

The Effect of Implementing Pressure Ulcer Prevention Educational Protocol on Nurses' Knowledge, Attitude and Practices

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Abstract

Background: Pressure ulcer represent a significant burden to the patient, family and healthcare organization. It has a great impact on quality of life physically, psychologically and socially leading to pain, increase a length of hospitalization and rehabilitation.

Aim: To determine the effect of implementing pressure ulcer prevention educational protocol on nurses' knowledge, attitude and practice.

Methods: A quantitative quasi-experimental study. A convenience sample of 100 nurses were voluntarily participate in the study.

Setting: The study carried out at AL Noor Specialist Hospital.

Tools: Nurses knowledge was measure by knowledge test; attitude was measured by nurses' attitude questionnaire and nurses practice was measure by observation checklist. Data were collected immediately before the educational session, immediately after the session, two weeks and one month after intervention.

Result: The result revealed a positive association between pressure ulcer educational protocol prevention and nurses' knowledge, attitude and practice to ward pressure ulcer prevention. The pretest result indicated that nurses' knowledge was a moderate level (74.05% SD \pm 13.499), nurses attitude was positive (42% SD \pm 4.767) and nurses practice was (67% SD \pm 2.983). However, the mean percentage of all posttest showed a significant increase in nurses' knowledge, attitude and practice.

Conclusion: The pressure ulcer prevention educational protocol is an effective tool to improve and update nurses' knowledge, attitude and practice toward PU prevention. The result of current study indicates the important of ongoing nurses' education regarding PU prevention.

Recommendation: developing a continuous educational program to improve nurses' knowledge, attitude and practice toward pressure ulcer prevention

Keyword: Nurses' knowledge, attitude, practice and PU prevention.

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I. Introduction

Pressure ulcer (PU) represent a significant burden to the patient, family and healthcare organization. It has a great impact on quality of life physically, psychologically and socially leading to pain, increase a length of hospitalization and rehabilitation (Stevenson et al., 2013). According to (Briggs et al., 2013), PU had been recognized as one of most physically and financial debilitating complication in the 20th century, that affect all age group in both hospital and community setting (Barker et al., 2013). However, the risk increase in elder individual, immobilized and patient with neurological deficit (Qaddumi & Khawaldeh, 2014). Despite, availability of all resources needed to prevent PUs, it reminds one of the health issues affecting many health care organizations (Barker et al., 2013).

PU poses an increasingly serious challenge for global health systems that must be confronted. Internationally in Canada and Australia the prevalence of PUs ranges from 8.3% to 25.1% (A Tubaihat, Dean, Aljezawi, & Qadire, 2013). In addition, a prevalence rate of 0.4% up to 38% was record in acute care setting in United State (Qaseem, Mir, Starkey, & Denberg, 2015) while in Middle East a prevalence rate of 12% was recorded in Jordan (A Tubaihat et al., 2013). In Saudi Arabia, 39.3% incidence of PUs were reported in two intensive care units which concluded that it's also prevalent in the Kingdom (Tayyib, Coyer, & Lewis, 2015).

Significance of the study

PU complications lead to 60,000 deaths yearly in the USA, and around 2.5 million patients will develop PUs annually in the United States (Sullivan & Schoelles, 2013). The high prevalence rate of PU reflects the quality of care. Therefore, a numbers of strategies had been used to reduce PU rate and improve patient quality of care such as- education of health care member, availability of PU guidelines and equipment used to reduce PU (Barker et al., 2013). Most of PUs are preventable through using PU guideline, which can be correctly identify population at risk (El Enein & Zaghoul, 2011). There are many common and widely accepted prevention guidelines for PU currently available. Unfortunately, adherent to PU guideline is not consistently carried out (Waugh, 2014). Literature identified that nurses knowledge regarding pressure ulcer is inadequate (Iranmanesh, Rafiei, & Forough Ameri, 2011); (El Enein & Zaghoul, 2011). And therefore, PU prevention depend on the nurses knowledge to accurately identify PU and document the finding, however several studies reveled a deficit in nurses knowledge in PU classification and documentation (A. Thomas, 2012).

Recognition of PU in early stage are needed to inhibit progression to higher stage (Aydin & Karadağ, 2010). Nurses need continuous updating on PU prevention and staging system (Cox, Roche, & Van Wynen, 2011). Inadequate level of knowledge and performance will lead to PU development or worsen of PU. The level of Knowledge, value and performance are significant to provide high quality of care (Kaddourah, Abu-Shaheen, & Al-Tannir, 2016).

II. Material and Method

Study Aim: This study aimed to determine the effect of implementing pressure ulcer educational protocol prevention on nurses' knowledge, attitude and practices.

Study Design: A quantitative quasi experimental design one group pre-posttest. The participants go through four phases of data collection as following in figure 1:

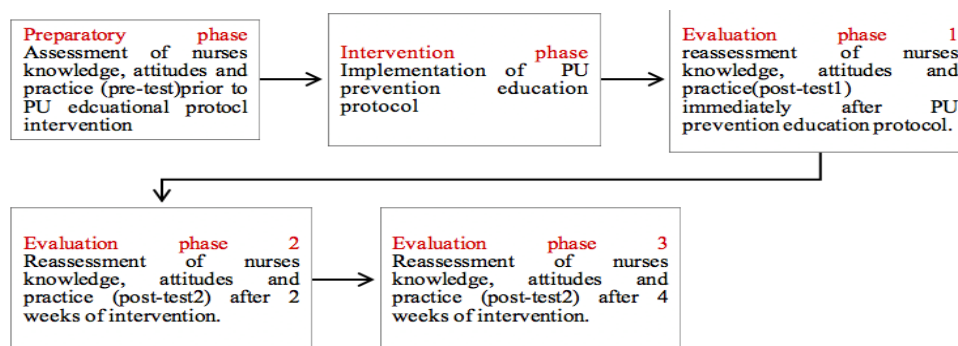


Figure1 Data Collection and Intervention Process

Study Setting: The study was conducted at Al-Noor Specialist Hospital in Makkah, Kingdom of Saudi Arabia at medical, general surgical, neurosurgical, orthopedic, coronary care unit (CCU) and intensive care unit (ICU). It is government hospital under the supervision of Ministry of Health that located at the center of the Holy City with total bed capacity of 500 beds.

Sample size: The estimated population size of participants in selected area are 200 nurses. By considering the response distribution among them as 50 % (to obtain the largest sample size, the margin of error as 5% and confidence level as 95%; the calculated sample size was 132 using Epi-info software (version 7), for sample size calculation. However, the total who participated in current study were 100 nurses due to shortage of staffs and schedule.

Study sample: A convenience sample of 100 nurses were participated from both gender who provide direct care for Immobilized / bedridden adult patients with at least six months' experience in selected units.

Study tools:

Tool I: P-Z Pressure ulcer knowledge test (PUKT). The tool was divided to two parts. Part I assessed Socio-demographic and clinical data while part II assessed nurses' knowledge to PU prevention, staging and wound description. A cutoff greater than 80% were set as passing rate for knowledge.

Tool II: Nurses' attitude structure questionnaire. The scores ranged from 11 to 55. The closer scores to 55 consider positive attitude while closer scores to 11 consider negative attitude toward PU prevention. **Tool III:** Nurses practice toward pressure ulcer prevention observational checklist developed by author. A score above 80% indicate adequate practice of pressure ulcer prevention

Ethical consideration: Official approval was obtained from ethical committee in Faculty of Nursing, King Abdulaziz University. In addition, to approval from both Makkah region ministry of health Institutional

Review Board department and Al-Noor Specialist Hospital (Review Board Committee). Ethical approval was obtained from study participants.

III. Result

1. Characteristics of study sample

Table 1 Sociodemographic Characteristic of The Study Participants (n=100)

Sociodemographic data	Participants (n=100)	
	Frequency (n)=100	Percent (%)
Age		
<30	59	59
30-40	38	38
41-51	3	3
Gender		
Male	7	7
Female	93	93
Marital Status		
Single	60	60
married	38	38
Divorce	2	2
Educational Status		
Diploma	33	33
Associated	5	5
BSN	62	62
Years of Clinical Experience		
<1	8	8
1-5	52	52
>5 - <10	27	27
10 - <15	9	9
15- <20	4	4
Area of practice		
Medical	29	29
Surgical	23	23
Orthopedic	11	11
Neurosurgical	6	6
ICU	19	19
CCU	12	12

Table 2 Clinical experienced of The Study Participants (n=100)

Clinical data	Participants (n=100)	
	Frequency (n)=100	Percent (%)
last time attended workshop o PU		
0-1 year	23	23
> 1 year -< 2 years	15	15
2- 3 years	7	7
4 years or >	2	2
Never	53	53
last time since reading an article or book about PU		
One year or less	54	54
> 1 year- < 2 years	12	12
2-3 years	11	11
4 years ->	7	7
Never	16	16
Last time since searching Web for information about PU		
No	46	46.0
0-1 year	42	42.0
> 1 year -< 2 years	7	7.0
2-3 years	4	4.0
4 years or >	1	1.0
Read NPUAP/ EPUAP guideline about PU prevention and treatment		
No	87	87.0
One year or less	12	12.0
>1 year - < 2 years	1	1.0
2-3 years	-	-
4 years - >	-	-

Table 1&2 present the distribution of socio-demographic and clinical data of study participants. A large proportion of study participants age was less than 30 years accounted for 59% and the lowest was between 41-51 years accounted for 3%. It is noteworthy that majority of staff nurses were primarily women (n=93) and were single. Regarding educational level sixty-two percent of study sample achieved bachelor's degree in nursing, 5% were diploma and only 33% were associated degree, respectively while most clinical experience of nurses ranged from 1 year to 5 years. Twenty-three percent of nurses attended a workshop on PU prevention within 1 year or less while 53% had never attended. Responses to question about last time nurse read a book or an article about PU showed that 54% of nurses read within one year or less while 16% had never read. Almost 46% of nurses reported that they had not search Web for obtaining information about PU while 42% had south web within one year or less. However, 87% of nurses claimed that they had not read NPUAP/ EPUAP guideline of PU prevention and treatment.

2. Nurses knowledge toward PU prevention

Table 3 The Comparisons of Nurses Knowledge Prior to Educational Session and Poestest 1, Posttest 2 and Poestest

PU Knowledge	Pretest			Posttest 1			Posttest 2			Posttest 3			P-value
	Min-Mix	Mean ± Std. D	Total	Min-Mix	Mean ± Std. D	Total	Min-Mix	Mean ± Std. D	Total	Min-Mix	Mean ± Std. D	Total	
PU prevention	6-37	73.2 ± 5.34	74.04 ± 13.49	36-40	98.3 ± 97	96.37 ± 2.38	33-40	39 98% SD±1.28	95.28 ± 2.31	33-40	97.2 ± 1.28	95.03 ± 2.32	.000*
PU staging	4-42	81 ± 6.11		35-42	99 ± 1.30		35-42	98% ± 1.128	98 ± 1.128	35-42	98 ± 1.128	.000*	
PU wound description	1-16	69 ± 3.22		14-16	100 SD±.506		13-14	96.4 ± 699	14-16	96.4 ± 654	.000*		

*. Correlation is significant at the 0.05 level

From the data in table 3, it is apparent that nurses' total mean correct responses had improved immediately after educational session comparing to pretest from 74.04% SD ± 13.49 to 96.37% SD± 2.381. In addition, although there were slightly declined in knowledge level two week after intervention with a mean percentage of 95.28 % SD±2.31 and one month after the educational session with a mean of 95.03% SD±2.32 yet it considers higher than the pretest.

Table 4 The Relationship Between Pretest Nurses Knowledge and Sociodemographic & Clinical experienced Data (n=100)

Sociodemographic	Mean ±SD	F	Sig.
Age			
<30 (n=59)	74.46 ± 14.984	.120	.887
30-40 (n=38)	73.63 ± 11.293		
41-51 (n=3)	71.00 ± 11.269		
Gender			
Male (n=3)	69.86 ± 26.978	T.721	.398
Female (n=93)	74.35 ± 12.132		
Marital status			
Single (n=69)	76.08 ±12.359	11.064	.000
Married (n=38)	72.87 ±11.480		
Divorce (n=2)	35.00 ±28.284		
Educational level			
Diploma (n=33)	71.18 ±18.802	1.108	.334
Associate(n=5)	75.80 ± 7.727		
BSN (n=62)	75.42 ± 9.988		
Year of clinical experience			
<1 n=8)	73.75 ± 7.166	.116	.977
1 - 5 (n=52)	73.42 ± 13.965		
> 5 years - <10 years(n=27)	75.22 ± 16.362		
10 years - < 15 years(n=9)	75.22 ± 7.242		
15 years - < 20 years(n=4)	72.00 ± 9.416		
Last time attend workshop about PU			
0-1 year (n=23)	73.65 ± 16.019	.637	.637
> 1 y-<2 years (n=15)	71.27 ± 11.659		
2- 3 years (n=7)	79.71 ± 9.160		
4 years or > (n=2)	82.00 ± 4.243		
Never(n=53)	73.94 ± 13.516		
Last time read a book or an article about PU			
0-1 (n= 54)	75.20 ±13.463	.520	.721
> 1 year - < 2 years (n= 12)	70.58 ±9.876		
2-3 years (n=11)	74.36 ±9.688		
4 years or > (n= 7)	76.71 ±10.029		
Never (n= 16)	71.31 ±19.029		
Last time south information on web about PU			
No (n=46)	71.46 ± 15.712	.810	.522
0-1 (n=42)	76.31 ± 11.282		
> 1 year - < 2 years (n=7)	75.00 ± 10.661		
2-3 years (n=4)	76.75 ±12.038		
4 years or > (n=1)	80.00 ± 0		
Last read NPUAP/EPUAP guideline about PU prevention and treatment			
No (n=87)	73.92 SD ± 13.734	.677	.510
0-1 (n=12)	76.08 SD ± 11.943		

*. Correlation is significant at the 0.05 level

As presented in table 4, no statistical significant found between nurses' knowledge and nurses age, gender, educational level, clinical experience, last time attend workshop regarding PU, last time read a book or an article about PU, last time south information on web about PU and last read NPUAP/EPUAP guideline about PU prevention and treatment. In contrast, the nurses' marital status had a significant relationship with their knowledge with P value (.000) < .05

3. Nurses' attitude toward PU prevention

Table 5 The Comparisons of Nurses Attitude Prior to Educational Session and Poestest 1, Posttest 2 and posttest

Attitude	Pretest		Posttest1		Posttest2		Posttest3		Test of Sig.
	Min - Mix	Mean ± Std. D	Min - Mix	Mean ± Std. D	Min - Mix	Mean ± Std. D	Min - Mix	Mean ± Std. D	P-value
	30-55	41.86 ± 4.767	38-55	47.25 ± 2.955	37-55	46.96 ± 2.663	35-54	47.05 S±2.935	.000*

*. Correlation is significant at the 0.05 level

As shown in table 5, the initial evaluation of nurses' attitude toward PU was reflecting a positive attitude toward PU prevention with a mean score of 41.86 ± 4.767 . However, the mean scores had increases after the educational session immediately 47.25 ± 2.955 . There were slightly declined in the mean score of posttest2 46.96 ± 2.663 comparing to posttest1. Eventually, the mean score had been improved in posttest3 47.05 ± 2.935 a month after the educational.

4. Nurses Practice toward PU prevention

Table 6 The Comparisons of Nurses Practice Prior to Educational Session and Posttest 1, Posttest 2 and Posttest

Practice	Pretest		Posttest1		Posttest2		Posttest3		Test of Sig.
	Min-Mix	Mean ± Std. D	Min-Mix	Mean ± Std. D	Min-Mix	Mean ± Std. D	Min-Mix	Mean ± Std. D	P-value
	9-24	66.7 ±2.983	18-27	93.75 ±1.411	15-24	85% ±1.513	14-24	82 ±1.719	.000*

*. Correlation is significant at the 0.05 level

Table 6 showed the effect of PU educational prevention protocol on nurses practice, the mean score percentage at initial evaluation was 66.79%. however, it raised up 93.75% immediately after educational session. Two weeks after intervention the mean average declined to 85% lower than posttest1 and higher than the baseline. In posttest 3 a month after the intervention the mean nurses practice reached 81.9%.

IV. Discussion

Sociodemographic characteristics of study sample

Nurses from different clinical areas engage in the education session, with highest attending of nurses' staff working in medical unit Similar result found by (Bayoumi & Bassuni, 2016). More than half of study sample were less than thirty years old. This result are line with finding of (Taha, 2014);(Ahmad Tubaishat & Aljezawi, 2014) and (El Enein & Zaghoul, 2011). In addition, the number of female participants are much higher than male participants. This was harmony with (Kaddourah et al., 2016); (Alves Rodrigues et al., 2016); (Bayoumi & Bassuni, 2016);(Andrade et al., 2014) and contrast to study by (Saleh, Qaddumi, & Anthony, 2012), as they found that 58.6% of participants were male. Regarding the marital status, the dominated response were single nurses This result was a parallel with (Dilie & Mengistu, 2015), who found that 68.4% of study sample were single and differ from (Taha, 2014), who stated that 80% of the participants were married

Likewise, more than half of study sample have clinical experience that ranged from one year to five years. Similar result was found by (Taha, 2014); (Beckman, Defloor, Schoonhoven, & Vanderwee, 2011);(El Enein & Zaghoul, 2011) and contradicted to(Gunningberg et al., 2013) were majority of nurses had experience >10 years. In addition, a diversity of nurses with different background engage in educational session with more than half of the sample belong to nurses with bachelor degree(n=62). The fining was agreed with (Kaddourah et al., 2016); (Dilie & Mengistu, 2015);(Ahmad Tubaishat & Aljezawi, 2014); (Gunningberg et al., 2013);(Cox et al., 2011) and contradicted with(Taha, 2014) and(El Enein & Zaghoul, 2011).

Regarding last time nurses attend training on PU, an overwhelming number of 53% nurses mention that they had never attend workshop regarding PU. Similar result was found (El Enein & Zaghoul, 2011), indicated that 74.6% of their study sample had not attend training about PU. 46 % of nurses said that they had never search website about PU while 42% had searched internet within one year or less. This was contradicted to (Pieper & Zulkowski, 2014), indicated that 78% of study sample used web for gathering information about PU in first data collection in 2012 and 73.3% in 2013.

Regarding last time nurses read about PU in a book or journal article more than half of participants read within one year or less. while 16% had never read about PU. This finding was a line with (Dilie & Mengistu, 2015), who mentioned that 51% of study sample had never read about PU. The result show that almost more than eighty percent of nurses were not aware of NPUAP/EPUAP about prevention and treatment of PU. This was a line with (Cox et al., 2011), as only 18% of their participants had read PU guideline in their study.

Nurses knowledge regarding PU prevention

PU knowledge test was aimed to assess nurses' knowledge in three areas; prevention, staging and wound description. The baseline result confirmed that nurses' knowledge was at moderate level of knowledge in

all the three areas. The nurses' response on PU prevention, staging and wound description showed that PU prevention measurement are not well known by nurses'. After implementing the PU educational session nurses showed a very high level of knowledge to all items in prevention 99%, staging 98% and 100% in wound description. The posttest 2 (two weeks after educational intervention) showed slightly decrease in scores of correct answers. PU prevention and staging had similar result of 98% while wound description had 96.4%. The posttest3 (4 weeks after educational session) revealed a mean score of 95.03 than pretest but lower than posttest 2 and posttest 3. However, the ranged of correct answers were higher than pretest and posttest1 but similar to posttest 2.

As it was observed, nurses level of knowledge had improved and sustained through study period comparing to pretest. Therefore, the outcome of analysis confirms the effectiveness of the PU educational protocol as pretest result was lower than all posttest. The moderate study participants level of knowledge might be explained by following: First, in this study above the half of the study participants had bachelor degree in nursing. However, an educational degree itself is not enough to ensure adequate knowledge. The content of undergraduate is not containing a lot of information about pressure ulcer and most of this information are not up-to-date. According to (Pieper & Zulkowski, 2014), there are a vast different between obtaining knowledge in classroom and between knowledge acquired and applied to clinical practice. Second, lack of education opportunity through attending workshop as almost half of study sample had never attend workshop relate to PU prevention. Training through attending in service education assist nurses to update their knowledge with the recent evidence and enhance their competence and confidence. This new learn knowledge encourage nurses to implement them in their daily care and disseminate it with other member in nursing team. However, lack of time and staff could be a barrier preventing nurses to attend workshop about PU.

The results of current study are consistent with an experimental study used similar survey for knowledge assessment before and after an educational workshop that involved both registered nurses' and nurses' technician (n=71) working in three hospital in Brazil. Nurses were divided into (n=50) belong to intervention group and (n=21) belong to control group. The education intervention was based on recommendation of international guideline once a week for 10 meeting. The pre-intervention result indicated a mean score of $74.1\% \pm 26.9$ for intervention group and a mean of $76.1\% \pm 22.9$ for control group. The immediately posttest showed a mean of $87.8\% \pm 18.8$ for intervention group and $79.1\% \pm 22.2$. The result proves the effectiveness of education intervention on nurses' knowledge which evidence by the mean score of intervention group on posttest comparing to control group (Baron, Brandenburg, Beatriz, & Krug, 2016).

One of interesting finding that parallel with the current finding was a true-experimental study conducted in Jordan by (Saleh et al., 2012), to assess the effect of education program on nurse knowledge. The study involves a random selection of registered nurses (n=112) assigned to experimental group and (n=108) assigned to control group. The pretest result showed a mean of $10.8/26 \pm 1.05$ for experimental group and a mean of control group had a mean of 10.4 ± 2.05 . however, the posttest indicated a mean score of 15.2 ± 1.5 for experimental group and a mean of 13.6 ± 1.80 . this finding indicated the effectiveness of educational program on nurses' knowledge toward PU prevention as the nurses' post-test show higher result comparing to pre-test and control group.

In contrast (Pieper & Zulkowski, 2014), tested the new version of PUKT which is known by PZ-PUKT nowadays in 2012. The survey was administered to nurses who attended a conference at New Jersey hospital in 2012 and 2013 to validate the tool. A total of 108 Nurses were divided in to two group (n=54) where asked to answer questions related to PU prevention and staging while second group were asked to complete questions related to wound description. The total correct score was 80% which higher than our finding. The sub-scores of PU prevention was 77%, PU staging was 86% and PU wound description was 77%. In current study, the highest percentage in PU sub-scores were related to staging similar to this finding.

The finding of current study state that nurses level of knowledge about PU prevention were not different in regard to age, gender, educational level, length of clinical experience. A similar result was found by (AlKharabsheh, Alrimawi, Assaf, & Saleh, 2014), as no relationship were found between nurses' knowledge and level of education, level of experience and ages. In addition, (Kaddourah et al., 2016), found no association between nurses' knowledge and level of educational as well as the length of clinical experience which is parallel with our finding. Further added, participant age was correlated to level of knowledge with (p value <.001). The result of current study was a line with (Iranmanesh et al., 2011), based on their result no association between level of knowledge and length of experience. In contrast (Taha, 2014), found a significant correlation between level of knowledge and participants' age of (p value <.001) as well as a correlation between nurses knowledge and level of education with (p value <.001).

Neither last time attend workshop nor reading a book or article about PU had effect the level of knowledge. Regarding last time south information about PU on website and last time read NPUAP/EPUAP guideline about PU prevention both had no influence on the study participants level of knowledge. However, (Taha, 2014), reported a correlation of .0001 between level of knowledge and training about PU. In

addition,(Zulkowski, Ayello, & Wexler, 2007), stated that a significant correlation of p value $<.5$ was found between nurses' knowledge level and attending lectures about PU, reading article or book, searching website and reading about PU guideline. Also, (Källman, 2009), indicated that nurses who read article about PU or attend lectures had high result. However, a significant correlation of P value (.000) was found between marital status and level of knowledge. Single nurses showed the highest mean, follow by married and divorced. In contrast to (Taha, 2014), who found a correlation of $>.05$ between nurses' knowledge and ma In order to reject or accept study hypothesis, a test of significant repeated measure (ANOVA) was carried out. The test revealed a statistical significant of p-value .000 less than 0.5 which indicate the effectiveness of PU educational intervention on nurses' knowledge.

Nursing attitude toward PU prevention

The result of initial evaluation prior to the educational intervention revealed that nurses demonstrate a positive attitude about PU prevention. The finding showed that nurses were agreed that all patient were at potential risk of having PU and that regular and proper assessment provided information about patient risk. It is noteworthy that majority of nurses believed that most PU are preventable, risk assessment should be carried out for all patient, and prevention of PU is a priority. In addition, nurses were concern and interested in PU prevention in their practice. The finding was a line with (Strand & Lindgren, 2010).Nurses were convinced that clinical judgment should be integrated with the use of risk assessment tool. This was similar to finding of (Moore & Price, 2004);(Kaddourah et al., 2016).

The posttest 1 result indicated that nurses attitude had increase after obtained information related to PU prevention comparing to the pretest. In addition, the posttest 2 revealed that nurses attitude remained satisfactory. Furthermore, the posttest 3 showed increased in nurses' attitude. Therefore, the result indicated that educational intervention had a significant impact on nurses' attitude about PU prevention and that nurses overall attitude scores sustained after one month of the intervention.

The finding of this study was parallel with a descriptive cross-sectional study performed to explore the registered nurses attitude and behaviors as well as perceived barriers regarding PU prevention at six teaching hospital. The finding indicated that nurses demonstrate a favorable attitude toward PU prevention with a median of 40 and range of 28-50(Moore & Price, 2004). A similar result was found in intervention study aimed to assess the effect of educational intervention on nurses attitude by (Saleh et al., 2012);(A Tubaishat et al., 2013) and (Källman & Suserud, 2009).On other hand, the result was contradicted to the finding of study aimed to assess the health professional attitude toward PU at king Khalid medical city by (Kaddourah et al., 2016),using same questionnaire and (Islam, 2010). However, none of that study were providing the educational intervention to nurses.

Nursing Practice toward PU prevention

The pretest indicated that majority of nurses maintain skin care, placed pillow while turning patient, encouraging activity, used air mattress to bed ridden patient, carry out pain assessment. (Hoviattalab, Hashemizadeh, D'Cruz, Halfens, & Dassen, 2015), found that 93.8% of nurses maintain skin care while 56.2% of patient had not PU redistribution matters. However, when it comes to most of nursing care activity that aimed to prevent PU nurses demonstrated low level of practice. 74% of participants were not competent to heel protection through offloading pressure, 72% elevate head of bed higher than 30 degree which increase shear force leading to deep tissue injury, 60% massage boney prominent area which is against the recent recommendation, 43% had not document finding and 39% had not protect skin during patient transfer which lead to skin injury due to friction affect. (Hoviattalab, Hashemizadeh, D'Cruz, Halfens, & Dassen, 2015), reported that half of patient in their study did not had heel protecting through off-loading pressure, above of 90% protect patient skin during transfer,

After implementing the educational intervention about PU prevention, nurses level of practice had significant improved to following areas; patient assessment upon admission, turning patient timeframe, avoid massage, protection of skin during transfer and documentation. Regarding, nursing care to protect heel and minimized elevation of head of bed these two areas of nursing care had improved comparing to the pretest yet it considers low level of practice that required more improvement and assessment. Although, the nurses level of practice decline over time of study yet it considers higher than pretest and was parallel with increase nurses' knowledge.

The finding of this study was similar to an observational study by (Hoviattalab, Hashemizadeh, D'Cruz, Halfens, & Dassen, 2015)aimed to assess nurses practice about PU prevention and adherent to PU guideline in German. According to the authors, high risk individual for PU development did not received appropriate care.

V. Conclusion

The overriding aim of this study was to determine the effectiveness of PU prevention educational session on nurses' knowledge, attitude and practice. To answer this question, quasi-experimental pre-and-post design was used to compare between finding. The initial evaluation prior to intervention indicated an inappropriate level of nurses' knowledge and practice toward PU prevention while attitude level was satisfactory. However, the immediately posttest 1, two weeks' posttest 2 and one month posttest 3 evaluation following the intervention showed a statistical significant increase in the total mean scores of knowledge, attitude and practice. These finding indicated that continuous nurses educational regarding PU prevention is important.

VI. Recommendation

Developing a continuous educational program to improve nurses' knowledge, attitude and practice toward pressure ulcer prevention.

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Figure 1 Data Collection and Intervention Process	3
Table 1 Sociodemographic Characteristic of The Study Participants (n=100).....	4
Table 2 Clinical experienced of The Study Participants (n=100).....	4
Table 3 The Comparisons of Nurses Knowledge Prior to Educational Session and Poestest1, Posttest2 and Poestest3	5
Table 4 The Relationship Between Pretest Nurses Knowledge and Sociodemographic & Clinical experienced Data (n=100).....	6
Table 5 The Comparisons of Nurses Attitude Prior to Educational Session and Poestest 1, Posttest 2 and posttest.....	7
Table 6 The Comparisons of Nurses Practice Prior to Educational Session and Posttest 1, Posttest 2 and Posttest.....	7

Dear Dr.

I am pleased to submit an original research article entitled “The Effect of Implementing Pressure Ulcer Prevention Educational Protocol on Nurses’ Knowledge, Attitude and Practices” in your journal. Pressure ulcer is one of the significant health problems that affect all age group and has negative impact on patient quality of life. The impact of pressure ulcer effect the patient’s families, nurses and health care organization. The cost of pressure ulcer treatment is higher than prevention. Many studies had conducted in Saudi Arabia to assess nurses’ knowledge, attitude and practice toward pressure ulcer prevention. This study assesses the effect of pressure ulcer educational intervention on nurses’ knowledge, attitude and practice. The finding of current study has important implication for developing an educational program about PU prevention based on nurse’s needs which affect their performance. It is our pleasure to publish IN YOUR JOURNAL as pressure ulcer is one of the quality indicators that affect the patient safety.

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