

- **Name of the study:** Dietary Intake and Nutritional Status of Community-Dwelling Adults with Intellectual and Developmental Disabilities (IDD) in Israel.
- **Year:** 2025
- **Type of research:** research
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### Abstract

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### **Background**

The life expectancy of people with intellectual-developmental disabilities (IDD) is increasing worldwide. Despite this, almost no research in the fields of health and nutrition has been carried out on this population. In Israel, there is no information regarding the nutrition status of the general population with intellectual-developmental disabilities, particular in this elderly sub-population. And this, even though organizations around the world have emphasized the importance of nutrition research in this area. Community-dwelling adults with IDD, unlike the general population, show signs of premature aging and are at an increased risk of morbidity and mortality, mainly from chronic diseases such as obesity and diabetes as well as an increased nutritional risk of nutrient deficiencies and malnutrition. The lack of information about their nutritional status, along with the lack of follow-up, and nutritional monitoring, place them at significant nutritional risk, and impair their chances of reaching old age in good health.

There is an absence of validated and appropriate dietary intake assessment tools for those with IDD, who are characterized by limited cognitive abilities and impaired memory. This absence of appropriate tools is the main obstacle to receiving reliable information on dietary intake and quality, in order to develop nutritional guidelines, so as to improve their health and nutrition status. Other challenges are the ethical complexity of receiving approval for conducting research and recruiting community-dwelling IDD people for nutrition research. This research took upon itself, as an objective, to deal with these obstacles. This study provides, for the first time, reliable and accurate information on the nutritional and health status of community-dwelling elderly adults with IDD in Israel and it sheds light on the etiology leading to nutritional risk, based on our findings, a formulation of population-specific guidelines aimed at risk factor reduction, and interventions programs can be developed.

## **Study aims**

(1) To develop a validated population-tailored method for assessing the nutritional intake of community-dwelling adults with IDD, to bridge the cognitive and intellectual gaps, and to be applicable and adapted to collect information on dietary intakes in this population as a basis for further nutrition research. (2) To estimate the dietary intake and diet quality of community-dwelling adults with IDD and identify risk factors for nutritional deficiencies, as a basis for the formulation of population-specific guidelines.

## **Methods**

Based on the literature review, when considering the limitations of various IDD-nutritional questionnaires, and in light of the cognitive limitations of the IDD population, we developed the Photo.Rec24.IDD. This nutritional tool combines two assessment methods, recall, and photography, thereby closing the information gap of the dietary intake of the IDD population. In order to validate the Photo.Rec24.IDD, and after obtaining the necessary approval from the Ministry of Welfare, and Social Affairs, we recruited a convenience sample of 22 IDD adults living in an assisted living compound within the community, who work in a sheltered workshop located in the compound, and agreed, together with their legal guardians, to take part in the study .

We compared the intake obtained by the Photo.Rec24.IDD to the dietary intake assessed through observation by a clinical, experienced dietitian. The nutrients intake obtained by the dietitian's observational assessment was compared to that obtained by the Photo.Rec24.IDD method (with photography) and that obtained by the traditional 24-hour recall without photography (Rec24h). This comparison was made to quantify the improvement in the dietary recall, assisted by photography.

After obtaining the ethics approval from the supreme Helsinki Committee for medical research in the Ministry of Health, we approached IDD employment centers in order to recruit participants to assess their nutritional status. We carried out a cross-sectional study. The convenience sample included 121 community-dwelling adults aged 33-76 (mean  $\pm$  SD, 48.29 $\pm$ 10.7) with light-moderate levels of IDD. After receiving full written consent from the participants (with assistance) and their legal guardians. Each participant underwent a complete nutritional and health assessment, using a photo-assisted 24-hr dietary recall interview (Photo.Rec24.IDD), socio-demographic, lifestyle, health status and clinical questionnaires, and anthropometric measurements. All dietary intake records were entered into the "Tzameret" dietary analysis software program for analysis, assessment of diet quality, and identification of nutritional risk. Dietary intakes were compared with the dietary recommendations [DRI] and with the general Israeli population, adjusted for age and sex. The diet quality was estimated by accepted nutritional indexes [Healthy Eating Index-2015 (HEI-2015), Mediterranean-diet score (Med-Diet), and the percentage of energy (calories) consumed as Ultra-processed foods (UPF) [using the NOVA classification system]. The

nutritional and health status were compared with the National Health and Nutrition (MABAT) survey in adults (2014-2015) of the same age group and with the MABAT-Zahav survey (2014-2015) for age 65 and over. Lastly, we assessed the link between health characteristics and lifestyle, nutritional intake, and dietary patterns with the prevalence of underweight and overweight among the IDD population. All dietary intake records were entered into the "Tzameret" software program, developed by the Nutrition Department of the Ministry of Health. Data processing was carried out using IBM SPSS statistics software (version 26). Tests were considered statistically significant at P values below 0.05 (both sides). The statistical analysis was carried out in several stages: description of the variables, univariate analysis, and multivariable regression analysis.

## **Results**

In this study, we developed a unique method, the Photo.Rec24.IDD method, to obtain nutritional information about the dietary intake of the IDD population. The method is based on the traditional 24-hour dietary recall with the addition of photography of food consumption. Through the validation of the Photo.Rec24.IDD we consistently found a 17-30% increase in dietary intake due to the added benefit that photography gives .

Regarding the health and nutritional status results of the study population, , we found that the majority (73%) of the IDD population reported having one or more medical diagnoses of chronic illness, and 68.4% consumed one or more medications (up to a maximum of 10 medications) on a daily basis. In comparison with the general population, we found that the IDD population had a higher prevalence (13.2%) of obesity, and thyroid problems (14%). The prevalence of obesity (37.2%) and underweight (18.2%) was higher in the IDD population as compared also to the elderly population. We found a low level of physical activity compared to the aforementioned population (only 13.2% met the international recommendations). We found low intakes of fiber, vitamin D, vitamin E, folate, vitamin A, calcium, magnesium, potassium, and zinc. Only a third of the participants (33.8%) reported that they consume one or more nutritional supplements. 96.7% of the IDD participants consumed sodium above the recommended amount (AI) and more than the general, including elderly, Israeli population. The diet quality of the IDD population was assessed as medium to low levels of adherence to the Mediterranean diet, mean score of 2.53 (SD=1.1) out of a maximum score of 9, and to the Healthy Eating Index (HEI), mean score of 40.1 (SD=10.3) out of a maximum score of 100. 37 % of the participants' daily energy came from ultra-processed foods .

We found that obesity was significantly associated with a greater number of medications and nutritional supplements taken, a greater number of diseases, a greater prevalence of diabetes and hypertension, less physical activity, a larger waist circumference, higher zinc intake, and lower calcium intake. In multivariable logistic regression, age and sex-adjusted, participants with a calcium intake at the upper quartile were 45% less likely to be obese compared to those who

consumed calcium in the lower quartile (OR = 0.547, p=0.005), and the prevalence of obesity was 5 times higher among those with diabetes (OR=4.977, p=0.039).

## **Conclusions**

This study offers a wide and reliable understanding of the health and nutritional status of the elderly IDD population living within the Israeli community and provides evidence that this community-dwelling population is at a health and nutritional risk. This research indicates a higher prevalence of obesity and underweight among the IDD population in comparison to the general Israeli population. In addition, malnutrition (undernutrition) was found among this population as a result of inadequate dietary intake, poor dietary patterns, and poor food quality including excessive intake of added sugars, refined grains, sodium, ultra-processed foods as well as an inadequate intake of fruits and vegetables. We observed early signs of aging and functional decline and a higher prevalence of diabetes than in the general population .

The IDD population dwelling in the community, that approaching old age, requires improvement in dietary patterns and food quality which will provide adequate intake of macro and micronutrients and dietary fiber by increasing adherence to the Mediterranean diet patterns. This will, in turn, delay dependency and promote optimal aging while improving and maintaining health, function, and nutritional status.

Due to the early onset of aging in this population, there is a need to determine standards for early detection of nutritional risk and chronic morbidity, as well as providing personalized nutritional interventions focused on the prevention and management of diabetes, obesity, undernutrition (including sarcopenic obesity), loss of bone and muscle mass, frailty, as well as providing support for recovery from illness. The results of this research are essential for the development and application of tailored nutritional guidelines and intervention plans among the elderly IDD population.

The dietary assessment method, Photo.Rec24.IDD, which was developed and validated in this study will allow for further research to be conducted with larger samples in order to confirm and strengthen our findings and provide a better understanding of the health and nutritional status of the IDD population in Israel and around the world..

## **Keywords**

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Developmental Disabilities; Intellectual Disabilities; Dietary Records, Questionnaire Design; Nutritional Assessment; Body Mass Index; Nutritional Surveys; Nutritional Food Quality; Nutrition Index; Mediterranean Diet; Healthy Eating Index; Ultra-Processed Foods.

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