

# Wound care within Flemish residential care centres: An update

In Belgium, the average age of inhabitants is still rising, due to better life expectancy and because of an increase in the relative proportion of older people in society. As a result, the number of chronic disorders and comorbidities is increasing as well.

The aim of this study was to acquire an overview of the wounds and wound care present in residential care centres.

## Keywords:

wound care; prevalence; nursing knowledge and education; wound care protocol; residential care centre

## ABSTRACT

### Objectives

To obtain prevalence figures for the different wound types present in residential care centres (RCCs), to investigate nurses' prior education in wound care and to find out if RCCs have wound care protocols.

### Background

The number of RCC residents is rising due to our aging society. There are almost no figures available on the prevalence of wounds in RCCs and the level of education of the care providers employed in these centres.

### Method

An observational retrospective cohort study was conducted during the period 2012–2014 in 16 RCCs (on 1,238 residents). Residents were screened for the presence of wounds, and if a wound was present, additional clinical data were collected. On the obtained data, descriptive statistics, a t-test and/or a chi-square test were performed.

## Results

A general wound prevalence of 11% was found. Pressure ulcers were the largest group with a prevalence of 36%, followed by skin tears (17%) and venous ulcers (8%). Within the RCCs surveyed, only 37% of the care providers were nurses. Of the interviewed nurses, 8% possessed the certificate of Reference Nurse in Wound Care. Of the nurses, 90% indicated that they needed additional training in wound care, but only 48.7% received the opportunity for additional training from their employers. Of the RCCs studied, 47% had wound care protocols.

## Conclusion

Further research into wound prevalence and nurses' knowledge of wound care is necessary. Employers have an important role to play in keeping nurses' knowledge of wound care up to date and in ensuring that their institutions possess wound care protocols.

## Key messages

- The average age of Belgian citizens is rising. As a result, the number of chronic disorders and comorbidities are increasing as well.

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- In 2007, 8% of people aged over 65 and 42% of those aged over 85 lived in residential care centres. Of these residents, 11.2% suffered from 1 or more wounds.
- The aim of the current study was (a) to acquire an overview of the wounds present in residential care centres (RCCs) and obtain prevalence figures, (b) to investigate nurses' prior education in wound care and (c) to discover whether RCCs have wound care protocols.

### Results

- In general, a wound prevalence of 11% was found.
- 90% of the nurses indicated that they needed additional training in wound care, but only 48.7% of them received the opportunity from their employers.
- 47% of the RCCs in this study had wound care protocols.

### INTRODUCTION

This article presents results from a survey measuring the prevalence of different wounds in Flemish residential care centres (RCCs). It will also give an overview of nurses' prior education in wound care and the presence of wound care protocols in these centres.

#### Wound prevalence

In Belgium, the average age of inhabitants is still rising, due to better life expectancy and because of an increase in the relative proportion of older people in society. When there are more elderly people in a population, more chronic disorders and co-morbidities are also observed. This also means that more people are in need of receiving help from healthcare providers. In 2007, 8% of people older than 65 and 42% of those older than 85 lived in residential care centres.<sup>1,2,3</sup> Of these, 11.2% had to deal with 1 or more wounds, with skin tears, venous leg ulcers and decubitus and diabetic foot ulcers being the most common.<sup>4</sup> Limited data are available on wound care and the prevalence of wounds in Flemish RCCs because, currently, there are only two publications available on this subject: L. Gryson's 2011 study<sup>4</sup> on the prevalence of wounds in Flemish hospitals and RCCs and a study by P. Capellier in 2014<sup>5</sup> about the prevention of diabetic foot ulcers in RCCs by Certified Nursing Assistants.

To provide adequate wound care, it is necessary that nurses possess sufficient knowledge regarding such care, especially because, in Belgium, nurses are responsible for the daily care of wounds. We all know that good wound care starts with good observation of the wound. In recent years, there has been an evolution in the concepts regarding this observation. A good example is the TIME concept. But do nurses know about this and other such concepts? At the moment, there are no studies on this that concern nurses in Flemish RCCs.

### IMPORTANCE OF WOUND CARE PROTOCOLS

Wound care protocols ensure that healthcare providers provide cohesive and consistent wound care therapy to the patient. They also lead to a better patient outcome.<sup>6</sup> Currently, there are no data available about the presence of wound care protocols in Flemish RCCs. Because of this, research with more recent data on the prevalence of wounds, prior education and the availability of wound care protocols in Flemish RCCs is necessary.

### OBJECTIVE

The aims of this study were (a) to obtain an overview of the wounds present in residential care centres (RCCs) and to obtain prevalence figures, (b) to investigate nurses' prior education in wound care and (c) to find out if RCCs have wound care protocols.

### METHOD

#### Design

This observational retrospective cohort study analysed the results from observations made by students on the Wound Care, Stoma Care and Tissue Repair postgraduate programmes during the period 2012–2014. These students had to observe the wounds and wound care of inhabitants of Flemish RCCs and collect data from patient records, including those on co-morbidities, types of wounds and wound treatment. In addition, they gathered information about the availability of wound care protocols, the decision-making process regarding wound classification and wound therapy and the staff of healthcare providers, including their prior education level in wound care. The students all used the same questionnaire to gather this information.

**Population**

The population in this study was the 42,151 residents being managed in Flemish RCCs in 2011 and their healthcare providers.

**Sample size**

A total of 17 different RCCs participated in the study. A minimum sample size of 653 residents was necessary to work with a confidence level of 99%. With a response from 1,238 residents, our sample size was sufficient.

**Inclusion and exclusion criteria**

In order to be included, the obtained data had to come from an RCC located in Flanders, Belgium. The data also had to be obtained with the explicit permission of the management, staff and residents of these centres. If the data did not meet these criteria, they were not included in the study.

**Study protocol**

In the period 2012–2014, students of postgraduate Wound Care, Stoma Care and Tissue Repair carried out a survey, which included the management of RCCs and their employed nurses. Furthermore, all residents were observed for the presence of wounds and the wound care that they received. All collected data were anonymised using a study code. These anonymised data were used for the current study. This means that these data were processed and statistically analysed by someone who did not participate in the observations and surveys.

**Data analysis**

The data analysis was carried out using Microsoft Excel®. Descriptive statistics, the student t–test and the chisquare test were used to determine whether

there was a significant difference between the averages of the studied groups of the population.

**Ethical issues**

We received the approval of the local ethical committee to use the data from the student reports for this observational retrospective cohort study. All observations respected the 2013 ethical guidelines of the Declaration of Helsinki.

**RESULTS**

**General**

A total of 17 different RCCs participated in the study. One Dutch RCC was excluded as it did not meet the inclusion criteria. Of the included RCCs, 45% were public and 55% were private. Of the RCCs, 6 (4 private, 2 public) accommodated more than 100 residents. The smallest RCC accommodated 38 residents, and the largest had 217 residents.

**Data about the employees**

In Belgium, there are two major care providers in the residential care setting: nurses, who obtain a nursing degree after four years of study (a Bachelor’s Degree in Nursing) or three years of study (a Graduate Nurse), and Certified Nursing Assistants, who receive a certificate after one year of study. Belgian law clearly describes which tasks related to wound care a Certified Nursing Assistant may perform under the supervision of a nurse, for example, the hygienic care of a healed stoma, helping a resident with eating and drinking and taking precautionary actions against pressure ulcers. A nurse will instruct the Certified Nursing Assistants and take care of other nursing procedures, like wound care, the stoma care of non–healed stomas

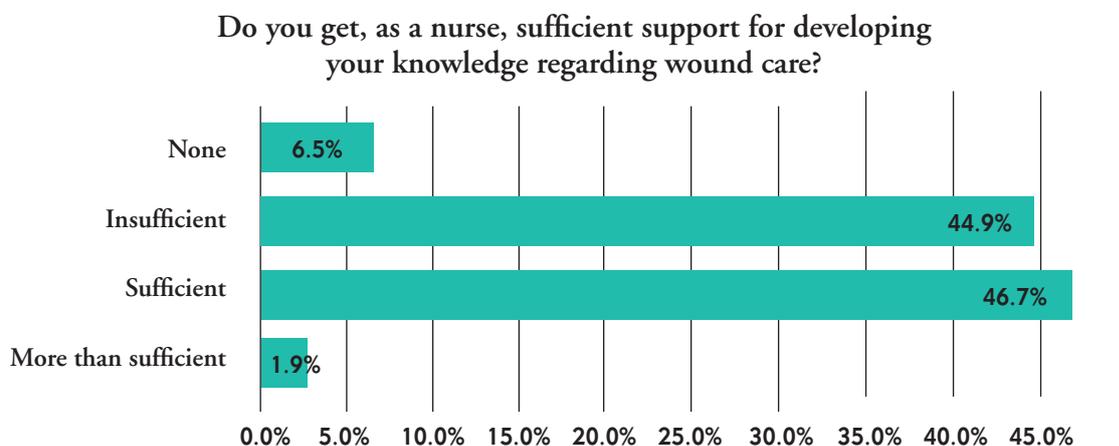


Figure 1. Do nurses get sufficient support for developing their knowledge regarding wound care?

and the debridement of pressure ulcers.

In the 16 RCCs, 570 people took part in the daily care of the residents. Of these, 37% had a nursing degree and the remaining 63% were Certified Nursing Assistants. This means that, on average, 19 nurses (minimum 8, maximum 35) and 32 Certified Nursing Assistants (minimum 12, maximum 51) work in an RCC. Based on the deployment of staff per resident, it is possible to notice a difference between private and public operated RCCs. Private RCCs employ an average of 0.76 care providers per inhabitant, whereas public RCCs employ only 0.53 care providers per inhabitant. However, this is not a significant difference ( $t(4) = 0.73, p = 0.51$ ). The nurses interviewed were on average 44 years old (min. 23 years, max. 62 years), and 87% were female and 13% male. The majority, 62.3%, had a Graduate Nursing diploma, 35.2% had a Bachelor's Degree in Nursing and 2.5% also had a master's degree or licentiate certificate. It was mainly male nurses (56%) who had a bachelor's degree. The female nurses had a bachelor's degree in 32% of the cases.

#### Nursing knowledge regarding wound care

Of the nurses surveyed, 8% possessed the certificate of Reference Nurse in Wound Care. In Belgium, nurses can receive this certificate after completing a 40-hour course on wound care. When asked about the need for training or further training in wound care, only 10.1% of the nurses indicated that they had sufficient knowledge. Of the nurses in need of ad-

ditional training or education regarding wound care, 6.5% were not given the opportunity to retrain by their employers. Another 44.9% indicated that they were insufficiently able to develop their knowledge regarding wound care, as shown in Figure 1.

To get an impression of whether nurses are up to date with the newest wound observation tools, they were asked if they were familiar with concepts like TIME, TIME DHN and MEASURE. Only 36% of the interviewed nurses were familiar with the TIME concept, and 12% were also familiar with the TIME DHN concept. Another 11% did not possess knowledge of TIME but were familiar with MEASURE. This means that less than 50% of the nurses are knowledgeable about the latest wound observation tools. The amount of work experience possessed by the nurses was not investigated.

#### Presence wound care protocols

Of the 17 RCCs, 8 (47%) had wound care protocols. Only in three of them was the wound care nurse involved in drafting the protocol. For the others, it was mainly a doctor in collaboration with a nurse without additional training in wound care (4 RCCs) or the care coordinator (1 RCC) who had created the protocol. It is remarkable that all private RCCs had wound care protocols available in their institutions, but there was only one public RCC that had a wound care protocol available. Deviations in the protocol were mainly assigned by a doctor.

	GENERAL (Number vs % of a total of 153 residents with a wound)	MALE (Number vs % of a total of 43 men with a wound)	FEMALE (Number vs % of a total of 110 women with a wound)
Medication	57 (37%)	13 (30%)	44 (40%)
Diabetes	37 (24%)	15 (35%)	22 (20%)
Rheumatism	9 (6%)	0 (0%)	9 (8%)
Deep vein thrombosis	13 (8%)	4 (9%)	9 (8%)
Varicose veins	13 (8%)	2 (5%)	11 (10%)
Atherosclerosis	34 (22%)	12 (28%)	22 (20%)
Hypertension	32 (21%)	6 (14%)	26 (24%)
Arthritis	12 (8%)	0 (0%)	12 (11%)
Smoking	5 (3%)	1 (2%)	4 (4%)

Table 1. Overview regarding the medical history of the residents with an active wound

## Prevalence of specific wound types in Flemish residential care centres

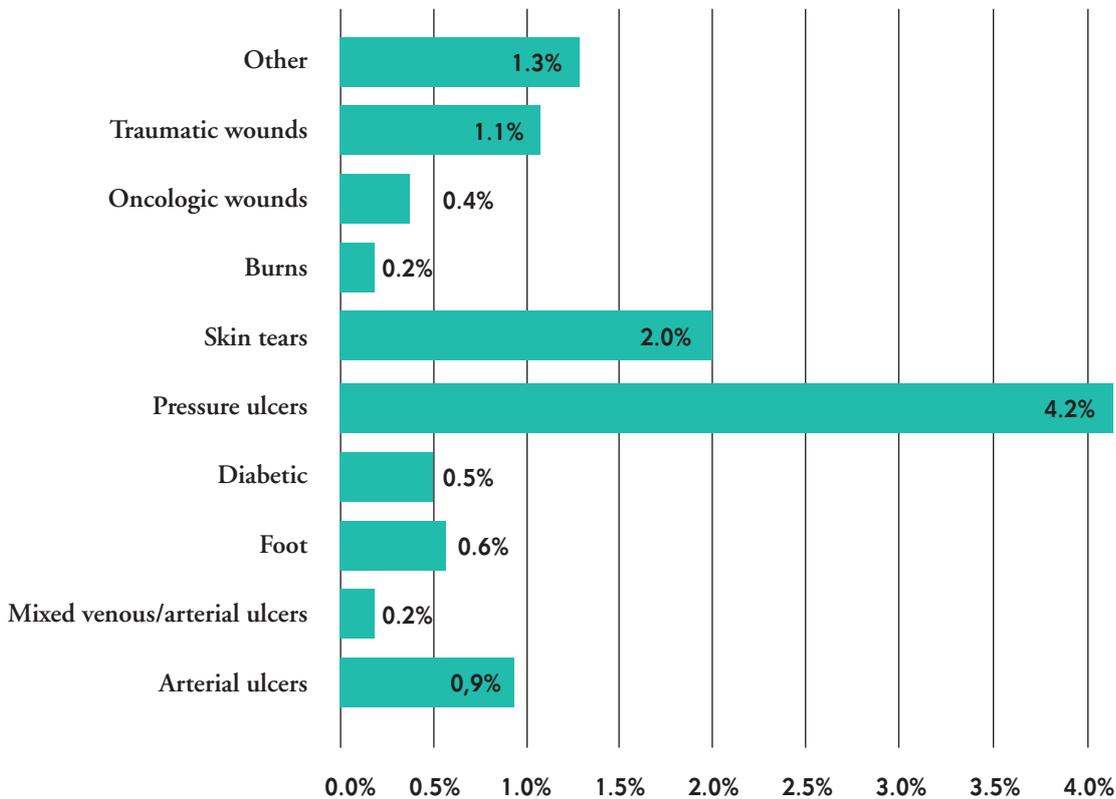


Figure 2. Prevalence of specific wound types in Flemish residential care centres

**Data regarding residents with a wound**

On average, the residents had already spent 3.5 years (min. 6 days, max. 23.5 years) in an RCC at the time of the observation. The average age was 85.51 years (min. 59 years, max. 101 years, median 86.5 years). Of the 153 residents with a wound, 43 were male, and 110 were female. The men were 83.18 years old on average (min. 59 years, max. 93 years), and the women were 86.43 years old (min. 60 years, max. 101 years). This difference in age is statistically significant ( $t(70) = -4.20, p < 0.01$ ). Most residents also had one or more disorders in their medical histories that have a negative influence on wound healing or put the resident at high risk of obtaining a wound. Table 1 shows an overview of these risk factors. It is remarkable that women with a wound show significantly more rheumatism ( $t(108) = -3.12, p < 0.01$ ) or arthritis ( $t(108) = -3.66, p < 0.01$ ) in their medical histories than men.

**Wound prevalence**

In general, a prevalence rate of 11% was obtained. The highest prevalence rate obtained for an RCC was 26%, and the lowest was 1%. Furthermore, an

average of 5% of the residents in private RCCs had an active wound. In public RCCs, an average of 14% was obtained, which is, however, a non-significant difference ( $t(4) = -1.28, p = 0.27$ ). RCCs with more than 100 residents had lower prevalence figures than those with a lower number of residents (3.5% versus 16.5%). Again, this was not statistically significant ( $t(3) = 2.29, p = 0.11$ ), but it could be a subject for further investigation. Finally, a comparison was also made between wound prevalence in RCCs with and without wound care protocols. This also yielded no significant difference ( $t(3) = -0.32, p = 0.77$ ).

**Prevalence of specific wound types**

Decubitus ulcers (category 2 or more; 38%), together with skin tears (18%), represent more than 50% of the wounds in RCCs, closely followed by venous leg ulcers (8%). As shown in Figure 2, this results in a prevalence of 4.2% for pressure ulcers (category 2 or more), 2% for skin tears and 0.9% for venous leg ulcers. Several caregivers were involved in diagnosing the type of wound, but with 65% of the wounds, it was the nurse who made the diagnosis. For 11%

of the wounds, it was the general practitioner, and for 14% of them, it was the nurse together with the general practitioner who made the diagnosis. In all other cases, it was the physician specialist who made the diagnosis. It should be noted that, in view of the population, it was striking that a geriatrician did not make any wound diagnoses, but it was mainly medical specialists from other disciplines (orthopaedic surgeons, dermatologists, vascular surgeons, oncologists) who made them. Whether these medical specialists had completed a specialised course regarding wound care was not observed.

#### Data regarding the provided wound care

This research also investigated who prescribes and adjusts the treatment of a wound. A virtually even distribution between general practitioners (30%), nurses (37%) and wound care nurses (27%) was noticeable. As far as the adjustment of wound care therapy is concerned, the distribution is slightly different. In this situation, it is mainly the nurse (41%) and the wound care nurse (40%) who adjust the wound policy. In all other cases, it is mainly the general practitioner who adjusts the wound policy. It is noticeable that it was rarely indicated that the wound policy was changed by a multi-disciplinary team. It was a joint decision made by the general practitioner and a nurse that scored the best (15%). Furthermore, it was remarkable that nurses took care of the wounds on a daily basis in 80% of the cases observed, despite the fact that they used bandages that can remain on the wound for several days. It turned out that one in five bandages that were made to remain on the wound site for several days (foam bandages, alginates, hydrocapillary bandages) were replaced daily.

## DISCUSSION

#### The role of education regarding care providers

Caregivers and, more specifically, nurses, play a crucial role in the treatment and observation of wounds. Doctors also rely on the observations of the nurses to adjust or set up possible wound policies. It is therefore crucial that correct observations and conclusions are made. Within the literature, it is possible to find a number of studies that look at the knowledge of nurses. However, they always look at the knowledge of a certain type of wound and not at general knowledge. In their research from 2014, Zarchi<sup>7</sup> and his research team also stated that patients with chronic wounds benefit from being treated by specialised staff, since

wound care is not a priority for other healthcare providers. They also noted that nurses gained the most information about wound care by working together with others who possess a large knowledge of it. Following additional training courses has a lower yield. It should be noted, however, that there is great diversity in further training, varying from a few hours to several days, which means that the effect of a specific type of further training is levelled out. The number of years of work experience of nurses is also often associated with more knowledge. However, if there is no support from the organisation for gathering and retaining knowledge and the nurse does not take any initiatives himself/herself, more work experience does not mean that more knowledge is available from the care provider.

#### Wound prevalence

It is estimated that about 1% to 2% of the population in developed countries will be confronted with a chronic or non-healing wound in their lives.<sup>8</sup> Diabetic foot ulcers, venous leg ulcers and pressure ulcers form the majority of these chronic wounds.<sup>9</sup>

According to a study by BEFEZO, the Belgian Federation for Certified Nursing Assistants, about 2% of residential care residents suffer from diabetic foot ulcers.<sup>5</sup> This is in line with the estimation made by Pataky<sup>10</sup> in 2007, in which he stated that about 5% of diabetic patients aged over 65 had a pre-diabetic foot injury. However, more accurate figures on the prevalence of diabetic foot ulcers in RCCs are lacking.

Graham et al. (2003) teach us, based on their systematic review<sup>11</sup>, that ulcers of the lower legs have a prevalence of between 0.6% and 3.6% and that these figures increase with age. As a result, we can expect a higher prevalence among our residents because of their ages. For example, Srinivasaiah and his colleagues report, in their 2007 study<sup>12</sup>, that, in North East England, there is a prevalence of 37.6% for venous leg ulcers, as well as one of 12.4% for arterial ulcers and mixed arteriovenous ulcers alike. In Australia, we also see comparable figures for elderly populations, in, for example, a prevalence of 13%.<sup>13</sup> It can generally be stated that, within the adult population, there is a prevalence of 0.5% to 1.5% with regard to venous leg ulcers.<sup>14</sup> The difference in these figures may possibly be explained by the education given to the patient regarding venous leg ulcers. Gonzalez et al. proved in 2017, with their research<sup>15</sup>, that patient education is an important

factor in the prevention of venous ulcers. In addition, the difference can also be explained by means of the included population. The higher the age of and the more women in the population, the higher the prevalence of ulcers.<sup>16</sup> In addition, the figure itself can cause confusion, as some studies show a prevalence per 1000 persons and others, a prevalence figure for their entire study population. However, this is not always clearly noted in the studies.<sup>17,18</sup> In addition, studies often do not distinguish diabetic foot ulcers, venous leg and/or arterial ulcers, given that these are all in the same region, namely the lower leg and foot.

The prevalence of decubitus ulcers varies from study to study and from country to country. For example, in the literature, it is possible to find prevalences of 9%<sup>19</sup>, 8.8%<sup>20</sup> and 13.9%<sup>21</sup> for Germany. Davis and Caseby<sup>22</sup> reported a prevalence of 45% for Canadian retirement homes in 2001, while Woodbury and Houghton<sup>23</sup> recorded a prevalence of 29.9%. For the United States of America, Vangilder et al.<sup>24</sup> found a prevalence of 14.4% in 2008, which is similar to the 13.7% that Temkin–Greener<sup>25</sup> and her team found in 2012, but well below the 23% that Bauer et al.<sup>26</sup> found in their retrospective study in the period 2008–2012. In Italy, a prevalence of 27% was determined by Capon et al. (2007)<sup>27</sup> and one of 29.2% in the Netherlands.<sup>28</sup> Van Leen et al.<sup>29</sup>, however, recorded a prevalence of 4% in 2014. For Denmark, prevalences of 15% and 25% were found<sup>30</sup>, while in Finland, there was one of 15.1%<sup>31</sup>, and in North East England, a prevalence of 17.4% was recorded.<sup>12</sup> The big differences between these prevalence figures can be due to the way the data are collected. For example, care providers in one study must provide data themselves to the researchers, while in other studies, research nurses are called in to collect the data. In addition, not all categories of pressure ulcers were included in the studies, so a distorted image can also be obtained.<sup>32</sup> Another possibility that can explain the difference in prevalence is the organisation and cohesion of the teams of care providers. Temkin–Greener et al.<sup>25</sup> showed that the occurrence of pressure ulcers in nursing homes with teams with strong mutual cohesion is significantly lower than in those with teams where this is less. The way in which prevention is carried out can also be a cause of these differences.<sup>20</sup>

For incontinence-associated dermatitis (IAD), a prevalence of 0.5% was measured within this study. In the literature, however, the prevalence figures

are remarkably higher. They usually vary between 5.6% and 50%.<sup>33,34,35</sup> The measured figure of 0.5% is therefore considerably lower than the 30% for IAD category one and the 6% for IAD category two that were registered in a study by the University of Ghent.<sup>36</sup> In Austria, Kottner et al.<sup>37</sup> noted a prevalence of 3.1% in nursing homes, while in the Netherlands they noted one of 6.5%, and a German study<sup>19</sup> noted a prevalence of 35.4%. In 2006, Bliss et al.<sup>38</sup> reported a prevalence of 6% for Germany. However, further research is needed to explain these differences.

Data about the prevalence of oncological ulcers are rare. In the 2010 national guidelines on ‘Oncological Ulcers’ of the Comprehensive Cancer Centre of The Netherlands<sup>39</sup>, skin ulcers are reported to occur in 0.7% to 9% of all patients with cancer, especially breast carcinomas, tumours in the head and neck area, gynaecological tumours and rectal carcinoma. There are no figures on how often oncological wounds occur in RCCs. Finally, it must also be considered whether a correct distinction has been made between oncological wounds (wounds caused by oncological treatment) and oncological ulcers (wounds caused by growth of the primary tumour or metastasis); a distinction between these two is often not made in practice.

As far as burns are concerned, no information can be found about the prevalence of burn injuries in RCCs. However, it is stated in a study by Brusselaers et al.<sup>40</sup> that elderly people make up 10% to 16% of patients with severe burns. These burns, however, usually occur during activities at home or as a result of an accident during relaxation activities; as a result, this still does not give a picture of the development of burns in our RCC residents.

Hahnel et al.<sup>19</sup> found a prevalence of 6.3% regarding skin tears in Berlin RCCs in 2017, while Skiveren, Wahlers and Bermark<sup>30</sup> registered a prevalence of 4.6% in 2017 for a Danish RCC. They also showed that the prevalence of skin tears was much higher among residents who had already had a skin tear in the past compared to those who had never had a skin tear (83.3% compared with 16.4%). In 2014, a prevalence of 3.9% was observed in a Japanese study.<sup>41</sup> For Australia, the prevalence figures vary widely in studies, ranging from 5.5% to 9%.<sup>13,30</sup> However, other prevalence figures regarding skin tears are lacking. The big differences are often dependent

on the study design: which population is examined (age) and whether all residents with a skin tear are included or only those with a skin tear on the lower limbs.

#### Limitations

The data used in this study are based on the answers obtained from a questionnaire that was completed by the interviewed nurses or by postgraduate students of Wound Care, Stoma Care and Tissue Repair if it concerned the data of the residents. Regarding the wound care protocols, only the presence of the protocol was tested. Whether these are up to date remains unknown. In addition, data were only collected concerning residents with a wound and not from all residents. Also, the definitions of the different wound types were determined by the students without prior agreement. Finally, there are also diagnoses made by nurses, where the advice of a doctor is not unimportant, i.e. differential diagnoses of venous, arterial or mixed-venous ulcers.

#### CONCLUSION

In general, it can be stated that research into wound prevalence and the knowledge of care providers regarding wound care within Flemish RCCs is appropriate and this with a protocol that clearly states the definitions of the wound types used to classify the observed wounds. After all, the results obtained in this study are difficult to compare with prevalence figures from the past or with international figures because there are strong differences or uncertainties in the included population, the education level of the care providers and the definition used for a certain type of wound. The level of education of the persons who screened the residents also has an influence on the obtained information. Nevertheless, it can be stated that with a prevalence rate of 11%, the incidence of wounds within Flemish RCCs is comparable to international figures. Larger RCCs score better than smaller ones in this area, but this difference could not be retained as significant. Pressure ulcers, with a prevalence of 4.2%, are by far the most common wounds in RCCs, closely followed by skin tears (2%), ulcers (1.7%) and diabetic foot wounds (0.5%). Because, within this study, only clinical data were collected if residents had an active wound, it was not possible to present risk factors. However, this study showed that there was a significant difference between men and women regarding the presence of rheumatism and arthritis in their medical histories. In terms of staffing, certified nursing assistants make

up the largest part of the teams in RCCs. Employed nurses mainly hold the graduate nursing diploma. Bachelor nurses are in the minority, and nurses with a master's degree are rare. Of the 122 nurses surveyed, 16 of them were wound care nurses. This study also showed that 90% of the questioned nurses indicated that they need additional training regarding wound care. Only 48% of these nurses got the opportunity from their employers to fulfil this need. The employer therefore has a significant influence on the further training processes of its employees. Support from the employer is indispensable because the amount of work experience does not provide the certainty of more knowledge. Less than half of the RCCs surveyed had wound care protocols. Private RCCs scored better here than public ones. Unfortunately, only a minority (37%) had a wound care nurse involved in drafting these protocols. It is therefore advisable that all institutions work on drafting a wound care protocol, preferably in a multidisciplinary way involving wound care nurses.

#### IMPLICATIONS FOR CLINICAL PRACTICE

- The employer has a significant influence on the further training process of its employees.
- Less than half of the RCCs surveyed had a wound care protocol. It is therefore advisable that all institutions work on drafting a wound care protocol, preferably in a multidisciplinary way involving wound care nurses.
- It is advisable that healthcare providers pay more attention to interprofessional collaboration regarding wound management.

#### FURTHER RESEARCH

- Further research into wound prevalence and the knowledge of care providers regarding wound care within Flemish RCCs is appropriate and this with a protocol that clearly states the definitions of the wound types used to classify the observed wounds.

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