

(RESEARCH ARTICLE)



KNOWLEDGE, ATTITUDES, AND PRACTICES OF HEALTHCARE STAFF REGARDING THE PREVENTION AND MANAGEMENT OF PRESSURE ULCERS: A CROSS-SECTIONAL STUDY IN THE KHÉNIFRA HEALTH AREA

Kibbou Mostafa ^{1,*}, Kartite Driss ², Sabah EL kouri ³ and Ennouhi Mohammed Amine ⁴

¹ Resident Physician, Department of Reconstructive and Aesthetic Surgery, Moulay Ismail Military Hospital (HMMI), Meknes, Morocco.

² Resident Physician, Department of Reconstructive and Aesthetic Surgery, Moulay Ismail Military Hospital (HMMI), Meknes, Morocco.

³ Resident Physician, Department of Reconstructive and Aesthetic Surgery, Moulay Ismail Military Hospital (HMMI), Meknes, Morocco.

⁴ Head of the Department of Reconstructive and Aesthetic Surgery, Moulay Ismail Military Hospital (HMMI), Meknes, Morocco.

* Corresponding Author

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ABSTRACT

Pressure ulcers are a frequent complication among patients with reduced mobility and represent a genuine public health issue because of their impact on morbidity, patients' quality of life, and care costs. Their prevention and management rely mainly on the skills and involvement of healthcare staff. This study was conducted in health facilities of the Khénifra health area to assess the knowledge, attitudes, and practices of health professionals regarding the prevention and management of pressure ulcers. Data were collected using a standardized 30-item questionnaire divided into five sections, then analyzed to identify strengths, shortcomings, and training needs. The results will help formulate recommendations aimed at improving the quality of care and strengthening pressure ulcer prevention in the Khénifra health area.

Study objective: The main objective of this study is to assess the knowledge, attitudes, and practices of healthcare staff regarding the prevention and management of pressure ulcers in health facilities of the Khénifra health area, in the Béni Mellal-Khénifra region, Morocco. The specific objectives are to identify gaps in knowledge, analyze professional practices, highlight the difficulties faced by caregivers, assess their training needs, and propose appropriate recommendations to improve the quality of prevention.

Keywords: Pressure ulcers; Prevention; Healthcare staff; Knowledge, Attitudes and practices; Khénifra health area.

1 INTRODUCTION

Pressure ulcers, or pressure injuries, are a major public health problem because of their frequency, their impact on patients' quality of life, and the substantial costs they generate for healthcare systems [1,2]. Although largely avoidable, they remain a frequent complication among patients with reduced mobility, elderly people, and patients with chronic conditions [1,3]. Pressure ulcer prevention relies on the early identification of at-risk patients, the implementation of appropriate preventive measures, and multidisciplinary management involving all healthcare professionals [1]. The effectiveness of this prevention largely depends on the knowledge, attitudes, and practices of healthcare staff, whose role is essential in the screening, prevention, and management of pressure ulcers [2,4]. Assessing these different aspects makes it possible to identify shortcomings, difficulties encountered, and continuing education needs in order to improve the quality of care [3,4]. Given this context, the present study aims to assess the knowledge, attitudes, and practices of healthcare staff regarding the prevention and management of pressure ulcers within health facilities under the Khénifra Territorial Health Grouping, in order to propose recommendations tailored to on-the-ground realities.



Figure 1: Complicated Pressure Ulcer: A Clinical Case from Our Department

2 MATERIALS AND METHODS

2.1 Study type

This is an observational, descriptive, cross-sectional study with an analytical aim, conducted among healthcare staff working in health facilities of the Khénifra health area. Data will be collected using a standardized, self-administered questionnaire designed to assess participants' knowledge, attitudes, and practices regarding the prevention and management of pressure ulcers.

2.2 Study setting

The study will be conducted in health facilities of the Khénifra health area, part of the Béni Mellal–Khénifra region. The health area comprises four health sectors. The care facilities included in the study are distributed as follows [5].

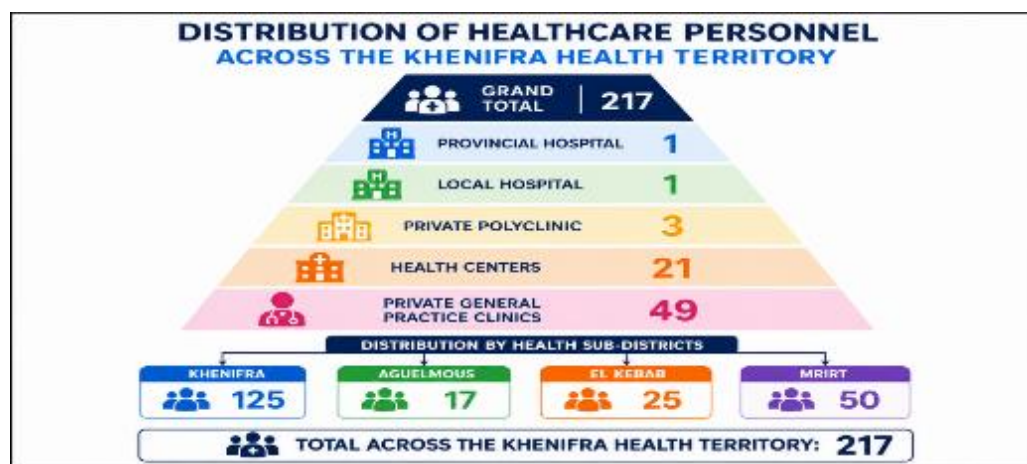


Figure 2: Distrution of healthcare personnel

The study will cover all healthcare staff working in these public and private health facilities who are involved in the prevention and management of pressure ulcers. The total number of participants will be determined based on a census of eligible staff in the various health facilities included in the study.

2.3 Target population

The target population of this study consists of all health professionals working within public and private health facilities of the Khénifra health area, directly or indirectly involved in the prevention and management of pressure ulcers. It includes general practitioners, specialist physicians, nurses, physiotherapists, and other health professionals involved in the care of patients at risk of developing pressure ulcers.

The target population was estimated based on staffing data provided by the Human Resources Department of the Provincial Delegation of the Ministry of Health and Social Protection of Khénifra. This data was updated by excluding staff temporarily absent (on leave or on assignment) as well as those not carrying out clinical activity related to patient care. At the end of this process, the population eligible for the study was estimated at approximately 217 health professionals.

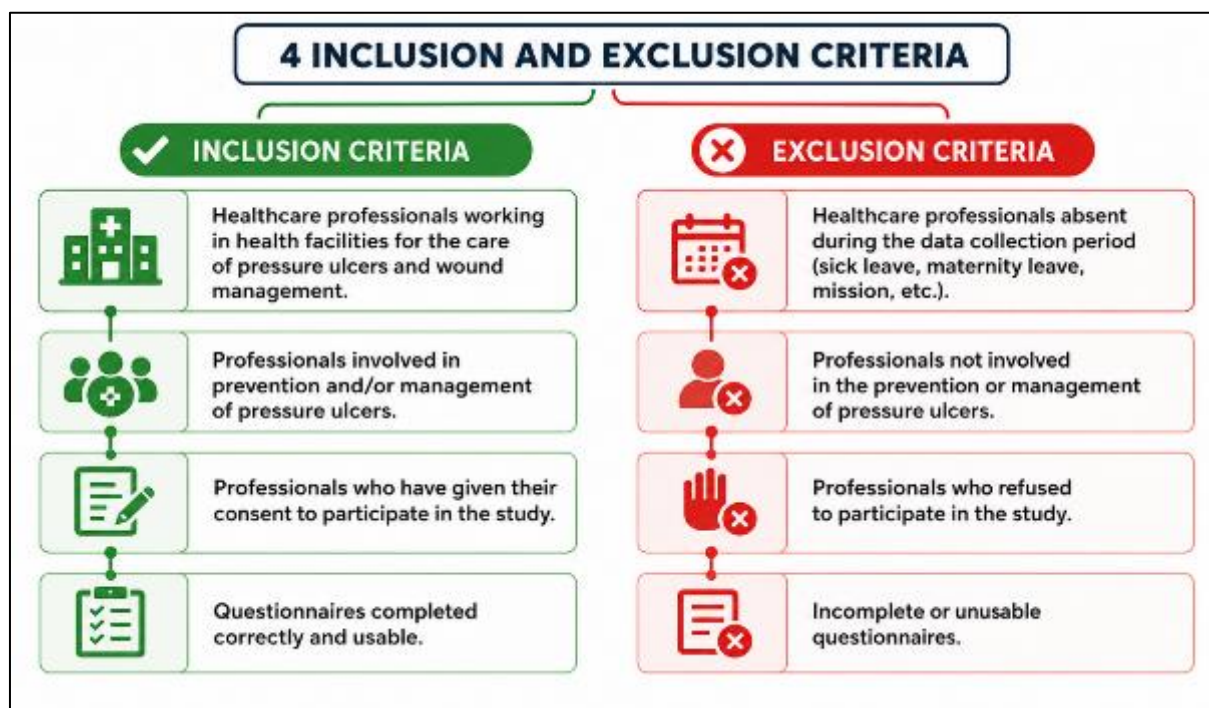


Figure 3: Incusion And Exclusion Criteria

2.4 Data collection

Data were collected using a standardized, self-administered questionnaire developed from a literature review and international recommendations on pressure ulcer prevention and management. The questionnaire, administered electronically via the Tally, included 30 questions divided into cinq sections: participants' sociodemographic and professional characteristics, knowledge, attitudes, practices, as well as the difficulties encountered and training needs. Responses were mainly multiple-choice and Likert-scale items. The collected data were automatically recorded on the Tally, then exported to Microsoft Excel for quality control, coding, and descriptive statistical analysis. The results will be presented as counts, percentages, tables, and figures.

2.5 Questionnaire distribution

The questionnaire was administered electronically via TALLY. Its distribution used several channels to ensure broad participation of health professionals. The questionnaire link was shared within the WhatsApp groups of the various participating health facilities. It was also relayed by the heads of the health facilities as well as by the communication units of the facilities concerned, which ensured its transmission to healthcare staff. This distribution strategy aimed to reach the maximum number of eligible participants within the Khénifra Territorial Health Grouping.

2.6 Ethical considerations

Authorization to carry out this study was obtained from the Provincial Delegate of Health and Social Protection of Khénifra, as well as from the directors of the health facilities concerned. Participation in the study is free and voluntary. Participants were informed of the study's objectives and procedures before answering the questionnaire. It is anonymous and does not collect any identifying data. The information collected is treated as strictly confidential and

used solely for scientific research purposes. Results will be presented in aggregated form to ensure participant anonymity, in accordance with the ethical principles of biomedical research

3 RESULTS

3.1 Study course and participation:

The study was conducted over a period of three months, among health professionals working in the health area studied. Out of a target population of 217 health professionals, 181 fully completed the questionnaire, corresponding to a participation rate of 83.4%. In addition, the electronic questionnaire recorded approximately 300 visits that did not result in a complete submission. To ensure data quality and completeness, only fully completed questionnaires were retained for statistical analysis.

3.2 General characteristics of the population studied:

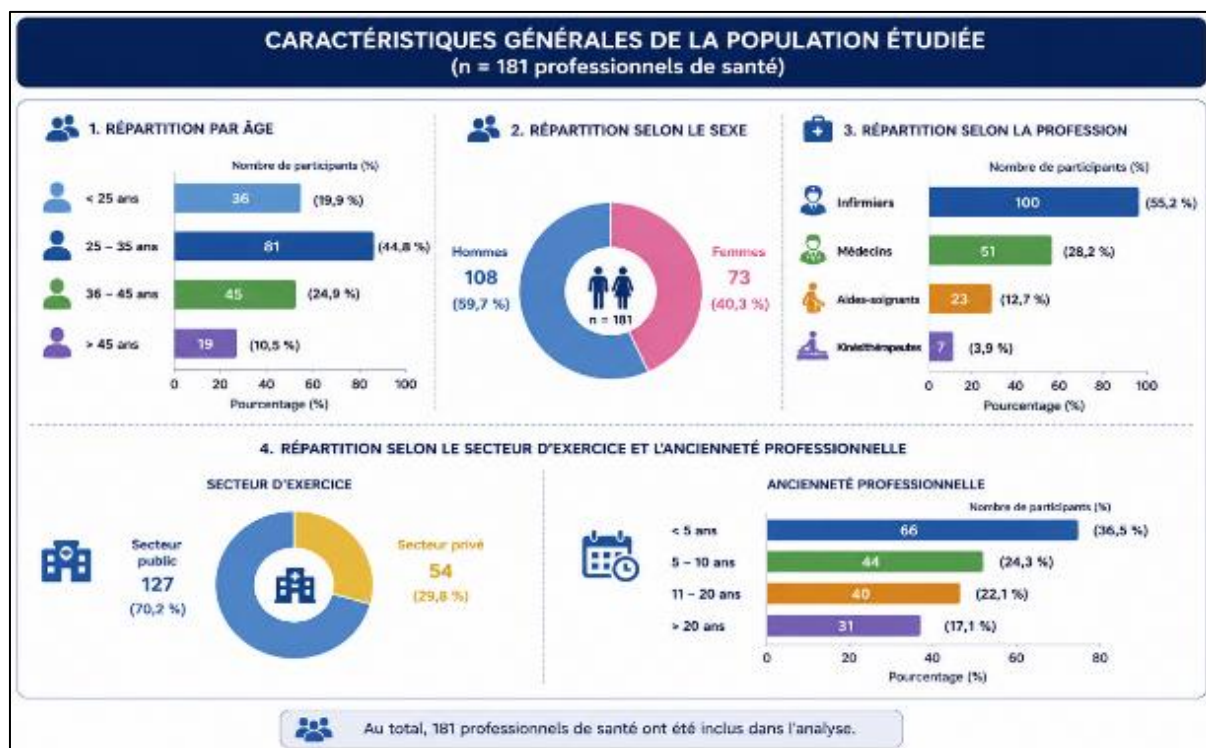


Figure 4: Sociodemographic Characteristics of the Study Population

4 RESULTS RELATED TO KNOWLEDGE

4.1 Prior training on pressure ulcers

The majority of professionals surveyed, namely 121 (66.9%), had never received specific training on pressure ulcers. Conversely, only 60 professionals (33.1%) had already received training in this field. These results highlight insufficient specific training among healthcare staff, which may be a factor limiting the acquisition and updating of the knowledge needed for adequate prevention and management of pressure ulcers.

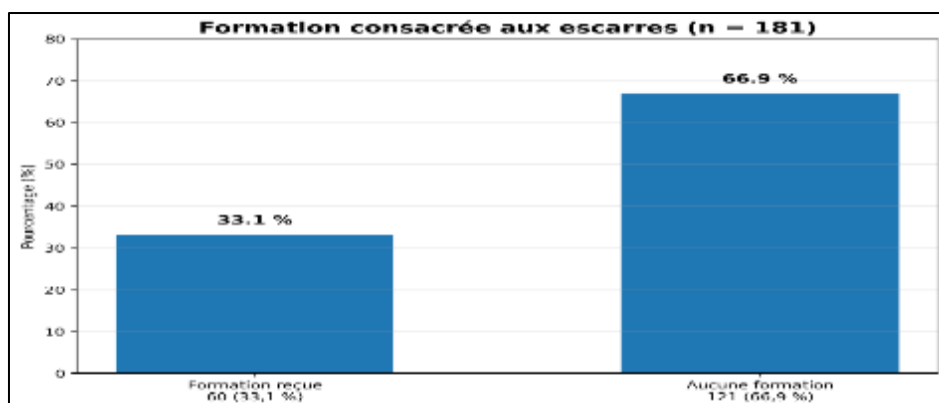


Figure 5: Percentage of formation

4.2 Knowledge of risk factors

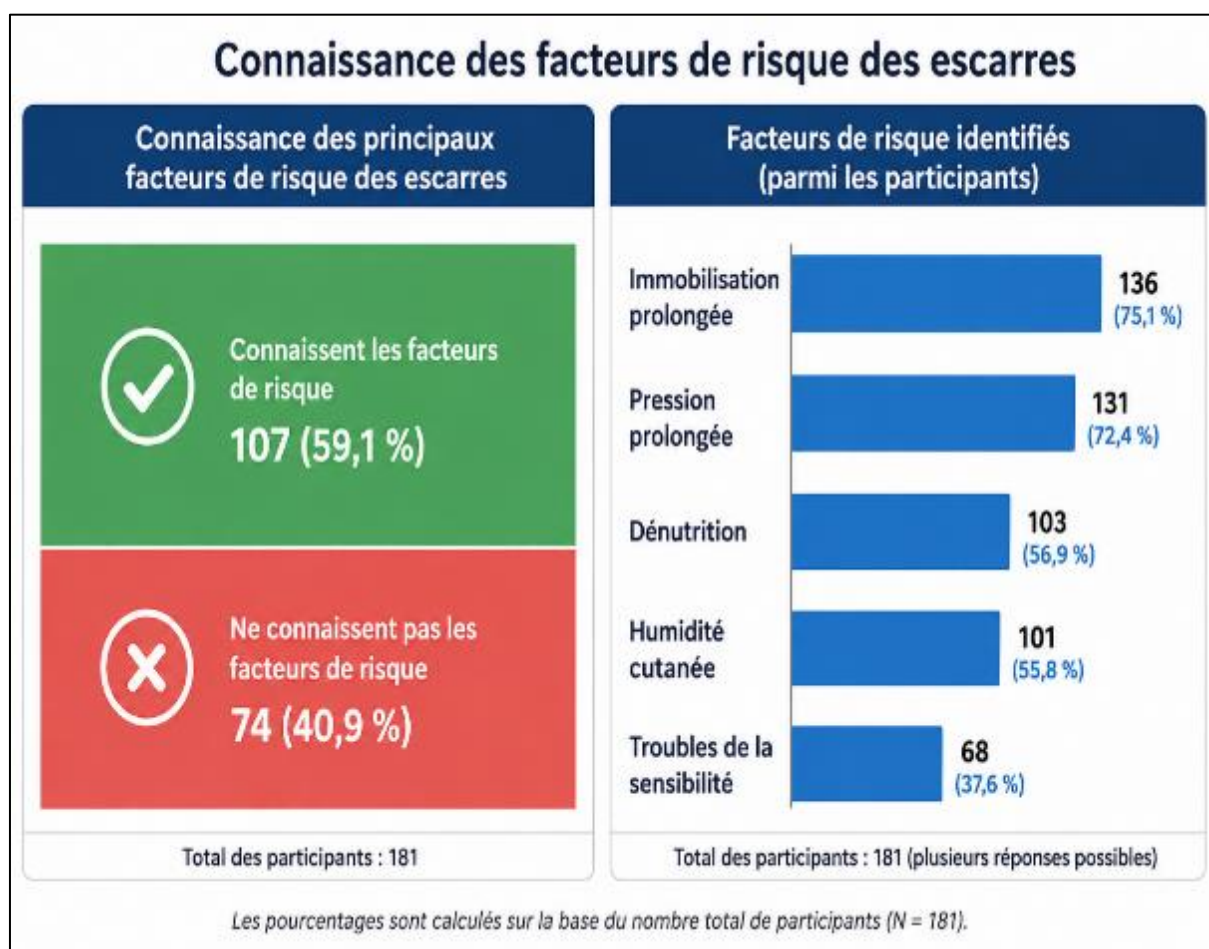


Figure 6: Knowledge of Pressure Ulcer Risk Factors”

4.3 Knowledge of pressure ulcer stages

Knowledge of the different stages of pressure ulcers was reported by 87 professionals (48.1%), while 94 (51.9%) reported that they did not know them.

4.4 Knowledge of prevention methods

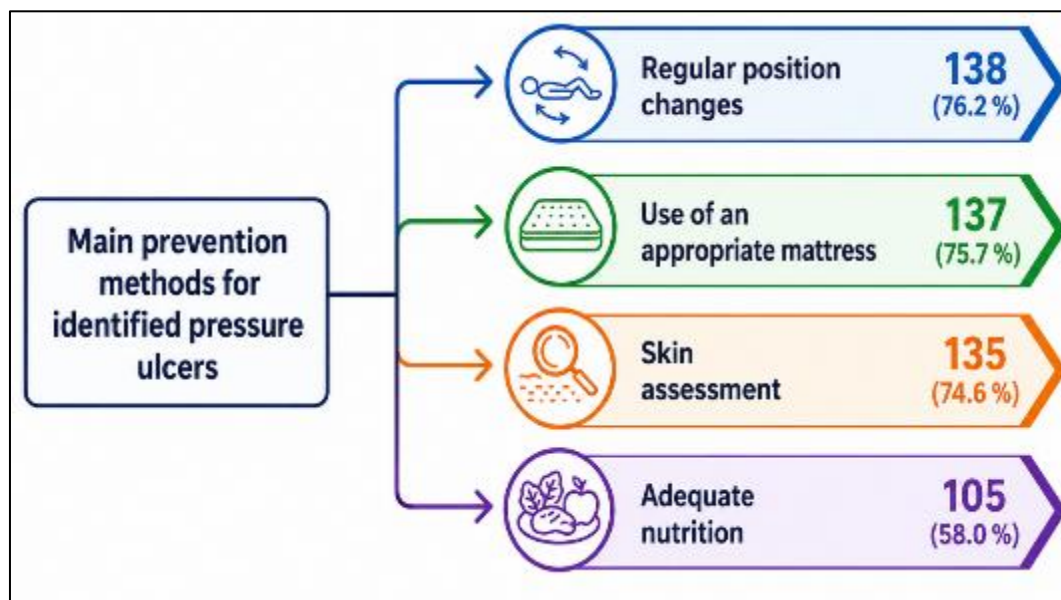


Figure 7: Percentage of Knowledge of prevention methods

4.5 Knowledge of surgical treatments

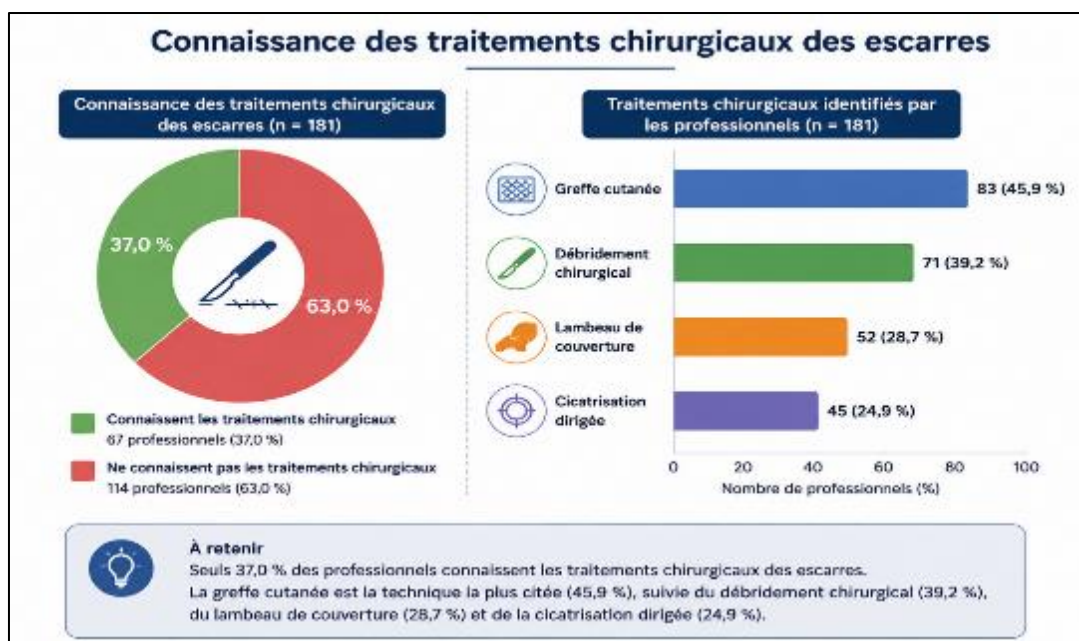


Figure 8: Percentage of Healthcare Professionals Aware of Surgical Treatments for Pressure Ulcers

5 RESULTS RELATED TO ATTITUDES

5.1 Difficulties encountered in management

A significant proportion of the professionals surveyed, namely 140 out of 181 (77.3%), reported encountering difficulties in the management of pressure ulcers, compared with 41 (22.7%) who did not report any.

The main difficulties identified concerned lack of equipment, lack of training, staff shortage, as well as patient-related difficulties.

5.2 Perception of multidisciplinary management

Multidisciplinary management was considered likely to improve outcomes by 114 professionals (63.0%), while 67 (37.0%) did not share this view.

5.3 Priority given to prevention

Pressure ulcer prevention was considered a priority in the department by 64.6% of participants, whereas 35.4% did not consider it a priority.

5.4 Need for further training

A need for additional training on pressure ulcers was expressed by 165 professionals (91.2%), compared with only 16 (8.8%) who did not consider it necessary. This result highlights a strong demand for strengthening professional skills in the field of pressure ulcer prevention and management.

5.5 Desired training topics

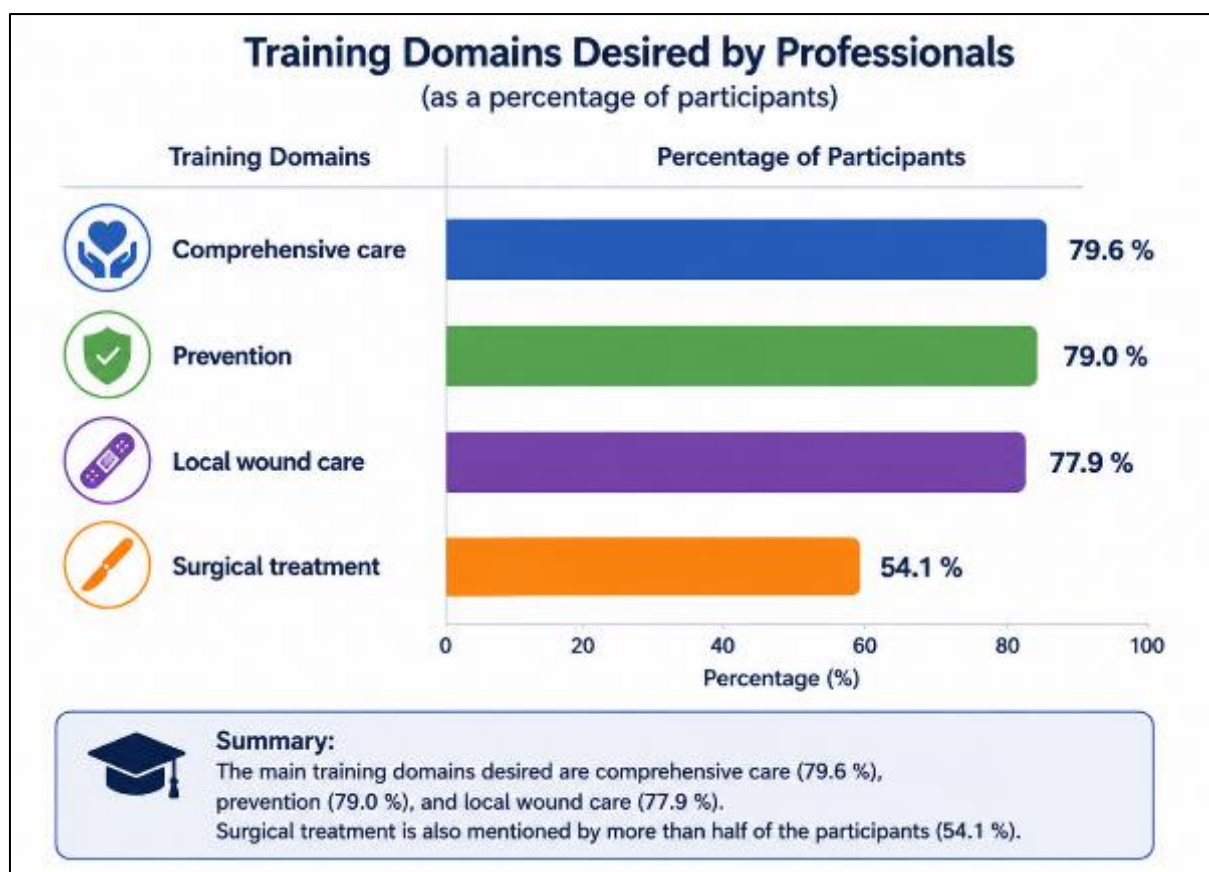


Figure 9: training domains desired by professionals

6 RESULTS RELATED TO PROFESSIONAL PRACTICES

The analysis of practices shows uneven application of pressure ulcer prevention and management measures.

6.1 Preventive and nutritional measures

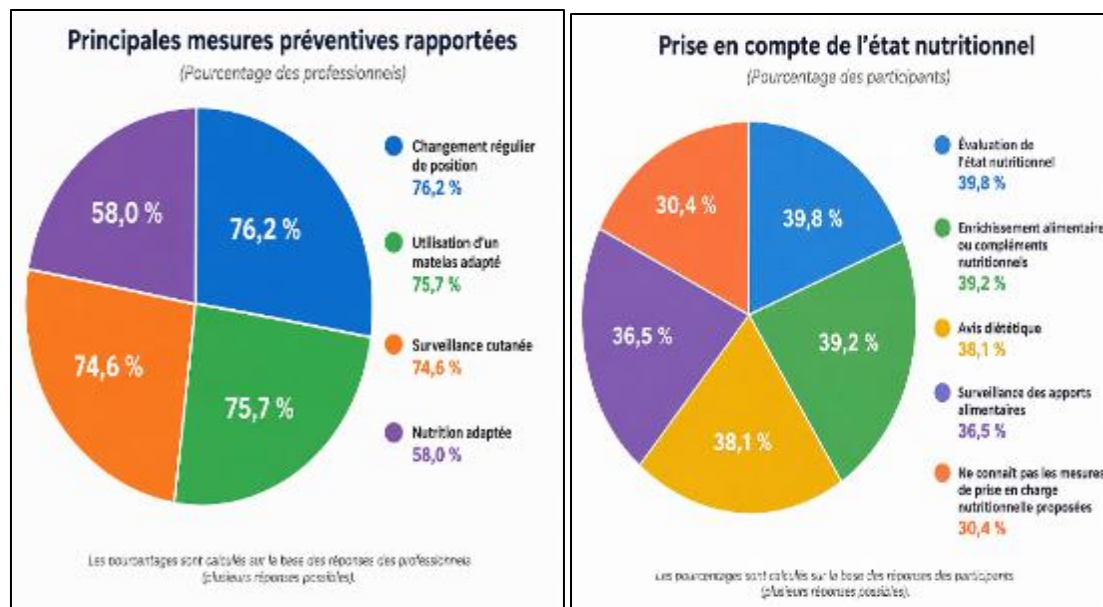


Figure 10: Percentage of Preventive and nutritional measures

6.2 Local and surgical management

Regarding the various methods of managing pressure ulcers, professionals mainly cited overall management, prevention, and local wound care. Knowledge of surgical treatment methods, however, appeared more limited: only 30% of participants knew that surgical treatment could be indicated in the management of pressure ulcers. Among the surgical methods identified, skin grafting was the technique most frequently cited, followed by surgical debridement, coverage flaps, and directed wound healing. These results reflect relatively limited knowledge of the place of surgery in pressure ulcer management, whereas surgery may be indicated in certain complex or deep forms, particularly after failure of conservative treatment

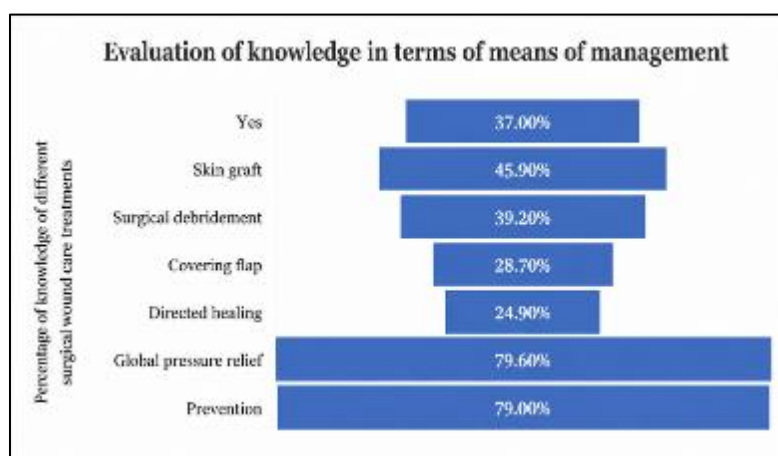


Figure 11: Evaluation of knowledge in terms of means of management

7 DIFFICULTIES ENCOUNTERED AND AREAS FOR IMPROVEMENT:

Overview of all the difficulties encountered by health professionals in the prevention and management of pressure ulcers:

Table 1: Percentage OF THE Difficulties encountered

Difficulties	Percentage (%)
Lack of equipment	76.8%
Patient-related difficulties	64.6%
Lack of training	60.2%
Staff shortage	53.0%
Other difficulties	41.4%

Participants' comments made it possible to identify other difficulties in the prevention and management of pressure ulcers, notably the absence of standardized protocols, heavy workload, and lack of time devoted to preventive measures. They also highlighted insufficient coordination among professionals, limited family involvement, and difficulty accessing specialist advice. Finally, insufficient traceability and regular monitoring of at-risk patients was reported as an obstacle to optimizing pressure ulcer management.

8 DISCUSSION

Pressure ulcers are a significant public health issue in terms of quality and safety of care, particularly among patients with motor impairment, functional dependence, or multiple risk factors. Their prevention relies on early risk assessment, regular skin monitoring, mobilization and repositioning, the use of appropriate support surfaces, and consideration of nutritional status and skin moisture. The international recommendations updated in 2025 emphasize an individualized, multidisciplinary approach to prevention and management [6].

In our study, involving 181 health professionals in the Khénifra region, nurses constituted the most represented professional category.

This predominance is probably explained by their central role in the prevention and daily monitoring of pressure ulcers. It could also be related to the characteristics of care provision in the Khénifra region, marked by a low density of medical and specialized facilities.

In this context, nurses provide a substantial share of care and continuity of care.

- The predominance of young professionals could be linked to the geographic characteristics of the region, which includes several hard-to-access areas.
- Khénifra is thus a territory where young professionals are particularly likely to receive their initial posting. The significant proportion of physicians working in the public sector could also reflect the local organization of care provision.
- The public sector remains indeed the main source of care for a population whose purchasing power may limit access to the private sector.
- The low representation of the private sector could thus be related to this socioeconomic context and to a relatively less developed private offering.
- Moreover, the Khénifra region appears generally less professionally attractive than major urban and university centers. Access difficulties, geographic remoteness, and more limited opportunities for specialized training may contribute to this situation.

These territorial characteristics could partly explain the young age of the study population and the predominance of the public sector.

8.1 Professionals' knowledge

The results of our survey show generally adequate knowledge of certain aspects of pressure ulcer management, notably prevention, local wound care, and the need for comprehensive management. This trend is consistent with the literature, which nonetheless shows considerable variability in knowledge levels depending on the populations studied, the training received, and the care settings. In a study conducted among health professionals in Saudi Arabia, the average level of knowledge regarding prevention was considered intermediate, despite strong concern among professionals about this issue [7].

A more recent study conducted in Nigeria also showed that, despite a sufficient level of knowledge among a significant proportion of the professionals surveyed, the level of preventive practice remained markedly lower. These results suggest that acquiring theoretical knowledge does not necessarily guarantee its translation into clinical practice. [8].

This discrepancy between knowledge and practice is a particularly important factor to consider in our context. It can be explained by several organizational and structural factors, notably workload, understaffing, limited availability of appropriate equipment, and the absence or inadequacy of standardized protocols. A mixed-methods systematic review conducted by Yu et al. showed that the effective implementation of pressure injury prevention measures was influenced by individual and organizational factors, notably professionals' knowledge and skills as well as the work environment and resource availability. These results suggest that favorable attitudes and satisfactory knowledge are not always sufficient to guarantee optimal application of preventive measures in clinical practice [9].

8.2 Attitudes toward prevention

In our study, prevention appeared to be an important component of pressure ulcer management for a significant proportion of participants. This attitude is particularly relevant since the majority of pressure injuries can be prevented through early identification of at-risk patients and prompt implementation of appropriate measures. However, a non-negligible proportion of professionals felt that prevention did not play a major role in pressure ulcer management. This perception could notably be explained by a lack of training and specific knowledge regarding pressure injury prevention. It thus highlights a gap between theoretical recommendations and their adoption by some professionals. These results highlight the value of strengthening continuing education for healthcare staff, in order to improve understanding of the importance of prevention and encourage its systematic integration into clinical practice.

The literature generally shows a more favorable attitude toward prevention than the actual level of practice. A study conducted among health professionals in rehabilitation notably showed that the vast majority of participants considered prevention important, even though certain difficulties persisted in its day-to-day application. [10].

More recently, a study conducted among health professionals in Nigeria also revealed a discrepancy between knowledge, attitudes, and practices. The authors notably highlight the importance of lack of training and understaffing as factors likely to limit the implementation of preventive measures. [8].

Thus, in our context, improving attitudes should not be considered independently of working conditions. A favorable attitude toward prevention must be accompanied by human, material, and organizational resources enabling professionals to effectively implement the recommended measures.

8.3 Management practices

In our series, overall management, prevention, and local wound care were the main management modalities reported. This orientation is consistent with current principles of pressure injury management, which favor a comprehensive, individualized approach rather than simply treating the wound.

However, the literature highlights a frequent discrepancy between reported practices and actually observed practices. A Canadian study conducted among 590 professionals notably showed that, despite good general knowledge of preventive measures, certain recommended interventions remained insufficiently applied [11].

This observation is important for interpreting our results. A self-reported questionnaire can indeed overestimate certain practices due to social desirability bias. It would therefore be worthwhile, in future work, to supplement the self-reported assessment with a clinical audit or direct observation of practices in health facilities.

8.4 Role of surgical treatment

Knowledge of surgical treatments appeared more limited in our study. Professionals mainly identified skin grafting, surgical debridement, coverage flaps, and directed wound healing.

This more limited knowledge can be explained by the specific place of surgery in the therapeutic strategy. Unlike preventive measures and local wound care, which concern a large number of professionals on a daily basis, surgical treatment is mainly used in complex or deep forms, particularly when lesions require extensive debridement or reconstruction of the tissue loss. Surgery should thus be integrated into a comprehensive strategy that also includes control of risk factors, optimization of general and nutritional status, and preparation of the operative site. Moreover, this limited knowledge could also be linked to the still limited place given to pressure ulcers in the initial training of health professionals, particularly nurses and physicians, as well as to insufficient continuing education specifically dedicated to their prevention and management. Several studies indeed show that professionals' knowledge remains insufficient and highlight the value of further integrating pressure ulcer prevention into training curricula and developing regular continuing education programs. [12].

In our context, the absence of a specialized plastic and reconstructive surgery department within the health area studied could also limit professionals' exposure to situations requiring surgical management of pressure ulcers and reduce opportunities to learn from specialists. This organizational feature could thus contribute, at least in part, to explaining the low level of knowledge observed regarding surgical options. The limited knowledge of surgical options observed in our study should therefore not necessarily be interpreted as a general knowledge deficiency. It may also reflect the limited exposure of some professionals to these specialized indications. Nevertheless, better knowledge of the indications for seeking surgical advice could promote earlier referral of patients with complex lesions.

8.5 Difficulties encountered and training needs

The difficulties reported in our study, notably the absence of standardized protocols, workload, lack of time, insufficient coordination among professionals, variable family involvement, and sometimes difficult access to specialist advice, are probably important determinants of practices.

These results are consistent with international data. Recent studies regularly identify staff shortages, heavy workload, insufficient resources, and lack of training as major obstacles to effective prevention.

In this context, continuing education appears to be an essential lever. It should, however, go beyond simply transmitting theoretical knowledge and include practical training on risk assessment, repositioning, skin care, the use of preventive support surfaces, nutritional management, and the identification of situations requiring specialist advice. Recent data also suggest that recent training is associated with better knowledge and better preventive practices [13].

Recommendations

In light of the results of our study and given the specific characteristics of the Khénifra health area, several recommendations can be made to improve the prevention, management, and referral of patients with pressure ulcers:

- Strengthen continuing education for health professionals, particularly nurses and physicians, on risk assessment, repositioning, skin care, nutrition, pressure ulcer classification, and management of established lesions.
- Develop and disseminate standardized protocols for pressure ulcer prevention and management, tailored to the different levels of care in the territory, in order to harmonize professional practices.
- Improve the availability of preventive equipment, notably appropriate mattresses and cushions, offloading devices, and equipment needed for local wound care, paying particular attention to primary healthcare facilities.
- Strengthen traceability and systematic risk assessment, notably through the use of validated tools to document skin condition, position changes, and lesion progression, based on photographs to monitor evolution.
- Develop a multidisciplinary approach bringing together physicians, nurses, physiotherapists, nutritionists, and other professionals involved in the care of at-risk patients.
- Strengthen education for patients and their families, notably on mobilization, repositioning, nutrition, skin hygiene, and early recognition of signs of pressure ulcers.
- Organize a regional referral pathway for complex cases, enabling early referral of deep, infected, recurrent pressure ulcers or those resistant to conservative treatment to a specialized facility.
- Create or develop a plastic and reconstructive surgery unit within the Khénifra health area, in order to improve local access to specialized management of complex tissue loss, notably pressure ulcers requiring surgical debridement, skin grafting, or flap coverage.
- Establish structured collaboration with regional plastic and reconstructive surgery centers, pending the development of a local specialized facility, notably for remote opinions, surgical indications, and patient referral.
- Raise professionals' awareness of the indications for reconstructive surgery, in order to promote earlier referral of patients who could benefit from surgical treatment.

- Regularly conduct practice audits in the various health facilities of the territory in order to assess protocol application, identify shortcomings, and measure the impact of corrective actions.

Encourage multicenter, prospective studies at the regional level, in order to assess the incidence of pressure ulcers, management modalities, and the impact of training programs, standardized protocols, and the development of specialized care on clinical outcomes.

Study limitations

This study has certain limitations that should be considered when interpreting the results. Distribution of the questionnaire posed a difficulty, notably due to the size of the territory studied and the diversity of the facilities and professionals involved, which may have limited access to the questionnaire and the participation of some professionals. In addition, the electronic and self-reported nature of the questionnaire could have exposed the responses to selection bias and social desirability bias. Another limitation lies in the limited availability of comparable studies in the literature, particularly in the Moroccan context, which made it more difficult to directly compare our results with those of other studies. Finally, the issue of pressure ulcers may be perceived as less of a priority or less appealing by some professionals, which could have contributed to lower participation and potentially to underrepresentation of certain profiles. These factors should be taken into account when generalizing the results to all health professionals.

9 CONCLUSION

This study, conducted among 181 health professionals in the Khénifra health area, reveals knowledge and practices that remain uneven regarding the prevention and management of pressure ulcers. Despite good knowledge of certain preventive measures, shortcomings persist notably in risk assessment, nutrition, and knowledge of stages and treatments. The main difficulties reported are lack of equipment, patient-related difficulties, insufficient training, and staff shortages. These results highlight the need to strengthen continuing education, protocols, and care coordination. Primary healthcare facilities also play an essential role in early screening, prevention, education, and follow-up of at-risk patients. Strengthening them is therefore a major element in improving the quality and continuity of pressure ulcer management in Khénifra.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

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