

# **Nurses' knowledge and beliefs about pressure ulcers care: a systematic review of literature**

By

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## SUMMARY

**Objectives:** To determine the current state of knowledge on the prevention measures and treatment of the UPP in nursing professionals.

**Design:** Systematic Review.

**Data Source:** 14 bibliographic data bases have been used. Database of Abstracts of Reviews of Effectiveness (DA-RE); Cinahl; Medline; Current Contents: Clinical Medicine, Social and Behavioural Sciences, Life Sciences; Spanish Medical Index (IME); Cuiden; Latin American and Caribbean Centre of Information on Health Sciences (LI-LACS); Cochrane Library; EBSCO; ScienceDirect; Springer; InterSciencia; ProQuest and Pascal.

**Reviewing Methods:** The following methods have been included: knowledge surveys articles about pressure ulcers that were published in Spanish, English, French and Portuguese, and a quasi-experimental study, to see the influence on knowledge of a specific educational session about UPP. Studies about knowledge which use methodologies that impede their comparison, have been excluded.

**Results:** 18 articles have been included. The majority used convenience sampling. The participants in the studies were nurses with degrees, nurse auxiliaries and students. The global knowledge index is 70% as an average; with a range of between 73 and 85% for prevention and from 56 to 78% for treatment. The training level has an influence over the knowledge index. The best known risk factors are incontinence, immobility, maintained pressure or malnutrition. The best known nursing interventions are skin care, maintaining the bed clean and posture changes. The use of pressure relief surfaces, patient education and the classification of UPP are among the nursing interventions known by a smaller number of professionals.<sup>189</sup>

**Conclusions:** There exists an acceptable level of knowledge of the recommendations for prevention and care of UPP, the risk factor and prevention knowledge index being higher than that of the treatment. The specific training about UPP improves this knowledge index.

## KEYWORDS

Knowledge, systematic review, pressure ulcers.

## INTRODUCTION

Pressure ulcers (UPP) constitute an important sanitary problem that daily affects the citizens and the health care systems (1). There exists a controversy about the prevalence of UPP is a good indicator of the quality of care. Thus, while the Department of Health of the United Kingdom (2) suggests this, other investigations (3, 4) consider that the prevalence cannot be used exclusively as a determiner of quality of care since it cannot be taken separately without a knowledge of the state of risk of the people, because a UPP is not the same thing in a surgical unit as one in a long stay unit, where the patient risk is much higher.

With the purpose of improving the care quality and decreasing the variability of the clinical practice, researchers and institutions of different countries have developed clinical practice guidelines about prevention and treatment of UPP (5-9). The implementation of the recommendations contained in these clinical guidelines permit the reduction of the incidence and prevalence of UPP, as well as the costs incurred in an inadequate practice (10). Although the

clinical guidelines facilitate the dissemination of results (11), their existence, by themselves, cannot guarantee that the nursing professionals know the UPP care based on the best evidence, nor that they include them in their daily clinical practice, as shown by different studies that suggest that the professionals have an unsatisfactory knowledge of the investigations results. It seem that there exists a low dissemination of knowledge in nursing, mainly because the methods that traditionally have been used to that effect, such as congresses and professional journal publications, are not sufficiently effective (10, 12).

In order to take to the practice the results of the investigations related to prevention and treatment of UPP, combined strategies are needed which can act on the different elements we have previously mentioned (13). Thus, the <sup>31</sup> first step is to make a “diagnostic analysis” of the knowledge acquired by the nursing professionals about these measures. Once the status of their knowledge is known and if it is adequate, it will have to be determined to what degree this is applied in the professional practice; it’s what is called “use of the investigation”, which is defined as a process aimed at transferring the knowledge to the practice, based on the investigation through its systematic use in all aspects of professional practice (10).

Although the need for the nursing practice based on evidence is very much accepted, currently the change in practice is complex and difficult, we can say that there exists a gap between knowledge and practice (13). The nurses identify multiple obstacles that prevent the investigations to be used in the clinical practice. Those obstacles can be classified by attitude, resources and support.

Attitude refers to the beliefs of the nurses about the practice based on evidence. Many do not read publications about nursing, or they read those that contain a few or no research studies. Others do not know the results of the investigations; they do not understand or believe in them. There are some who think that the bibliography presents contradictory results, or are little willing to change their practice in relation to the new ideas set forth and believe that the benefits derived from changing their practice would be minimal (10, 14-17).

The resources are considered as very important factors that hamper the practical application of the results of the investigation. The lack of time to implement the new ideas that arise from the investigation is an obstacle faced by all professionals, albeit it is also claimed that during the professional practice there is no time for reading the investigations. There is difficulty for the nurses to gain access to the information sources, and the available resources are scarce, so there exists a perception of lack of divulgation and availability of the results <sup>32</sup> of investigations (10, 12, 14, 15, 17).

Lack of support constitutes the third great obstacle. A deficient institutional backing by governing entities is perceived – based on evidence - in funding and assistance for nursing. Besides, it is also considered that there is no support from professionals, nurses and others, especially from those with more seniority who tend to adopt inflexible attitudes but, on the other hand, there is a frequent lack of authority and autonomy for the nurses to carry out the changes derived from the results of the investigation. The nurses also perceive that they find themselves lacking the supervision and support of experienced fellow investigators with whom to discuss and try the findings of the investigation (10, 12, 14, 15, 17-19).

Because of that, the objective of this study is to determine, through a systematic review, the current state of

knowledge that the nursing professionals have about the procedures for UPP prevention and treatment.

## **METHODOLOGY**

### **Search strategy**

A bibliographical search was made throughout the entire scientific production related to the nurses' knowledge of prevention and treatment of UPP. 14 bibliographical data bases have been used: Database of Abstracts of Reviews of Effectiveness (DARE); Cinahl; Medline; Currents Contents: Clinical Medicine, Social and Behavioural Sciences, Life Sciences; Spanish Medical Index (IME); Cuiden; Latin-American and Caribbean Centre for Information on Health Sciences (LILACS); Cochrane Library; EBSCO; ScienceDirect; Springer; InterSciencia; ProQuest and Pascal.

The period included in the search was between 1966 and 2005. We have used the following terms as descriptors: "úlceras por presión" (pressure ulcer) or "úlceras por decúbito" (pressure sores) and "conocimiento" (knowledge). Additionally, we made an inverse search starting from the bibliographical references of the selected studies. For locating and retrieving the unpublished studies we assessed investigation reports, national and international congresses' proceedings, as well as consultations to experts in the subject.

### **Selection of articles**

In the search we have included all articles that made reference to nurses' knowledge, skills, or aptitudes (graduate, auxiliary or nursing students) related to pressure ulcers, independently of the study's design type, published in Spanish, French and Portuguese.

### **Validity assessment**

Being fundamentally descriptive studies, no special criteria have been considered.

### **Data extraction**

The data were independently extracted by the members of the research group. Later, all reviews were revised and analysed by other members of the group.

### **Characteristics of the selected studies**

We have selected knowledge survey-type articles about pressure ulcers published in some of the previously mentioned languages. A quasi-experimental type study has also been included to see the influence on knowledge, of a specific educational session about UPP.

We have excluded those studies that, although dealing with knowledge, use methodologies that prevent their comparison. Thus, the studies by Maylor (20, 21) for measuring studies of locus of control, have not been considered. Nor has the study by Saliba (22), about clinical records to measure the implementation of the AHQR guideline and the assessment rates of its application, been included.

### **Data synthesis**

The data are expressed as percentages with maximum and minimum ranges.

## **RESULTS**

**Type of articles included**

The total number of articles included is 18. Of them, the method employed to gather the information was basically transverse descriptive, except in the case of Provo (23), where a quasi-experimental type methodology was used (Table 1). In almost all the studies, the information was gathered through self-managed questionnaires the same day of the intervention. The Provo study is divided in three phases. First, a gathering of information was carried out before the patient interventions; in a second phase an educational session was conducted, and in a third phase information was again gathered three weeks later. The influence of an educational intervention on the knowledge level of UPP risk and prevention; a plan for documented studies about the skin, and the prevalence of UPP in the hospital, could be proven in that way.

The majority of the articles used, in their methodology, convenience sampling of the population; only some used random sampling (Table 1).

**Variables of the questionnaires**

The questionnaires that are used to gather information in all studies reviewed intend to obtain data of different types: demographic and professional; education; general knowledge; prevention and treatment of UPP; staging and risk factors of UPP. These questionnaires also gather information about assessment of patient care plans and UPP nursing knowledge. Some inquire about the needs for nursing education in UPP. Only in one of the studies (24) information is sought about obstacles to a good practice.

	<b>Type of study</b>	Comparative of real knowledge and self-perception of need for education	Transverse descriptive	Transverse descriptive	Patients with hip fracture	Transverse descriptive	Transverse descriptive	Transverse descriptive	Transverse descriptive
							Quasi-experimental Study with educational intervention Comparative study	Transverse descriptive Prevalence study and its relationship with the resources	Transverse descriptive

**Table 1. Type of study, place, participants and sample with response rate**

Author / Year	Place	Sample and participants	Response rate
Beitz & Frey & O'Biren (1998)	U.S.A.	Convenience: 59 nurses, 11 auxiliary nurses and 4 students	
Bostrom & Kenneth (1992)	U.S.A.	Random: 10% staff. 398 nurses	62%
Gunningberg, et al. (2001)	Sweden	Complete staff: 556 nurses Systematic: 60 nurses 58 auxiliary nurses	23,9%
Hallett (1996) Harfens & Eggink (1994)	UK Holland	Health Area (Community hospitals, elderly and mental health units) Hospitals	
Larcher, et al. (2003) Maylor & Torrance (1999)	Greece	Convenience: 83 students 625 nurses and auxiliary nurses Convenience: 69 nurses 97 auxiliary nurses	50% 70,2%
Pieper & Mattern (1997)	U.S.A. CE TTTT	400 (Se select 75 ICU nurses)	76,5%
Provo, et al. (1997) Russell (1996)	U.S.A. UK	Systematic: 67 Nurses and auxiliary nurses Convenience: 30 nurses	40,3% 100%
Sharp, et al. (2000) Torrance & Taylor (1999)	Australia UK	All the nurses: 2113	
Wilkes, et al. (1996)	Hong Kong	Convenience: 34 nurses	100%

**Table 2. Percentage of knowledge, prevention, treatment and influence of experience**

Author	% Score overall knowledge	% Knowledge, prevention	% Knowledge, treatment	Influence of experience/training
Beitz & Frey & O'Biren (1998)	78%	-	-	-/-
Bostrom & Kenneth (1992)	71%	-	-	-/-
Esperón & Vázquez (2004)	70%	73%	56%	YES (Increases with experience)/ YES (Especially in latter three years)

García Fernández, et al. (2002)	81%	85%	78%	YES (The extremes of experience, more and less, have least knowledge)/ YES (Degree and training for the practice)
Hallett (1996)	60% (Knowledge level, good or acceptable)	-	-	-/-
Halfens & Eggink (1994)	54%*	-	-	-/-
Lacher, et al. (2003)	68%	-	-	-/YES (Several means of training)
Maylor & Torrance (1999)	68%* (71% nurses and 58% auxiliaries)	-	-	YES (Increases with experience)/ YES (In those who had pre- and post-graduate training)
Mockridge & Anthony (1999)	73% more than 50% of responses	-	-	NO/YES (Clinical degree)
Panagiotopoulou & Kerr (2002)	-	71%	-	NO/YES (Professional qualification)
Pieper & Mattern (1997)	71%	71%*	69%*	NO/NO
Pieper & Mott (1993)	72%*	-	-	NO/YES (Attendance to congresses and article reading)
Provo, et al. (1997)	80%	-	-	NO (In the educational intervention carried out)
Russell (1996)	69%	-	-	-

\*Data obtained by investigators from data provided by the primary investigation.

### Population studied

The participants in the studies were nurses, in all the articles except in the study by Larcher (25), which included nursing students. Several studies included graduate nurses as well as auxiliary nurses (Table 1) (21, 24, 26, 28).

The number of participants varies a lot from one study to another, from only 30 nurses up to 2.113 nurses, as in the case of the work by Sharp and colleagues (29). Nevertheless, in order to see the scope of the study, the participation of these subjects has to be taken into account. The response rate can vary between 100% to somewhat more than 20% (Table 1).

### Knowledge about prevention and treatment of UPP

The overall index or score of UPP knowledge of nursing personnel in the different studies is variable, with a range of between 54% and 81%. The average score is around 70% (Table 2).

Some of the studies produce partial marks in prevention and treatment (Table 2). The indices on prevention knowledge (range 50% to 85%) are somewhat higher than those on treatment knowledge (range 56% to 78%). On the other hand, Halfens and Eggink (30) showed that, out of 9 treatment procedures to be used on all patients, 6,9 are known; of 11 procedures to use in concrete cases, 5,9 were known; and of 7 non-useful methods, 1,9 were known. Mockridge and Anthony (31) found that 73,2% of nurses correctly answered more than 50% of the questions that measured UPP treatment knowledge. In the study by Bostrom and Kenneth (32) 91% of nurses correctly identified 9 out of 11 risk factors, and 71% identified 10 or more factors, while Hallet (33) found that 60% of nursing professionals identified at least 5 risk factors, compared to 20% who could not identify more than 4 factors.

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Table 3. Knowledge of risk factors

Best known risk factors	Percentage [Range]	References	Least known risk factors	Percentage [Range]	References
High pressure kept over bony prominences	[90%-100%]	46 / 24	Mental confusion	[26%-60%]	24/37
Incontinence	[68%-100%]	36 / 25 / 24 / 37	Low marks Baja in Braden scale	13,3%	25
Immobility	[68% - 100%]	36 / 25 / 37	Analgesic intake	11%	24
Malnutrition	[40%-100%]	36 / 25 / 37			
Low albumin levels	64,8%	24			
Skin condition	[40%-94%]	25 / 37			

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### Influence of training and experience on knowledge

Almost all the studies that analyse the influence of training indicate that the latter influences the index of knowledge of professionals, fundamentally if they have received it in the last three years, if they have received it at pre- and post-graduate levels or if they have attended congresses and read scientific articles on the subject. Besides, the professional qualification also influences their knowledge. Only one study does not find that relationship (34) (Table 2). The new technologies also start to be a source of knowledge, as shown by the Larcher study.

We found more discrepancies in the professional experience. Four of the seven studies where this is analysed do not find a difference, whereas in three they do find it. Some authors (35, 20) find that knowledge increases with experience, while others (27) say that the extremes [little experience (< 2 years) and much experience (> 20 years)] are those with the least amount of knowledge.

### Knowledge of risk factors and nurses interventions

In Table 3, the best known risk factors are incontinence, immobility, maintained pressure or malnutrition. Among the least known are mental confusion or lack of score in the Braden scale.

The best known nurses interventions (Table 4), are especially those related to skin care, their hygiene and inspection, maintaining the bed clean or the changes in posture. The use of relief surfaces (local or general); patient education; the use of risk assessment scales; description and classification of UPP, as well as its treatment, are among the nursing interventions known by a

smaller number of professionals (Table 4).

Also, those interventions that now are clearly unadvised for being detrimental to the patient, must be pointed out. Nevertheless, they continue being used (Table 5), such as massaging bony prominences, use of donut-ring cushion devices or cleaning antiseptics, among others.

### Limitations of the studies

One main limitation of the studies analysed is the small size of the studied samples in some of them (23, 36, 37). In other studies, although the size of samples initially considered was adequate, it later suffered a decrease due to low rate of response, (29-31, 35) or due to the need to exclude cases lacking sufficient conditions for their inclusion in the analysis (29, 30). Also, in some studies the samples changed through the development of the investigation (20, 21, 23).

In some studies, the sample is not well defined: There is not a good characterisation of the type of professionals in the sample, in terms of professional experience or previous training in UPP care (30).

In other occasions the concrete description of the studied professionals has allowed the determination of the specific character of those samples, since they involve nurses from a military hospital (24); nurses from a consortium for the application of investigation to the clinical practice (32); or nurses who are still not professionals (26), samples not comparable to the more frequent realities.

The instrument for information gathering in the analysed studies was a questionnaire. The use of a questionnaire for measuring knowledge can be considered a limitation, in the sense that there is no way to guarantee that the response from the professionals had been issued without previous consultation of manuals or other resources. Something similar occurs when assessing the clinical practice by means of a questionnaire, since in this way the data obtained are about declared practice rather than observed practice, therefore differences could exist with the healthcare reality. Although the analysis of clinical histories is a more direct way of assessing the care practice, it could also be actually different than the real practice; it could occur that the personnel performs the care in a more complete way than it appears registered in the clinical record.

**Table 4. Knowledge about nursing interventions**

Better known nursing interventions	Percentage [Range]	References	Least known nursing interventions	Percentage [Range]	References
Skin care and hygiene	[94%-99%]	32 / 30 / 24	Use of special pressure relief surfaces	[9%-67%]	24 / 30 / 26 / 32 /
Maintain the lower bed sheet clean, soft and dry	[98%-99%]	30 / 24	Patient and family education	[26%-37%]	32 / 36
Patient posture changes and repositioning	[95%-100%]	24 / 35 / 36 / 37	Use of a UPP risk assessment scale	[37%-55%]	30 / 36 / 47 / 31
Assessment and nutritional support	[58%-100%]	36 / 30 24 / 37 / 32 / 25	Reposition sitting patients	13%	25
Prevent maceration	[89%-97%]	24 / 30	UPP infection criteria	(14%-29%)	35 / 31
Feel and inspect skin daily	[73%-91%]	24 / 30	Way of describing the state of a UPP and classifying in different stages	38% - 56%	47 / 36 / 35 / 26

**Table 5. Knowledge about unadvised interventions by the clinical practice guidelines**

Unadvised and still used interventions	Use percentage [Range]	References
Massage over bone prominences	[33%-75%]	47 / 24 / 35 / 37
Use of donut-type cushion devices	[22%-65%]	47 / 35 / 24
Use of "lamb skin"	15%	37
Use of antiseptics in UPP cleaning	[6%-50%]	35 / 37

## DISCUSSION

The large number of articles found, about twenty, about UPP nursing knowledge, carried out in different countries and contexts (United States of America, United Kingdom, Holland, Spain, Brazil, , etc.) show the high interest in a “diagnostic analysis” of the nurses’ knowledge on such an important health problem as UPP. The establishment of the level of knowledge is a first phase before deciding where to direct the resources, for the dissemination of knowledge or for its implementation. As some authors say (26, 38-40), the development of UPP is tied to the training, competency and attitudes of the nurses. The success of prevention is a function of the knowledge, skills and attitudes of the nurses and, therefore, we have to accept the responsibility and the role to reduce the incidence of these lesions.

Well, although we found an acceptable rate of knowledge around 70%, we can say that there still exists an important number of recommendations of the clinical practice guidelines that are not known by the nursing professionals (almost 1 of each 3). The prevention and risk factor guidelines are better known than those for treatment, this treatment practice being a not much assessed aspect by the studies found. This aspect is important because it seems clear that little or inadequate knowledge contribute to the increase of prevalence of UPP (20, 39, 41, 42).

These data are verified by our study, where it seems that the specific training about UPP improves the knowledge indices, especially if it is received during both pre-and post-graduate. That is why it seems necessary that universities include in their curricula a basic training on prevention and care of UPP, that must be accompanied later in the post graduate training, with the attendance to congresses related to the subject and with a knowledge update through the clinical practice guidelines, scientific articles, etc.

Nevertheless, the influence of professional experience seems to be more related to the individual training decisions opted by the professional, than with the general situation of experiences,<sup>195</sup> although the studies indicate that with more experience there is more knowledge, and this in turn improves the practice. This is also shown in the review of Moore (39), although after about 20 years, maybe due to tiredness, routine, etc., this knowledge may begin to diminish.

If we concentrate more closely on concrete aspects of knowledge, we observe how the risk factors are well identified, and it is very significant that the factors that nurses think are more influential, coincide with those determined by Braden and Bergmstron in their conceptual scheme of the origin of the pressure ulcers (43), that allowed the development of the scale for assessment of the risk of developing UPP (Braden scale) (44).

Mental confusion stands out among the lesser known risk factors. This element, already considered of high risk in the first scale developed by Doreen Norton in 1962, has been eliminated from the majority of scales due to the difficulty in measuring it objectively. Maybe that is why nurses find it difficult to relate to it. Nevertheless, it could be an element that favours the development of these lesions. This contrasts enormously with the use of risk factor assessment scales for the development of pressure ulcers. In general, it is one of the least known interventions by nurses, which we must assume is related to its infrequent use in clinical practice. Today we know that there are several validated scales (Braden, Norton, EMINA) whose use is above the clinical judgement, that favours the use of preventive measures (more and faster) and with a better optimisation of existing resources (45), which seems to justify an effort toward the diffusion of this knowledge.

If we analyse the best-known nursing interventions, the majority are related to the local traditional care associated to the pressure ulcers, skin care, clean and dry sheets, good hygiene, skin inspection and, of course, posture changes. Nevertheless, the most “original” interventions, use of special pressure management surfaces, patient or family education, or use of local pressure relief products, are among the least known. This - together with the fact that other recommendations formerly used and now unadvised because they are detrimental (massaging bony prominences, use of donut-shaped rings or the use of lamb skin) continue being used by a considerable number of professionals - shows the difficulty in modifying the practice once this knowledge is acquired, although they are later varied.

The treatment interventions are worse known than those of prevention. Data show that for the majority of nurses it is easier to prevent the ulcers than to treat them. Difficulties can be seen in fundamental care elements like describing their state and classifying them in stages. Infection criteria are not known, treatment measures unadvised by the Clinical Practice Guides for more than a decade continue being used, like the use of antiseptics, and there is an important lack of knowledge about the adequate use of the new measures based on humid cure, such as hydrogels or hydrocolloids.

Finally, we must mention the limitations encountered in the analysed studies, that are a function of the design chosen by almost all the authors for their development, the surveys and those related to the sample. In the first place because, except for some studies where the sample size was already small, in many the general low response rate of these studies, the variability or its singularity reduces credibility of the results. In second place, because the use of questionnaires shows declared practice, that can differ from the real one. Besides, those who usually respond to questionnaires are the most motivated professionals or who believe they have a better knowledge index, so we must assume that the declared response can be the best of situations and that the reality can reveal an even deeper lack of knowledge.

## CONCLUSIONS

- There is an acceptable level of knowledge of the recommendations for the prevention and care of the UPP, while the risk factor and treatment prevention index is higher than the treatment index.
- The specific training on UPP improves this knowledge index.
- The most important risk factors are known by a great proportion of nurses.
- The traditional prevention interventions are also well known. But some interventions that in the past few years have been proven of considerable importance in prevention of these lesions, are little known. Among the latter are the use of pressure management surfaces and education of patient and family.
- Long time unadvised prevention recommendations are still being used. This makes it necessary for all the actors (professionals, scientific societies, health care services) to try to implement in the practice the knowledge as it is produced by the scientific community. Otherwise the ultimate purpose of research, which is to improve the practice, will never be achieved, and thus the effort expended in the investigations will be senseless.
- It seems necessary to make a training effort in the treatment of UPP, because fundamental and essential elements of their management are unknown for a high number of professionals.

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