

## **Optimal nutrition care for all, from policy to action – a national nutrition program in Israel**

**Endevelt R RD, PhD<sup>1,2</sup>, Kachal J, RD, MPH<sup>1</sup>, Zinger P MD<sup>3</sup>, Doyev R, RD<sup>4</sup>, Goldsmith R, RD, MPH<sup>1</sup>, Grotto I MD, MPH, PhD<sup>5, 6</sup>.**

Nutrition Department, Israel Ministry of Health 2. Haifa University, School of Public Health 3. Rabin Medical Center 4. Abbot company 5. Public Health Services, Israel Ministry of Health 6. Ben Gurion University of the Negev

[rendevelt@univ.haifa.ac.il](mailto:rendevelt@univ.haifa.ac.il)

[ronit.endevelt@moh.gov.il](mailto:ronit.endevelt@moh.gov.il)

### **Abstract**

#### **Background**

Malnutrition is a significant public health problem which includes both ends of the nutrition spectrum, with obesity and overweight at one end and under nutrition at the other. Israel is one of 14 countries in Europe which has joined the European Nutrition for Health Alliance (ENHA) whose common goals are 'Optimal Nutrition Care for All'(ONCA). Israel is unique in that the four health maintenance organizations, which provide coverage for all, are fully computerized, with big accessible data.

#### **Objective**

Creating national awareness for better nutrition for all the population.

#### **Methods**

Four subcommittees were formed to develop policy: interventions in hospitals; within the community; communication and patient opinion; continuity of care with the aid of computerized and big data tools.

#### **Results**

All stakeholders signed a charter which included: Implementation of weighing in all health-care settings; screening for malnutrition; creating health quality indicators; improving the nutritional quality of food served to patients in hospital settings; continuity of treatment-care sequence; promoting a healthy lifestyle for the entire population and establishing a national malnutrition registry.

#### **Conclusion**

Multidisciplinary teams must work together at a national level towards reaching the goal of 'Optimal Nutrition Care for All' against malnutrition.

### **Introduction**

Malnutrition is a significant public health problem which includes both ends of the nutrition spectrum, with obesity and overweight at one end and under nutrition at the other. Various programs exist for combating the obesity epidemic but under nutrition has been largely ignored despite having equal costs to society in health and economic terms and severely impacting on the quality of life of those experiencing it. Israel is one of 14 countries in Europe which has joined the European Nutrition for Health Alliance (ENHA) whose common goals are 'Optimal Nutrition Care for All' in healthcare systems and the community across Europe

The American Certification Standard (JCI), as adopted by many hospitals in Israel and encouraged by the Ministry of Health, relates to several aspects of nutrition in hospitals including screening and protocols of care.

The European Journal of Clinical Nutrition and Metabolism (ESPEN), together with other global nutrition bodies, issued a new document with new definitions regarding nutritional disorders, including malnutrition. Malnutrition is further divided into three categories:

1. Linked to socioeconomic status and social inequality.
2. Not related to morbidity.
3. Malnutrition related to morbidity (DRM).

It should be noted that due to the efforts of ESPEN and other groups SARCOPENIA was added to the ICD-10 list, as an important diagnosis for people within various weight ranges who suffer from malnutrition.

Disease-related malnutrition (DRM) is a critical public health concern in Europe costing EU governments up to 120 billion Euros every year. Malnutrition is caused primarily by poor nutrient intake when patients in hospitals or people in the community setting fail to meet their daily requirements for energy, protein and micronutrients.

Malnutrition is further frequently observed in both acute and chronic diseases. This may be related to the patients' health status, their economic situation or other problems. Malnutrition significantly increases morbidity, mortality, length of hospital stay and hospital readmission rate. The prevalence of malnutrition reaches 30-50% within hospitalized patients, but nutrition status may deteriorate or malnutrition develop during the

hospital stay - a phenomenon called 'hospital malnutrition'. Nutritional risk may vary, not only due to medical or geographical settings, but also because of the different patient populations admitted to the hospital, as well as the differing case mixes.

Disease-related malnutrition (DRM) is a significant burden to individuals and their caregivers due to delayed recovery, more complications, increased dependency and higher mortality. Often wrongly associated with low income countries only, DRM is a common but often overlooked issue in all high income countries. Young and older patients across healthcare settings are affected.

Although the prevalence of DRM is highest in hospitals and care homes, the majority of malnourished individuals reside at home in the community. DRM is also a major drain on scarce health and social care resources. For example in the Republic of Ireland the annual public health and social care costs of adult DRM is estimated to be over €1.4 billion or 10% of the health care budget (1). Finally, Professor Laviano called for early identification and management of disease-related malnutrition (1). Sadly for many patients intervention often begins too late. Professor Marinos Elia, from University of Southampton, United Kingdom stated that since DRM affects every body system its negative effects are seen in patients across every specialty and care setting posing a major public health and economic problem. Data from a new report from the United Kingdom suggest that it costs about 3-4 times more to manage a person with malnutrition than without and that it costs more not to treat malnutrition than to treat it (1).

Two systematic reviews were published last year by Professor Marinos Elia. The first review focusing on the hospital setting included nine publications. A mean cost saving of 12% was identified from the cost analyses when malnourished patients receiving nutrition treatment (dietitian consultation and oral nutrition support- ONS) were compared to those receiving routine care. Meta-analysis of abdominal surgical studies showed that the mean net cost saving of administering ONS was £746 per patient (€1,076). Cost savings were typically associated with significantly improved outcomes which included reduced mortality (by 35%), lowered complication rates (by 35%) and decreased length of hospital stay (by 2 days, corresponding to a ~13% reduction). Cost effectiveness was also

demonstrated by avoiding the development of pressure ulcers or by gaining quality adjusted life years [1].

The second systematic review focused on the community and included 19 publications. Meta-analysis found that nutritional care and providing food was associated with a reduction of 16.5% in hospitalizations. Many clinically relevant outcomes favoring the treatment were reported including improved quality of life, reduced infections, reduced falls and fewer functional limitations. [2]

Net savings in costs related to nutritional support for adults ranked third within the framework of the clinical guidelines of the organization NICE (The National Institute for Health and Care Excellence) and quality standards in England. Therefore, strategies to combat malnutrition should address all settings and conditions using a consistent integrated, multidisciplinary and coordinated approach. [3].

The question is, if the evidence is in favor of nutrition therapy for patients who are at risk for malnutrition, why don't healthcare systems around the world (with a few exceptions), take action to implement it? There are four reasons:

1. DRM is poorly understood in an obesity-focused society
2. It is overlooked and under-detected because it is considered an inevitable consequence of illness and ageing
3. Until recently, there was no reference to the financial burden of DRM
4. Management of malnutrition has not been evaluated correctly and is perceived as an easy target for budget cuts.

For example, health economic data have been successfully used in Ireland to drive changes in policy and practice. Generating local data on the prevalence and the burden of DRM has led to the development of policy recommendations and a costed implementation model for effective identification and management of DRM (1).

Therefore, policy makers should drive changes in policy and practice by implementing tailored activity plans for each nation.

The issue of DRM and its effective management via appropriate nutritional support needs to be addressed in every part of every healthcare system. It must become as integral a part of

routine healthcare delivery as hand washing is for the reduction of infections.

In Israel there are only limited data available regarding the prevalence of food security and nutritional risk situations of the various populations.

Data on the prevalence of malnutrition from The National Health and Nutrition survey of the community- dwelling elderly aged 65 and above, conducted in 2005- 2006 by the Israel Center for Disease Control of the Ministry of Health, shows that 19.9% of the elderly were at high risk of malnutrition, 43.3% were at moderate risk, and 36.8% were not at risk (according to the DETERMINE questionnaire) [4].

According to the MNA-SF tool 22.6% were at risk of malnutrition.

In addition, it was found that 5.5% ate less than they wanted in the 12 months prior to the interview because there was not enough money to buy food [4]

The Nutrition Day (ND) initiative has been promoted by the European Society for Clinical Nutrition and Metabolism (ESPEN) to assess and audit the nutritional status of hospitalized patients as well as to promote awareness. Israel has been participating annually in this project since 2006.

In Israel, 2303 patients (in 114 various medical specialty units) were included in the study during a 7 year survey, while 4316 units recruited 91,351 patients in the world (W), between 2006 and 2012. The median age of patients was 68 years, 44% were female, and the BMI range was  $27 \pm 6$  (25 in W), 43% of the patients experienced weight loss within the last 3 months prior to admission (same for W); 36.7% described a 50% decrease in their normal food intake (21.3% in W). Food intake at ND showed that 51.4% of the patients ate between half to none of the served meal (56.2% in W). [5].

In 2013, the American Journal of Clinical Nutrition, ASPEN (American Society for Parenteral and Enteral Nutrition) published a position paper calling for decision makers in the health system to develop training programs to promote nutrition therapy interventions as part

of medical treatment. The paper explains that the phenomenon of malnutrition in hospitals is a significant hidden component and expensive cost of health care in the different health systems. Hospital administrators and clinicians alike have harnessed the benefits of nutrition therapy as an essential element and an integral part of medical care and various health services. It is imperative to add nutrition studies to the curricula of medical training and nursing training in order to increase their awareness of these professionals of nutrition and promote their knowledge of the benefits of nutrition screening and referrals to nutrition therapy by dietitians to patients. Hospitals need to include dietitians as core team members in patient care, so that methods of detection of poor nutrition status and nutrition therapy are incorporated in patient care plans, so as to improve the nutritional status of patients. Suitable training programs, nutrition intervention programs, including implementation of quality measures in the diet can help prevent and treat nutritional risk situations, and thus contribute to reduce complications, shorten hospital stays and reduce hospitalizations.

Nutrition therapy has been proven as an effective treatment to improve the patient's clinical outcomes and reduce health care costs [6].

The aim of the intervention study was to develop a nationwide policy for Optimal-Nutrition Care for All (ONCA) , by accessing and utilizing the big data sets ,belonging to the 4 national HMO's as well as accessing computerized self-detection screening tools- all of which can assist in identifying those at risk of malnutrition in various settings.

## Methods

Four main strategies were used:

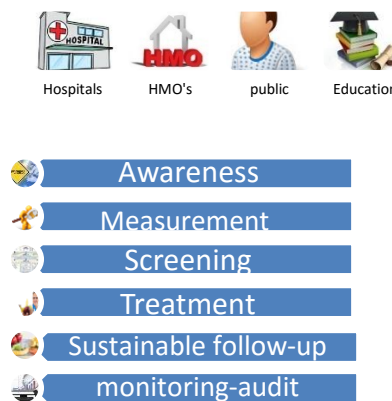
1. Detection and treatment of nutritional risk situations in hospitals with the aid of computerized screening tools.
2. Detection and treatment of nutritional risk situations in clinics and community health centers with the aid of computerized screening tools and BI big data models. We collected snapshot data of selected nutritional biomarkers from the HMO's in Israel covering the period from 2013-2015 including: Vitamin D, Iron, Albumin, Folate, Transferrin, Vitamin B12,

Hemoglobin, Homocysteine, MCV and Ferritin.

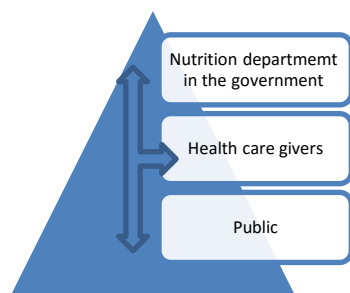
The data presented are from all the patients who underwent these tests in that period regardless of health status, medication and supplements use.

3. Creating a policy for continuity of care between health settings.
4. Raising public awareness of the importance of early treatment of nutritional risk situations by digital and other means of communications, including call for action for high-tech companies.

**The global model: Multidisciplinary challenges in Optimal Nutrition Care for All with nationwide BI systems.**



**The communication model**



## Results

1. **Detection and treatment of nutritional risk situations in hospitals**

Recognition of nutrition-related health risk situations is an issue of high national priority. Chair scales were recommended to be included as part of the permanent equipment in hospitals for weighing patients who cannot stand. Development of the proper infrastructure needed for measuring in any medical center was recommended. In addition, the screening tool for malnutrition, as required as part of the accreditation process, was incorporated into the electronic medical file. It was also recommended that the ICD coding for malnutrition be included in the list of diagnoses where appropriate. [7]

Obligatory routine screening for malnutrition was recommended to be carried out at the time of admission. This would therefore allow for use of an algorithm to determine which patients are at nutritional risk, and require nutritional intervention by a dietitian within 72 hours of admission. Another problem was the continuity of care. Therefore, it was recommended that the dietitian's instructions upon discharge to the community should include a letter detailing the latest information and guidelines for nutritional care within the community.

The Ministry has given priority to development of a standardized electronic record of nutritional characterization. To date this has been implemented with an interface developed between the hospital's computerized medical file and management systems, and the Ministry of Health's Food and Nutrient database software program (Tzameret) for calculating dietary intake. This interface has also included communication with the hospital's food management services.

In addition a staffing level standard for dietitian positions per beds was determined with the human resources department. The standards allows for 1 dietitian position per 50 beds in general hospitals and 1 dietitian position per 100 beds in psychiatric hospitals.

The use of Diet Quality Indicators to determine success of nutritional screening and treatment in the geriatric hospitals was introduced. It is currently under discussion for possible implementation in psychiatric and general hospitals.

The role for a dietitian in supervision of the food chain was defined, which includes building a model to improve the nutritional quality, food security, food safety and culinary aspects of the

food service. Thirty dietitians underwent training courses and started working in various hospitals with the aim to improve food and the service in a hospital setting. Cooperation between the food services managers and food service dietitian supervisor has borne positive results.

It is recommended by the Ministry that hospitals participate in "Nutrition Day" which is aimed at identifying the food waste in the medical centers, and at least one department in each hospital is required to implement the questionnaire. Nine hospitals participated this year.

The results were compared to those of other European countries, and showed that there is still a lot of work needed to improve the food served to the patients because a 50% level of food waste was reported.

## 2. Detection and treatment of nutritional risk situations in clinics, community health funds

Health services in the community are a key element in the prevention of risk factors, diagnosis, treatment and support of nutritional risk situations. In Israel all of the population is covered by health insurance through four health funds and all have electronic patient records, which in turn generate big data

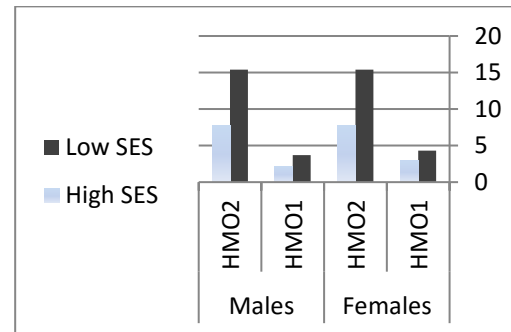
Measuring the height and weight of adult at outpatient (ambulatory) clinics is now obligatory through the National Quality Indicators program. It will take place every five years until the age of 65, every two years for ages 65-74, and yearly after that, for those aged 75 and over. Individuals over the age of 74 who experience a weight loss of 10% or more over the course of the two assessment periods will be noted and a referral should be given for nutritional counseling. In the near future compulsory screening for malnutrition will be added, inclusion of ICD codes for nutritional risk to the medical file and diagnoses will be implemented, implement diagnosing set to nutritional risk according to the ICD10 an integral part of medical diagnosis and a **registry for malnutrition will be launched**.

Last year all the oral nutritional supplements (ONS) for people with tube feeding up to the age of 19 were added to the technologies basket of the HMO's. This year it is supposed to extend

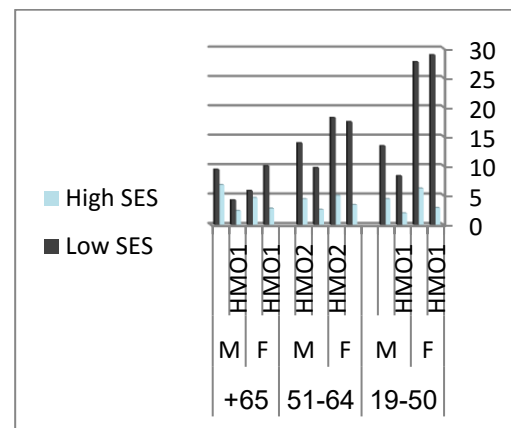
to older ages. (People will need to pay only a small part of the expenses for ONS).

A survey covering the big data of two of the four HMO's which cover almost 1/2 of the Israeli population focused on results of blood tests for nutritional biomarkers in Israel and impressive results were found:

**Figure 1 Percentage with low albumin levels, among those aged 65 and over**



**Figure 2 Percentage with Vitamin D levels <10 ng/ml by age group**



It can be seen (Figure 1) that among the elderly (65 and above) low albumin levels are more prevalent among the low SES population. It can also be seen that Vitamin D deficiency is more prevalent among the younger population (figure 2) and in all age groups, among those with lower SES status.

Fig.3 Mean Iron levels, in mcg/dl, by age

			High SES	Low SES
19-50	F	HMO1	88.8	74.8
		HMO2	84.1	73.5
	M	HMO1	103.8	96.1
		HMO2	96.9	90.3
51-64	F	HMO1	87.6	76.8
		HMO2	83	74.2
	M	HMO1	97.2	87
		HMO2	90.8	83.2
65+	F	HMO1	81.4	70.9
		HMO2	74.2	69
	M	HMO1	87.4	77.8
		HMO2	79.8	74.7

As for iron status, mean iron levels (Figure 3) decreased with increase in age. In all age groups, lower levels were more common in those with lower SES status.

Other nutrients and biomarkers that were examined included Vitamin B12, Folate. Homocysteine. For Folate and Vitamin B12, status was worse in the lower SES groups, and in the older age groups. The prevalence of high levels of homocysteine, increased with increase in age, and SES did not play a role in any age group.(data not shown)

Recommendations include: implementation of guidelines for home care nutrition, and, in the future, creating a model similar to the Well Baby Center model- Tipat Halav, (Drop of Milk), to be called "Drop of Gold". The family physician will be asked to proactively invite the elderly, age 75 and over, to come in for an annual checkup (healthy visit). Also, a dietitian is to be included as part of a professional team in the comprehensive geriatric clinic assessment.

There is a recommendation to the municipalities to hire a dietitian who will liaise with the HMOs, the schools, the hospitals and the public health department in the Ministry of Health for better continuity of care. Another important part of the work is to supervise the nutrition of people living in hostels for special needs and mental illness, and supervise lunch programs for children and the elderly.

Another recommendation is to include multidisciplinary team work in any treatment setting of physicians, nurses, dietitians, social workers and speech therapists, to discuss the cases of malnutrition and refer the patient to treatment. For example, in the case of a person who received dietary recommendations and cannot buy these foods, there should be a referral to a social worker. In addition, there is a need for speech therapists to be integrated in all home care units to prescribe the correct food textures needed/ necessary for all patients.

### 3. Education and training professionals

There is a lack of knowledge and awareness among medical personnel and caregivers about the importance of screening and treatment of various nutritional risk situations. The program aims to raise awareness of these conditions and provide knowledge on the subject.

Target professional audiences include: staff physicians, nurses, social workers, first line therapists (care givers), allied health professionals such as physiotherapists, occupational therapists, pharmacists, speech therapists etc.

Three educational programs were built and presented to more than 200 dietitians: A. physical assessment as part of the nutritional assessment process of the dietitian (an international program in conjunction with Rutgers University). B. course in nutrition for psychiatric patients. C. course in food service management for dietitians.

Nurses developed an educational program on the importance of screening for malnutrition. Medical schools were asked to add nutrition education to the syllabus for family physicians and geriatricians.

A short web-based survey aimed at raising awareness among the public and medical staff for malnutrition will be distributed by the Ministry of Health and a conference with case reports of success will be launched.

### 4. Raising public awareness of nutritional risk situations and the importance of early treatment

The minimal awareness of nutritional risk situations and their consequences in the Israeli public often leads to late diagnosis. This subsequently leads to lack of early intervention, the postponement of treatment and handling and inefficient management of treatment. This

occurs most notably among chronically ill and cancer patients. It is therefore necessary to raise the public awareness of this issue.

The initiative of **web-based tools** will be created and implemented to help enlighten the population (chronically ill and cancer patients), to recognize the problem and know how to treat it. This resource will inform the patient of the dangers of nutritional risk situations, in cooperation with representatives of the public.

Researchers will conduct qualitative research among groups of patients to acknowledge their nutritional special needs. Together with these representatives, families will be able to identify the needs of patients through discussions such as in focus groups. It is intended to collaborate with various NGO's and patient advocacy groups to survey what services and assistance those with special nutrition needs would like the Ministry of Health to provide. This knowledge will inform a social networking media campaign, intended to increase awareness of the issues involved.

Awareness of these issues among subgroups of at risk patients will be developed through meetings, media, social networks and viral videos. Additionally, this information can be conveyed while waiting in line at clinics (via pamphlets), through newsletters, or visual presentations. Ultimately, an interactive video will be produced to demonstrate the importance of detection and treatment of nutritional risk situations. There is an awareness within the framework of the media campaign of the necessity to explain the difference between obesity and intentional weight loss and weight loss due to situations of malnutrition and nutrient deficiencies. This will be taken into account when creating the proper material.

At the other side of the spectrum a call for action with a scholarship is published by the government to ask high-tech companies to develop a digital tool for better nutrition in the fight against obesity.

## Discussion

A program to lower the prevalence of malnutrition, led by the Nutrition Department in the Ministry of Health, has the potential to generate coordination and cooperation between multiple stakeholders and to promote a national project. The combination of raised awareness by education, regulation and use of an algorithm

to prioritize treatment and continuity of care and digital communication tools is crucial for better treatment of the patients who are at risk for malnutrition in all the spectrum. It is a complex challenge to implement screening tools in health care settings, to regularly check for nutritional biomarkers and to look for malnutrition in the community. Encouraging ongoing education, creating regular auditing, and the establishment of screening routines and ward practices is recommended to further improve compliance [8]. Many countries face the same challenge, as seen in the literature. Auditing the nutrition care system has been fundamental and the implementation of screening tools, like MUST, has allowed training, additional time and educational resources to be allocated to specific wards to facilitate improvements in screening. The head dietitian, with the support of nursing staff, will carry out monitoring of nutrition status, and where appropriate, dietitians will initiate diet therapy. These steps will improve patient nutrition status and will improve adherence to dietary recommendations and facilitation of identification of patients at moderate and high risk of malnutrition [9].

It is crucial to screen for malnutrition and treat it at the right time in order to lower morbidity and mortality rates and length of stay at the hospitals. Malnutrition is a common complication of disease and a major determinant of hospital stay outcomes. Dutch hospitals are required to screen for malnutrition on the first day of admission. In a survey of 564,063 admissions, 74% were screened, and 1 out of 7 patients were recorded as malnourished. For geriatrics, oncology, gastroenterology, and internal medicine, this ratio was even greater (1 out of 3-4). Hospital stay was 1.4 days longer among malnourished patients than among those who were well nourished [10].

As for the other side of the spectrum preventing obesity needs a nationwide strategy with the leading of the health government for regulation to establish a healthier environment better awareness of the medical staff and the giving the public educational tools to face the obstacles on the way for better nutrition and better health.

## Limitations

There are some limitations with use of the HMO's snapshot data, in that the tests represented are not mandatory for all patients, and the results shown are of those who



presented at their family physicians for various reasons, including during periods of illness.

Another limitation is that the study has only preliminary results and it mostly presents the main challenges.

## Summary and Conclusion

Creating a national model, by utilizing the computerized big data that identifies the area for investment for developing the right

infrastructure to raise awareness, screen treat, and audit is crucial for a better well-nourished nation.

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