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Telenutrition for the management of inflammatory bowel disease: Benefits, limits, and future perspectives

Güney Coşkun M *et al*. Telenutrition for IBD

Abstract

Patients with inflammatory bowel disease (IBD) require lifelong and personalized care by a multidisciplinary health care team. However, the traditional medical model is not ideal for patients who require continuous close monitoring and whose symptoms may dramatically worsen between regularly scheduled visits. Additionally, close dietary follow-up and monitoring of IBD in a traditional setting are challenging because of the disease complexity, high pressure on outpatient clinics with a small number of IBD specialist dietitians, and rising incidence. Given the significant burden of IBD, there is a need to develop effective dietary management strategies. The coronavirus disease 2019 pandemic caused an unprecedented shift from in-person care to delivering healthcare *via* technological remote devices. Traditional nutrition therapy and consultation can be provided by telenutrition through remote electronic communication applications which could greatly benefit patient care. Telenutrition might be useful, safe, and cost-effective compared with standard care. It is likely that virtual care for chronic diseases including IBD will continue in some form into the future. This review article summarizes the evidence about telenutrition applications in the management of IBD patients, and we aim to give an overview of the acceptance and impact of these interventions on health outcomes.

Key Words: Telenutrition; Telemedicine; Digital health; Inflammatory bowel disease; Symptom monitoring; Self-management

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Core Tip: Routine nutritional assessment, education, and close communication about diet are essential for professionally recommended diet and they are a potential therapeutic strategy for inflammatory bowel disease (IBD) onset and severity.

Traditional nutrition therapy and consultation can be provided by telenutrition through remote electronic communication applications, which could greatly benefit patient care. Telenutrition is a self-management tool offering cost-effective, quick, and accessible personalized dietary advice for IBD patients that require lifelong follow-up and maintenance treatment. However, there are certain barriers to legacies, education, sufficient equipment, and privacy. Further studies and interventions should focus on removing barriers while improving benefits.

INTRODUCTION

Traditional inflammatory bowel disease care

Inflammatory Bowel Disease (IBD) is a relapsing IBD manifested by focal asymmetric, transmural, and granulomatous inflammation, which includes ulcerative colitis (UC) and Crohn's disease (CD)[1]. Ethnic origin, genetics, gut microbiome, environmental factors, immune response, and lifestyle are the main factors in the epidemiology of this disease[2]. Incidence and prevalence of IBD have been increasing from 0.5% in 2010 to 0.75% in 2020 and it is expected to rise to > 1% of the population by 2030[3]. This will be resulting in high demand for healthcare worldwide[4,5]. IBD is characterized by active disease (flares), remission periods, and symptoms that may dramatically worsen between regularly scheduled visits. Inadequate clinical management might be resulted in irreversible intestinal fibrosis and even cancer[6-8].

Diet is considered a potential therapeutic strategy for IBD onset and severity. IBD specified nutrition care could have an anti-inflammatory effect, regulate the immune system, support the mucous layer, contribute to microbial healing, and other mechanisms. International Organization for the Study of IBD s revealed dietary guidance based on the best current evidence to provide expert opinions[9]. Dietary recommendations are included regular intake of fruits and vegetables (in remission) and reduce saturated, trans, and dairy fat intake for CD patients. The dietary practice focuses on increasing the consumption of natural sources of omega-3 fatty acids while decreasing the consumption of saturated, trans, dairy fat, and red and processed meat

for UC patients[9]. Although several dietary patterns (such as the Mediterranean diet, Specific Carbohydrate Diet, and CD Exclusion Diet) are commonly recommended for patients with IBD, a personalized approach and close monitoring are the key to successful nutritional support[10-12]. Additionally, diet recommendations and characteristics of the diet may differ depending on whether the patients' disease is acute or in remission, the medication type, perianal abscess fistula if stricture development is present, and pre-and post-op status[9,13].

On the other hand, malnutrition and body mass index of people with obesity are predictive factors for IBD[2]. In order to determine unintentional weight loss, rapid weight gain, and nutritional deficiencies, nutrition consultation should be provided and aimed to early-stage dietetic support[14]. Furthermore, close dietary follow-up and monitoring of IBD in a traditional setting are challenging due to the disease complexity, the limited number of IBD specialist dietitians in outpatient clinics, and rising disease incidence. The British Society of Gastroenterology consensus guidelines suggests that 0.5 whole-time equivalent dietitians should be allocated to gastroenterology per population of 250000[15]. Along with that, IBD patients require continuous, close, and personalized monitoring to minimize short and long-term undesirable outcomes. However, the traditional medical model for IBD care may not be ideal for patients who require lifelong and personalized care by a multidisciplinary health care team (gastroenterologists, surgeons, nurse practitioners, psychologists, and dietitians).

The traditional medical model for IBD offers a routine follow-up visit depending on disease history, phenotype, activity, and current treatment, including regular disease monitoring tests (clinical, biochemical, stool, endoscopic, cross-sectional imaging, and histological investigations)[2]. The clinical follow-up timeline given by the ECCO-ESGAR Guideline recommended that in patients with IBD who have reached clinical and biochemical remission, monitoring ensures early recognition of the disease flare[2]. The interval of monitoring should be between 3 to 6 mo depending upon the duration of remission and current therapy. Moreover, endoscopic surveillance changes from one to five years depending on risk factors[2]. Therefore, this study aimed to review the

literature on the benefits and limits of telenutrition in IBD nutrition care and provide future perspectives to improve telenutrition applications.

Transition to telemedicine and telenutrition in IBD

In broad terms, telemedicine can be defined as the transfer of health resources and health care in distance conditions. The telemedicine term embodies many concepts that cover telemonitoring, tele-education, teleconsultation, and telecare as well as m-health[16]. According to a definition provided by The American Telemedicine Association, it also aims to improve a patient's clinical health status[17]. The transformation of IBD cares is rapidly rising after coronavirus disease 2019 (COVID-19) through novel approaches to telemedicine with targeting convenient access and well-tolerated IBD care. ECCO Position Statement on IBD management during the COVID-19 outbreak recommended implementing telemedicine, monitoring at distance, reporting outcomes online, promoting local labs with e-mail reports, implementing point-of-care biomarkers, calprotectin measurement at home, measurement of drug levels (therapeutic drug monitoring) with rapid tests[2]. On the other hand, most of the IBD patients experienced psychological distress and were inadequately informed about the management of their chronic condition during COVID-19[18,19]. A vital issue is considering the psychological well-being of the patients, detecting vulnerable groups *via* various questionnaires, and preventing stigmatization during the consultation[20-22]. Therefore, switching to telemedicine as an alternative first-choice follow-up tool supporting therapeutic adherence is highly recommended after the pandemic.

Given the significant burden of IBD, there is a need to develop effective dietary management strategies. Traditional nutrition therapy and consultation can be provided by telenutrition through remote electronic communication applications which could greatly benefit patient care. Telenutrition is one of the major components of telemedicine and the Academy of Nutrition and Dietetics characterized it as virtual dietary consultations including telecommunications technologies to apply the Nutrition Care Process[23]. In recent years, there has been an increasing interest in telenutrition

applications for the long-term monitoring and nutrition management of chronic diseases[24]. A growing body of literature follows this statement: Telenutrition is becoming a suggested strategy to overcome barriers and increase access to nutrition care[25]. Consequently, the transition to telenutrition practices in IBD can be promising to overcome the barriers and challenges that arise in the nutrition care of the disease.

Techniques and applications of telenutrition in IBD

Telemedicine is most frequently transmitted through the internet *via* high-quality web portals, online courses, smartphone applications, or telephone[26]. Telenutrition modules could implement in those applications to make them complete for IBD patients' care. Dietitians who specialized in IBD could also be involved in applying and operating most telemedicine interventions and projects. Routine nutritional assessment, education, and close communication about diet are essential for professionally recommended diet and dietary restrictions to control symptoms, and long-term monitoring of behaviors that may trigger symptoms[27]. Additionally, various factors and nutritional factors can affect patients' health and quality of life[28]. Therefore, telenutrition as a communication method could be considered to meet individual patients' requests. A comprehensive medical history of IBD patients should be recorded at the first consultation. Assessment tools are also useful for ensuring a consistent approach and can be used by dietitians in first and continuous telenutrition visits. Validated tools such as Objective measures such as the IBD Questionnaire[29] which is considered the gold standard for use in clinical trials, food-related quality of life[30], Subjective Global Assessment, the Malnutrition Universal Screening Tool, Malnutrition Inflammation Risk Tool, Saskatchewan IBD Nutrition Risk Tool and Nutrition Risk Screening 2002[31] could be appropriate and useful in certain situations. Monitoring and identifying psychological dimensions which could affect the clinical course of the disease with various approaches would be useful in determining the psychological effects of nutrition[32]. Additionally, micronutrient deficiencies should assess in the beginning and reassess as needed. Deficits can occur even in apparently well-nourished

patients or in patients without laboratory results[33]. Patients on elimination diets, who present with symptoms of deficiency, or who meet < 75% of estimated energy requirements for > 1 mo should monitor closely. Last but not least nutritional education must be included in telenutrition consultations. Figure 1 summarized the telenutrition in IBD care with medical and dietary considerations, which can be implemented in the first consultation and long-term monitoring of IBD patients.

Benefits and limits of telenutrition in IBD care

The benefits of telemedicine can be listed under several headings: Access and monitoring, cost-effectiveness, information sharing, and communication between health professionals and patients[34]. An umbrella review that investigated the clinical effectiveness of telemedicine revealed that it can positively affect diet and lifestyle-related factors such as improvement in glycemic control in diabetic patients; helping patients increase physical activity; and improving diet quality and nutrition[35]. Telemedicine technology enhances the accessibility of medical data and healthcare professionals' monitoring patients[34]. Accessibility to telehealth applications including telenutrition has grown rapidly during the COVID-19 pandemic time due to contact limitations[36]. The results from a survey study conducted in Italy demonstrated that after the COVID-19 pandemic, the accessibility of telenutrition has extended from 16% to 63%[37]. Australia's study on telehealth dietetics services reimbursed showed that telehealth items for dietitians have been increased by 17.7% and 5% of total dietetics services provided by telemedicine[38].

Moreover, financial burdens and difficulties can be considered key barriers for patients with IBD to the ability to obtain healthcare services[39]. Existing research recognizes the financial contribution of telehealth considering the importance of cost-effectiveness and cost-saving in the health care system. Collective data supported the economic benefits of m-health usage compared to traditional applications[40]. These results seem to be consistent with other research which found videoconferencing can be cost-saving and high-effective for patients with IBD[41]. It is important to bear in mind

that the majority of studies investigate telehealth rather than telenutrition. Although the results obtained from telehealth studies can be reflected in telenutrition, it should be noted that diet-related factors may affect the outcomes. The improvement in telehealth technologies is unlikely to cause significant increases in cost or access and will assist the population to support a healthier diet to fight against chronic disease outcomes. Telemedicine particularly for IBD patients used for treatment management, education, patients' self-reported disease activity, and outcomes[42]. A recent review reported mixed results when comparing face-to-face visits with telemedicine visits[42]. Most IBD-related apps allow patients to record symptoms, bowel habits, and dietary history to log meals, nutrition, medications, and mood[43-45]. Telemedicine systems become prominent in being safe, feasible, cost-effective, meeting patients' needs, and overcoming distance barriers between patients and healthcare facilities[44]. Several telemedicine systems for IBD patients which provide nutritional support are listed in Table 1.

In spite of all mentioned above benefits of telemedicine, there are certain limitations that are necessary to elaborate on and consider. The most important limitations appear that legal and ethical issues include privacy protection, difficulties with equipment setting, educating patients and health professionals in the usage of telenutrition, patient-centered barriers, and financial sources spent on system adjustments[51,52]. Telemedicine systems may not be appropriate for patients who do not have well-established treatment plans. Furthermore, patients may not be familiar with the technological applications or have to invest time extensively to become familiar. Also, it must be underlined that studies were mainly conducted in developed countries, there might be differences in terms of equipment quality and internet availability in some countries[40]. Telemedicine settings in low and low-middle-income countries may limit by financial elements and interference with the cost-effectivenes[40]. Besides the financial barrier, careful consideration must be given to patient privacy and data protection. There is a need for further improvement, from both clinical dietetic practice and patient perspective. Even though the results of limited study samples cannot be generalized, evidence shows that telenutrition has significant results on patients' education,

treatment adherence, medication management, quality of life, and care has no negative impact on those parameters[42].

Besides limitations related to telemedicine, nutrition-specific barriers must be recognized in overcoming possible obstacles. Considering that anthropometric measurements are essential components of nutritional assessments, self-reported weight and height bias must be addressed as a limitation of telenutrition[40].

CONCLUSION

Digital health interventions and self-monitoring offer quick, cost-effective, personalized, accessible medical care and nutritional advice[53]. Especially when considering the rising number of IBD patients and an insufficient number of specialists telemedicine could reduce the burden on the healthcare system by providing digital sources. Patients with less aggressive disease severity or in remission can likewise be followed up *via* telenutrition applications supported by a dietitian. However, studies showed some barriers, and not yet proven if telemedicine monitoring can change the natural disease course of IBD. Future studies with larger sample sizes are needed to evaluate the telenutrition side of digital health interventions in the following areas: (1) Nutritional assessment accuracy, dietary model acceptability, telenutrition visits' effectiveness, and self-management of dietary triggers; (2) Dietary recommendations through artificial intelligence need proper validation and investigation of their clinical utility in real-life settings before recommending clinical use; (3) More ease-of-use virtual interface adaptations are needed for delivering telenutrition for dietitians and populations including the elderly or with limited digital literacy; and (4) Last but not least, standard telenutrition care procedure needs to establish and include data protection systems to ensure patients' privacy and security with IBD[54].

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