

Research Project for the MMed degree in Family Medicine

Title: A survey of wound care knowledge in South Africa

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Declaration

I, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree.

Signature: 

Date: 12/8/2010

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Abstract

Chronic wounds afflict millions worldwide, incurring significant health care costs and chronic suffering. Clinicians are often unsure about treatment, resulting in poor outcomes.

Objective

To determine the scope of knowledge possessed by fifth year medical students, general practitioners (GP's) and surgical registrars, concerning chronic wound management.

Design

Cross sectional study

Methods

Deans of eight South African medical schools received letters requesting information regarding time devoted to wound-care training. Knowledge-based questionnaires were distributed to final-year students at two universities, surgical registrars at three universities and general practitioners attending refresher courses.

Result.

Four medical schools replied, of whom only two offered formal teaching. 162 medical students, 45 GP's and 47 surgical registrars completed questionnaires. The overall median (25th–75th percentiles) knowledge scores for registrars, GP's and students were 65%;(55%–70%), 55%;(45%–65%) and 45%;(35%–50%) respectively. Whereas the scores of registrars and GP's did not differ, the student scores were significantly less. Only 32% of registrars and 18% of GP's attained scores of 70% or more. 96% considered training to be inadequate. Interest in wound-care was only mild to moderate, with more GP's than registrars requesting literature.

Conclusions

Very little, if any training on chronic wounds is offered in South Africa. The levels of knowledge cannot be considered adequate for successful treatment, nor for teaching to undergraduates. This preliminary study cannot reflect the attitudes and knowledge throughout the country; however it is clear that there is a need for improved education about these conditions that have huge clinical and economic consequences.

Introduction

A chronic wound is defined as any break in skin integrity that persists for longer than six weeks or recurs frequently.¹ The main causes for these wounds include vascular insufficiency, complications of diabetes, skin damage due to pressure and postoperative complications. Chronic wounds affect 2.8 million patients in the USA and four million in Germany, the prevalence being 120 per 100,000 between the ages of 45 and 65 years, increasing to more than 800 per 100,000 in patients older than 75.2 years^{2,3}. The cost to healthcare systems is enormous amounting to billions of dollars. For example in 1992 treatment of venous leg ulcers accounted for 1.3% to 2% of the annual health care costs of the United Kingdom, France and Germany.⁴ In 2005, the USA spent \$2.3 billion on advanced wound care products. This is expected to rise at an annual growth rate of 12.3% to \$4.6 billion in 2011.³ In Germany, the cost is five billion Euros annually.³ Additionally there are losses to countries' economies as these lesions are often socially isolating, take years to heal and recur frequently. Most important is the reduced quality of life experienced by these patients and their families. In spite of the prevalence of chronic wounds, wound care education is regarded as inadequate in the USA and in Germany.^{3,5} A Canadian study reported that most family physicians feel ill-prepared to manage pressure ulcers, suggesting that they do not receive enough training in this disorder.⁶ Canadian nurses expressed little confidence in the knowledge of physicians who supervise treatment of chronic wounds.⁷

In South Africa, chronic wound care is often left to unsupervised nursing personnel, who may or may not seek help from medical practitioners, especially in primary health care clinics where standards of care may vary. At present many practices are derived from questionable sources such as from company representatives and time-honored procedures that are conveyed by word-of-mouth.⁸ Improper wound care leads to prolonged hospital admissions and prolonged healing times that result in wastage of limited resources.³ Conversely, it has been shown that wound education campaigns have beneficial effects on the use of resources and on patient outcomes such as duration of hospital stay and time to achieve wound healing.^{3,9}

During eight years of rural hospital practice one of the authors (FC) has repeatedly been faced with patients who had complicated, non-healing wounds. It became apparent that knowledge in this regard was scanty and that treatment guidelines were not readily available. At present, there is no information regarding the adequacy of chronic wound care knowledge in South Africa.

The aim of this study:

The purpose of this cross sectional study was (i) to ascertain how much time is devoted by South African medical schools to formal teaching about chronic wound care and (ii) to determine the state of knowledge about wound care among general practitioners (GP's), surgical registrars and final-year medical students.

Methods

Approval for the study was obtained from the Health Research Ethics Committee of Stellenbosch University.

Study population

The study firstly included the eight medical schools of South Africa in a survey concerning the training offered to medical students in wound care.

Secondly, another survey addressed the wound care knowledge of medical students in their final year of study, general practitioners and surgical registrars. The groups in the knowledge survey represent important levels of medical practice relating to wound care; medical students are the future health care workers that will have to treat patients with chronic wounds, general practitioners represent those who are currently treating those who suffer from chronic wounds and surgical registrars should reflect the knowledge and skill of wound care experts. These groups were targeted in order to estimate the amount of the knowledge these groups possess by means of a questionnaire and to comment if surgical registrars could act as teachers concerning wound care. Including these groups could allow me to make some interesting comparisons and it could provide useful data. Family medicine registrars were not included this study because of possible bias concerning fellow students who have been exposed to the protocol of this study and due to logistical problems with distributing questionnaires. The study population therefore includes all the final year medical students and surgical registrars from the eight medical schools in South Africa (Medical University of Southern Africa/ University of Limpopo, University of Cape Town, University of Kwa-Zulu Natal, University of Pretoria, University of Stellenbosch, University of the Orange Free State, University of the Witwatersrand, Walter-Sisulu University) and all the general practitioners practicing in South Africa.

Due to limited resources and timeframe for this masters thesis it was decided to aim for at least the minimum sample size to detect a significant statistical difference between these groups.

Calculation of sample size:

Regarding analysis of variance (ANOVA) of three groups: If a meaningful result is obtained when two score means differ by 33% (standard deviation 40% of the smallest), the required sample size to detect a difference with an alpha value of 0.05 and power of 0.9 is 30 per group. Additionally, to detect a difference between the proportions of three groups with a power of 0.8, presupposing an effect size (W) of 0.33, requires a total sample of 89. It was decided to collect a minimum number of 30 completed questionnaires from each of the three groups.

The study sample

In the first survey no selection process was performed and letters were sent to the deans of all the medical schools in South Africa explaining the purpose of the study and requesting information with regard to the number of hours of formal instruction that are devoted to teaching wound care to undergraduate medical students, surgical registrars and family medicine registrars. (See attached copy at the end of this document) In addition permission was requested from certain universities to distribute the questionnaires to students and registrars. A copy of the Ethics Committee approval was attached to each letter.

The second survey, on wound care knowledge, study sample included students and registrars from University of Cape Town and University of Stellenbosch since they could be visited without incurring much travel expenses and those universities who were willing to distribute questionnaires amongst students and registrars themselves. For the same reason it was decided to include general practitioners attending academic activities within the Western Cape Province and the added reason that surveys conducted via e-mail and ordinary mail are known to have a very low response rate.

On obtaining permission from the deans, questionnaires were handed out directly to registrars and final-year students during pre-arranged personal visits to two local institutions (University of Cape Town and University of Stellenbosch) and the remainder were mailed to the two distant universities (University of the Free State and University of Pretoria) who had responded to the letters. Questionnaires were distributed amongst GP's during regional, continued professional development activities and during a GP conference held at Cape Town University (Division of Family Medicine GP conference, 13-15 January 2010).

Validation of the questionnaire

A questionnaire was compiled from evidence-based resources regarding chronic wound treatment.¹⁰ The draft was sent to the president of the Wound Healing Association of South Africa (WHASA) who subjected it to scrutiny by a panel of experts attending the 3rd National Conference of WHASA, (Durban, April 2009), validated the questions and made recommendations. The final, approved questionnaire comprised two sections. The first included items to identify covariates that may influence wound care knowledge (age group, gender, institution, level of training, qualifications held, professed level of interest in wound care and their opinion of the adequacy of their wound care training). The second consisted of 20 knowledge-related, multiple-choice questions that were grouped into four domains concerning (i) dressings (ii) diabetic foot ulcers (iii) stasis ulcers and (iv) pressure ulcers. To each questionnaire an information leaflet was attached that set out the aims of the study, assuring participants that their contributions were voluntary and anonymous. A copy of the questionnaire and the correct answers can be obtained via Email from the corresponding author. (A copy of the questionnaire is attached to this document.)

Statistical analysis:

Inter-group comparisons of numerical data were done using ANOVA. If the data did not meet the assumptions for performing parametric tests (Gaussian distribution of the underlying population and equal variances), or if the data was ordinal, equivalent, non-parametric, distribution-free tests were performed (Kruskal-Wallis ANOVA), followed by Dunn's post-hoc multi-comparison tests. Proportional data were analyzed using chi-square and Fisher's exact tests where appropriate. Multiple linear regression with the knowledge scores as the dependent variable was performed to identify covariates that may influence wound-care knowledge. An alpha value of 0.05 was accepted as indicating a significant result.

Results:**Institutional teaching:**

Four deans responded to the letters, of whom only two stated that there was formal wound-care teaching: for undergraduates 2h and 20h, for family medicine registrars 3h and 4½h, for surgical registrars 0h and 50h.

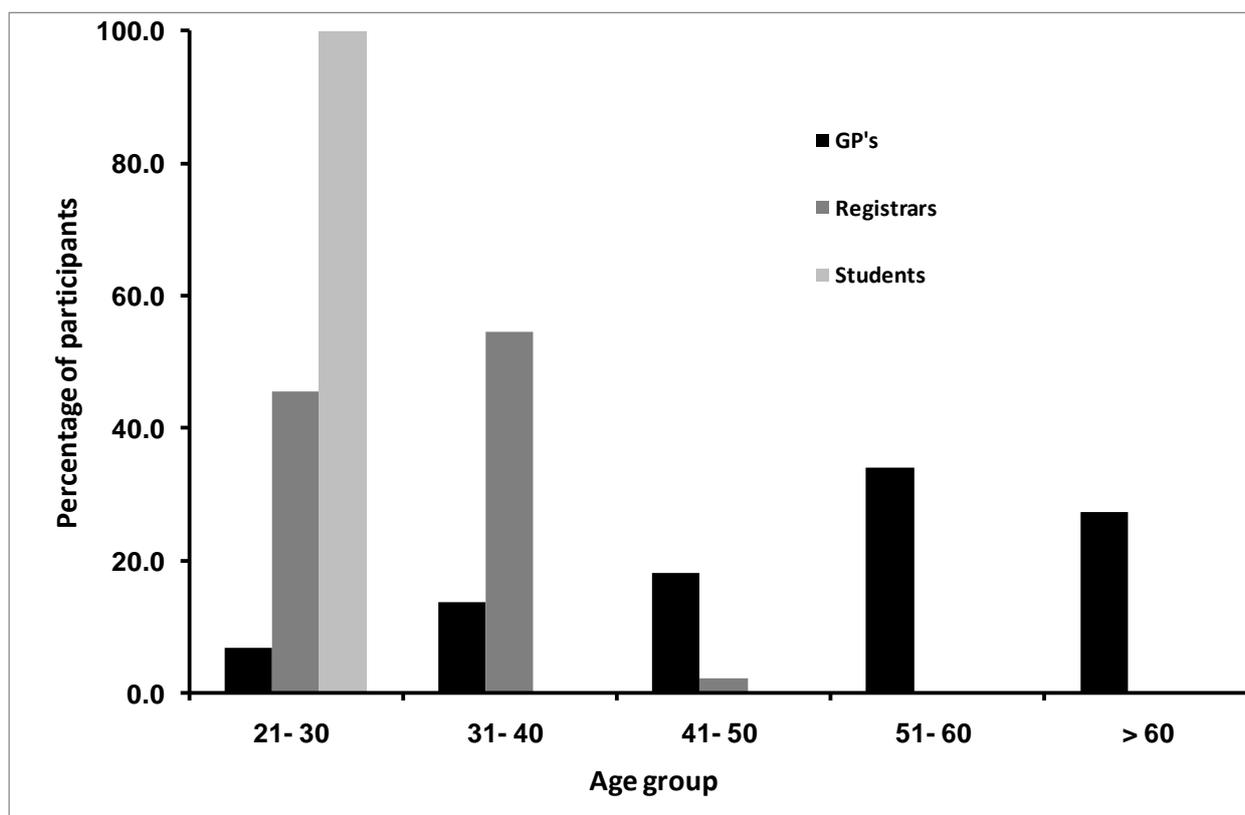
Individual knowledge:

Two universities returned questionnaires completed by students, and three universities returned questionnaires from surgical registrars. 212 questionnaires were handed out personally to students and registrars and 150 questionnaires were posted to a university to handout. Completed questionnaires comprised 45 from general practitioners, 47 from registrars and 162 from students. Of the 362 questionnaires distributed 257 completed questionnaires were returned, a response rate of 71%, of which three were incomplete.

This response rate is made up out of: 35 out 110 general practitioners attending a GP conference (31%), 10 out of 10 general practitioners attending a CPD meeting (100%), 133 fifth year medical students out of a class of 160 (83%), 29 out of a group of 30 medical students (97%) and 47 out of 47 registrars returned completed questionnaires (100%).

The age-group distribution of participants is depicted in table figure 1. Students were 21-30 years old, while registrars were approximately equally distributed between 21-30 and 31-40 years. Most GP's were aged 40-60 years. The proportion of males and females were the same (50.4% and 49.6%). Postgraduate degrees (MMed or College of Medicine fellowship) were held by 7 GP's and 4 registrars. One GP had earned a diploma in wound care therapy.

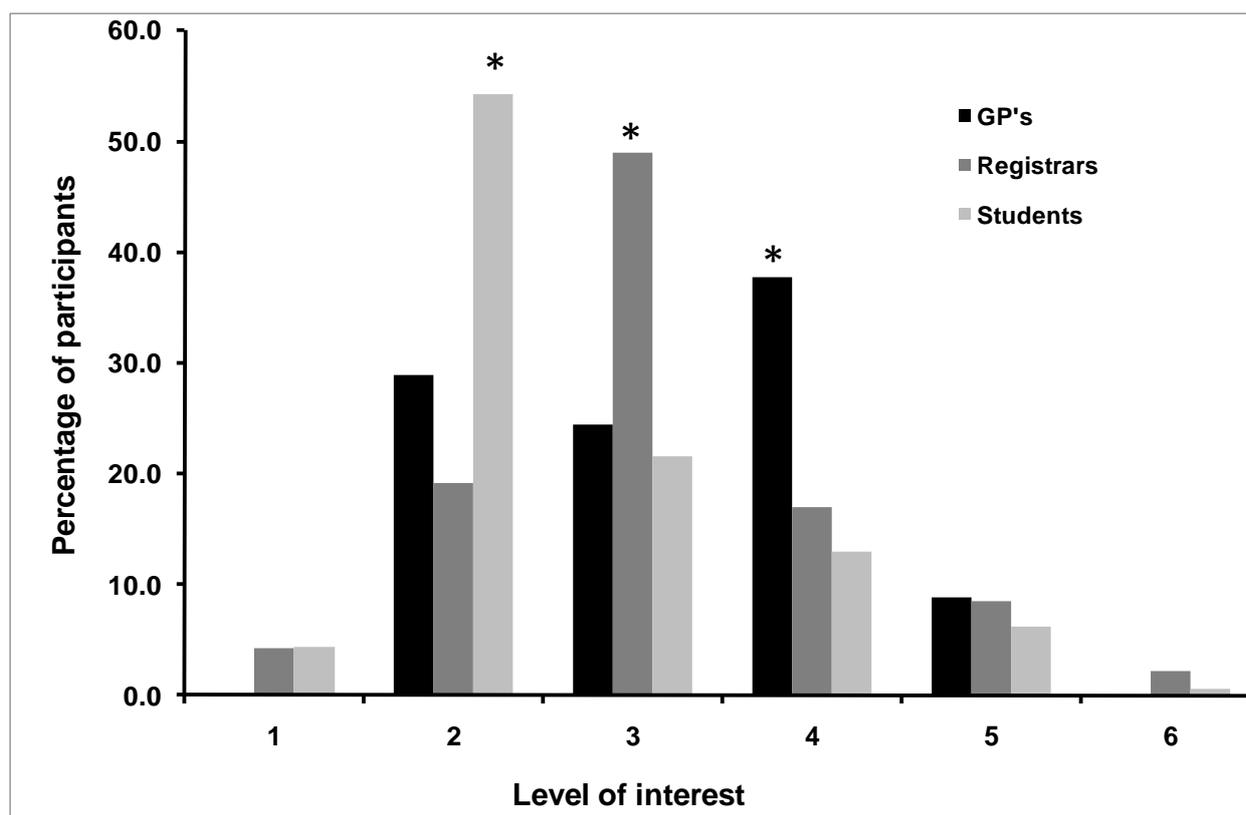
Figure 1: Proportions (%) of participants according to age group.



Participants' interest in chronic wound care according to a scale of 1-6 is displayed in figure 2. Less than 10% of each group expressed keen interest in wound care (Levels 5 & 6). Significantly more GP's than registrars and students were sufficiently interested to request literature on the subject (Level 4) (38% vs. 17% and 13%; $p < 0.001$). More registrars than GP's and students were only mildly interested (Level 3) (49% vs. 24% and 22%; $p < 0.001$). The majority of students (54%) professed interest but did not read about the subject (Level 2) and this proportion was greater than those of the GP's (29%) and registrars (19%); ($p < 0.001$). 4% of registrars and students admitted that they were not interested. Median interest levels indicated moderate interest among GP's (3[2-4]) and registrars (3[3-4]), but low among students (2[2-3]); ($p < 0.001$).

96% of the 254 participants were of the opinion that the training that they had received regarding chronic wound care was either "totally inadequate" (137) or "too basic" (108). Five registrars, two GP's and one student thought that their training was "appropriate" and one registrar that it was "advanced".

Figure 2: Proportions (%) of participants' interest in wound care.



1 = "Not interested"

2 = "Interested but do not read about it"

3 = "Interested and I have read about it"

4 = "Very interested: send me reading material"

5 = "Very interested: send me on a wound care course"

6 = "Very interested: I would like to do research in this area"

* = $p < 0.001$ (Chi-square test)

Numerical data were not normally distributed; results are reported as median values [25th–75th percentiles] and where appropriate, 95% confidence intervals (95% CI). The highest score (90%) was achieved by a registrar and the lowest score (5%) by a student. Details of the results that were achieved by the three groups are presented in Table 1 and Figure 3.

Table I: Knowledge scores by level of training:

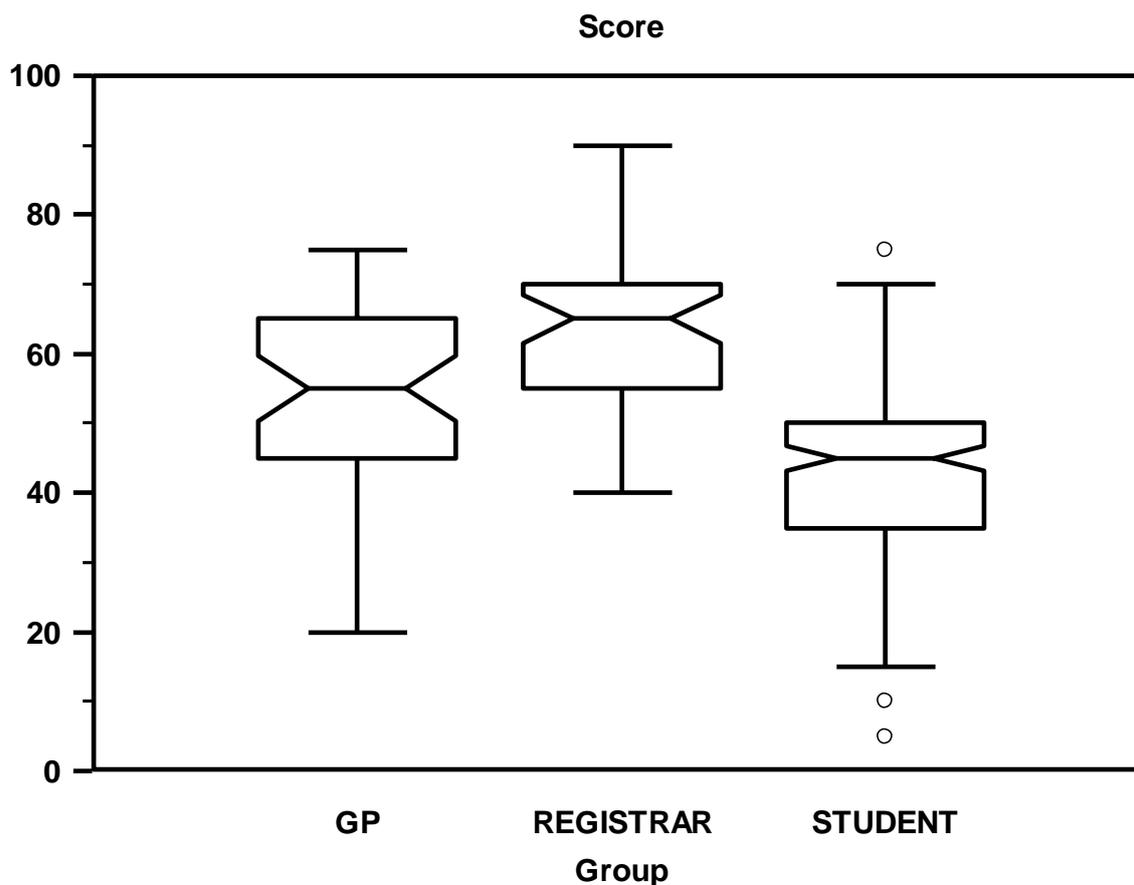
Level	N	Median	Percentiles (25 th – 75 th)	95% CI	Range
GP's	45	55*	45 – 65	50 – 60	20 - 75
Registrars	47	65*	55 – 70	50 – 65	40 - 90
Students	162	45	35 – 50	40 – 45	5 - 75

Results are expressed as percentage of correct answers out of a total of 20 questions
N = number of participants.

P < 0.001 (ANOVA)

* = GP's and Registrars differ significantly from Students, but not from each other ($p < 0.05$)

Figure 3: Notched box and whisker plots of knowledge scores obtained by the various groups.



Interpretation: "Notches" = 95% confidence intervals; lines joining "notches" = median values; horizontal box borders = 25th & 75th percentiles; "whiskers" = range of values; circles = outliers.

Surgical registrars achieved the highest median score (65% [55–70%]) which was not significantly different from that of the GP's (55% [45 – 65%]). The low median score by the students (45% [35–50%]) differed significantly from both practitioner groups. The proportions of the three groups that achieved certain knowledge scores and greater are presented in table II. In all these analyses, the students' scores differed significantly from the practitioners (table II and figure 4). Again, the practitioner groups did not differ from each other.

Table II: Proportions of participants who achieved certain knowledge scores and greater.

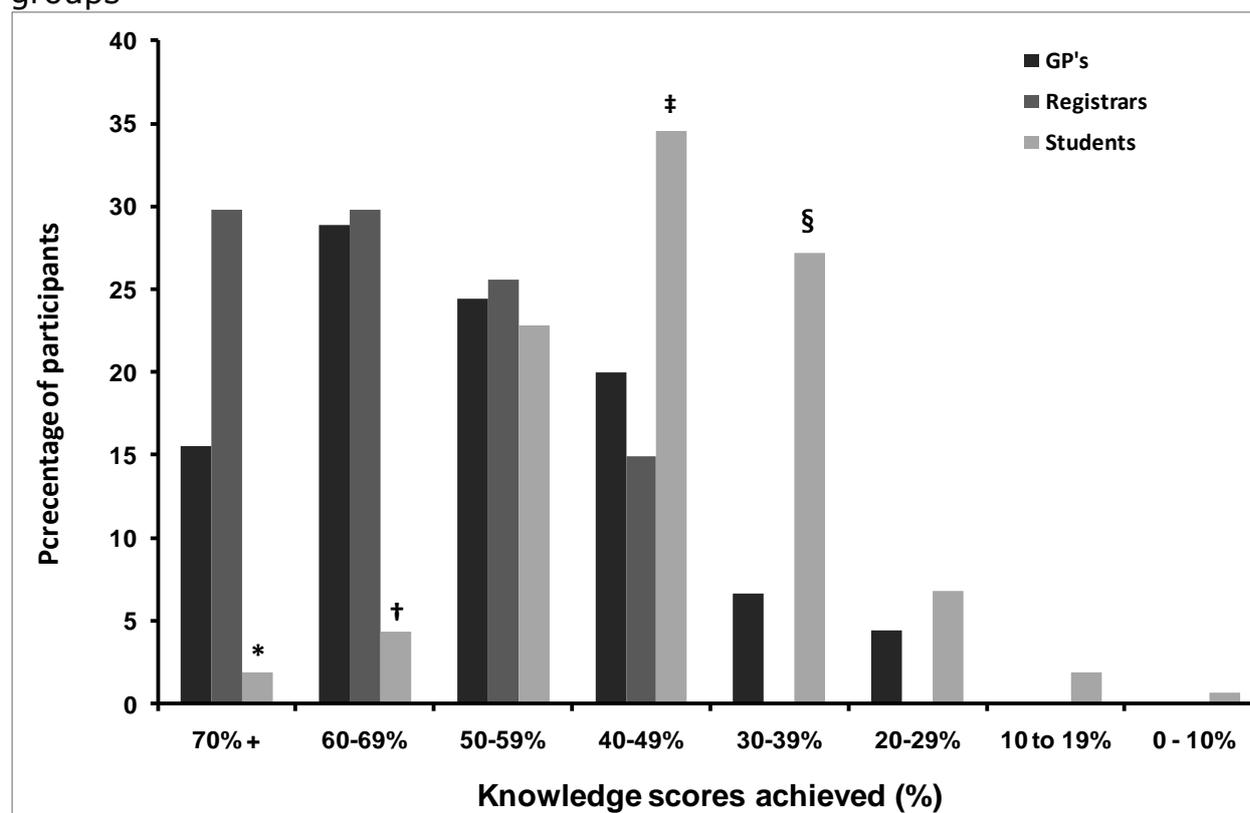
	Knowledge score		
	70% +	60% +	50% +
GP's (%)	18* (9 to 31)	47* (33 to 61)	69* (54 to 81)
Registrars (%)	32* (20 to 46)	62* (47 to 74)	85* (72 to 93)
Students (%)	3 (1 to 6)	7 (4 to 12)	30 (23 to 37)

Data are presented as percentages of the total possible score (95% confidence interval).
70% +; 60% +; 50% + = scores of 70% and greater etc.

* = GP's and Registrars differ significantly from Students, but not from each other ($p < 0.05$)

Whereas the proportions of students who attained scores above 50%, 60% and 70% differed from the GP's and registrars, these proportions did not differ between the two practitioner groups. An analysis by intervals of the scores achieved by the three groups is presented in figure 4.

Figure 4: Distribution of percentages of correct answers for the three groups



* = $p < 0.001$ (Fisher's exact test); † = $p < 0.001$ (chi-square test);
 ‡ = $p = 0.012$ (chi-square test); § = $p = 0.004$ (Fisher,s exact test);

Table III depicts the scores achieved in the four knowledge categories (dressings, diabetic foot ulcers, stasis ulcers and pressure ulcers). All three groups fared the best in the venous stasis category and worst in the wound dressing selection category. Here too, students scored significantly less than the GP's and registrars, whose scores did not differ between each other. Table IV depicts the scores achieved by the groups from the three medical schools. The students from university B attained slightly higher median scores than those from university C (45% vs. 40%; $p < 0.001$). The scores achieved by the three registrar subgroups did not differ.

Backward stepwise regression indicated three covariates that influenced the knowledge scores, namely the institution attended by the students and registrars, the level of training (student, GP or registrar) and the age group ($r = 0.58$, $r^2 = 0.34$, Durbin-Watson statistic 1.7). The following covariates were rejected from the model: gender, qualifications, and professed interest.

Table III: Correct answers for each category of knowledge by level of training

Category	Level	N	Median	Percentiles (25 th – 75 th)	P (ANOVA)
Dressings	GP's	45	2*	1.75 – 3	< 0.001
	Registrars	47	2*	2 – 3	
	Students	162	1	1 – 2	
Diabetes	GP's	45	3*	2 – 3	0.003
	Registrars	47	3*	3 – 4	
	Students	162	3	2 – 3	
Pressure sores	GP's	45	3*	2 – 3.25	< 0.001
	Registrars	47	3*	2 – 4	
	Students	162	2	1 – 3	
Venous stasis	GP's	45	4*	2 – 4	< 0.001
	Registrars	47	4*	3 – 4	
	Students	162	2	1 – 3	

Maximum score per category = 5

* = GP's and Registrars differ from Students, but not from each other

Table IV:
Knowledge scores achieved by the groups from the three participating medical schools.

ANOVA = analysis of variance

Group		University A	University B	University C	P (ANOVA)
Registrars	Mean	57.9	66.3	58.5	0.069
	(SD)	(9.3)	(13.4)	(11.1)	
	N	21	16	10	
Students	Median		45	40	< 0.001
	[25 th – 75 th]		[41 – 55]	[35 – 45]	
	N		31	131	

[25th – 75th] = 25th to 75th percentiles
N = number of participants

Discussion:

The 50% response rate by the deans of the eight medical schools is disappointing. Taken together with the fact that only two of the respondents stated that wound-care was formally taught and then only for a few hours, it is perhaps an indication of how unimportant wound care is perceived to be in South African universities. There appears to be a similar attitude towards wound-care education in the USA, Germany and the United Kingdom. Patel et al.⁵ reported that in 2005 only 50 of 100 American medical schools documented any educational time dedicated to undergraduate wound care training where the mean was 9.2 hours. In Germany and the United Kingdom, the hours of wound-care training were 9.0 and 4.9 respectively.³

The finding that nearly all respondents (96%) regarded their training in wound care as inadequate is in accordance with previous surveys in other countries. Over 70% of a sample of 155 family physicians in Minnesota felt that they were ill-prepared to manage pressure ulcers.⁶ In Canada only 16% of 107 family physicians felt confident about their ability to manage leg ulcers and 61% reported that they did not know enough about wound-care products.⁴ In a survey among Canadian home-care nurses, nearly half (48%) indicated that although initial treatment planning was usually done by family physicians, they could not

rely on them to have up-to-date information on leg-ulcer treatment.⁷ Furthermore, more than half reported receiving patients with less-than-adequate diagnostic workup or stated disease etiology and that initial treatments ordered by physicians were inappropriate. GP's were more interested in receiving wound-care literature than the registrars, however the general levels of interest were quite low (38% of GP's vs. 17% of registrars). These are surprising findings considering that both groups regarded their training as having been inadequate. This may indicate that a greater number GP's have to treat chronic wounds or alternatively that registrars are confident about their wound-care knowledge. On the other hand it may also reflect a general feeling of apathy towards treatment of chronic wounds.

To our knowledge, this is the first survey to test wound-care knowledge among undergraduate students. It is unsurprising that pre-final-year students scored less than practitioners, considering that their exposure to chronic wound care is short, mainly theoretical and constitutes at best, a minor component of a busy, multifaceted curriculum. However their median score was a poor 45% (95% CI 40-45%), indicating that on leaving medical school, they are not equipped with the necessary knowledge to treat chronic wounds and are forced to pick up skills by means of self instruction. Nevertheless 3 out of 162 students achieved scores $\geq 70\%$ and seven who scored between 60-69%. This probably indicates that students learn about wound-care in a disorganized manner and that the traditional, discipline-based undergraduate curriculum has resulted in a fragmented approach to wound-care education¹¹. Knowledge scores achieved by students from the two participating medical schools differed significantly. Whereas the dean of the lower-scoring group did not reply to our letter, the dean of the higher-scoring group indicated that their students received two hours of training. The result was that it was not possible to determine whether undergraduate wound-care instruction had any influence on the scores attained by the students.

This is probably also the first survey to compare wound-care knowledge between GP's and trainee surgeons, possibly constituting practitioners who treat chronic wounds most often. Registrars appeared to have scored better than the GP's (table 1, figure 2), however the difference did not achieve statistical significance. The study was probably underpowered to detect a real underlying difference, however the median difference was only 5% and the

confidence interval of the difference between the medians was quite wide (0.00% to 10.00%), so that if a real statistically significant difference does exist, it is unlikely to be of practical importance. It is possible that the GP knowledge scores do not reflect the true situation in South Africa as there may have been selection bias due to the fact that the GP's were all attendees at refresher courses and may represent a group who were particularly enthusiastic about continued professional development (CPD).

If a knowledge score of 70% is regarded as indicating sufficient knowledge to treat various types of chronic wounds successfully, then only small proportions of practitioners and future practitioners qualify (Table II). By this standard; taking the GP's and registrars sampled together, 75% (69/92) (95% CI from 65% to 83%) of GP's and trainee surgeons do not possess adequate knowledge to treat chronic wounds. Even if a score of 60% is regarded as acceptable, then approximately half of clinicians are probably inadequately trained (46%; 95% CI from 36% to 56%). These findings are alarming, because not only do the large number of wrong answers possibly indicate that practitioners are actually applying potentially harmful treatments, but these practices are probably being taught to students during the little clinical teaching to which they are exposed.

There are some weaknesses to this study. If the authors would have been able to visit each university personally, a better response rate might have been obtained, to gain a more complete picture of the situation in South African medical schools. Furthermore there may have been selection bias with regard to the GP group; therefore the results of this small study cannot be regarded as being a true reflection of the state of knowledge countrywide. This study comprised the thesis for a master's degree in family medicine (FC) so that for logistical and financial reasons, it was not possible to extend it further. Secondly, it was not possible to perform an in-depth evaluation of the participants' knowledge using only 20 multiple-choice questions. Nevertheless this limited survey does indicate that there are serious deficiencies in the wound-care knowledge of clinicians as well as importantly, future practitioners.

Conclusions:

In spite of the limitations and weaknesses of this preliminary study, certain conclusions can be made about the care of patients with chronic wounds in South Africa.

- (i) Nearly all students and practitioners regard their training as inadequate.
- (ii) As in other countries, time allocated to formal teaching varies widely and in addition, appears to be insufficient.
- (iii) GP's appear to glean knowledge after leaving medical school. The knowledge possessed by most final year students and a large proportion of practitioners (GP's and registrars) appears to be deficient.
- (iv) Despite the huge financial and clinical significance, little importance is attached to teaching about chronic wounds. Furthermore there appears to be a general lack of interest therein.
- (v) Surgical registrars may possess insufficient knowledge to act as teachers during a wound care module.

A study of the deficiencies of wound-care training in English medical schools provided recommendations by the General Medical Council's Committee for Undergraduate Medical Education.¹¹ Included were suggestions that wound-care education should be integrated with the basic sciences, it should promote self learning and it should make use of available technologies to the advantage of learners.

Recommendations:

A more comprehensive study including all of the medical schools of South Africa, a larger and more representative GP-sample as well as the nursing profession needs to be conducted. This could accurately determine the extent wound care teaching and the wound care knowledge, or the lack of it, of those practicing wound care in South Africa.

An investigation into the wound care education opportunities for general practitioners available in South Africa should be done and if it is found to be deficient, more opportunities should be created.

Effort should be made to highlight the importance of correct management of chronic wounds and to promote interest in wound care among doctors.

Ideally wound care training should be a harmonized endeavor governed by a central body composed of experts in wound care who in turn can establish accepted guidelines for the treatment of wounds. These guidelines then should be promoted as part of the curriculum at the various medical schools of South Africa.

Some South African medical schools are in the process of revising their curricula and this could present an excellent opportunity to include a formal module on the management of wounds. Designing a curriculum may prove challenging, since there is a wealth of available knowledge and a limited amount of time to be allocated. Perhaps the medical schools should attempt to achieve consensus with regard to such content in collaboration with the Wound Healing Association of South Africa (WHASA).

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20 November 2009

Dear Dean of Medical School

Concerning: Survey on wound care knowledge and wound care training.

I am a post-graduate student doing a masters degree in Family Medicine at the University of Stellenbosch. At present, I am in my third year and I am doing a research project concerning the wound care knowledge of doctors in South Africa. I am also doing a survey concerning the training opportunities available for undergraduate medical students and surgical registrars. (See attached outline of the study for more details)

I would appreciate it if you could assist me by answering a few questions concerning wound care training at your medical School and by allowing me to hand out questionnaires concerning the management of chronic wounds to final year medical students and general surgery registrars. Please take note that strict confidentiality will be maintained and that if this study is published, medical schools will be referred to by code and not by the official name of the medical school. (For example Medical school 1, Medical school 2, etc.)

The questions:

1. How many hours of formal teaching on wound care does your medical school present to **undergraduate medical students** during their entire curriculum?
2. How many hours of formal teaching on wound care does your medical school present to **surgery registrars** during their entire curriculum?
3. How many hours of formal teaching on wound care does your medical school present to **Family Medicine Registrars** during their entire curriculum?

I have attached an article of a similar survey performed in the United Kingdom, Germany and the USA, should you be interested.

Kind regards and thank you for your attention.

.....
Dr Francois Coetzee
(Principal investigator)

Wound care management survey

This 5 page questionnaire should take only 5-10 minutes to complete.

Please indicate the information applicable to you by marking an "X" in the appropriate box. If "other" is selected, please elaborate in the box with the dotted line.

By completing this questionnaire it will be accepted that you have agreed to participate in this research. Anonymity and confidentiality will be maintained.

Age

< 20 years	21- 30 years	31- 40 years	41- 50 years	51- 60 years	> 60 years
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Gender

Female	Male
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Current academic activities

none	Final year MBChB	Registrar, general surgery	MFamMed/ RegistrarFamily Medicine	Other
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Qualifications held

None	BSc	MBChB	MMed/College fellowship	Wound care diploma	Other
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Your wound care interest

Not interested	Interested, but do not read about it.	Interested and I have read about it.	Very interested, send me reading material.	Very interested, send me on a course.	Very interested, I want to do research in this area.
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Please indicate the correct option by writing an "X" in the appropriate box.

Each question has only one correct answer.

1. The ideal dressing for a wound with dry necrotic tissue is:
 - a. Foam dressing (e.g. Allevyn® or Biatan®)
 - X** b. Hydrocolloid gel and covering (e.g. Comfeel®)
 - c. Alginate dressing (e.g. Kaltostat®)
 - d. Dry gauze
 - e. All of the above

2. The ideal dressing for a wound with slough (wet necrotic tissue) is:
 - X** a. Honey and paraffin gauze
 - b. Mercurochrome
 - c. Vacuum dressing
 - d. Dry gauze
 - e. All of the above

3. The ideal dressing for a granulating wound is:
 - a. Maggots
 - X** b. Hydrocolloid gel and paraffin gauze (e.g. Nu-gel®)
 - c. Alginate dressing (e.g. Kaltostat®)
 - d. Dry gauze
 - e. All of the above

4. The ideal dressing for a dry and epithelializing wound is:
 - a. Foam dressing (e.g. Allevyn® or Biatan)
 - X** b. Hydrocolloid gel and paraffin gauze (e.g. Intracyte®)
 - c. Alginate dressing (e.g. Kaltostat®)
 - d. Dry gauze
 - e. All of the above

5. The ideal dressing for an ulcer producing excessive exudate is:
 - a. Hydrocortisone cream and gauze
 - b. Hydrocolloid gel (e.g. Intracyte® or Nu-gel®)
 - X** c. Alginate dressing (e.g. Kaltostat®)
 - d. Dry gauze
 - e. Peanut butter and gauze (e.g. Black Cat®)

Please indicate the correct option by writing an “X” in the appropriate box.

Each question has only one correct answer.

6. Diabetic foot ulceration at the metatarsal joint of the big toe is best treated by:
- a. Weight loss (diet and exercise)
 - X** b. Pressure offloading (plaster cast or adaptation of shoe)
 - c. Antibiotic cream and gauze
 - d. Dry gauze
 - e. Amputation
7. Chronic diabetic foot ulceration is often complicated by:
- X** a. Deep soft tissue infection
 - b. Superficial soft tissue infection
 - c. Myocardial infarction
 - d. Extreme pain.
 - e. Secondary cancer.
8. Removal of callus around a diabetic ulcer:
- a. Requires daily soaks in warm water and macerated skin.
 - b. Can only be performed in a theatre.
 - c. Is harmful and should be avoided.
 - X** d. Activates wound healing by release of intrinsic growth factors.
 - e. Increases the pressure on the wound area.
9. The ideal wound cleansing solution for a diabetic foot ulcer is:
- a. Povidone-iodene (undiluted)
 - b. Hydrogen peroxide
 - X** c. Normal Saline
 - d. 10% Acetic acid
 - e. Sodium Hypochlorite
10. Goals of management for infected diabetic foot ulceration includes all of the options below **except**:
- a. Thorough wound cleansing
 - b. Debridement of callus and necrotic tissue
 - c. Use of systemic antibiotics
 - d. Offloading of pressure
 - X** e. Application of biological wound dressings (e.g. Derma-graft®)

Please indicate the correct option by writing an "X" in the appropriate box.

Each question has only one correct answer.

11. A grade 3 pressure ulcer is characterized by:
- a. A red area with no break in the skin.
 - b. Necrosis to the level of the bony structures.
 - c. The need for urgent surgery.
 - X**d. Involvement of subcutaneous tissues but not fascia.
 - e. Healing within two weeks and does not cause pain.
12. Optimal treatment for pressure ulcers will :
- a. Increase pressure on other bony areas.
 - b. Kill every bacterium in the wound
 - c. Increase the local inflammatory response
 - d. Dry up the wound environment
 - X** e. Create a moist wound environment
13. Optimal treatment options for pressure ulcers include all of the option below **except** :
- a. Foam dressing + Hydro gel
 - b. Hydrocolloid paste and hydrocolloid dressing
 - c. Alginate dressing (e.g. Kaltostat®)
 - X** d. Gauze and iodine ointment (e.g. Betadine®)
 - e. Negative pressure wound therapy (a vacuum dressing)
14. Wound evaluation for the purpose of reevaluating treatment objectives should be done:
- a. Daily
 - X** b. Weekly
 - c. Monthly
 - d. Every 3 months
 - e. Every 6 months
15. Indications for systemic antibiotics include all of below **except** :
- a. All grade 4 pressure ulcers
 - b. Septicemia
 - c. Osteomyelitis
 - d. Advancing cellulitis
 - X** e. Non-healing pressure ulcers

Please indicate the correct option by writing an "X" in the appropriate box.

Each question has only one correct answer.

16. Which of the following is correct concerning venous stasis ulcers:

- a. Antibiotics should be reserved for patients with cellulitis or those with active infection requiring a skin graft.
- b. Ulcer dimensions should be measured every second day.
- c. Lanolin should be used to cleanse the ulcer
- d. Topical antibiotics seldom cause skin sensitivity
- e. Saline should not be used to cleanse the wound

17. Applying a four layer compression system for a leg ulcer:

- a. Is ideal therapy for venous stasis ulcers
- b. Contraindicated for all ulcers
- c. Best for arterial ulcers
- d. Requires a duplex Doppler before it is safe
- e. Is expensive and does not work

18. Compression therapy for venous ulcers include all of the below **except**:

- a. Elastic compression bandages
- b. Multi-layer compression bandages
- c. Elastic hose (e.g. Tubi-grip®)
- d. Class three compression stockings
- e. Class two compression stockings

19. Look at the picture of a patient's leg and decide which is the correct option concerning debriding the dead tissue:

- a. Will not help with managing infection.
- b. Should only be done surgically.
- c. Cannot be achieved with applying a hydro gel
- d. Should not be achieved by means of enzymes.
- e. Can be achieved by surgery or applying a desloughing cream. (E.g. Aserbine®)



20. The following should be considered for first line of treatment for venous stasis ulcers:
- a. Bed rest
 - b. Amputation
 - c. Oral antibiotics
 - d. Topical antiseptics
 - x** e. A graduated multilayer high compression system
21. Do you consider your pre graduate training in wound care to be?
- a. Totally inadequate
 - b. Too Basic
 - c. Appropriate
 - d. Advanced
 - e. Unnecessary

Thank you for your participation!