

Knowledge, Attitude And Practice On Pressure Ulcer Among Nurses In Hospital

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Abstract

Background: Pressure ulcer (PU) has been recognized as one of the major causes of morbidity, mortality and a burden to healthcare. PU is an indicator of the quality of nursing care and nurses can prevent PUs well if they have sufficient knowledge. As a result, there was an increase in the length of hospitalization, over utilization of resources and affects patient's satisfaction. There was also a lack of adequate evidence on knowledge, attitude and practice for effective prevention of pressure ulcers. **The study aims** to assess the knowledge, attitude, and practice of pressure ulcers among nurses. **Methods:** A cross-sectional was used among 389 nurses working in all inpatients department. **Results:** Found that the knowledge on pressure sore was good (64%) but the attitude (75.1%) and Practice (93.1%) to prevent pressure ulcer was low¹. Scientific analysis also showed that knowledge had a significant correlation with working experience ($p=0.034$), which reveals that the longer the duration in the service, the more the knowledge was gained. Subsequently, the more the knowledge was gained, the practice on prevention on pressure ulcer increases ($p=0.036$). **Conclusion:** The study revealed that retention of the experienced nurses is extremely important because continuing medical education updates the knowledge, which eventually improves the patient's care whereas behavior change remains challenging because of individual attitude and perception.

Keywords: Incidence, pressure ulcer, hospitalization, knowledge, attitude, practice, working experience, prevention.

Introduction

Pressure Ulcers (PU) are localized skin damages that occur when soft tissue is compressed between a bony prominence structure and external forces for an extended period of time. It can occur because of shear and friction. Its effect is worldwide, which affects millions of people and has variation in the magnitude and severity of damages to the skin, underlying tissue, and muscle. It remains a significant health problem that affects approximately 3 million adults⁽¹⁻⁴⁾. The tissues of the skin are destroyed, because of progressive exposure of external forces for a long period of time. It is a major threat to the health of clients by increased mortality rates, compromised quality of life, longer period of stay in hospital, high costs for patient care and body image disturbance, a long period of time for the healing process and have a negative effect on patients' overall performance⁽⁵⁻⁹⁾.

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The most common predisposing factors for the occurrence of PU are immobility, sensory loss, impaired level of consciousness, and friction and shear⁽¹⁰⁻¹³⁾. The treatment of PU is more expensive than the prevention of it and has been estimated that the cost of treating PU is 2.5 times higher than the cost of preventing it⁽¹⁴⁻¹⁶⁾. Providing of regular health education and sustainable training on the prevention of PU for the health care provider is considered as a determinant component of pressure ulcer prevention methods. Nurses are responsible to provide good nursing process to patients who are admitted in hospital. Qualities of care in a particular patient are maintained by the application of good nursing process and it prevents the incidence of PU. Knowledge and attitude of nurses have a significant effect on the type of nursing process and patient outcome intervention⁽¹⁷⁻²⁰⁾.

The prevention of PU can be considered as intensive nursing. The frequent assessment and effective skin care prevent the development of PU. Proper application of the pressure ulcer risk assessment tool like the Braden scale can prevent the occurrence of the development of PU. Changing the patient's positions every 2 h and the use of a pressure relieving mattress also reduces the development of PU⁽²¹⁻²⁴⁾. If the patient is developing PU, nurses can provide a wound healing process by change of dressing, continued wound assessment, and proper nutrition to maintain quality of care. Several studies showed that PU prevention remains a significant challenge for nurses and its incidence is considered an indicator of poor quality of care⁽²⁵⁻³⁰⁾.

Many studies that have been conducted to evaluate nurses' knowledge about pressure ulcer prevention, reported that only 23.5 % nurses had scored 60 % knowledge in Belgian⁽³¹⁾, 73 % of Jordanian nurses had scored lower than the mean knowledge about pressure ulcer prevention⁽³²⁾, nurses had scored lower on pressure ulcer prevention knowledge than the average in Iran⁽³³⁾, 51.1 % which was less than the cutoff point (60 %) in Australia⁽³⁴⁾, 70.5 % which is a good level of knowledge in Greece⁽³⁵⁾, and Nepal revealed that only 59 % of nurses had adequate knowledge about pressure ulcer prevention⁽³⁶⁾. Several studies have explored about the prevalence of PU among hospitalized patients across the globe and revealed that it was 22.9 % in Sweden⁽³⁷⁾, 18.2 % in Norway⁽³⁸⁾, 27 % in Italy⁽³⁹⁾, and 18.7 % in Brazil⁽⁴⁰⁾. On the other hand, the prevalence of PU in Africa was 17.23 % in the Sub-Saharan Tertiary Centre⁽⁴¹⁾, 3.22 % in South-west Nigeria⁽⁴²⁾, and 19.3 % in Tunisia⁽⁴³⁾.

In KSA, a study conducted by Guerrero et al., (2023)⁽⁴⁴⁾ revealed that the mean scores of nurses' level of knowledge regarding PU prevention were as follows etiology: 62.81 ± 23.77 ; classification and observation: 50.86 ± 23.28 ; risk assessment: 31.19 ± 24.26 ; nutritious diet: 46.04 ± 25.96 ; prevention: 22.36 ± 12.41 ; and specific patient groups: 14.84 ± 22.88 . Furthermore, the score for nurses' overall level of knowledge of PU prevention was 39.55 ± 8.84 out of 100, interpreted as low based on the 60% cutoff; the minimum knowledge score was 0. Notably, knowledge of PU etiology, classification, observation, and specific patient groups differed based on the hospital of affiliation. Interestingly, gender was the only demographic characteristic based on which nurses' knowledge regarding specific patient groups differed⁽⁴⁴⁾.

Therefore, this study aimed to assess knowledge, attitude and practice among nurses, generate baseline data on incidences and prevalence of pressure ulcer, and finally, the findings will be implemented to improve the efficiency of pressure ulcer management in KSA.

Methodology

A cross-sectional quantitative study was conducted to determine the knowledge, attitudes and practices of nurses who work on the inpatient units of **hospital in Jeddah, KSA**. The sample size of the study was calculated as follows by equation: Necessary Sample Size = $(Z\text{-score})^2 * SD^2 * (1-SD) / (\text{margin of error})^2$ Choosing 95% confidence level, 0.5 SD, and a margin of error (confidence interval) of +/- 5%. $((1.96)^2 * .5(.5)) / (.05)^2 = (3.8416 * .25) / .0025 = 0.9604 / .0025 = 384.16$. Based on previous equation sample size 385 respondents

are needed

A pretested (Randomly conducted among 20 nurses) using structured self-administered questionnaire on Knowledge, Attitude, and Practice (KAP) ⁽⁴⁵⁾ while modified version of the existing data entry form for pressure ulcer was used to collect data for incidence and prevalence. Target population for KAP was all the nurses working with inpatients in hospital. The enumerators for Knowledge, Attitude and Practice data collection in the high-risk areas were the pressure ulcer prevention and management nurse member. These enumerators are briefed about the questionnaires and the importance of data quality. The nurses were not pressurized however requested to answer honestly, so that we can come up with the activities which will eventually benefit the nurses and improve the quality services to the patients.

Prior to data collection, approval for the study was obtained from Research Ethics Board of Health. Study population: All the nurses (398) presented during the data collection were included. Incidence and prevalence of pressure ulcer data collection was done from high risk wards and units. Inclusion criteria: The Regular and contract nurses working with inpatients in hospital who are directly involved in patient care. Exclusion criteria: Nurses working in outpatient department. Data analysis: The data were recorded in the excel sheet and exported to SPSS 28 for analysis and report generation. Regression analysis was used to evaluate the correlation between the demographic variables and Knowledge, Attitude and Practice. The proportion was used to determine the incidence and prevalence of PUs.

Results

Social-demographic characteristics of the study population

Table (1) shows 389 participated in the study, yielding a response rate of 97.25%. The mean age of the respondents was 29.18 years (SD 5.766). More than half of the respondents (62.7%) were female, 58.6% of the nurses had a diploma certificate. Majority of them (62%) had working experience of less than 5 years.

Knowledge, Attitude, Practice on Pressure Ulcer Prevention

Based on the literature ⁽⁴⁶⁾, participants were asked questions to assess their knowledge on pressure ulcer prevention, and they were categorized into two groups based on their score. Knowledge: good (64%) poor (36%), in attitude: good 97 (24.9%) poor 292 (75.1%), and in practice: good 27(6.9%) poor 362 (93.1%). (**Table 2**)

Knowledge and Working experience

Analysis scientifically shows that knowledge has significant correlation with working experience (P-value 0.034). The longer the duration in the service, more the knowledge is gained. However, from the demographic profile, majority of the staff are below 5 years of working experience (62%)

Knowledge and Practice

There is significant correlation between the knowledge and practice (P-value 0.036), which indicates the more knowledge you gained, subsequently practice on prevention of pressure ulcer increases.

Attitude and Practice

There is no significant correlation between the attitude with practice (p-0.56) and attitude with education (P-value 0.654). Attitude on knowledge and practice depends on individually as there is no correlation statistically.

Table 1: Social-demographic characteristics of the study population

Variables	Frequency	Percentage
Male	145	37.30%

Variables		Frequency	Percentage
Gender	Female	244	62.70%
	Male	145	37.3%
Age	20-29	265	68.3%
	30-39	92	23.7%
	40-49	29	7.5%
	≥50	2	0.5%
Education	Masters	5	1.3%
	Bachelor's in nursing	98	25.2%
	Diploma in nursing	228	58.6%
	Certificate	58	14.9%
Work Experiences	< 1- 4 years	241	62%
	5- 9 years	84	21.6%
	≥ 10 years	64	16.5%

Table (2): Knowledge regarding Pressure Ulcer

		Correct		Incorrect	
		n	%	n	%
1	High loading pressure is the contributing factor for pressure ulcer formation.	339	87.1%	47	12.1%
2	Immobility is the most important factor for pressure ulcer Formation.	383	98.5%	6	1.5%
3	Bowel and bladder incontinence are the favorable environment for bacterial growth in the form of maceration.	339	87.1%	50	12.9%
4	Low albumin is the critical determinant for pressure ulcer formation.	269	69.2%	115	29.6%
5	Head to toe skin assessment is a procedure for a patient who is at high risk for pressure ulcer development.	331	85.1%	57	14.7%
6	Norton scale is the risk assessment scale for pressure ulcer.	354	91 %	32	8.2%
7	Norton scale >14 is high risk for pressure ulcer.	140	36%	247	63.5%
8	Partial skin loss with blister and abrasion is correct answer for the sign of stage two pressure ulcers.	312	80.2%	76	19.5%

		Correct		Incorrect	
		n	%	n	%
9	Pale, red, or bluish- grey discoloration on the skin is the sign for pressureulcer development.	368	94.6%	21	5.4%
10	Topical cream is appropriate method for skin care.	246	63.2%	142	36,5%
11	Turn position every four hours is significant activity for protecting skin damage.	263	67.6%	125	32.1%
12	Lift the patient without dragging is a correct practice for maintaining skin integrity	354	91%	36	9%
13	Use pillow under the patient's leg to prevent heel ulcer.	359	92.3%	28	7.2%
14	Vitamin C and E is important to maintain healthy skin.	367	94.3%	22	5.7%
15	Elevate the head of bed < 30 ⁰ is the activity for reducing shearing force.	269	69.2%	118	30.3%
	Overall Number (n) and Rate (%)	313	80%	75	18%

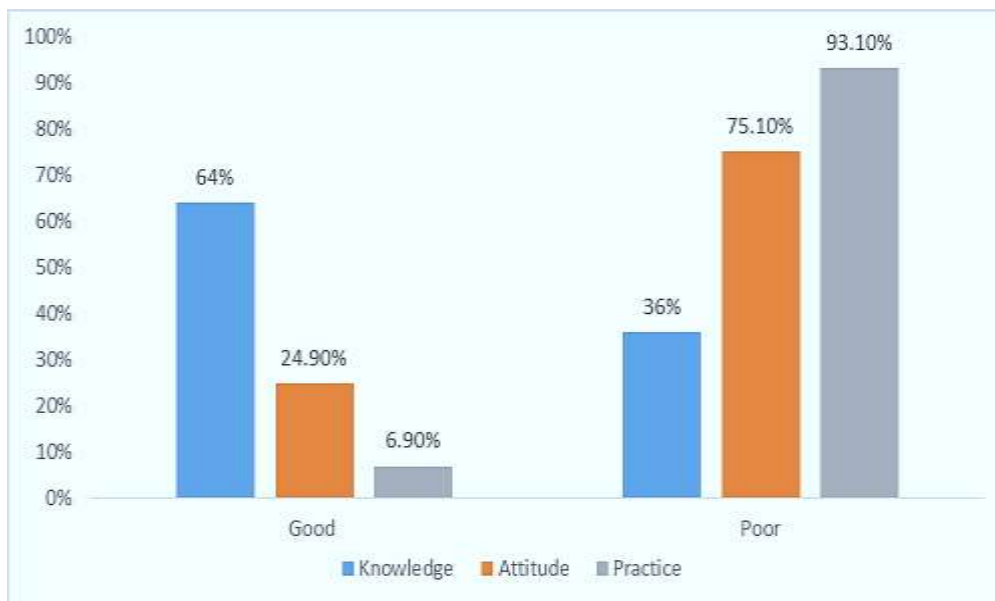


Fig 1: Knowledge, Attitude, Practice on Pressure Ulcer Prevention

Discussion

The incident of the pressure ulcer (PU) among the patients remains challenging for every nurse. Despite every effort by the PU team members monitoring, still increased incidence of PU among inpatient patients has been reported in hospital. The result even showed the significant correlation between the working experiences with knowledge. There are precipitating factors as shown in some studies^(45, 47, 48) affecting the practice for the PU because the result shows poor practice (>90%) for preventing the PU. Even 75% of nurse's

attitude toward pressure management is low which could be the lack of implementation strategies. Documentation of pressure ulcer prevention and treatment improved after the educational session ⁽⁴⁹⁾.

Analysis scientifically shows that knowledge has a significant correlation with working experience (P-value 0.034). The longer the duration in the service, more the knowledge is gained. However, from the demographic profile, majority of the staff are below 5 years of working experience (62%). There is significant correlation between the knowledge and practice (P- 0.036), which indicates the more knowledge you gained, subsequently practice on prevention of PU increases. There is no significant correlation between the attitude with practice (p-0.56) and attitude with education (P-0.654). Attitude on knowledge and practice depends on individually as there is no correlation statistically.

The findings are also consistent with the current studies done by Qaddumi and Khawaldeh (2014) ⁽⁵⁰⁾ which found that Jordanian nurses (N=141) had insufficient knowledge with means scores 10.84 out of 26 (SD=2.3). Mwebaza et al. (2014) ⁽⁵¹⁾ also found low level of knowledge about pressure ulcer among Ugandan registered nurses (N=56) in a teaching hospital.

Conclusion

It is recommended that the retention of experienced nurses is extremely important because more knowledge was gained with the duration in the service. Frequent continuing medical education needs to conduct since it helps in renewing the knowledge to date and improves the patient's care. Behavior change is challenging but strategies are required to overcome the barriers and perpetuate the attitude on the prevention of the pressure ulcer.

References

1. Lyder, C.H., and Ayello, E.A. Pressure ulcers: a patient safety issue, in: R.G. Hughes (Ed.), Patient Safety and Quality: an Evidence-Based Handbook for Nurses, Agency for Healthcare Research and Quality (US), Rockville (MD), 2008 Apr. Chapter 12.
2. Suzzane C. et al. Brunner and Suddarth's Text Book of Medical-Surgical Nursing. twelfth ed., London.
3. Edsberg, L.E. et al., Revised National Pressure Ulcer Advisory Panel pressure injury staging system: revised pressure injury staging system, *J. Wound, Ostomy Cont. Nurs.* 43 (6) (2016) 585.
4. Haesler, E. National Pressure Ulcer Advisory panel, European Pressure Ulcer Advisory panel and pan pacific Pressure Injury alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide [Internet], 2014.
5. National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel. Prevention and Treatment of Pressure Ulcers: A Clinical Practice Guideline, 2009.
6. Kottner, J., Balzer, K., Dassen, T., and Heinze, S. Pressure ulcers: a critical review of definitions and classifications, *Ostomy/Wound Manag.* 55 (9) (2009) 22–29.
7. Kuptniratsaikul, V. et al., Complications during the rehabilitation period in Thai patients with stroke: a multicenter prospective study, *Am. J. Phys. Med. Rehab.* 88 (2) (2009) 92–99.
8. Capon, A. et al., Pressure ulcer risk in long-term units: prevalence and associated factors, *J. Adv. Nurs.* 58 (3) (2007) 263–272.
9. Moore, Z. Price, P. Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention, *J. Clin. Nurs.* 13 (8) (2004) 942–951.
10. Anders, J., Heinemann, A. et al. Decubitus ulcers: pathophysiology and primary prevention, *Dtsch. Arztebl. Int.* 107 (21) (2010 May) 371–381.

11. Lowthian, P. The distinction between superficial pressure ulcers and moisture lesions, *Skinmed* 6 (3) (2007) 111–112.
12. Bates-Jensen, B.M., McCreath, H.E., Pongquan, V. Subepidermal moisture is associated with early pressure ulcer damage in nursing home residents with dark skin tones: pilot findings, *J. Wound, Ostomy Cont. Nurs.* 36 (3) (2009 May-Jun) 277–284.
13. Smith, G., and Ingram, A. Clinical and cost effectiveness evaluation of low friction and shear garments, *J. Wound Care* 19 (12) (2010 Dec) 535–542.
14. Spetz, J. et al., The value of reducing hospital-acquired pressure ulcer prevalence: an illustrative analysis, *J. Nurs. Adm.* 43 (4) (2013) 235–241.
15. Oot-Giromini, B. et al., Pressure ulcer prevention versus treatment, comparative product cost study, *Adv. Skin Wound Care* 2 (3) (1989) 52–55.
16. Bennett, G., Dealey, C., and Posnett, J. The cost of pressure ulcers in the UK, *Age Ageing* 33 (3) (2004) 230–235.
17. Porter Armstrong, A.P., Moore, Z.E., Bradbury, I., McDonough, S. Education of healthcare professionals for preventing pressure ulcers, *Cochrane Database Syst. Rev.* (5) (2018).
18. Soban, L.M., Hempel, S., Munjas, B.A., Miles, J., Rubenstein, L.V. Preventing pressure ulcers in hospitals: a systematic review of nurse-focused quality improvement interventions, *Joint Comm. J. Qual. Patient Saf.* 37 (6) (2011 Jun 1), 245-AP16.
19. Shahin, E.S., Dassen, T. Halfens, R.J. Pressure ulcer prevalence in intensive care patients: a cross-sectional study, *J. Eval. Clin. Pract.* 14 (2008) 563–568.
20. Avsar, P., Patton, D., O'Connor, T., Moore, Z. Do we still need to assess nurses' attitudes towards pressure ulcer prevention? A systematic review, *J. Wound Care* 28 (12) (2019 Dec 2) 795–806.
21. Araújo, T.M., Araújo, M.F., Caetano, J.A. Using the Braden scale and photographs to assess pressure ulcer risk, *Rev. Esc. Enferm. USP* 46 (4) (2012 Aug) 858–864.
22. Serpa, L.F., Santos, V.L., Campanili, T.C., Queiroz, M. Predictive validity of the Braden scale for pressure ulcer risk in critical care patients, *Rev. Lat. Am. Enferm.* 19 (1) (2011 Jan-Feb) 50–57.
23. Shiferaw WS. Evidence on the effect of position change on pressure ulcer among hospitalized adult patients in Ethiopia: systematic review and meta-analysis.
24. Iglesias, C., Nixon, J., Cranny G., et al., Pressure Trial Group. Pressure relieving support surfaces (PRESSURE) trial: cost effectiveness analysis, *BMJ* (7555) (2006 Jun 17) 332.
25. Inui, S., Konishi, Y., Yasui, Y., Harada, T., Itami, S. Successful intervention for pressure ulcer by nutrition support team: a case report, *Case Rep. Dermatol.* 2 (2) (2010 Jul 2) 120–124.
26. McGuinness, J., Persaud-Roberts, S., Marra, S. et al., How to reduce hospital-acquired pressure ulcers on a neuroscience unit with a skin and wound assessment team, *Surg. Neurol. Int.* 3 (2012) 138.
27. Assadian, O., Oswald, J.S., Leisten, R. et al., Management of leg and pressure ulcer in hospitalized patients: direct costs are lower than expected, *GMS Krankenhhyg Interdiszip* 6 (1) (2011).
28. Banks, M.D., Graves, N., Bauer, J.D., and Ash, S. Cost effectiveness of nutrition support in the prevention of pressure ulcer in hospitals, *Eur. J. Clin. Nutr.* (2012 Oct 10).
29. Blenman, J., and Marks-Maran, D. Pressure ulcer prevention is everyone's business: the PUPS project, *Br. J. Nurs.* 26 (6) (2017) 16–26.
30. Baharestani, M., Black, J., Carville, K. et al. Dilemmas in measuring and using pressure ulcer prevalence and incidence: an international consensus, *Int. Wound J.* 6 (2009) 97–104.
31. Beeckman, D., Defloor, T., Schoonhoven, L., Vanderwee, K. Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals,

- Worldviews Evidence-Based Nurs. 8 (2011) 166–176.
32. Qaddumi, J., and Khawaldeh, A. Pressure ulcer prevention knowledge among Jordanian nurses: a cross-sectional study, *BMC Nurs.* 13 (1) (2014) 6.
 33. Tirgari, B., Mirshekari, L., Forouzi, M.A. Pressure injury prevention: knowledge and attitudes of Iranian intensive care nurses, *Adv. Skin Wound Care* 31 (4) (2018) 1–8.
 34. Usher, K., Woods, C., Brown, J., Power, T., Lea, J., Hutchinson, M., et al. Australian nursing students' knowledge and attitudes towards pressure injury prevention: a cross sectional study, *Int. J. Nurs. Stud.* 81 (2018) 14–20.
 35. Panagiotopoulou, K., Kerr, S.M. Pressure area care: an exploration of Greek nurses' knowledge and practice, *J. Adv. Nurs.* 40 (3) (2002) 285–296.
 36. Shrestha, N., Shrestha, P. Knowledge of pressure ulcer management among nurses, *J. Gandaki Med. Coll. Nepal* 9 (2) (2017) 47–51.
 37. Gunningberg, L., Stotts, N.A. Tracking quality over time: what do pressure ulcer data show? *Int. J. Qual. Health Care* 20 (4) (2008 Aug) 246–253.
 38. Bredesen, I.M. et al., The prevalence, prevention and multilevel variance of pressure ulcers in Norwegian hospitals: a cross-sectional study, *Int. J. Nurs. Stud.* 52 (1) (2015) 149–156.
 39. Capon, A., Pavoni, N., Mastromattei, A., Di Lallo, D. Pressure ulcer risk in long-term units: prevalence and associated factors, *J. Adv. Nurs.* 58 (3) (2007 May) 263–272.
 40. Strazzeri-Pulido, K.C. et al., Pressure injuries in critical patients: incidence, patient-associated factors, and nursing workload, *J. Nurs. Manag.* 27 (2) (2019) 301–310.
 41. Asiyambi, G., Adekola, O., Desalu, I. A Retrospective study of Pressure ulcers in critically ill patients in a Sub-Saharan Tertiary Centre, *Afr. J. Anaesth. Intensive Care* 14 (2) (2014).
 42. Adegoke, B. et al., Pressure ulcer prevalence among hospitalised adults in university hospitals in South-west Nigeria, *Wound Pract. Res.: J. Aust. Wound Manag. Assoc.* 21 (3) (2013) 128.
 43. Ghali, H. et al., Incidence and risk factors of pressure ulcers in a Tunisian University Hospital, *Rev. Epidemiol. Sante Publique* 66 (2018) S340
 44. Guerrero, J. G., Mohammed, H., Pingue-Raguini, M., Cordero, R. P., & Aljarrah, I. A Multicenter Assessment of Nurses' Knowledge Regarding Pressure Ulcer Prevention in Intensive Care Units Utilizing the PUKAT 2.0. *SAGE open nursing*, 2023; 9, 23779608231177790. <https://doi.org/10.1177/23779608231177790>
 45. Nuru N, Zewdu F, Amsalu S, Mehretie Y. Knowledge and practice of nurses towards prevention of pressure ulcer and associated factors in Gondar University Hospital, Northwest Ethiopia. *BMC nursing*. 2015;14(1):34.
 46. Jamal Qaddumi, Abdullah Khawaldeh Pressure ulcer prevention knowledge among Jordanian nurses: a cross-sectional study. *BMC Nursing*. 2014.
 47. Claudia G, Diane M, Daphney SG, Danièle D. Prevention and treatment of pressure ulcers in a university hospital centre: a correlational study examining nurses' knowledge and best practice. *International journal of nursing practice*. 2010;16(2):183-7.
 48. Källman U, Suserud BO. Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment—a survey in a Swedish healthcare setting. *Scandinavian journal of caring sciences*. 2009; 23(2):334-41.
 49. Provo B, Piacentine L, Dean-Baar S. Practice versus knowledge when it comes to pressure ulcer prevention. *Journal of WOCN*. 1997; 24(5):265-9.
 50. Qaddumi, J., and Khawaldeh, A. Pressure ulcer prevention knowledge among Jordanian nurses: a cross-sectional study. *BioMed Central*, 13 (2014)
 51. Mwebaza, I., Katende, G., Groves, S., and Nankumbi. J. Nurses' knowledge, practices, and barriers in care of patients with pressure ulcers in a Ugandan teaching hospital. *Nurs Res Pract*,

(2014)