

ORIGINAL ARTICLE

Digital Nutrition Consultation among Hand-Held Device Users During COVID-19 Pandemic

Manju P. George¹, Kalpana C. A.²¹Chief Dietitian, Department of Clinical Nutrition, VPS Lakeshore Hospital, Kochi, Kerala-682040, India.²Professor, Department of Food Science and Nutrition, Avinashilingam Institute of Home science and Higher Education for Women, Coimbatore, India.

ABSTRACT Nutrition and clinical dietetic services provide evidence-based support which has become essential for maintaining healthy lifestyle and avoiding malnutrition among population. National health with digital technology integration is gaining importance in the current COVID-19 pandemic scenario. Digital health technologies offer valuable means for community to create and share information about healthcare. Measurement of food intake, energy expenditure and constant interaction in the form of personalized information has been offered by digital nutrition platforms. A three-month study was conducted to assess the preferences of hand-held device users towards means of diet consultation using digital media when compared to traditional diet consultation methods, seeking options to develop Artificial Intelligence (AI) integrated cloud based digital health solution. It involved a Google survey using the digital platform, WhatsApp and Face book channels. Of the different criteria offered, diet consultation using smart phones scored the maximum (84.1%, n = 1062) which were taken as the supportive data to develop the digital diet consultation application for hand-held device users for personalized nutrition/ diet consultation support. Along with that, secondary data analysis of people choosing digital diet consultations for a period of 16 months had been observed and an increasing trend toward the same was found out. COVID-19 has brought the benefit of being able to utilize digital solutions to nutrition practice, rather than those being options for 'add on'.

Keywords: Digital technology, Digital nutrition platforms, Artificial Intelligence, Cloud based digital health solution, Hand-held device users, Personalized nutrition

Address for correspondence: Manju P. George, Chief Dietitian, Department of Clinical Nutrition, VPS Lakeshore Hospital, Kochi, Kerala-682040, India. E-mail: manju23george@gmail.com

Submitted: 11-Jan-2021

Accepted: 15-Jun-2021

Published: 26-Jul-2021

INTRODUCTION

Much attention in the popular media and the health services has been devoted to the possibilities and potential of new digital health technologies in recent years [1, 2]. Healthcare systems do not make the best use of their available resources to support this process still. According to the Pew Research Center, a median of 68% of adults in advanced economies reported owning a smart phone in 2015 [3] and 77% of smart phone owners had downloaded smart phone apps [4]. As per the report by McKinsey Global Institute in 'Digital India - Technology to Transform a Connection Nation' the country is one of the largest and fastest-growing markets for digital consumers. Data costs were falling by 95% since 2013, and thus India's internet users would raise by about 40% and similarly, the number of smart phone users to double by 2023 [5]. Alongside the digital age, the prevalence of obesity and its associated non-communicable diseases has rapidly

increased [6, 7] leading to rising social, health care, and economic costs [8].

The continuous delivery of high-quality and cost-effective nutritional care has been shown to be an increasingly difficult task. Development of a cloud-based tool could be efficiently utilized for continuing nutrition for client education intervention programs. With this in mind, consultation preferences of users of hand-held devices were assessed to understand the choice towards such an initiative. Along with the COVID-19 pandemic, utilization of digital technologies was found to be a necessity and secondary data analysis was undertaken to observe the trend towards digitalization options.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online
Website: www.ijfans.org
DOI: 10.4103/ijfans_31_21

How to cite this article: Manju P. George, Kalpana C. A. Digital Nutrition Consultation among Hand-Held Device Users During COVID-19 Pandemic. *Int J Food Nutr Sci* 2021; 10(3):18-22.

SUBJECTS AND METHODS

There were two phases for the study namely:

1. Assessment of the preference of hand held device users towards digital nutrition service options and
2. Assessment of the trend towards digital nutrition services during COVID-19 pandemic

Assessment of the Preference of Hand Held Device Users Towards Digital Nutrition Service Options

The analysis was undertaken to study the preference and choice of users of hand-held devices towards digital nutrition consultation options when compared with traditional one-to-one consultation pattern. Snowball sampling method was used to select the samples of the study, with on-line survey using validated questionnaire through Google forms (<https://forms.gle/LYAKoYDRhjEK6W7N9>) and was sent to maximum possible hand-held device users along various digital media platform (WhatsApp and Face book). The participants were Indians, both residents and non-residents. The questionnaire contained 20 questions; mostly with Yes/No category-close ended form and also included a mini assessment of their current health awareness followed by options/preferences for convenient diet consultation methods. Respondents were requested to circulate the Google survey form to maximum possible contacts so as to reach even to the distant contacts. The study period was for three months and the responses obtained were 1090. The data collected included Age, Gender, Profession, locality, knowledge on healthy diet habits and various preferences for diet consultation methods. Google survey form was made active and open for those who were willing to participate in the study.

To rank preferences across all respondents, the details received were consolidated to identify the scoring for each criterion.

Statistical analyses included Percentage, Standard deviation and Association (p-value analysis) of the data.

Inclusion Criteria: Willingness for participation in the study, familiarity with the usage of digital media.

Exclusion Criteria: None.

Assessment of the Trend Towards Digital Nutrition Services During COVID-19 Pandemic

An observational study with secondary data analysis was done to understand the choice and trend of people opting for diet consultation services pre and post COVID-19 pandemic. A period of 16 months was selected as the observation period (2019 August to 2020 December). Clinical Nutrition Department of a multispeciality hospital in Kerala was selected as the area of the study, and the monthly OP (out-patient) statistics for diet consultation services was analyzed.

RESULTS

In the first phase, the study was conducted to assess the preference for real time diet consultation over one-to-one approach. Total respondents were 1090 of which, 373 (34.2%) were males and 717 (65.8%) were females. The age of the respondents varied from 19 years to 60 years, with a mean age of 36 years and standard deviation +/-12.7.

Introductory questions were to assess the self awareness on health related aspects and the parameters are discussed in Table 1.

It was found that 1065 (98.1%) of the respondents were using smart phone where only 21 (1.9%) were not using the same (n = 1086). Among the participants, 1017 (98.1%) were using one or more kinds of mobile applications where 72 (6.6%) were not using any (n = 1089). 818 (75.2%) of them were interested in healthcare applications whereas 270 (24.8%) participants opined that they were not interested (n = 1088).

Table 1: Report on the Self Analysis of Health Care Practices/Awareness of the Respondents

S. No.	Parameter	Yes	No	No. of Respondents (n)
1	Habit of taking daily breakfast	964 (88.5%)	125 (11.5%)	1089
2	Following balanced diet	569 (52.6%)	513 (47.4%)	1082
3	Undergoing regular health check-up	334 (30.7%)	754 (69.3%)	1088
4	Aware of health risks of wrong lifestyle	999 (91.7%)	90 (8.3%)	1089
5	Self modification being done on diet and lifestyle	815 (74.8%)	274 (25.2%)	1089
6	Have ever felt the need of a personal nutritionist/dietitian?	536 (49.2%)	553 (50.8%)	1089
7	Having a guidance to plan self nutritional goals	470 (43.2%)	617 (56.8%)	1087

Of the 1084 responses received, 1061 (97.9%) against 23 (2.1%) were using mobile apps in smart phones (P-value <0.001) and of 1083 responses, 1061 (98.0%) showed interest in healthcare apps where 22 (2.0%) were not interested in the same (P-value = 0.206).

Out of 1090 responses, only 129 (11.8%) persons were using personal diet apps while 961 (88.2%) were not using any. 171 (29.9%) responded that they were satisfied with the present diet apps where the majority-400 (70.1%) respondents-were not satisfied (n = 571). Opinion for on-line consultation was less, and the least response was obtained for telephonic consultation.

Out of 1071 responses, 902 (84.2%) preferred a follow-up for their nutritional advice while 169 (15.8%) showed reluctance for follow-up plans.

The type of follow up preferred by the respondents has been shown in Figure 1. It was observed that 394 (38.3%) participants preferred a follow up with smart phones, and the least preference was given to telephonic follow ups-107 (10.4%) responses.

Of the 1045 responses received, 881 (84.3%) preferred diet consultation at their personal/convenient setting while 164 (15.7%) were not having a proper response (P-value <0.001). The preference of users in opting digital applications is discussed in Table 2.

Out of 1062 responses, 893 (84.1%) were of the opinion that web/mobile based consultation will be effective in the future, while 169 (15.9%) were not positive on that (P-value < 0.001). Out of 1040 respondents, 879 (84.5%) were of the opinion for getting real time, authenticated digital nutrition interventions in the future while 161 (15.5%) were not favouring the remark (P-value < 0.001). It was concluded that since majority (84.1%, n = 1062) of the respondents supported the effectiveness of digital nutrition consultation services, further development in the field using cloud based options would be the gaining recognition for enhancing quality of patient care services.

In the second phase of the study, the trend analyses towards utilization of digital options for a period of 16 months had been observed as COVID-19 pandemic was on a rise. Of the total referral and walk-in patients consulted, the choice

Figure 1: Follow Up Preference Opted by Respondents (n = 1029)

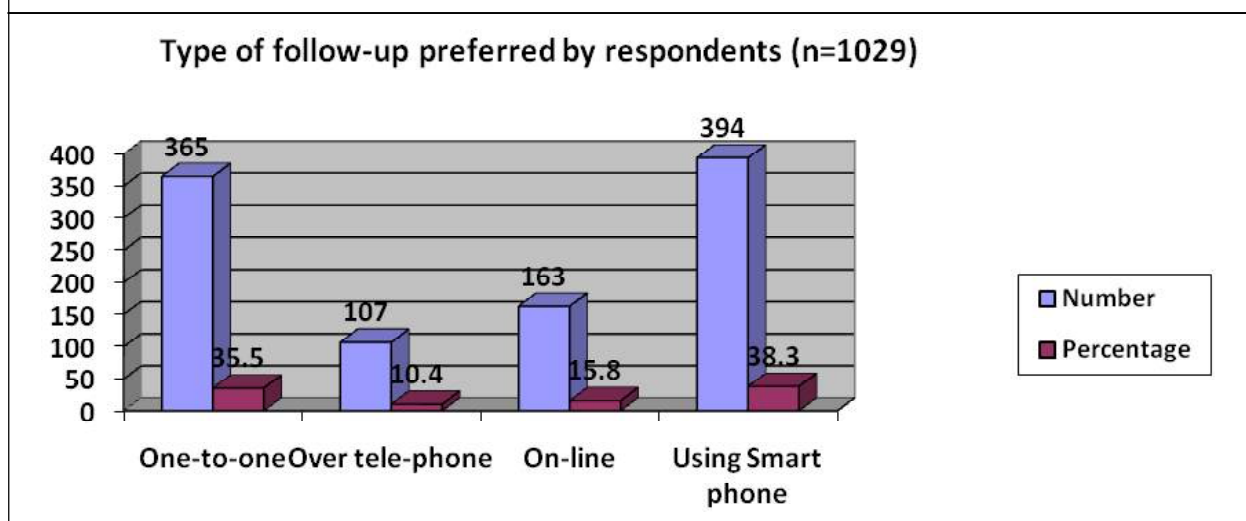


Table 2: Preference on Real Time Diet Consultation Using Digital Application

S. No.	Parameter	Yes	No	No. of Respondents (n)
1	Interested to get authenticated digital intervention tool to achieve nutritional goals	754 (71.2%)	305 (28.8%)	1059
2	Prefers freedom of diet consultation at one's own convenience	984 (92.8%)	76 (7.2 %)	1060
3	Willing to monitor diet and lifestyle practices using a mobile application	797 (74.1%)	278 (25.9%)	1075
4	Confident to make lifestyle changes with the help of authenticated on-line dietitian	814 (77.2%)	241 (22.8%)	1055

towards consultation services other than traditional one-to-one method was observed namely; telephonic, video consultation, QMS (Quick messenger services) and e-mail consultations were assessed. It was found that from 2019 August to 2020 April, none of the patients opted for newer means of consultation methods other than the traditional pattern of face-to-face consultations. Since May 2020, preference for digitalized options for diet consultation methods was exhibited which showed an upward trend throughout the observational period. Referral and Walk-in patients continued where physical presence was required for post surgical/critical illness nutritional management. Otherwise, maximum preference was observed for QMS (quick messenger services) using WhatsApp booking and follow-ups, followed by tele-consultation, e-mail queries and then for video consultation services. The increasing trend towards newer diet consultation options for seven months (2020 June to 2020 December) has been discussed in Table 3.

As evidenced by the table above, of the newer trend, significant increase for choice of QMS (Quick Messenger Service-40%, n = 73) options for diet consultation was shown by the patients followed by Tele-consultation (31%, n = 58) and E-mail queries (45%, n = 24). The pictorial representation has been shown in Figure 2.

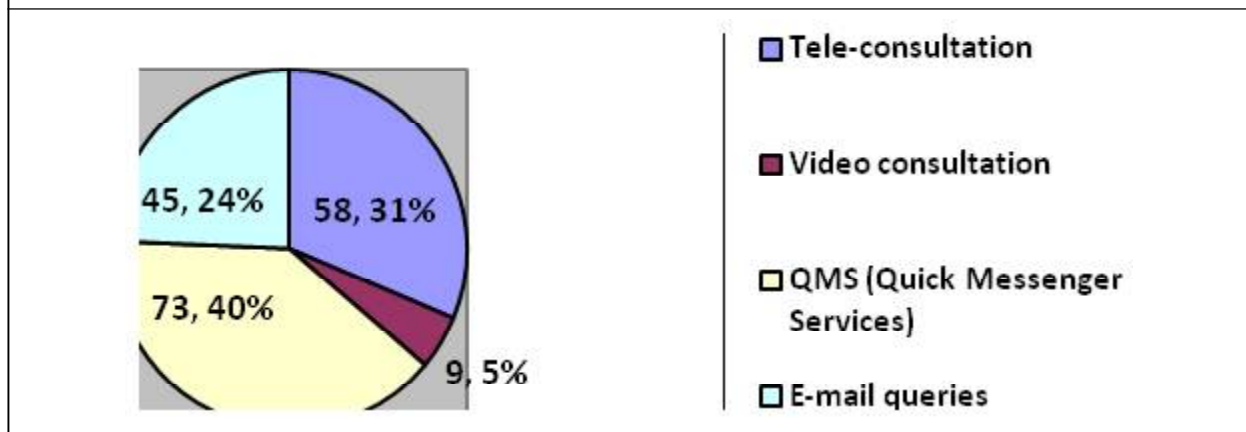
DISCUSSION

Technology can be a perfect solution to maintain services and minimize risk, and there are huge varieties of digital options at our finger tips. The app design preferences of mobile phone users more generally, have been more commonly explored [9]. The criteria valued in weight loss apps were usually attractive user interfaces, structure, ease of use, personalized features, and accessibility [10], and usability, cost, and content quality were valued among wellness apps [11]. Automatic tracking and monitoring of progress toward physical activity goals and an integrated music were some of the features included among physical activity apps [12].

Table 3: Analysis on the Usage of Modified Diet Consultation Options in COVID-19 Pandemic by Out Patients in a Multispecialty Hospital in Kochi, Kerala from June 2020 to December 2020

Month	Out Patient (Total)	Categories					
		Referral by Consultants	Walk-in	Tele Consultation	Video Consultation	QMS (Quick Messenger Services)	E-mail Queries
2020 June	65	37	17	6	0	2	3
2020 July	41	11	12	7	3	5	3
2020 August	34	2	10	7	2	7	6
2020 September	55	23	11	6	0	11	4
2020 October	66	18	18	8	2	13	7
2020 November	67	13	16	11	1	16	10
2020 December	59	3	11	13	1	19	12

Figure 2: Comparison of the Trend Towards Newer Diet Consultation Options During COVID-19 Pandemic (June 2020 to December 2020)



The findings of the study revealed that the opinion collected were much positive on the aspect that people require an authenticated diet consultation support as well as a follow up. Even though the first consultation was preferred face-to-face (one-to-one), follow up plans were scored maximum at their convenience, mostly by using smart phones. Consultations at one's own convenient setting would save time and also any reluctance in asking questions to the consultant dietitian, especially on the weight management/more personalized options. It is found that telephonic consultation scored the least, both for options sought for first hand consultation and also for follow up. More remarkable approach is attained towards personalized consultations, at one's own privacy.

Mobile phone applications and web-based tools—both technologies—are particularly advantageous when many individuals are advised to maintain physical distance from others [13]. The data supportive for future diet consultations using web/mobile based/digital platform throws light into the wide area for developing such applications for the community. This would support in the health care segment's venture of reaching people on a real-time basis for managing their personal nutrition goals and this to keep a track of follow-up plans and better quality of life.

REFERENCES

1. Lupton, D. Digital health now and in the future: Findings from a participatory design stakeholder workshop. *Digital Health*, 2017, Vol 3: 1-17.
2. Powell J, Newhouse N, Boylan A-M, *et al.* Digital health citizens and the future of NHS. *Digital Health*, 2016. <http://journals.sagepub.com/doi/full/10.1177/2055207616672033>.
3. Poushter J. Pew Research Center. *Smartphone ownership and internet usage continues to climb in emerging economies*, 2016.
4. Olmstead K, Atkinson M. Pew Research Center. *Apps permission in the Google play store*, 2015.
5. "Internet users in India to rise by 40%, smartphones to double by 2023: McKinsey". *The Economic Times*, 2019.
6. NCD Risk Factor Collaboration Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants. *Lancet*, 2016, 1377–96.
7. World Health Organization. Geneva, Switzerland: *Global status report on non-communicable diseases*, 2014.
8. Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. *Health and economic burden of the projected obesity trends in the USA and the UK*. *Lancet*, 2011
9. Chen, J, Lieffers, J, Bauman, A., Hanning, R., Allman-Farinelli, M. "Designing Health apps to support Dietetic Professional practice and their patients: Qualitative results from an international survey", *JMIR MhealthUhealth*, 2017, 5(3): 40.
10. Tang J, Abraham C, Stamp E, Greaves C. *How can weight-loss app designers' best engage and support users? A qualitative investigation*. *Br J Health Psychol.*, 2015. 20(1):151-7.
11. Stvilia B, Choi W. Mobile wellness application-seeking behaviour by college students—an exploratory study. *LibrInfSci Res.*, 2015, 37(3):201-8.
12. Rabin C, Bock B. *Desired features of smartphone applications promoting physical activity*. *Telemed J E Health*, 2011, 17(10):801-3.
13. Lyons, P.J. "Coronavirus Briefing: What Happened Today," *The New York Times*, 2020.