

A New Communication Model Between Clients/Patients and Dietitians: Telenutrition, Evaluation of the Perspectives of Clients/Patients and Dietitians

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ABSTRACT

Purpose: The aim of this cross-sectional study was to determine the status, advantages, and disadvantages of telenutrition from the perspectives of clients/patients and dietitians.

Methods: A total of 100 clients/patients and 100 dietitians were assigned to this cross-sectional study. To assess the status as well as the advantages and disadvantages of telenutrition, a set of inquiries, based on the literature review, were posed to both clients/patients and dietitians.

Results: Both dietitians (%92) and clients/patients (%61) were found to use telenutrition mainly for weight loss diets. It was found that clients/patients who had time constraints due to their busy lifestyle (63%) and whose dietitian was in another city (36%) preferred telenutrition more frequently. Clients/patients (51%) were more concerned than dietitians (32%) that anthropometric measurements were not taken by the expert ($p<0.05$). 44% of clients/patients stated that they frequently change their appointments due to the time-flexible system.

Conclusion: Telenutrition has become a necessity today due to the time constraints that many people complain about due to their busy lifestyles, difficulties in traveling to and from hospital/clinic, especially in the elderly age group, pandemics, or natural disasters. In this direction, the steps to be taken to improve telenutrition will increase the quality of telemedicine services. When making relevant improvements, the opinions of the clients/patients group receiving this service and the dietitians providing this service should be consulted and the participation of clients/patients in the formation of health policies should be supported.

Keywords: Client, Dietitian, Patient, Telehealth, Telenutrition

ÖZET

Amaç: Bu kesitsel çalışmanın amacı, danışan/hastaların ve diyetisyenlerin bakış açıları doğrultusunda telenütrisyon hizmetinin mevcut durumunu, avantaj ve dezavantajlarını belirlemektir.

Yöntem: Bu kesitsel çalışmaya toplam 100 danışan/hasta ve 100 diyetisyen dahil edilmiştir. Telenütrisyon hizmetinin mevcut durumunu, avantaj ve dezavantajlarını değerlendirmek için danışan/hastalara ve diyetisyenlere literatür taramasına dayanan bir dizi soru yöneltilmiştir.

Bulgular: Hem diyetisyenlerin (%92) hem de danışan/hastaların (%61) telenütrisyonu daha çok ağırlık kaybı diyetleri için kullandığı tespit edilmiştir. Yoğun yaşam tarzları nedeniyle zamanı kısıtlı olan (%63) ve diyetisyeni başka bir şehirde olan (%36) danışan/hastaların telenütrisyonu daha sık tercih ettiği saptanmıştır. Antropometrik ölçümlerinin uzman tarafından alınmamasından danışan/hastalar (%51), diyetisyenlere (%32) kıyasla daha fazla endişe duymaktadır ($p<0.05$). Danışan/hastaların %44'ü esnek zaman sistemi nedeniyle randevularını sık sık değiştirdiklerini belirtmiştir.

Sonuç: Telenütrisyon; birçok insanın yoğun yaşam tarzı nedeniyle şikayetçi olduğu zaman kısıtlılığı, özellikle yaşlı yaş grubunda hastaneye/kliniğe gidiş gelişte yaşanan zorluklar, salgın hastalıklar ve/veya doğal afetler nedeniyle günümüzde bir gereklilik haline gelmiştir. Bu doğrultuda telenütrisyonun iyileştirilmesi için atılacak adımlar telesağlık hizmetlerinin de kalitesini artıracaktır. İlgili iyileştirmeler yapılırken bu hizmeti alan danışan/hasta grubunun ve veren diyetisyenlerin görüşlerine başvurulmalı, sağlık politikalarının oluşturulmasında danışan/hastaların katılımı desteklenmelidir.

Anahtar Kelimeler: Danışan, Diyetisyen, Hasta, Telesağlık, Telenütrisyon

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Today, 67.1% of the 8.12 billion population uses telecommunication services (1). It is known that 5.34 billion of these service users actively use mobile phones, 5.03 billion use the internet, and 4.70 billion use social media (1). Compared to the previous year, mobile phone usage increased by 1.8%, internet usage by 3.7%, and social media usage by 5.1% (1). When evaluated on a regular basis, it is noticeable that these rates are constantly increasing. Developing technology and communication tools facilitate information sharing in many fields today (2). This technology is also frequently used to bring healthcare professionals and patients together (2). In 2020, the social isolation caused by the Coronavirus disease-19 (COVID-19) pandemic and the difficulties in accessing health services caused applications such as telehealth, telemedicine, and telenutrition to come to the fore and related applications have started to come to the fore in many fields (2,3).

Telehealth is the sharing of health data, care information, and education among healthcare personnel and patients, students, and/or other healthcare personnel via telecommunications using telephone, computer, interactive television, or a combination of these means (4). Telenutrition is defined as the interactive use of electronic information and telecommunication technologies by a specialized dietitian to deliver nutritional care to clients/patients in a remote location (5). In this process, with telecommunication applications determined by the dietitian, all steps of medical nutrition therapy, such as taking anamnesis of the clients/patients, evaluation of anthropometric, laboratory, and physical findings, determination of nutritional behaviors with food consumption records and frequency, planning, and follow-up of medical nutrition therapy, can be managed (6). Thus, even if the patient and dietitian cannot come together in a physical environment, they can meet online and carry out treatment processes (6).

As in every process, telenutrition has some disadvantages (limited ability to use online platforms, lack of face-to-face communication, etc.) and advantages (time-place flexibility, no travel costs to reach the hospital or clinic, etc.) (7). In addition, as it is a process that is just beginning to mature, there are points that need to be explored and clarified. In this direction, one of the steps to be taken to improve telenutrition is to consult the opinions of people who receive and use this service, list advantages, and disadvantages, and exchange ideas on how measures can be taken for disadvantages.

In the literature review, it was observed that studies on telenutrition were mostly conducted on patients with inflammatory bowel syndrome (5, 8, 9) and studies were conducted to determine the rate of telenutrition during the pandemic period (7, 10). The motivational force in the planning of the study was the unavailability of a study that evaluates tele-nutrition practices in line with the communication model, interprets them from the perspective of the dietitian and the client/patient, and includes plans for the future in the literature review.

The aim of the study is to determine the current status of telenutrition, which is a newly maturing concept, in terms of clients/patients and dietitians, to identify its advantages and disadvantages, and to make predictions about what can be done in the future to improve telenutrition in order to improve communication in health services.

Material and Methods

Study design: This cross-sectional study's sample size was calculated using G*Power version 3.1.9.2 (11). The chi-square test was used to compare the perspectives of both clients/patients and dietitians regarding telenutrition. The sample size was determined based on hypothesized values of $\alpha=0.05$ and $\beta=0.95$, considering a medium effect size. The sample size, which was calculated as 191 in total, was revised to 200 considering the possibility of faulty questionnaires, and it was aimed to reach an equal number of participants: 100 dietitians and 100 clients/patients. Data was collected in September 2023 on 100 dietitians providing telenutrition and 100 clients/patients receiving telenutrition via an online questionnaire (Google Forms). The dietitians providing telenutrition services for at least one year and clients/patients receiving telenutrition services for at least one year were included in the study.

Data collection tools: According to the literature review (5, 7-10, 12), 28 questions including open-ended questions and multi-optional questions about the advantages and disadvantages of telenutrition were prepared. This questionnaire form was designed to determine the current views of both dietitians and clients/patients, and all questions were asked of both dietitians and clients/patients. The data were collected in September 2023 using an online questionnaire via Google Forms. Dietitians in Türkiye and clients/patients receiving telenutrition services were contacted for data collection through the Turkish Dietetic Association.

Statistical analysis: The data were analyzed using the IBM SPSS Statistics 22.0 statistical package program (Statistical Package for the Social Sciences, SPSS Inc., Chicago, USA). The normality of the data was assessed using the Shapiro-Wilk normality test. The data were expressed as number (n), percentage (%), mean ($\bar{x}$), and standard error ($\pm$ SE). The variables of two independent parametric groups were compared by t-test. Chi-square analysis was used to compare categorical variables. Values were considered significant at $p < 0.05$ at a 95% confidence interval (13).

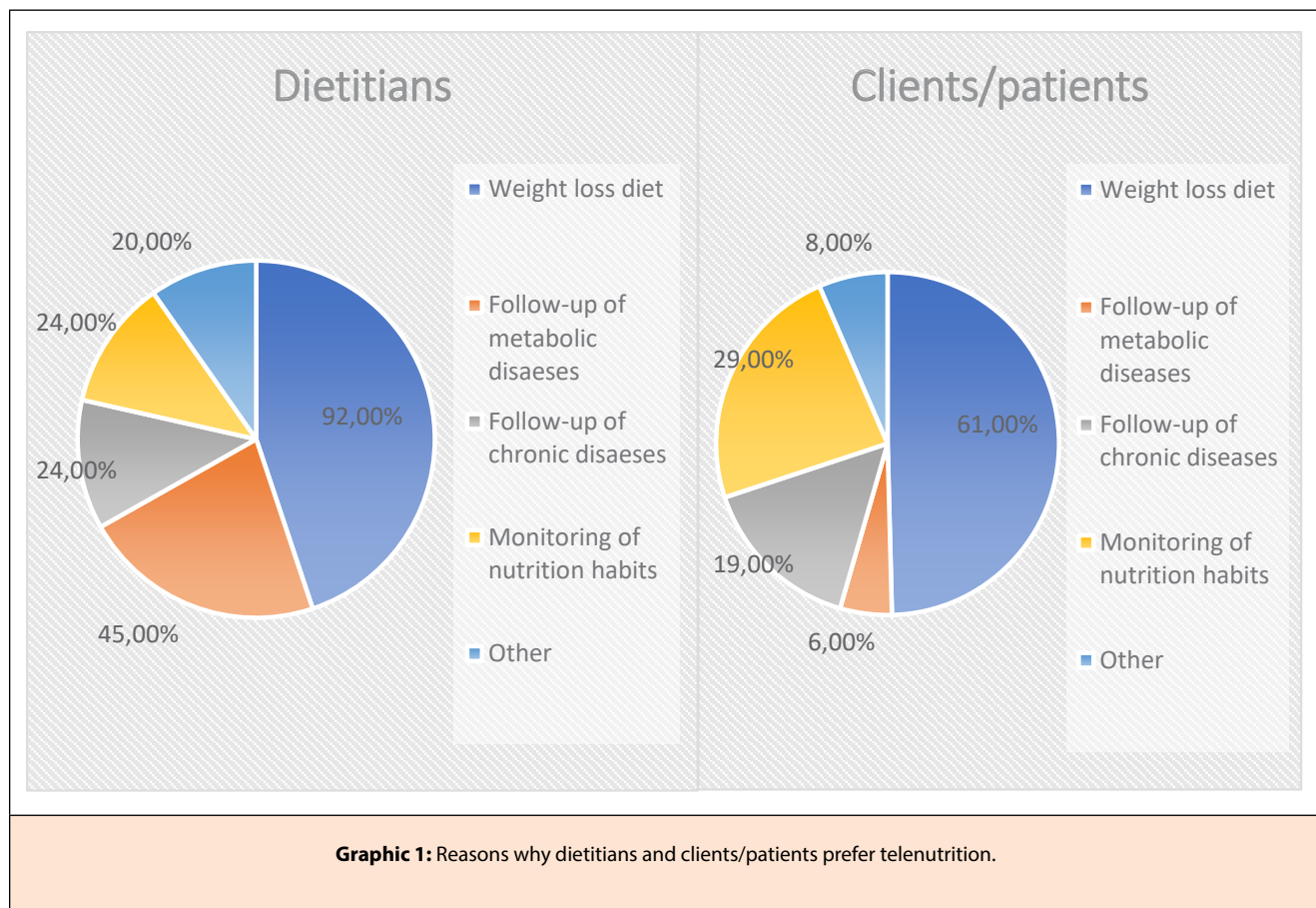
Finally, The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines were used to report this study in detail (14).

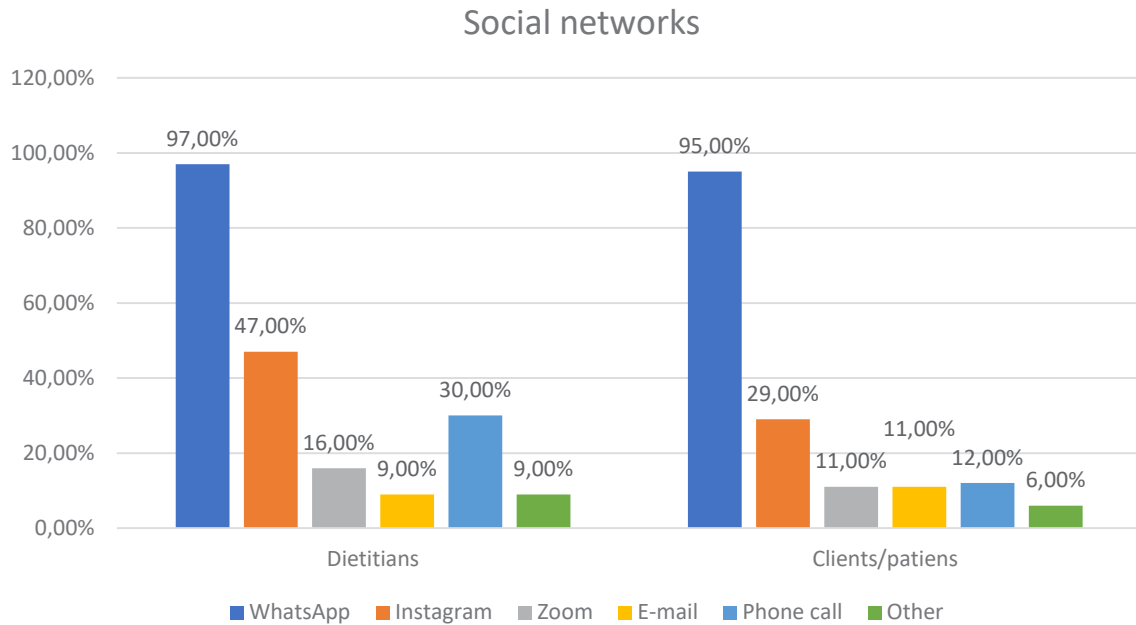
Results

This study was conducted with 100 dietitians and 100 clients/patients who voluntarily agreed to participate

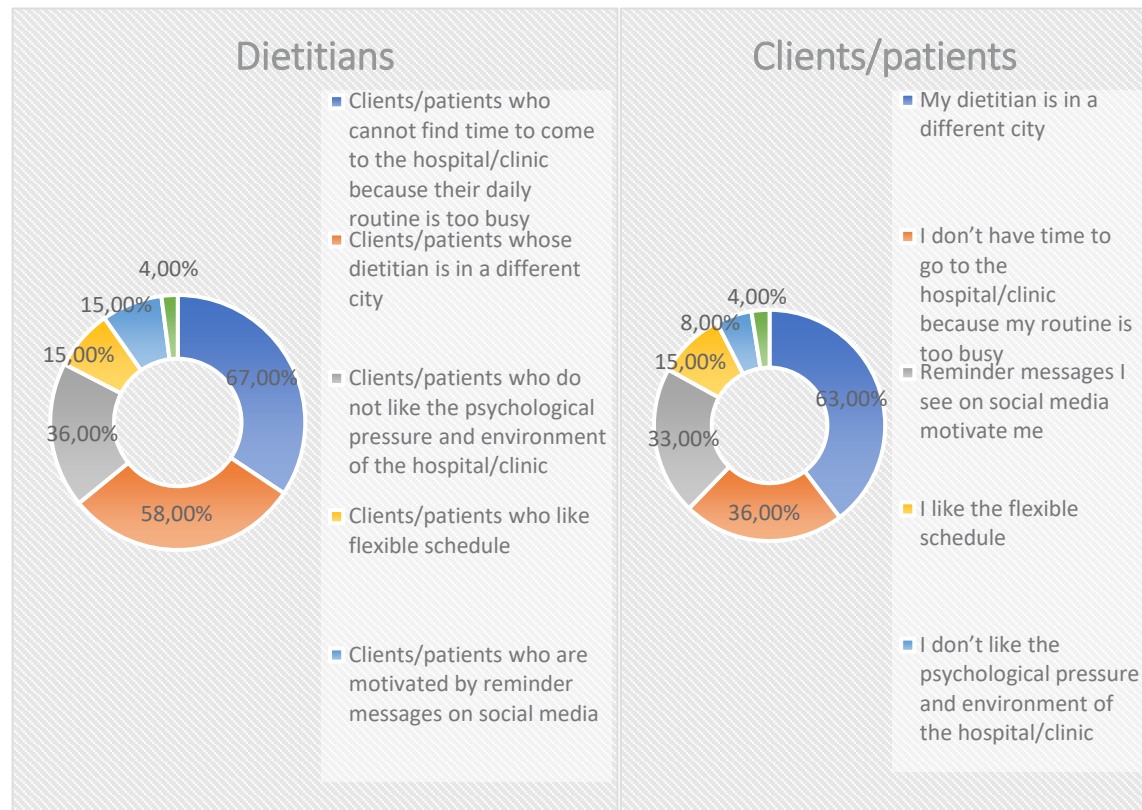
in the study. 86.0% (n=86) of the dietitians were female and 14.0% (n=14) were male; 79.0% (n=79) of the clients/patients were female and 21.0% (n=21) were male. The mean age of the dietitians was 28.35 ± 6.56 years and that of the clients/patients was 32.26 ± 6.70 years. 25.0% (n=25) of the dietitians were married and 75.0% (n=75) were single; 71.0% (n=71) of the clients/patients were married and 29.0% (n=29) were single.

Graphic 1 presents reasons why dietitians and clients/patients prefer telenutrition. Either dietitians or clients/patients were found to use telenutrition mostly in weight loss diets. Furthermore, it is observed that dietitians mostly use telenutrition for the follow-up of metabolic diseases, while clients/patients prefer telenutrition for the monitoring of nutrition habits. It was found that 20% of dietitians and 8% of clients/patients used telenutrition for other reasons.





Graphic 2: The preferred social networks for telenutrition by dietitians and clients/patients.



Graphic 3: Reasons for preferring telenutrition from the perspective of the dietitians and the clients/patients.

The preferred social networks for telenutrition by dietitians and clients/patients are shown in **Graphic 2**. The first social media platform preferred by both dietitians (97.0%) and patients (95.0%) is WhatsApp. This is followed by Instagram with 47.0% for dietitians and 29.0% for clients/patients. Telephone calls came in third, with dietitians (30.0%) and clients/patients (12.0%) sharing the same opinion.

When dietitians and clients/patients were asked how many minutes or hours a consultation period should be on average within the scope of telenutrition service, dietitians answered 35.00 ± 10.00 minutes, and clients/patients answered 40.00 ± 5.00 minutes. No significant

difference was found between the opinions ($p > 0.05$, *independent two-sample t-test).

Graphic 3 shows that, reasons for preferring telenutrition from the perspective of the dietitians and the clients/patients. According to dietitians, clients/patients who cannot find time to come to the hospital/clinic due to busy daily routine prefer telenutrition more (67.0%). From the perspective of clients and patients, the preference for telenutrition is primarily due to their dietitians being in a different city (63.0%). The first two reasons are common to both perspectives: busy daily routines and the geographical separation of clients/patients and dietitians.

Table 1. Dietitians' and clients/patients' responses to the survey questions

Questions	Dietitian		Clients/patients		p*
	Yes	No	Yes	No	
	n	n	n	n	
The fact that we are mutually accessible at any time increases the success of telenutrition.	80	20	86	14	0.331
It is a positive opportunity for both sides to see the environment where the client/patient eats, the refrigerator, etc. by the dietitian.	59	41	69	31	0.141
Not waiting in too long queues at the hospital/clinic for the interviews makes it possible to keep appointments more faithfully.	67	33	73	27	0.355
One of the motivating aspects of telenutrition is that it doesn't involve traveling to the hospital/clinic, searching for a parking space, or travel costs.	87	13	94	6	0.091
One of the important advantages of telenutrition is that mutual communication can continue even in situations such as epidemics and earthquakes.	83	17	91	9	0.093
Failure to have anthropometric measurements taken by an expert affects the reliability of the results.	32	68	51	49	0.006
I think the process will be more successful when we meet face to face (client/patient-dietitian).	56	44	59	41	0.668
The presence of distractions in the interview environment during the interview (noise at home, etc.) reduces the quality of the interviews.	26	74	25	75	0.871
Not being able to get an opinion from other health personnel (physician, physiotherapist, psychologist, etc.) about the medical nutrition process causes the telenutrition service to be incomplete.	31	69	33	67	0.762
The technological/technical problems I experience with the telenutrition platform I use cause breaks in appointments and interviews.	13	87	16	84	0.547
Since I don't have sufficient knowledge and experience in social networks, I sometimes question the quality of the telenutrition service.	4	96	19	81	<0.001
Since it is a time-flexible system, there are frequent appointment changes.	17	83	44	56	<0.001
I have knowledge about the social insurance processes (repayment, etc.) of the telenutrition system.	40	60	53	47	0.065
I know the legal aspects of the telenutrition system (personal data protection law, taxation).	67	33	64	36	0.655
The ethical limits of telenutrition are clearly defined by law.	34	66	53	47	0.007
Although I like to provide/receive services in the hospital/clinic environment, the current conditions lead me to telenutrition.	58	42	66	34	0.244
* A Chi-square test was administered. Since the number of participants was 100 for both dieticians and clients/patients, n and % are equal.					

Discussion

This study was conducted to learn the perceptions of dietitians who actively provided tele-nutrition and clients/patients who received tele-nutrition during the study period, to determine the current situation and to comment on what can be done in the future to develop tele-nutrition to improve communication in health services. In terms of the age range and gender of the participants in the study, it was observed that tele-feeding was more preferred by younger people and women. The study conducted by Pierce and Stevermer (15) found that women, people aged 45-65 years and people over 65 years preferred telemedicine services during the pandemic. Since Turkey is an economically developing country and middle-aged and older people are culturally distant from technology, we may have obtained a different result from Pierce and Stevermer (15). According to 2022 data from the Turkish Statistical Institute (16), it is observed that the age group of 65-74 has the lowest rate of internet usage at 36.6%. This rate is 64.2% in the 55-64 age group and 83.6% in the 45-54 age group. The main benefits of telenutrition are that clients/patients do not have to travel for consultations, struggle with parking, or endure waiting rooms. This allows them to access services from the comfort of their own homes, which is particularly important for elderly patients (12). The older age group may find it difficult to get to the hospital/clinic due to various comorbidities and may be confined to bed. Therefore, tele-nutrition in this age group should be promoted and at least basic information should be made available on social networks often used by governments or hospital administrations. In this way, it can be ensured that elderly customers/patients will receive a more appropriate service in the context of home health care.

When analyzing the data on telenutrition, it is clear that weight loss diets are at the top of the list for both dietitians and clients/patients. With the global obesity epidemic, dietitians in many countries are primarily focused on developing weight-loss diets and monitoring dietary habits (17). In this study, telenutrition was most commonly used for weight loss diet. So, this was an expected finding. The second area where dietitians frequently provide telenutrition is the follow-up of metabolic diseases. Congenital metabolic diseases (etc. phenylketonuria, glycogen storage disease) are common in Turkey due to frequent consanguineous marriages (18). Lifelong medical nutrition therapy should be strictly maintained in metabolic diseases (19). In this population

with rare diseases, many comorbidities, especially mental problems, are encountered if medical nutrition therapy is not adhered to (19).

In addition, since the number of dietitians working on congenital metabolic disease is limited, it may be difficult for patients who are not in the center to access a dietitian (19). Proper utilization of telenutrition will have positive results, especially for this patient group. Recent studies conducted with patients with phenylketonuria during the pandemic have found that the management of the disease (such as decreasing the frequency of drain diets and keeping phenylalanine values within the target range) is easier with the use of telenutrition (20, 21). Maintaining communication even in situations such as pandemics and natural disasters where the stress level increases significantly is another important step in ensuring the metabolic stabilization of patients. It is predicted that the widespread use of telenutrition in the follow-up of metabolic diseases will have positive results for patients.

When the reasons for preferring telenutrition were evaluated, it was found that clients/patients who could not find time to go to the hospital/clinic due to their busy daily routine and individuals whose dietitian was in a different city preferred telenutrition more frequently. Indeed, these processes constitute the most prominent positive aspects of telehealth services (22). Nowadays, many people's daily routines and work lives are very busy, causing them to live with time limitations and neglect themselves and their health. The fact that the dietitian from whom the person wants to receive medical nutrition therapy is in a different city also brings time and cost problems. Telenutrition is very useful in this respect. Thanks to telenutrition, even people living in different countries can communicate easily. In today's world where time limitations and economic problems are increasing day by day, it is predicted that promoting telenutrition will have beneficial results in this sense.

When analyzing the responses of the dietitians and the clients/patients to the survey questions, it was found that the opinions of both sides were similar on many questions ($p>0.05$, there was no difference between the groups, Table 1). In terms of anthropometric measurements, clients/patients were more worried than dietitians about not being measured by the expert. This situation was confirmed by the answers of the clients/patients to the open-ended question "What are your suggestions to improve telenutrition" as "I am not sure when I take my

measurements myself, I want to meet face to face on my measurement days, etc.". Anthropometric measurements are parameters that are one of the important indicators of the medical nutrition therapy process and should be taken in detail by experts in accordance with the technique (23). In order to eliminate this disadvantage, detailed education can be given to the clients/patients, the education given can be recorded and the clients/patients can watch this education later, the dietitian can watch the clients/patients via video conferencing while the clients/patients are measuring, or face-to-face meetings can be held on measurement days. Augmented virtual reality applications can be developed for this process, and anthropometric measurements can be taken by performing three-dimensional environmental measurements of the individual in front of the screen with the help of artificial intelligence.

Approximately 20.0% of the clients/patients reported that they sometimes questioned the quality of the telenutrition service they received because they did not have sufficient knowledge and experience in social networks. Their ability to use social media may limit care for some clients/patients, or not all clients/patients may have access to the technology required for telenutrition (12). In this direction, it may be recommended that dietitians should determine whether the candidate who wants to receive this service is the right person before starting to provide telenutrition service and, if necessary, get support from an informatics expert for their clients/patients. In addition, applications with simple interfaces can be developed and offered to the clients/patients. The use of these applications by other health professionals (doctors, physiotherapists, psychologists, etc.) will also increase the quality of the service provided.

44% of clients/ patients stated that they frequently change their appointments due to the time-flexible system. Continuity of treatment and regular follow-up of treatment in health services is a very important factor in achieving the targeted success. This situation is frequently emphasized in many studies in the literature (24-26). Medical nutrition therapy is a process that requires discipline. Clients/patients should be warned about regular follow-up appointments. It is thought that this situation will be prevented by setting rules for appointment follow-up (deterrent rules such as not being able to benefit from telenutrition for a while in case of frequent appointment changes).

Social insurance processes, legal aspects, and ethical limits are other issues that need to be clarified regarding telenutrition. Implementations such as placing the telenutrition service, whose usage rate is increasing day by day, into the reimbursement process, evaluating it within home care services for the elderly age group, and monitoring the scope and invoice codes for telenutrition visits can be realized. The evaluations to be made within the framework of regulations and legislation will help these processes to proceed faster. On 10 February 2022, "Regulation on the Delivery of Remote Health Services" was published (27). It is projected that having a sub-heading for telenutrition in the relevant regulation is one of the most important steps to be taken toward clarifying the official dimensions of telenutrition.

In future studies to be carried out in this field, participants can be classified according to the regions they live in (rural, urban) the regional utilization rate of telenutrition, and the aspects of telenutrition that need to be developed according to the regions can be determined. In this study, the fact that no comparison was made according to regions constitutes the limitation of the study.

Conclusion

Telenutrition has become a necessity today because of the time constraints experienced by many people because of their busy daily routine, the difficulties experienced in hospital/clinic arrival and hospital/clinic, especially in the elderly age group, pandemics, and natural disasters. In this direction, the steps to be taken to improve telenutrition (ensuring access to technology for all populations, increasing the knowledge and skill level of people for the use of social networks, determining the official processes of telenutrition, etc.) will increase the quality of telehealth services, communication in health care and improve public health.

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Declarations

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Conflict of interest

The authors declare that they have no conflict of interest.

Ethics approval

This study was conducted according to the guidelines laid down in the Declaration of Helsinki. Approval from the Cappadocia University Scientific Research and Publication Ethics Committee (28.08.2023/23.14) was obtained for the study.

Availability of data and material

The data sets are available in the Mendeley Data Repository.

Authors' contributions

Conceptualization: HKB, NÖ; **Methodology:** HKB, NÖ; **Formal analysis and investigation:** HKB, NÖ; **Writing - original draft preparation:** HKB; **Writing - review and editing:** HKB, NÖ; **Supervision:** NÖ.

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