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Research Article

Nutrition as a Factor Affecting Treatment of Non-Healing Wounds

Mária Šupínová1*, Mária Snitková2 and Elena Janiczeková1

[1]*SMU in Bratislava, Faculty of Health Seated in Banska Bystrica, Slovakia*

[2]*UKF Nitra, Faculty of Philosophies, Slovakia*

***Corresponding Author:** Šupínová Mária, SMU in Bratislava, Faculty of Health Seated in Banska Bystrica, Slovakia.

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Abstract

The important factor in treating non-healing wounds in all its phases is nutrition.

Aim: The aim of the article is to inform about the results of the research identifying the importance of nutrition in the process of healing of non-healing wounds.

Method: In the research was used the method of standardized questionnaire MNA (Mini Nutritional Assessment).

Sample: The sample included 104 respondents (47 men a 57 women), with a non-healing wound, hospitalized mainly at the departments of venous surgery and surgery in Slovakia (Lučenec, Zvolen) and Social Services Home in Kalinovo. As a consequence of non-healing wound 54 respondents had undergone the amputation.

Results: None of the respondents reached top level on assessing scales (range 24-30 points), representing very good level of nutrition. Average score of the whole sample was 17,51 points, which is the edge value for the risk of malnutrition (range 17-23,5 points). Very good, resp. good level of nutrition showed 5% (4,81) of respondents. Men´s average score was 17,98; women in average gained 17,13 points. The statistical dependence with p = 1,1900>0,005 between gender and the level of nutrition have not been proven. Regarding the age, the best score was reached by the respondents in the youngest age category, under 60 years (20,8 points). Age category over 81 have reached average scores of 13,62 points. The difference in age and the level of nutrition is statistically significant p = 0,1513<1,8665. Pearson´s correlation ratio proved high statistical dependence between the level of nutrition represented by the score on MNA and healing of non-healing wound with p= –0,2039<0,005.

Conclusion: The analysis shows that the nutrition is one of the key factors influencing healing of non-healing wounds. That is why the extension of knowledge about the healing process is inevitable for patients suffering non-healing wounds, as well as, for their relatives, nurses and other healthcare workers.

Keywords: Non-Healing Wounds; Healing; Nutrition; Assessment of Nutrition

Introduction

Condition´s former name - chronical wound - has been changed in Geneva Congress in 2010 to the term non-healing wound. According to researches conducted by European Wound Management Association (EWMA) the incidence of non-healing wounds in Europe is of 3 581 987 per year. Overall number of patients affected by bad wound healing is 1-1,5% of population [1]. Frequent causes of long-lasting healing process are patient´s malnutrition, colonisation by bacterial settlement, multiresistant nosocomial infection or patient´s immobility (Sokol, 2009). Non-healing wounds mostly include wounds resulting from the complications of diabetes mellitus disease, called diabetic foot [2]. Due to the indicated severity of the problem we deal with it in more details in order to improve provision of health care to the patients facing this problem.

The research problem

- Verification of the effect of nutritional state of a patient on the process of healing of non-healing wound.

The research questions

1. Is the state of nutrition of a patient with non-healing wounds sex dependent?
2. Is wound healing effected by patient´s age?
3. Is wound healing effected by patient´s obesity?
4. Is wound healing effected by patient´s malnutrition?

Research file and method

Selection of respondents to the research file was purposeful and targeted. The patients included in research file were hospitalized with non-healing wound – diabetic foot syndrome, lower leg ulcers or decubitus and wound dehiscence. Overall number of 104 respondents was hospitalized with non-healing wounds, in Health Care Facilities in BBSK, Slovakia. As an illustration of the severity of this problem we would like to point to the fact that 54 respondents from the research file had undergone amputation as a consequence of non-healing wound. The research included selective file, with purposeful and targeted selection of respondents. The condition for inclusion was the presence of non-healing wound that had been treated for over 4 months, regardless of respondents´ age, sex, overall health status and social status. The research was conducted within May - August 2016.

Method applied in the research was standardized questionnaire MNA (Mini Nutritional Assessment) [3]. This was supplemented with demographic data, amputation data and the data of exact diagnosis of a patient with non-healing wound and BMI. MNA includes 18 closed questions all belonging under the following four domains:

1. Anthropometric Assessment – with maximum score of 8 points,
2. Domain of Dependence - with maximum score of 8 points,
3. Dieting Habits - with maximum score of 9 points,
4. Subjective Assessment - with maximum score of 4 points.

Overall evaluation of gained points

Score points

- 24 – 30 points – nutritional state is very good to good,
- 17 – 23 points – risk of malnutrition,
- less than 17 – malnutrition.

The questionnaire was completed by nurses based on the patients' responses during the personal sessions. The anonymity was secured during the data analysis and interpretation. For data analysis were used statistical methods and procedures; namely Two-tailed t-test, Chi square test and Fischer´s exact two-sided test for contingency tables.

Results and Discussion

- Average gained score of the whole file was 17,51 points, which is on assessment scale placed alarmingly close to the section representing risk of malnutrition (range 17 – 23,5 points). Minimal score was 4,5 points, maximal 25 points.
- None of the respondents gained very good nutritional state (range 24 – 30 points).
- Respondents´ BMI mostly represented average weight with the span of values between 19 – 24,9. Assessment of respondents' BMI by their age showed more frequent occurrence of lower BMI values in respondents of higher age (13 respondents), defined as underweight and normal weight. BMI values on level of 21 points or more appeared altogether more often in respondents within the group of 61-80 years.
- Assessment of BMI in terms of sex representation was found comparably represented in both sexes.

Comparison of nutritional state Men – Women - balanced assessment (Table 1).

	Men n/%	Women n/%	Total n/%
Malnutrition	16/34,00	28/49	44/42.31
Risk of malnutrition	30/64,00	25/44	55/52,88
Very good/good	1/2,00	4/7	5/4,81
Total	47/100	57/100	104/100

Table 1: Comparison of Nutritional State Men – Women.

Between the sex and the nutritional state was not proven statistical dependence p=1,1900>0,005.

The average gained score was 17,98 in men and 17,13 in women. Comparable are also minimal and maximal score values; In men was minimum of 4,5 point and in women 7 points. Maximal values were of 25 points in men and 24,5 points in women. Very good nutritional state gained 7% (n = 4) women vs. 2% (n = 1) men. Risk of malnutrition threats 64% (n = 30) men vs. (n = 25) 44% women. The assessment scale showed malnutrition in 49% (n = 28) women vs. 34% (n = 16) men.

The worst assessment of nutritional state was in the oldest respondents group, over 81 years (table 2).

	Under 60 years n/%	61 - 80 years n/%	Over 81 years n/%
Malnutrition	3/15,00	20/33,33	21/87,50
Risk of malnutrition	13/65,00	39/65,00	3/12,50
Very good/good	4/20,00	1/1,67	0/0,00
Total	20/100,00	60/100,00	24/100,00

Table 2: Nutritional State by Age.

Differences in age and nutritional state are statistically significant p = 0,1513<1,8665.

The comparison of nutritional state within individual age categories showed the highest average values of gained gross score in the youngest age category - under 60 years (20,8 points). This category included 20 respondents and their overall total of gained points as a group was 416 points. Age group of 61-80 years – the largest group with 60 respondents included - gained average score of 17,9 points. The age category over 81 years gained average values of 13,62 points.

	Amputation YES n/%	Amputation NO n/%
Malnutrition	22/40,74	22/44,00
Risk of malnutrition	32/59,26	23/46,00
Very good/good	0/0,00	5/10,00
Total	54/100,00	50/100,00

Table 3: Nutritional State by Undergone Amputation.

More than a half of the overall file of patients had undergone amputation as a consequence of non-healing wound (in 54 cases). In all the respondents with the limb amputation as a consequence of non-healing wound was their nutritional state assessed by questionnaires as malnutrition, respectively, risk of malnutrition. In the group of respondents, who had not undergone amputation was in 5 respondents nutrition assessed by questionnaire as very good, respectively good (table 3). The group of patients after amputation gained average score value of 17,63 points, which is the value representing slight malnutrition. The same way was assessed group without amputation gaining 17,39 points. Overall total of points gained by the whole group was 953,5 in the group after amputation vs. 869,5 in respondents without amputation.

Pearson´s correlation coefficient have proven high statistical dependence of nutritional state expressed by MNA score and healing of non-healing wound p = –0,2039<0,005.

MNA Scale domains evaluation

	I. Anthropometric Assessment	II. Domain of Dependence	III. Dieting Habits	IV. Subjective Assessment
	n/%	n/%	n/%	n/%
Total	104/69,29	104/51,20	104/67,25	104/45,67

Table 4: Success Rate Percentage of Respondents in Individual Domains.

The respondents altogether gained in individual domains average success rates. The highest success rate was gained in domain I. Anthropometric Assessment. This result correlates with measured BMI values. The most of the respondents have normal weight however this does not mean good nutrition. The second highest success rate gained respondents in domain III. Dieting Habits 67,25%, followed by II. Domain of Dependence. This domain indicates relatively high dependence of respondents on help from their relatives (closest). The lowest success rate was gained in the domain IV. Subjective Assessment. This result outlines the fact that the respondents negatively assess the level of their nutrition and their health.

	I. Anthropometric Assessment		II. Domain of Dependence		III. Dieting Habits		IV. Subjective Assessment	
	n	Ø	n	Ø	n	Ø	n	Ø
Total	104	5,54	104	4,10	104	6,05	104	0,46
Scale		8		8		9		4

Table 5: Average Gained Score Point in Individual Domains.

Evaluation of gained score points in individual domains showed the highest average values in domain III. Dieting Habits and the lowest average values within the domain IV. Subjective Assessment. In the later the respondents out of maximal number of 4 points only gained alarming 0,46 points.

Specialists agree that, one of the factors crucially influencing treatment and wound healing process is nutrition [4]. Such example is the research conducted on 478 respondents in Taiwan, using MNA Scales showing that nutritional state of patients had major impact on healing process of non-healing wounds [5]. Similar results have proven research conducted in USA, where only 3 out of all researched patients with decubitus had very good nutritional state as reflected in their MNA nutritional assessment. Therefore the experts recommended application of MNA for nutritional state assessment as an appropriate method for its identification and in case of negative results suggested intervention in wound healing process, namely to its nutritional sphere as a prevention of further complications [6]. Comparison of nutritional state of men and women has proven groups equal therefore, differences were not statistically significant.

The oldest age category of respondents gained lowest average score values. This is influenced by more factors. First of all, digestion slowers with aging, the taste and the joy from food are changing, so older people naturally eat less. Closely related to aging is also lowered urge of thirst, causing the risk of dehydration. And here we get back to beginning, hydration is very important for correct wound healing [7-9].

All these factors were signed under the amputation in over a half of all the respondents in the research file as a consequence of non-healing wound. Here is necessary to point to their nutritional state assessed by questionnaire as malnutrition, respectively a risk of malnutrition. Therefore we can say that the nutrition repeatedly proves to be the carrier pillar influencing duration and process of wound healing.

The complexity of the questionnaire covers all factors affecting patient´s condition; therefore it is necessary to evaluate it in complex. In our research the respondents gained average success rate in individual questionnaire domains. The highest, as we mentioned above, was gained in the domain I. Anthropometric Assessment. This result correlates with the measured BMI values. But this domain shall be evaluated in a context of all four because, despite of the fact that the most of the respondents have normal weight, that does not prove good nutrition. A patient shall appear normal from outside, have normal weight, but inside, their reserves of proteins are reducing. Such hidden protein deficit can easily develop in malnutrition [10,11].

The IIIrd domain can help with the identification of potential risks/causes. Our file gained the second highest success rate in this domain, followed by the domain II. Domain of Dependence. This implies problems with dieting related to the factor of age (mentioned above) and relatively high reliance of respondents on the help from their closest. The IInd domain shows the quality of life, which is supplemented by IV. Subjective assessment. Our file gained the lowest percentage in domain IV. Subjective Assessment. These results indicate that respondents negatively assess their nutritional state and their health [12].

Grofova [13,14] states that elderly people are from physiological point loosing weight and therefore are highly at the risk of malnutrition. Nutrition plays an important role in wound healing process. The conducted research supports the thesis that caring about nutrition shall be inevitable part of complex nursing care about patient with non-healing wound.

Conclusion

All the non-healing wounds mean interference in the life quality of every person concerned. Attitude towards the treatment and wound healing process shall be holistic. This means that the care about a patient with non-healing wound should include proper nutrition along with the local treatment applied with professional approach. The conclusion based on our findings has undoubtedly pointed to the dependence of nutritional state and the healing process of non-healing wound, where BMI is being the indicator of good nutrition. Patients' sex did not play role in wound healing process. However, differences in age and nutritional state were statistically significant. Therefore increased attention shall be paid to the nutrition of seniors. The specialists recommend searching for risk patients with non-healing wounds threatened by the risk of insufficient nutrition. This shall be an inseparable part of the treatment of various diseases, but especially in treating non-healing wounds.

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