Reduction of the Incidence of Pressure Sores by an Education Program on Nursing Care

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Objectives: *To determine whether an education and campaign program would reduce the incidence of pressure sores.*
Material and Method: *The study was performed in a 1,400-bed teaching hospital in Thailand with a total number of 697 patients from 47 wards for a point prevalence study ; 1,201 and 1,268 patients from 12 wards to determine whether reduction of pressure sore occurrence would be obtained by an education program.*
Results: *The point prevalence of pressure sores was 10.8%. The significant risk factors were age older than 60 years, fecal incontinence, and history of diarrhea. The occurrence of pressure sores was significantly reduced after the educational program from 9.91% to 5.76%. The education on patient care aiming at reduction of the occurrence of pressure sores could be adopted nation-wide in order to reduce the morbidity, mortality and expenses.*
Conclusion: *The education program was effective in reducing the incidence of pressure sores.*

Keywords: *Incidence, Pressure sores, Education, Nursing care*

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Pressure sores are common complications found in patients who are comatose, paraplegic, or severely ill. The condition results from prolonged pressure onto the skin over prominent bones leading to tissue ischemia and ulceration. The pressure on the affected skin could be due to direct pressure, friction, or shearing forces. Normal capillary pressure in the skin is about 28-32 mmHg, which is sufficient for carrying nutrients and oxygen to skin tissue. When there are forces onto the skin that create pressure over 70 mmHg for longer than 2 hours, the skin cells would die off and become ulcerated. Contributory factors for pressure sores are : moisture of the skin, age of the patients, impairment of consciousness, vascular insufficiency, and malnutrition.

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The prevalence of pressure sores in England was about 5.0-10.0% in patients admitted in a hospital[1]. The prevalence in the US has been reported to be 1.4-36.4% of whom 50% were over 70 years old[2] and the prevalence was higher in elderly patients with broken femur (66-73%)[3,4]. The prevalence of pressure sores was reported at 8.7% in Thai hospitals[5].

Pressure sores increase duration of hospitalization, medical expenses, and other complications. There was a report that patients with pressure sores who were hospitalized for 7 days cost an extra 50,976 US dollars and if a special bed for pressure sores was needed, the cost would increase by 40-85 US dollars/day[2]. A study in Thailand in 30 pressure sores patients showed that the medical expenses for treatment of pressure sores was 1,167,926 baht or 48,765 baht/patients (40 baht = 1 US dollar)[6]. The mortality rate increased by 4 folds in pressure sore patients[7].

Pressure sores can reflex the quality of health care management in a hospital. Proper approach to prevent pressure sores could reduce morbidity/mortality and medical expenses. Such an approach has been reported to reduce the annual expense of 1,335 billion US dollars by 3%, or 40 billion US dollars could be saved each year in the United States[8].

The aim of the present study was to determine the efficacy of an education program on prevention of pressure sores by improving nursing care on the incidence of pressure sores in a university hospital in Thailand.

Material and Method

Prevalence study

The prevalence of pressure sores was determined in 697 patients admitted in 47 wards in February 2002.

Study of risk factors and effects of management intervention relating to the incidence of pressure sores :

Twelve wards were included in the present study to determine the risk factors of pressure sores. Development of improved quality of nursing care of pressure sores and personnel education were performed during the period of January to November 2002. The incidence of pressure sorse was recorded in two stages, pre-intervention and post-intervention. The information on pressure sores was recorded by the use of closed-end or fill-in-the-blank survey questionnaires for relevant demographic data including urinal and fecal incontinence. The risk of pressure sores was calculated using the Braden scale assessing the patients' skin sensation, skin moisture, patients' movement and activity, nutrition, and forces imposed on skin.[9] The score of 16 indicated risk of having pressure sores, and lower score indicated higher risk.

Statistic analysis

The statistic analysis was performed using the SPSS software. The relative risk and related risk factors were analyzed using Chi square test. The comparison of the incidence of pressure sores at pre-intervention and post-intervention stages was calculated using Chi square test and multiple logistic regression analysis.

Results

The point prevalence of pressure sore as determined in 47 wards from February 17 to 19, 2002 in 697 patients was 10.8%. The most affected site of pressure sores was the sacral area. The highest prevalence was found in surgical, followed by orthopedics and medical wards, respectively. The number of sites and degree of pressure sores are summarized in Table 1.

There were 1201 patients in 12 different wards monitored for the occurrence of pressure sores from June to July 2002, the pre-intervention phase. The pressure sores were found in 119 patients (9.91%) with a total of 204 sites. Positive correlation was found in all factors except body mass index (Table 2).

The odd ratios and p values of each related factors analyzed by multiple logistic regression are shown in Table 3.

By multiple logistic regression, only age over 60 years, fecal incontinence and history of diarrhea were significantly correlated with the incidence of pressure sores. The correlation of Braden's scale and the occurrence of pressure sores is shown in Table 4.

The incidence of pressure sores was determined in 1268 patients in the post-intervention stage, December 2002-Janury 2003. It was found to be decreased from 9.91% in the preintervention phase to 5.76% ($p<0.001$). The reduction rate of the pressure sores indicated that the education program was effective in reducing the incidence of pressure sores.

Discussion

The main purpose of the present study was to assess the efficacy of the training program in improving the quality of nursing care in the prevention of

Table 1. Point prevalence of pressure sores in 47 wards

Number of sites/patients	Number of affected patients (n=75)	%
1	47	62.7
2	12	16.0
3	7	9.3
4	7	9.3
8	2	2.7
Severity of pressure sore*[10]	**Number of sites (n=137)**	**%**
1	32	23.4
2	82	59.9
3	9	6.6
4	14	10.2

*Pressure sores were graded; 1, least severe; 4, most severe[8]

Table 2. The correlations of different risk factors and occurrence of pressure sores

Factors	Risk Factors	Number of patients	%	Number of affected patients	%	Relative risk	X^2 test	p
Sex	Male	795	66.2	85	10.0	1.27	1.617	0.024
	Female	406	33.8	34	8.4			
Age	≤60y	795	67.3	58	7.3	2.12	19.51	<0.001
	>60y	387	32.7	60	15.5			
Underlying diseases*	Presence	323	26.9	45	13.9	1.65	8.012	0.005
	Absence	878	73.1	78	8.4			
Body mass index	≤25	454	87.3	26	5.7	1.27	0.153	0.696
	>25	66	12.7	3	4.56			
Serum albumin	<3.5 g/dl	182	64.5	43	23.6	2.62	9.180	0.002
	≥3.5 g/dl	100	35.5	9	9.0			
Urine incontinence	Yes	75	6.2	26	34.7	4.18	54.931	<0.001
	No	1126	93.8	98	8.7			
Fecal incontinence	Yes	149	12.4	60	40.3	7.20	175.643	<0.001
	No	1052	87.6	59	5.6			
History of diarrhea	Yes	36	3.0	13	36.1	3.97	28.545	<0.001
	No	1165	97.0	106	9.1			
Medication**	Yes	225	18.7	32	14.2	1.70	5.772	0.016
	No	976	81.3	87	8.9			

* History of hypertension or diabetes mellitus.
** Medicine affecting the consciousness, incontinence or wound healing, such as tranquilizers, muscle relaxants, anticonvulsants, laxatives, diuretics, and steroids

Table 3. The related factors and their calculated odd ratios, 95% confidence interval, and p value

Related factors	OR	95% CI	p
Age > 60 y	2.60	1.16-5.78	0.019
Urine incontinence	1.59	0.50-4.99	0.424
Fecal incontinence	15.01	6.02-37.39	<0.001
History of diarrhea	7.89	1.85-33.51	0.005
Medication	0.92	0.40-2.13	0.857
Low serum albumin	2.07	0.80-5.34	0.130
Underlying diseases	0.65	0.28-1.54	0.337

pressure sores. Its prevalence rates in the present study and others in Thailand were similar to those in other countries[1,2]. The prevalence rate found in the present study was as high as 10.8% in this tertiary care hospital (Table 1). This prompted the authors to set up the education program. The nurses who participated in the

Table 4. The correlation of Braden's scores and the occurrence of pressure sores

Score	Number (n=1198)	Pressure sores	%	Relative risk	X^2	p
≤16	302	104	34.4	20.3	271.001	<0.001
>16	896	15	1.7			

present study were from 12 different wards. They were given practice guidelines on the prevention of pressure sores. The guidelines emphasized on the management of risk factors of pressure sores identified in the present study (Tables 2 and 3). They included old age, male patients, underlying diseases, low serum albumin, incontinence of urine and feces and certain medication. The findings indicated that these were the main risk factors of pressure sores in hospitals reported elsewhere[11,12]. By analysis with multiple logistic regression, only old age, fecal incontinence and history of diarrhea remained significally correlated with the occurrence of pressure sores (Table 3).

The education program consisted of the establishment of the practice guidelines on pressure sores prevention. It was formulated by literature review and by brain storming among the participating nurses. Risk assessment is the most important initial step in nursing care. Details of general care, nutrition support, moving patients, increasing the blood supply and positioning patients were all included in the written guidelines. Small group discussion was encouraged for sharing experience among nurses. After the education program, the guidelines were implemented in 12 wards. The incidence rate of pressure sores 119 in 1201 patients (9.91%) in June-July 2002 (pre-intervention) was reduced to 73 in 1268 patients (5.76%) in December 2002-January 2003 (post-intervention). The reduction of incidence of pressure sores after the education program was statistically significant.

Conclusion

The education program on the improving quality of nursing care was effective in reducing the incidence of pressure sores.

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การลดอุบัติการณ์การเกิดแผลกดทับโดยการให้การศึกษาการดูแลผู้ป่วย

วิจิตร ศรีสุพรรณ, วิลาวัณย์ เสนารัตน์, วิลาวัณย์ พิเชียรเสถียร, จิตตาภรณ์ จิตรีเชื้อ, มาลินี วัฒนากูล, ประทิน ไชยศรี, ลัดดาวัลย์ สิงห์คำฟู, ชาญวิทย์ ตรีพุทธรักษ์, สมหวัง ด่านชัยวิจิตร

วัตถุประสงค์ : *ประเมินประสิทธิผลของการให้การศึกษาเพื่อพัฒนาคุณภาพการพยาบาลในการลดอุบัติการณ์ของแผลกดทับ*

วัสดุและวิธีการ : *ศึกษาอัตราชุกของแผลกดทับในโรงพยาบาลตติยภูมิขนาด 1,400 เตียง ในพ.ศ. 2545 การให้การศึกษาและคู่มือการปฏิบัติแก่พยาบาลเพื่อป้องกันแผลกดทับ ประเมินประสิทธิผลของการให้การศึกษา โดยการศึกษาอัตราการเกิดแผลกดทับก่อนและหลังให้การศึกษา*

ผลการศึกษา : *อัตราชุกของแผลกดทับ 10.8% ปัจจัยสำคัญของการเกิดแผลกดทับคือ อายุมากกว่า 60 ปี ประวัติของอุจจาระร่วง และกลั้นอุจจาระไม่ได้ อุบัติการณ์ของแผลกดทับลดลงจาก 9.91% ก่อนให้การศึกษาเหลือ 5.76% หลังให้การศึกษา*

สรุป : *การให้การศึกษาสามารถลดอุบัติการณ์การเกิดผลกดทับ*