

Review Article

Clinical and cost benefits of medical nutrition therapy by registered dietitian nutritionists for management of dyslipidemia: A systematic review and meta-analysis

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Medical nutrition therapy;
Registered dietitian nutritionists;
Clinical effectiveness;
Cost savings;
Cardiometabolic risk factors;
Weight reduction;
Metabolic syndrome;
Blood pressure reduction

BACKGROUND: Faced with increasing health care costs, it is incumbent to discern whether managing dyslipidemia with medical nutrition therapy (MNT) by a registered dietitian nutritionist (RDN) is clinically and cost effective.

OBJECTIVE: To systematically examine evidence on the clinical effectiveness and cost benefit of MNT by an RDN for the treatment of dyslipidemia.

METHODS: English and full-text research articles published between January 2003 and October 2014 were identified using PubMed, MEDLINE, and the Worldcat.org site to identify literature specific to clinical and cost effectiveness of MNT for dyslipidemia. Studies were required to have at least one outcome measure of dyslipidemia: total cholesterol (Total C), low-density lipoprotein cholesterol, triglycerides, high-density lipoprotein cholesterol, and/or metabolic syndrome.

RESULTS: This systematic review identified 34 primary studies with 5704 subjects. Multiple individual face-to-face MNT sessions by an RDN over 3 to 21 months led to significant improvements in lipid profile, body mass index, glycemic status, and blood pressure. Results were summarized as mean differences with 95% confidence intervals when meta-analysis was possible. In a pooled analysis, MNT interventions lowered low-density lipoprotein cholesterol, total C, triglycerides, fasting blood glucose, hemoglobin A1c, and body mass index compared to a control group. Cost effectiveness and economic savings of MNT for dyslipidemia showed improved quality-adjusted life years and cost savings from reduced medication use.

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CONCLUSION: Evidence from this systematic review and meta-analysis demonstrates that multiple MNT sessions by an RDN are clinically effective and cost beneficial in patients with dyslipidemia and cardiometabolic risk factors.

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Introduction

The National Lipid Association published strong evidence-based recommendations supporting patient referral to a registered dietitian nutritionist (RDN) for medical nutrition therapy (MNT) for the management of dyslipidemia.^{1,2} Furthermore, several national guidelines, including the American Heart Association, the American College of Cardiology, the Obesity Society and the American Diabetes Association, also recommend referral of patients to an RDN for MNT for cardiometabolic risk factors, including dyslipidemia, hypertension (HTN), overweight/obesity, metabolic syndrome (MetS), prediabetes and diabetes (T2D).¹⁻⁵ However, universal access to MNT by an RDN is limited by existing health care coverage policies, including Medicare and Medicaid.

Faced with increasing costs of health care, it is incumbent on U.S. policy makers and third-party payers to discern whether managing dyslipidemia with MNT by an RDN is clinically effective and provides a cost benefit.

The four components of the MNT process by an RDN include (1) nutrition assessment, (2) nutrition diagnosis, (3) nutrition intervention, and (4) nutrition monitoring and evaluation. An in-depth nutrition assessment allows the RDN to develop a personalized cardioprotective dietary pattern for dyslipidemia that integrates patient's lifestyle, culture, and the presence of other cardiovascular risk factors (prediabetes, impaired fasting glucose, HTN, T2D, overweight, obesity, and MetS).⁶⁻⁹

Methods

This systematic review was conducted using the Academy of Nutrition and Dietetics (The Academy) Evidence Analysis Process.¹⁰ The Academy's Evidence-Based Practice Committee appointed an expert workgroup to conduct a rigorous systematic review of the evidence. The expert workgroup and evidence analysis team consisted of an Academy project manager, a lead analyst, six workgroup members with expertise in outcomes research, and six evidence analysts. The expert workgroup met monthly by teleconference to discuss potential PICO (population, intervention, comparison, and outcome) questions, search strategy, and each step of the Academy's Evidence Analysis Process from May 2013 until completion in May 2015.¹⁰

Questions

The workgroup defined two PICO questions:

- 1) In outpatient adults, what is the effectiveness of MNT provided by an RDN to improve disorders of lipid metabolism outcomes?
- 2) In outpatient adults, what is the cost benefit of MNT provided by an RDN to improve disorders of lipid metabolism outcomes?

Study selection

An intensive electronic search was conducted using PubMed and MEDLINE databases, along with the Worldcat.org site to identify literature specific to cost savings/benefit and MNT effectiveness. The analysis team created the search strategy with search MeSH terms identified as: MNT, nutrition therapy (nutrition counseling or intervention or monitoring), dietitian (including registered and the European spelling variation of) or nutritionist, lipid or dyslipidemia terms (lipids, high-density lipoprotein cholesterol [HDL-C] or low-density lipoprotein cholesterol [LDL-C], triglyceride, high blood cholesterol, hypercholesterolemia, hyperlipidemia, dyslipidemia, fatty liver, nonalcoholic fatty liver diseases [NAFLD], nonalcoholic steatohepatitis, lipid disorders, lipid metabolism, and lipid management), as well as cost benefit and cost savings. The list of titles and abstracts were independently reviewed and discussed at the expert workgroup meetings. Titles and abstracts were selected based upon a preplanned set of inclusion criteria. The inclusion criteria included English language; adults over 18 years of age; MNT provided by an RDN in an outpatient or ambulatory care setting; studies published between January 2003 and October 2014; 10 or more subjects per study group; and 65% completion rate. The completion rate at 65% was accepted due to an elevated attrition rate between 19% and 65% found in the ambulatory, outpatient setting.¹¹⁻¹⁷ Studies were required to have at least one outcome measure of dyslipidemia: total cholesterol (total-C), HDL-C, LDL-C, triglycerides (TG), and MetS. For the MNT effectiveness PICO question, randomized controlled trials (RCTs), cohort studies, nonrandomized clinical studies, observational/noncontrolled trials, retrospective, cross-sectional, and time series studies were included. See [Figure 1](#) for the flow chart. For the MNT cost benefit/savings analysis, any study design was considered acceptable due to the paucity of research identified during the literature search, which was expanded to January 1995.

Data extraction and quality assessment

Using a standardized online data extraction tool,¹⁰ key data were extracted from each included study: study design,

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