The burden of wounds in a resource-constrained tertiary hospital: A cross-sectional study

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Keywords: wounds burden, cross-sectional studies, wounds prevalence

Abstract

Objective: The aim of this study was to calculate the burden of wounds in several disciplines within a resource-constrained hospital to be a baseline for further studies.

Material and methods: An observational, cross-sectional study was performed at Robert Mangaliso Sobukwe Hospital during November 2013. All inpatients and outpatients who presented at all clinical units on the specific day of the study were included, and data concerning the presence and type of wounds was collected. Simple statistics were used to determine the burden of wounds in the hospital and for each discipline.

Results: Out of the 518 patients admitted, 179 presented with a wound, resulting in a wound burden of 34.6%. The burns unit (100%), ICU (75%) and general surgery (65%) were the predominant disciplines in this study. Acute wounds (including surgical wounds) with 45%, and traumatic wounds (including burn wounds) with 18%, were the most prevalent. Amongst chronic wounds, pressure injuries (9%) were predominant. Thirteen percent of wounds presented with clinical signs of infection and a positive culture.

Conclusion: The lack of published statistics on wounds in South Africa limited the author in comparing the burden amongst hospitals, but showed to be in line with a few studies in Africa, Europe and the United Kingdom. Studies from first world countries indicated that a multidisciplinary wound care team can play a role in the timeous diagnosis and effective and efficient management of patients with wounds so as to prevent complications. The final outcome should reflect a decrease in the clinical and financial burden of wounds. The reason that international studies were used for comparison is because no local studies were available; comparison to other countries also shows how our data compare with international studies. This is also the reason for the publication of the results for future comparison.

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Wound Healing Southern Africa 2019;12(1):29-33

Introduction

Throughout any hospital there will always be, at any specific time, patients with acute and/or chronic wounds. The treatment of such patients adds to the burden of the institution's resources. This burden will increase, should a patient with an acute wound not be managed properly, prolonging the hospital stay. This prolonged hospital stay will not only increase the financial burden, but will also have an effect on the patient's psychological and social wellbeing. A search in the literature for studies on the prevalence of wounds in a hospital setting generally produces studies from first world countries and they usually reflect the financial costs and burden related to chronic wounds.[1-5] Studies showing prevalence of wounds in an African country are rare, if they even exist.[6,7] Therefore, the aim of this study was to gather information on the number of wounds at a specific time within a resource-constrained hospital situated in South Africa.

Kimberley Hospital Complex (KHC) was re-named Robert Mangaliso Sobukwe Hospital (RMSH) after September 2018. It is situated in Kimberley, Northern Cape Province (NCP) in South Africa (SA). The province is one of the nine provinces of SA, being the largest inland mass (30,5%) and the least populated.[8] RMSH is the only tertiary hospital serving the whole province and receives patients from a 372 889 km² area. This area is divided into five district municipalities and 27 local municipalities. The province is sparsely populated (1 145 861 people or 2,21% of the South African population) and the population density differs from 0,9 to 28,3 people per km², an average of 3,1 people per km².[8] In the NCP, medical care is not always readily available due to the long distances between districts and the RMSH, and the lower than expected average income (assessed against the country's standard). Only 2% of households in the NCP own a motor vehicle, which would allow for easier access to healthcare facilities.[8]

Material and methods

This study was a one-day cross-sectional, descriptive study performed at RMSH on 8/11/2013. All patients admitted on the specific day were included in the study and the data was collected by a single professional nurse who visited all the units. The hospital has a capacity of 656 beds, divided into Surgical (229), Medical (173), Obstetrics and Gynaecology (94), Paediatrics (128), Adult ICU (11) and Private (22). There are eight specialised clinics on the premises of the hospital.

Table I. Distribution of wounds from admitted patients per discipline at RMSH, November 2013

Discipline/ward	Number of beds available (n)	Bed occupancy rate n (%)	Number of patients with wounds (%)
General surgery	74	74 (100)	65
Other surgical disciplines*	72	48 (67)	55
Orthopaedics	56	47 (84)	60
OBS and gynae**	94	66 (71)	44
Burns unit	26	16 (62)	100
Paediatric unit	128	92 (72)	12
Medical unit	173	156 (91)	9
ICU	11	8 (73)	75
Private patients ***	22	11 (50)	19
Total	656	518 (79)	34,6

* included: urology, ophthalmology, ENT, maxillo facial, neurosurgery, plastic surgery and cardio thoracic
** Obstetrics, gynaecology labour and postnatal
*** From all disciplines

For this study surgical wounds were considered acute wounds incurred during any type of surgery. All other types of acute wounds, including burns, were considered traumatic wounds.

Data collected for the inpatients consisted of the following:

- The hospital IT system (Nootroclin®) was used to obtain an inpatient list, in order to calculate the bed occupancy rate for that specific day.
- All the wards in the facility were visited by the professional nurse, to assess the doctor's notes and nurse's processes in each patient's file. This was done to obtain a diagnosis, as well as any information on the presence of and the type of wound(s) that the patient may have had.
- All the data from the files were then compared with data obtained from the nursing staff and the patients, to confirm the accuracy of the information.
- The data used included only the wounds; no personal information was used that could identify the patients. Informed consent was not needed because no personal patient information was used. Only the type of wound was relevant.

The clerk register was used to obtain information from the outpatient clinics and the data was confirmed by information in the specific patient's file, as well as information obtained from the nursing staff allocated to the specific clinic that day.

Data collected for inpatients was analysed as follows: 1) Bed occupancy rate for the specific day; 2) Burden of wounds for that specific day; 3) Percentage of patients with wounds per discipline; 4) Total percentage of patients with wounds within the hospital; 5) Different types of wounds per discipline and 6) Total of each type of wound within the hospital.

Data collected for outpatients on that specific day was analysed as follows: 1) Number of patients that visited the clinics; 2) Number of patients with any kind of wound; and 3) Percentage of patients with wounds. The percentage of the total number of patients with wounds that visited the clinics on that specific day was calculated and provided the burden of wounds for the outpatient clinic.

The outcome of the study was the burden of wounds within the hospital, on a specific day, presented as a percentage.

Ethical approval was granted by the Assistant Director Surgical Department, the Nursing Service Manager (NSM), the Acting Chief Executive Officer (CEO) of RMSH, as well as the Head of Department of the Northern Cape Department of Health, from the Research and Development Directorate.

Results

The total number of patients admitted (inpatients) on the specific day of this study was 518. One hundred and seventy-nine patients presented with wounds (34,6%). Table I and Figure 1 outline the distribution of patients per discipline and the total number of patients that presented with wounds that day. The Burns Unit had the highest percentage of patients with wounds (100%) followed by the ICU (75%) and the General Surgery Unit (65%).

Table II and Figure 2 depict the specific type of wounds from inpatients within the different disciplines at RMSH. Amongst the acute wounds, surgical wounds showed the highest percentage (45%), followed by traumatic wounds including burn wounds (18%). Amongst the chronic wounds, pressure injuries (9%) were closely followed by leg ulcers (9%) and fungating wounds (3%). Wounds presented as infected in 13% of all types.

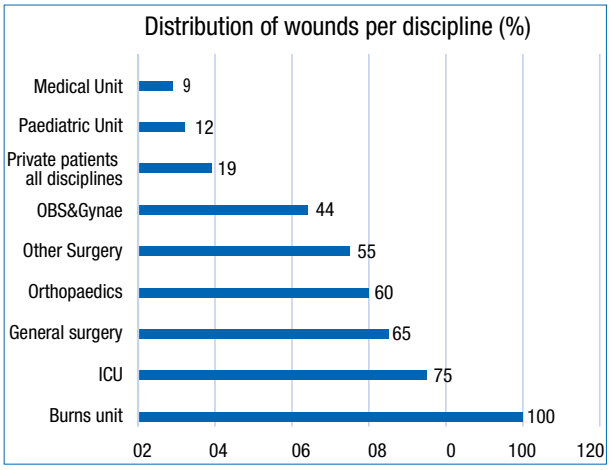

Figure 1. Percentage of wounds from admitted patients distributed by discipline at RMSH, November 2013

Table II. Specific types of wounds per discipline at RMSH, November 2013

	Surgical unit (n)	Medical unit (n)	OBSand gynae (n)	Paeds (n)	ICU (n)	Burns unit (n)	Total (n)	Total wounds (%)
Surgical wounds	42	0	29	6	3	0	80	45
Traumatic wounds	12	0	0	0	3	16	31	18
Pressure injuries	6	9	0	1	0	0	16	9
Fungating	4	2	0	0	0	0	6	3
Leg ulcers	14	1	0	0	0	0	15	9
Diabetic foot ulcers	6	0	0	0	0	0	6	3
Infected/septic wounds	17	1	0	4	0	0	23	13
Total	**101**	**13**	**29**	**11**	**6**	**16**	**177**	**100**

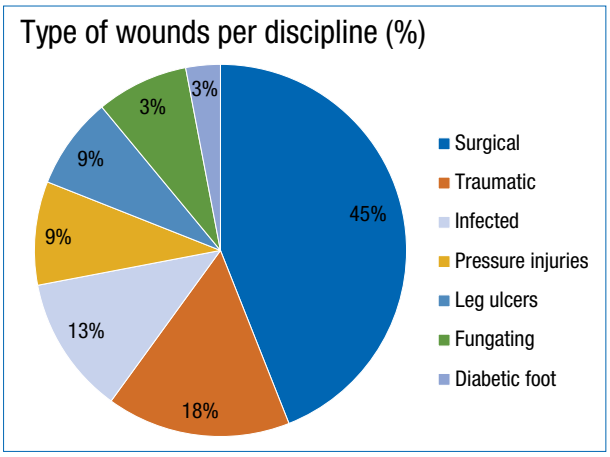

Figure 2. Distribution of wounds by type per discipline, RMSH, November 2013

The total number of patients seen at the outpatient clinics on the specific day of this study was 333. Sixty-three patients presented with wounds (18,9%).

Table III includes the data that was collected in the outpatient clinics and indicates the number and percentage of patients with wounds that visited the clinics. The Wound Care Clinic had the highest percentage (100%) amongst the clinics, followed by the Plastic Surgery Clinic (40%) and the Surgical Clinic (26%).

Discussion

Literature and published studies for SA and the African continent are almost non-existent and it was therefore difficult for the author to compare data obtained with that of other facilities, locally and regionally. For this reason, a decision could not realistically be taken showing the burden of the hospital's data on the presence of wounds in a snapshot. Contrary to this country's lack of data, data from a few studies from fist world countries could be compared to this study. A prevalence study in the United Kingdom (UK) indicated that surgical wounds formed the largest group (41%), followed by leg and foot ulcers (37%), pressure injury wounds (17,4%), diabetes-related wounds (15,1%) and malignant wounds (9,7%). This study also specified the importance of the timeous diagnosis of a wound, appropriate treatment, and prevention of complications in order to provide effective and efficient wound care.[1]

Table III. Number of patients seen in the outpatient clinics at RMSH and percentage of those presenting with wounds, November 2013

Outpatient clinic	Patients on the day (n)	Patients with wounds (n / %)
Surgical	73	19 (26)
Orthopaedics	71	15 (21)
Plastic surgery	20	8 (40)
Dermatology	22	0 (0)
Paediatrics	68	0 (0)
OBS and gynae	22	5 (23)
Medical	43	2 (5)
Stoma\wound care	14	14 (100)
Total	**333**	**63 (18,9)**

A study done in Denmark showed that 33% of inpatients had wounds and of those, 25% were surgical and traumatic wounds, followed by pressure injuries (3,3%), leg ulcers (1,7%) and diabetic foot ulcers (1,6%). The annual cost related to wound care was 7,7 million Euros (R124 million) or 1,8% of the Medicare benefits. The high costs supported the relevance of increased efforts to secure better wound prevention and treatment to reduce the nursing staff time and hospitalisation costs.[2]

Almost all the studies done in developed countries included the cost of wound care and the conclusion includes factors such as prevention, accurate diagnosis and treatment planning of all types of wounds. The emphasis is also more on chronic wounds and calculations on the cost burden that wounds have on an institution, rather than acute wounds. A one year study done in the UK included 2,2 million patients with wounds and it revealed a cost off £1,94 billion (R36 billion) for managing 731 000 leg ulcers and £89,6 million (R1 664 million) for managing 87 000 burns. Sixty-one percent of these wounds healed within that year. The cost of managing the healed wounds was estimated at £2,1 billion (R39 billion) with the individual cost per wound £698 to £3 998 (R13 000 to R74 000), compared to the £3,3 billion (R62 billion) with the cost per wound £1 719 to £5976 (R32 000 to R111 000) for the 39% of wounds that did not heal, resulting in a 135% increase. The study indicated that the institution, as well as the patient, will benefit if there are strategies on wound prevention, accurate diagnosis and improving wound-healing rates.[3]

In the United States (US) the cost impact of chronic wounds was calculated as 15% of the Medicare benefits ($8,2 million/ R116 million). If wounds were the primary treatment diagnosis the annual cost was $28 billion (R40 billion). Surgical wounds

accumulated the highest costs, followed by diabetic wounds. For individual wounds the highest costs per beneficiary were for arterial ulcers, followed by pressure ulcers.[4] Another study from the US showed the economic burden chronic wounds had on the economy as well as a decrease in the quality of life of those affected. A better understanding of this burden (humanistic and economic) proved to be essential for policy and planning purposes, to monitor trends and the cost-effectiveness of new treatments.[5]

Studies which could be compared to our hospital settings were identified in the literature. A one month study carried out in a tertiary hospital in Nigeria, Africa, included all patients visiting the hospital who had chronic wounds. The aim was to determine the point prevalence of chronic wounds and to have an evidence-based baseline on which to base wound care planning. The results included 48 patients with 78 wounds. Eleven percent of the 48 patients recorded visited the Department of Plastic and Reconstructive Surgery. The duration of the wounds ranged from 6–780 weeks (median 10 weeks) and the most common chronic wounds were diabetes-related and pressure injuries.[6] Another one day study from Nigeria provided data on the prevalence of wounds, their aetiology and cost implications. Two hundred and six patients were admitted of which 65 (31,55%) had a wound. These were divided into surgical wounds (36,9%), ulcers resulting from poorly managed trauma wounds (26,2%), pressure injuries (9,2%), chronic leg ulcers (6,2%), malignant ulcers (6,2%) and others (15,4%), including burn wounds. For 44,6% of the patients the cost to provide wound care was between 100 to 500 Naira (R4 to R20) per week; 32,3% spent 500 to 1 000 Naira (R20 to R40) per week and 15,4% spent 1 000 to 1 500 Naira (R40 to R60) per week. The amount spent is considered low compared to the South African currency (Rand), but is high for an average Nigerian family.[7]

The overlapping data analysed from the studies that were used for the purpose of this study are depicted in Table IV where it was possible to make a comparison. The burden for South Africa (from this limited study), Nigeria and Denmark were comparable, while lower for the UK. In all studies consulted, the surgical wounds showed the highest percentage. Traumatic wounds were prevalent in both the studies done in Nigeria and this study, with a higher occurrence in the Nigerian studies. Leg ulcers and pressure injuries were higher in the UK, while fungating wounds were almost the same in all four.

Table IV. Comparison of burden of wounds between literature and present study

	SA (%)	Nigeria (%)	Denmark (%)	UK (%)
Burden	34,6	31,55	33	12
Surgical wounds	45	36,9	25 *	41,5
Traumatic wounds	18	26,2	–	–
Pressure injuries	9	9,2	3,3	17,4
Leg ulcers	9	6,2	1,7	41,9 **
Diabetic foot	3	–	1,6	–
Fungating	3	6,2	–	9,7

* Including trauma
** Including diabetic foot

Most studies consulted showed that wound care, and especially that of chronic wounds, is often left to nursing staff that are not always sufficiently trained. Incorrect wound care can lead to prolonged healing time with prolonged hospital stay and wastage of limited resources. Education of staff has proved to improve patient outcomes and wound healing and prevent complications. Patient education can also benefit the patients if they are aware of what is abnormal and needs attention.

This study was done as a preliminary study and although it was performed a few years back it can still be used as a baseline for future studies. Although financial costs resulting from wounds have not been included, the author assumes that further studies may be possible using this preliminary data. In resource-constrained settings such as the RMSH, a study including data on costs would help stakeholders to address requirements in the training of staff and the implementation of a multi-disciplinary team. These measures would improve wound care, lower the burden on material as well as staffing and would lead to a satisfied and more compliant patient.

It is important to provide a baseline for future studies and to identify the specific needs within the facility. Resources are limited and to allocate the scarce healthcare resources and funding correctly for the best output is of utmost importance. A well functioning wound care clinic with an informed, trained and well-equipped multidisciplinary team is very important. This can solve possible problems such as the lack of knowledge in wound care, the correct use of wound care products, and timeous diagnosis and treatment of patients. Using the information on the burden and the effect that it can have on the healthcare system can guide a cost-effective wound care process.

Publication of more local studies should be encouraged to allow for the assessment of outcomes in South African institutions. Such studies could be used as evidence to motivate for functioning wound care clinics, or a multidisciplinary team approach. Alternatively, specific training needs within similar hospital settings can be justified and stakeholders motivated to invest in proper and functioning clinics in the outlying areas. This will address the concern presented by this author in a country where a higher burden of injuries is related to violence and road traffic injuries.[9]

Conclusion

The author found the lack of published statistics on wounds in South Africa a limiting factor in comparing the burden of wounds amongst hospitals. However the data from this study was found to be in line with a few studies in Africa, Europe and United Kingdom. Studies from first world countries found that a multidisciplinary wound care team can play a role in the timeous diagnosis and effective and efficient management of patients with wounds, thus preventing complications. The final outcome should reflect a decrease in the clinical and financial burden of wounds.

Ethics approval: Approval for the research and publication was granted by the Assistant Director Surgical Department, the Nursing Service Manager (NSM) and the Acting Chief Executive Officer (CEO) of RMSH as well as the HOD of the Northern Cape Department of Health, from the Research and Development Directorate.

Funding: None

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