

Awareness and Attitude of Nurses on the Use of Maggot Therapy in the Treatment of Diabetic Ulcers at the Bamenda Regional Hospital, Cameroon

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Abstract: Maggot therapy (MT) is a type of therapy in which live, disinfected maggots cultured in a sterile manner is placed into a non-healing skin and soft tissue wound of humans to clean out the necrotic tissue within a wound and to disinfect it. This therapy has been used for centuries for treatment of non-healing soft tissue wounds until the arrival of antibiotics and modern surgical techniques, by the beginning of the 40's, MT when it was quickly substituted and forgotten. The purpose of this study was to determine the nurses' awareness and attitude on the use of maggot therapy in the treatment of diabetic ulcers in Bamenda Regional Hospital. A hospital based descriptive study design was used in which 43 nurses were randomly selected with inclusion criteria being nurses at the diabetic unit and data collected using questionnaires. From the results obtained, 46.7% of nurses were aware of maggot therapy and their attitude towards MT was both positive and negative at almost equal levels. The main source of awareness here was the internet on the use of MT in treating diabetic ulcers. With the increasing burden of high blood pressure and diabetes in Africa there is the need use all the available tools in the treatment of the complications these patients can face; use of maggots inclusive which is cheaper especially in the resource limited context of Cameroon. With the divided awareness and attitude towards the use of maggots in the treatment of diabetic ulcers in this health facility, there is thus the need to increase awareness amongst the nurses on its importance in the treatment of diabetic ulcers.

Keywords: Awareness, Maggot Therapy, Diabetic Ulcers, Cameroon

1. Background

Maggot therapy (MT) is also known as maggot debridement therapy (MDT), larval therapy, larva therapy, larvae therapy, bio-debridement or bio-surgery. It is a type of therapy in which live, disinfected maggots (fly larvae) cultured in a sterile manner is placed into a non-healing skin and soft tissue wound(s) of humans to clean out the necrotic (dead) tissue within a wound (debridement) and to disinfect it. [1, 2] The fly most commonly used is *Luciliasericata* (or

green bottle fly) but other species are use with similar efficacy. The health care professional makes use of the natural ability of maggots to ingest necrotic or infected tissue without affecting healthy tissue, reducing bacterial burden locally and promoting wound healing.

MT is a popular treatment for the control of these infections and the treatment of wounds. However, with the arrival of antibiotics and modern surgical techniques, by the

beginning of the 40's, MT is quickly substituted and forgotten. Given the alarming increase in bacterial resistance, and the elevated cost of the care of patients with chronic wounds Sherman, re-explored this therapeutic option with an excellent results and a decrease in costs, however the technique is becoming popular again in all continents and the treatment is now cleared for marketing by the FDA in the United States of America, and it is benefiting thousands of patients all over the world. [3, 4] Chronic wounds (leg ulcers, diabetic foot, pressure ulcers, surgical dehiscence, etc.) represent a high percentage of healthcare costs. [5, 6] It is also estimated that 15% of diabetics develop one or more ulcers during the course of their disease. [6] Chronic wounds require effective debridement in order to heal and it is here that MT can be a useful treatment method. [6] Since its renaissance for the treatment of wounds with necrotic tissue, a large number of reports on its efficacy is being published as a result of the increase in antibiotic resistant strains of bacteria and in diabetic foot and pressure ulcers. [4, 5] This treatment is recommended for "non-healing necrotic skin and soft tissue wounds such as venous stasis ulcers, diabetic foot ulcers, pressure ulcers and non-healing traumatic or post-surgical wounds." This poses a significant impact on the health care system, because of the chronicity of care required and the associated costs. [7, 8]

There is still little research on the awareness and effectiveness of maggot therapy in comparison to other treatments. [8] If the health professional's focus is on debridement, larval therapy seems to be quick and produce good results. Diabetic foot ulcers (DFUs) have been associated with higher mortality and reduced quality of life. [8, 9] About 50% of patients with diabetic foot infections who have foot amputations die within five years". [8, 9] It is also estimated that up to 70% of all lower-limb amputations are related to diabetes. [8] Amputations are 15 times more frequent in diabetic patients than in the general population and 80% of amputations could be prevented, according to WHO estimates. [8, 10, 11] The cost attributable to caring for DFU during 2-3 years after diagnosis is about \$28000 in the USA. [2, 8, 12] In 2012, a report from the London School of Economics estimated that a total of 14 billion was spent on treating diabetes and its complications every year. [1, 3, 8]

This form of therapy will be of great help in a situation where the cost of treatment is costly to the patient and/or the conventional treatment is not working but before it finds its rightful place in the treatment of diabetic ulcers, there is need for it to be accepted by the health professionals involved especially at the treatment dispensation phase like the nurses. The study was to serve as basis for further research on maggot therapy in the context of Cameroon offering a standardized framework with recommendations developed in a systematic fashion that will facilitate decision making for the wound care professional in the treatment of patients and in the context of a well structured health facility. This study was thus implemented with main objective to investigate nurses' awareness and attitude with respect to maggot therapy in the treatment of diabetic ulcer.

2. Material and Methods

This was a hospital based descriptive study design carried out in Bamenda Regional Hospital in the North West Region of Cameroon. This Regional Hospital is found in the Regional Headquarter of the North West Region, acts as a referral hospital in the North West Region and has a very functional diabetic unit. Here the study population was the group of devoted nurses have worked or presently working at this diabetic unit who would voluntarily accept to participate in the study. The sample size was calculated using the below formula as thus using the proportion of a similar study carried out by Courteney *et al.*, 2000, who found out that 86% of nurses were aware of MDT use in DFU.

$$N = \left(\frac{CI^2 \times p(1-P)}{E^2} \right)$$
 (where Confidence Interval; CI=95%, Error=5% and Prevalence= 86%)

$$\left(\frac{0.95(0.9025) \times 0.86(0.14)}{(0.05)^2} \right) = 43$$

Therefore $n = 43$

Data was collected using questionnaires designed with the consent form included. The questionnaires were administered and respondents asked to fill it at their convenience. The Data was analyzed using SPSS version 16 and presented in figures and tables.

3. Results

The demographic characteristics of the participants as in table 1 below show that among the participants most were females (76.7%) who had worked for 1-4 years (36.6%) with the highest qualification being HPD/HND (30%).

Table 1. Demographic data.

		Frequency	Percentage %
Sex:	Male	7	23.3
	Female	23	76.7
	<1 year	8	26.7
Longevity:	1-4 years	11	36.6
	5-8 years	9	30
	>10 above	2	6.7
	HPD/HND	9	30
	SRN	7	23.3
Qualification:	Bsc	5	16.7
	Masters	1	3.3
	NA	8	26.7
Total:		30	100%

As show on table 2 below a bit more half of the participants were not aware of Maggot therapy (53.3%) and from the remainder (46.7%) who were aware, about 71.5% said their source of awareness was the internet. Awareness through had only 21.4% while only 7.1% accepted both books and internet as source of their awareness. When asked about the usage of the maggot debridement therapy, all of the participants said to have never practiced this method of therapy. Also their attitude towards the used of this therapy

was evenly divided between the positive and the negative attitudes with 50% each on both sides.

Table 2. State of awareness on maggot therapy and source of awareness.

	Frequency	Percentage %
Are you aware of maggot therapy?		
YES	14	46.7
NO	16	53.3
What was your source of awareness		
Books	3	21.4
Internet	10	71.5
Books and internet	1	7.1
Total	14	100%

From the results on implementation of MT when conventional treatment is not working as shown on table 3 below, 57.1% respondents agreed that MT should be implemented when the use of conventional treatment is not working while 42.9% respondents strongly agreed that MT should be implemented when the use of conventional

treatment is not working.

Table 3. Reactions to the use MT when conventional treatment is not working.

Should MT be implemented when the use of conventional treatment is not working?	Frequency	Percentage %
Agree	8	57.1
Strongly agree	6	42.9

From table 4 below, 50% respondents said MT in the management of patient wound was important in preventing amputation, debridement, disinfection and promotion of tissue formation. 28.6% of the respondents were for debridement, disinfection and effective while 21.4% respondents were of the fact that MT was important in enhancing wound healing, natural and debridement. Also a majority of the respondents 64.3% were of the fact that seminars should be used to improve nurses' awareness on the use of Maggot therapy as compared to 7.1% respondents who proposed the organization of refresher courses to improve awareness.

Table 4. Response to the importance of Maggot therapy in the management of patients wound.

What importance is maggot therapy in the management of patients wound	Frequency	Percentage %
Debridement, Disinfection and Effective	4	28.6
Enhances healing, Natural and Debridement	3	21.4
Prevent amputation, Debridement, Disinfection and Promote tissue formation	7	50

4. Discussion

The demographic results showed that most of the responses were from females' nurses (76.7%) with a few males (23.3%). This result is in line with that obtained by a study which mentioned that 80% of caregivers were women. 8 According to duration in service, most had worked for 1-4 years (36.6%) while 6.7% were >10 years and above in service. With respect to qualification, 50% were HPD/HND Nurses.

Results on awareness show that about half of the nurses were aware of Maggot therapy 16 (53.3%) with their main source of awareness being the internet (71.5%). This may be due to the free internet service and nurses are becoming more curious in finding solutions to problems. On the other hand when it came to practice all of the nurses (even those were aware of MT) said they had never practice maggot debridement therapy. This is possibly due to the fact that MT is not incorporated as one of the conventional treatment method. This study is contrary to that of Mumcuoglu who found out that more than 1,000 surgeons incorporated maggot debridement therapy (MDT) and 90% of nurses were able to practice. 13 Furthermore, the attitude of these nurses was evenly divided between positive and negative attitude. This is in line with Armstrong who used the cognitive, effective and behaviour dimensions to assess nurses attitude and found out their overall attitude was positive (53.3%) and (46.7%) negative reason being that maggot therapy is still unheard. [1]

Results on implementation show that 57.1% nurses agreed

that MT should be implemented when the use of conventional treatment is not working while 42.9% nurses strongly agreed that MT should be implemented when the use of conventional treatment is not working. This study is in line with that of Sherman who found out that Maggot debridement therapy worked quickly and more completely than the standardized therapy upon implementation, and in less than five weeks, the ulcers treated by maggot therapy were 80% debrided and 52% of conventionally treated wounds were not completely debrided in a 5.5 week period ($P=0.021$). [4] Also larval therapy is report as being cost-effective in comparison with conventional methods such as hydrogel which showed that all wounds treated with larval therapy were successfully debrided.

As concerns the importance of MT, 50% respondents said MT in the management of patient wound was important in preventing amputation, debridement, disinfection and promotion of tissue formation. This study is in line with Bowling in which 66% of respondents were for Granulation tissue formation, debridement and prevention of amputation. [11] Majority of the nurses (64.3%) were of the fact that seminars should be used to improve nurses' awareness on the use of Maggot therapy as compared to 7.1% who proposed the organization of refresher courses to improve awareness. This is in line with Steenvoorde who stated that by educating and providing valid information regarding larvae therapy, was vital in improving healthcare workers awareness, such that larvae therapy can become more widely accepted as a form of debridement for chronic wounds. [14]

5. Conclusion and Recommendations

This study found out that nurses awareness was 46.7% with an overall attitude of both positive and negative attitude (7 (50%) respectively) with the main source of awareness being the internet on the use of Maggot Therapy in the treatment of diabetic ulcers at the Bamenda Regional Hospital, Cameroon. In order to improve on nurses awareness towards the use of maggot therapy, seminars should be organized, MT should be implemented alongside the use of conventional therapy. Sources such as the internet and books should be made available to nurses. Also the attitude of nurses should be improved by incorporating maggot therapy into nursing training institutions.

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