lost. In the study by Almann *et al*., it was reported that there was a significant correlation between cachexia and pressure ulcer.[14,21,22]

The studies conducted found out that nutritional status and having Regime I (liquid foods) affected risk for pressure ulcer development for development of hypoalbuminemia sore risk.[15-17,21] In this study, it was determined that those having Regime I diet had higher risk for pressure ulcer ($p < 0.001$).

Mental retardation and disorientation affect individuals' perception of stimuli and prevent suitable reaction to these stimuli as well as restrict position-change and complicate their expressing the presence of pain and limit activities of living; all of which increases their predisposition to pressure ulcer.[18,19,21,22] It was pointed out in this study that BRAS scores of the individuals with mental retardation and disorientation were lower than other groups ($p < 0.001$). In the study of Tel *et al*., it was discovered that a significant correlation existed between mental status and pressure ulcer.[23]

In this study, it was observed that there was a meaningful correlation of BRAS scores and length of stay at nursing home and that as the length of stay

increased so did risk for pressure ulcer development ($p < 0.001$).

Nursing homes have been serving in Turkey since 2004 but no studies to evaluate the rate of pressure ulcer and its risk level have so far been performed at these homes. This study will be the foundation of prospective studies on the prevention of pressure ulcer both at the current nursing home and other centers because the number of the nursing homes has been increasing in our country.

CONCLUSION

In the light of these findings; it is recommended that individuals who are treated at the rehabilitation centers should periodically be assessed in terms of risk using risk assessment scales for pressure ulcers; preventive care interventions that include skin care, movement, position-change and nutrition should effectively be continued in collaboration with the patients diagnosed with pressure ulcer risk; preventive protocols against pressure ulcer should be designed for those patients under risk.

REFERENCES

1. Sendir M, Büyükyılmaz F, Aktas A. Doku Bütünlügünün saglanması ve yara bakimi, Hemsirelik Esasları, Atabek AT, Karadag A (eds). *Akademi Basın Evi, Istanbul* 2012; 488-530.
2. Dündar D, Özcan Keçeli S, Atmaca E. Evde Bakım Hizmeti Verilen Hastaların Basi Yaralarındaki Yüzeyel Kolonizasyonun Mikrobiyolojik Incelenmesi. *Kocatepe Med J* 2012; **13**:27-32.
3. Spector WD, Kapp MC, Tucker RJ, Sternberg J. Factors associated with presence of decubitus ulcers at admission to nursing homes. *Gerontologist* 1988; **28**:830-4.
4. Young L. Pressure ulcer prevalence and associated patient characteristics in one long-term care facility. *Decubitus* 1989; **2**:52.
5. Ay FA. Temel Hemsirelik Kavramlar, Ilkeler, Uygulamalar (1. Baskı), *Istanbul Medikal Yayıncılık* 2007: 205-21.
6. Pınar R, Oguz S. Norton ve Braden Bası Yarası Degerlendirme Ölçekleri nin yataga bagımlı aynı hasta grubunda güvenirlik ve geçerliginin sınanması, Uluslar arası Katılımlı VI. Ulusal Hemsirelik Kongresi, Kongre Kitabı, Ankara, 1998; 172-175.
7. Bergstrom N, Braden B, Kemp M. Multi-site study of incidence of pressure ulcers and the relationship between risk level, demographic characteristics, diagnoses, and prescription of preventive ınterventions. *JAGS* 1996: **44**;22-30.
8. Potter PA, Perry AG. Fundamentals of nursing (7th ed.) Missouri: *Mosby*, 2009; 1278-1308.
9. Lahmann NA, Halfens RJG, Dassen T. Pressure ulcers in German nursing homes and acute care hospitals: prevalence, frequency, and ulcer characteristics. *Ostomy Wound Manage* 2006; **52**:20-33.
10. Horn SD, Bender SA, Bergstrom N, Cook AS, Ferguson ML, Rimmasch HL, *et al.* Description of the national pressure ulcer long-term care study. *Am Geriatrich Society* 2002; **50**:1816-25.
11. Brandeis GH, Morris JN, Nash DJ, Lipsitz LA. The epidemiology and natural history of pressure ulcers in elderly nursing home residents. *JAMA* 1990; **264**:2905-9.
12. Aydin G, Mucuk S. The evaluation of daily living activities, pressure sores and risk factors. Rehabilitation nursing http://onlinelibrary.wiley.com/doi/10.1002/rnj.145/full.
13. Shahin E, Meijers M, Schols A. The relationship between malnutrition parameters and pressure ulcers in hospitals and nursing homes. *Nutrition* 2010: **26**;886-9.
14. Almann RM, Goode PS, Patrick MM. Pressure ulcer risk factors among hospitalized patients with activity limitation. *JAMA* 1995; **273**:865-70.
15. Thomas DR. Improving outcomes of pressure ulcers with nutritional interventions: a review of the evidence. *Nutrition* 2001; **17**:121-5.
16. Kurtulus Z, Pınar R. Braden skalası ile belirlenen yüksek riskli hasta grubunda albumin düzeyleri ile bası yaraları arasındaki iliski. *C.Ü. Hemsirelik Yüksekokulu Dergisi* 2003; **7**:1-8.
17. Westergren A, Karlsson S, Ohlsson O. Eating diffuculties, need for assisted eating, nutritional status and pressure ulcer in patient admitted for stroke rehabilitation. *J Clin Nurs* 2001; **10**:257-69.
18. Lepistö M, Erikson E, Hietanen H, Asko-Seljavaara S. Patient with pressure ulcers in Finnish hospitals. *Int J Nurs Pract* 2001; **7**:280-5.
19. Bender SA, Ferguson ML, Smout RJ, Bergstrom N, Taler G, Cook AS, *et al.* The national pressure ulcer long-term care study: pressure ulcer development in long-term residents. *J Am Geriatr Soc* 2004; **52**:359-63.
20. Meesterberends E, Halfens JGR, Spreeuwenberg MD, Ambergen TAW, Lohrmann C, Neyens JCL, *et al.* Patients in Dutch nursing homes have more pressure ulcers than patients in German nursing homes? A prospective multicenter cohort study. *J Am Med Dir Assoc* 2013; **14**:605-10.
21. Coleman S, Gorecki C, Nelson EA, Closs SJ, Defloor T, Halfens R, *et al.* Patient risk factors for pressure ulcer development: systematic review. *Int J Nurs Stud* 2013; **50**: 974-1003.
22. Bergstrom N, Horn S, Rapp MP, Stern A, Barrett R, Watkiss M. Turning for ulcer reduction: a multisite randomized clinical trial in nursing homes. *J Am Geriatr Soc* 2013; **61**:1705-13.
23. Tel H, Ozden D, Çetin G. Determination of risk for pressure ulcer development in bedridden patients and preventive measures that nurses use for these patients. *Hemsirelikte Arastırma Gelistirme Dergisi* 2006; **1**:35-45.