Journal of
Nutrition and Dietetic Practice

RESEARCH ARTICLE

How has COVID-19 pandemic changed dietetic practice? A cross-sectional approach

Annemarie B. Zamora*, Jeanne H. Freeland-Graves
Department of Nutritional Sciences at The University of Texas at Austin, Texas

Abstract

Background: The Coronavirus Disease 2019 (COVID-19) pandemic in the United States has affected healthcare practices substantially. Its effect on dietetics professionals in clinical nutrition has been investigated recently, but not in terms of the internet and how it has changed practice.

Objective: This research aimed to investigate change of practice since COVID-19 pandemic in Registered Dietitians (RD).

Methods: Dietitians were contacted by email and asked to fill out a survey. A total of 3000 RDs were invited by email from April to August 2020; a total of 260 responded with complete information. Main outcomes were changes to dietetic practice since COVID-19, health behaviors of clients/patients, and hours/week of internet use. Descriptives were calculated for demographic characteristics; linear regression models used to estimate associations between change in practice since the COVID-19 and hours/week of internet use.

Results: Participants had a mean age of 47.8 years; averaged 29 hours/week of internet use; primarily Caucasian (93%); lived in suburban (49%) locations; held a Master´s degree (59%) and worked in clinical nutrition (39%). The greatest change in dietetic practice due to COVID were working remotely (64%), decreased business productivity (18%), cancellation of nutrition classes for clients (11%), and mandatory use of PPE (7%). For the clients, there was more cooking at home (37%), snacking (26%), closure of gyms (60%) and less opportunities to leave the house (15%).

Conclusions: COVID-19 has changed dietetics by a shift to online practice, increased time spent on the internet, and greater levels of anxiety and isolation of clients.

Keywords: COVID-19, dietetic practice, internet, nutrition information, Registered Dietitian

Introduction

Since the first report of COVID-19 [1], the world has had more than 134 million cases [2]. The impact on health professionals has been substantial, with reports of increased levels of stress and anxiety [3]. These symptoms have been related primarily to work at medical facilities, isolation, or depression. Numerous health care workers have been fearful that they might become ill with coronavirus through contact [3].

In most situations dietitians are working remotely, without exposure to the COVID-19 patients. Yet they still have conducted assessments, prescriptions, and orders by phone or referral. Nonetheless, dietetic practice now has more emphasis on a responsibility to keep the public safe and avoid spread of the virus. Worldwide, dietitians have received substantial training on specialized care for nutrition support and diet prescription for COVID-19 patients [4, 5]. The objective of this research was to investigate the effect of the COVID-19 pandemic on the practice of Registered Dietitians.

Materials And Methods

Study Design

The Registered Dietitian (RD) Internet Nutrition Practice Survey was developed to determine internet utilization, its effects on dietetic practice, and changes in practice since the COVID-19 pandemic. An email list of 3000 RDs was generated from 1) alumni lists of The University of Texas at Austin and Purdue University, 2) dietitians identified from publications in nutrition journals, and 3) “Find an RD list” from the Academy of Nutrition and Dietetics. The dietitians were contacted on one occasion from April 23-August 26, 2020 and asked to fill out the survey by email. The survey was provided as an attachment in both WORD and Pdf forms in English. Some participants responded that they had recently retired (4%),

Correspondence to: Annemarie B. Zamora, Department of Nutritional Sciences at The University of Texas at Austin, Texas, USA, Email: abz256[AT]utexas[DOT]edu

Received: March 26, 2021; **Accepted:** April 14, 2021; **Published:** April 17, 2021

lacked time (40%), or were not an appropriate match (56%). Of those that lacked time, many also explained that they would have found time if the research would be transferred to an electronic survey platform. Thus, all forms were transferred to be administered on Qualtrics. The researchers created two different versions of the survey for distribution: an anonymous link and a survey with email address. Both versions had the informed consent at the beginning with all inclusion and exclusion criteria. If this was not checked the responses were not submitted as complete. A total of 1200 participants started the survey but did not complete. Of the total initial recruitment, 260 responded with complete information. The recruitment email contained "Registered Dietitians Internet Nutrition and COVID- Share Your Experience!" in the heading and explained the research and provided informed consent. To our knowledge, we do not think this might have created a biased response, since it was explanatory. The research methodology used in this research was adapted from Miller at al. in 2020 for the Qualtrics Survey platform [6]. The data were downloaded as a comma separated file to be transferred to SPSS for statistical analysis. All information was de-identified to protect the confidentiality of the participants by removing names and email addresses. The data files were password protected since all was collected virtually.

Participants

Inclusion criteria for this investigation was being a woman, ages 23 to 78 yr, who held current registration/licensure as a RD. Men were excluded because the sample size would have been too small, since it is well known over 95% of dietitians are women. A power analysis with G*Power 3.1 Software, 95% power with medium effect size $f^2 = 0.15$, with nine predictors: age, location, highest degree, employment, change in dietetic practice since COVID-19, change in diet of clients since COVID-19, change in exercise capabilities of clients since COVID-19, dietetic practice will change after COVID-19, and hours/week internet use. This multiple regression analyses suggested a minimum of 166 participants [7]. The multiple regression analysis effect size of f^2 in proportion of variance terms amounts to an R^2 of the model, equal to 0.13 [7].

Study Instruments

The Registered Dietitian Internet Nutrition Practice Survey:

For the development of the survey, a literature search about dietary factors believed to be associated with food and nutrition in the internet relevant to dietitians was conducted. Items were selected and incorporated into a preliminary survey with 47-items to determine sources of nutrition information, hours per week of internet use, reasons, major focus of dietetic practice, and topics of interest in nutrition. A panel of ten dietitians evaluated this survey for content, readability, and bias. These nutrition professionals removed four questions due to confusion or redundancy. A focus group of six dietitians evaluated the survey for content. The survey was pilot tested for clarity before use to eliminate technical or confusing questions and then slightly revised. The final Registered Dietitian Cyber Nutrition Practice Survey consisted of 43-items.

The survey was developed to include demographics, internet use, and change in practice since COVID-19. Demographic questions that were open-ended included age, race/ethnicity, personal income/year, membership to professional organizations, employment, dietetic internship program (name/location and year), and years in the nutrition field as a Registered Dietitian. Others were location of dietetic practice (urban, rural, or suburban), education (Bachelor´s, Master´s, Doctorate, certification, and other), internship program (dietetic internship, coordinated program in dietetics, Individualized Supervised Practice Pathway, and other), topics of interest in nutrition/food (breastfeeding, cancer, child nutrition, chronic diseases, eating disorders, fiber, food allergies, gluten-free, high protein, inflammation, intermittent fasting, keto, organic foods, paleo, physical activity, pregnancy, probiotics and prebiotics, recipes, supplements, vegetarian, weight loss), and major focus of dietetic practice. Internet use was measured by hours/week reported using the internet (open-ended), sources of nutrition information (Academy of Nutrition and Dietetics, clinical practice and peers, Medline and PubMed, Nutrition Care Manual, nutrition and food blogs, peer-reviewed articles, social media, textbooks and manuals), reasons of utilization (communication, personal use, research, social media, nutrition information, current topics in nutrition, health information, recipes, and other), and devices used for access (cellphone, computer, kindle, smart watch, tablet or iPad, and other). Note that all these provided response options as well. These parameters were selected by the scientific literature and the dietetic practice expertise of the investigators.

Questions included: "Has the coronavirus pandemic changed your dietetic practice?" The intention for this question was to assess overall change in dietetic practice since the pandemic (binary); health behaviors of clients/patients (open-ended); contact with clients/patients with COVID-19 in dietetic practice (no, if yes have you written diet order, and if yes have you prescribed nutrition support); how dietetic practice will change after COVID-19 pandemic (open-ended); use of the internet for COVID-related information, webinars, and telehealth (no, if yes specify; binary); and challenges for obtaining information about nutrition and food (open-ended). This survey was validated for content by the expert panel, but not for constructs since this investigation did not have established concepts to be measured and no previously validated tool exists to date [8]. The Institutional Review Board of The University of Texas at Austin granted approval for this investigation.

Statistical Analysis

All statistical analysis and data management were performed using Predictive Analytics Software 18.0 (IBM SPSS,

Chicago, IL) [9]. Descriptive statistics for age, highest degree, and ethnicity/race, years as dietetic practitioner, employment, and hours/week of internet use were determined. Demographic characteristics such as age, highest degree, ethnicity/race, and years as dietetic practitioner were controlled in all analyses. Age and years as dietetic practitioner were treated as continuous variables. Personal annual income was transformed to the following categories ($): 2,000-41,999; 42,000-81,999; 82,000-121,999; and 122,000-200,000 accordingly. All others were classified as categorical. Questions about the coronavirus pandemic and dietetics were evaluated qualitatively and coded either 1 for yes or 0 for no. All assumptions for regression analysis were evaluated for linearity, normality, and independence [10]. Linear regression analysis estimated associations between change in practice of dietitians since COVID-19 and hours per week of internet use. A binary regression model with predictors such as demographic characteristics and hours per week of internet use was used to predict change in dietetic practice. Independence and binary outcome measure were assumptions fulfilled to conduct this analysis [11]. All analysis were conducted on complete responses, no missing data was analyzed.

Results

Demographics

Characteristics of participants are shown on Table 1. The sample had a mean age of 47.8 ± 13.6 years, annual personal income of $ 75,224 ± 39,491.6, 21 ± 13.3 years in dietetic practice, and reported using the internet 29 ± 16.1 hours per week. The dietitians were primarily White (93%), had a suburban practice (49%), held a Master´s degree (59%), and had completed a traditional dietetic internship via a Didactic Program in Dietetics (62%). Other methods to obtain the supervised practice were Coordinated Program in Dietetics (33%), Individualized Supervised Practice Pathway (3%), or grandfathered (2%).

Internet use in dietetic practice

The top sources of nutrition information used by RDs via the internet were peer-reviewed articles (100%), the Journal of the Academy of Nutrition and Dietetics (40%), and the Nutrition Care Manual (28%). Topics of interest in nutrition/food were chronic disease (49%), inflammation (32%), weight loss (27%), and eating disorders (25%). The major focus of practice was weight loss (53%), chronic disease (52%), eating disorders (23%), and gut health/microbiome (17%).

The primary reasons that participants reported using the internet in professional practice are depicted in Figure 1. These included communication (53%), personal use (16%), and research (9%). Communication included email or any other form used in their practice. Other minor uses were for obtaining recipes, health information, and current topics of interest in nutrition and foods. Figure 2 illustrates the challenges reported for internet use: nutrition and food misinformation (53%), technical difficulties (21%), limited access to academic sources (18%), and lack of personal interactions (9%).

Table 1 Demographic characteristics of 260 Registered Dietitians from April-August 2020

Characteristics	Result
	mean ± SD[a]
Age (y)	47.8 ± 13.6
Personal income/year ($)	**n (%)**
2,000-41,999	37 (16)
42,000-81,999	117 (51)
82000-121,999	50 (22)
122,000-200,000	24 (11)
Race/ethnicity	
White	242 (93)
Hispanic	6 (2)
Asian	8 (3)
Other[b]	4 (2)
Location of dietetic practice	
Urban	86 (33)
Rural	48 (18)
Suburban	126 (49)
Education	
Bachelor´s	65 (25)
Master´s	154 (59)
Doctorate	41 (16)
Internship program completed	
Coordinated Program in Dietetics	85 (33)
Dietetic Internship	162 (62)
Individualized Supervised Practice Pathway	9 (3)
Other[c]	4 (2)
Work setting	
Clinical	101 (39)
Corporate/private practice	88 (34)
Education/research	56 (22)
Other[d]	15 (5)

[a]Standard deviation.

[b]Includes Black and any combinations of races.

[c]Includes Approved Pre-Professional Practicum and grandfathered into program.

[d]Includes administration, behavior/policy analysis, epidemiology, sports and community work settings.

The regression analysis was significant ($F(246) = 2.26$, $p = 0.008$, with 33% of the variance in hours/week of internet use explained by this model. The highest degree of education, a categorical variable, was transformed into three dummy coded predictors for the analysis. As these dummy coded predictors were added in separate steps to the regression (sequential) a significant change occurred in $R^2(248) = 0.055$, $p = 0.001$. Multiple linear regression analysis showed that age ($b = -0.158$, $p = 0.04$), the highest degree held ($b = 12.502$, $p < 0.001$) and use of internet for communication ($b = 4.401$, p

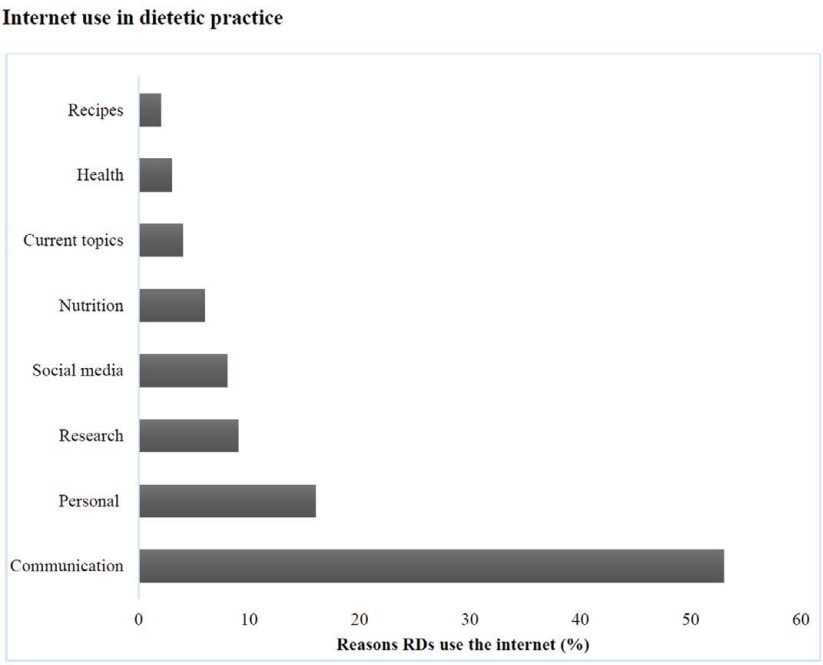

Figure 1 Primary reasons that RDs use the internet

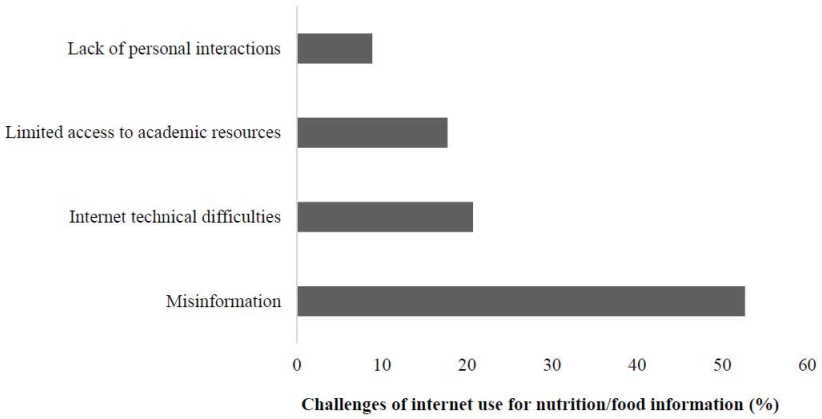

Figure 2 Challenges of internet use for nutrition/food information

= 0.034) were significantly associated with more hours/week of internet use. Other predictors in the model that did not yield significance were location of dietetic practice, change in diet of clients/patients, change in physical activity, change in dietetic practice since the COVID-19 pandemic, internet use for COVID-19 information, webinars, and use of telehealth. Internet use increased since COVID-19 began, particularly for communication, personal use, and research. Those who were younger and had advanced degrees used the internet the most.

Change in dietetic practice since the COVID-19 pandemic

Changes reported due to the COVID-19 pandemic were the switch to remote practice (64%), decreased business productivity (18%), cancellation of nutrition classes for clients (11%), and use of mandatory personal protective equipment (PPE) at facilities (7%). Some dietitians (9%) found it difficult to conduct counseling sessions through Zoom or phone due to the lack of facial gestures or nonverbal expressions.

The health behaviors reported in their clients and patients during the COVID-19 pandemic are shown in Figure 3. These include anxiety/depression (44%), inability to lose weight (38%), cooking at home (37%), management of cardiovascular disease/diabetes (31%), snacking/weight gain (26%), more exercise/walking at home (23%), less overall exercise (17%), food insecurity (16%), and eating disorders (8%).

Logistic regression analysis estimated four predictors of change in dietetic practice since the COVID-19 pandemic that were significant: urban location (Odds ratio (OR) = 3.107, p = 0.027), overall highest degree (Wald (2) = 9.665, p = 0.008), change in diet of clients/patients (OR = 2.996, p = 0.018), and dietetic practice will change after COVID-19 pandemic (OR =

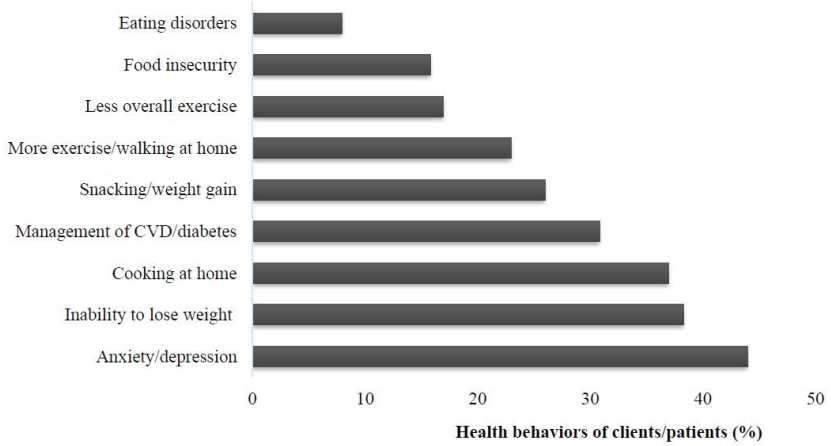

Figure 3 Health behaviors of clients/patients during COVID-19 pandemic

2.62, p = 0.029). Those participants who stated that COVID-19 had not changed dietetic practice were already working remotely; either practiced in suburban or rural locations; had a Bachelor´s degree; and either did not believe that COVID-19 had changed the diet of their clients or did not have clients.

Discussion

These data suggest that COVID-19 has changed dietetics primarily by the switch to remote practice and increased time spent on the internet. Other changes were a decline in business growth, cancellation of nutrition classes for clients, and use of PPE in facilities. Donnelly et al. reported similar changes in dietetic practice in Canada, as well as food insecurity of clients, technical problems with the internet connections, and lack of interactions [12].

Regarding the clients of dietitians, reports were of increased cooking at home and a reduction in overall less exercise. The greater extent of home cooking could certainly be beneficial, as diet quality has been reported to be higher in individuals who cook frequently at home. But this relationship is related also to household income which was not measured here [13]. Monfared et al. reported a similar percentage of individuals, 38%, who cooked at home during COVID [14]. Finally, the observed decline in physical activity is not surprising, given the increase in remote interactions and closure of gyms. Barkley et al. also found barriers to physical activity in students of remote classes since the onset of COVID-19 [15].

A high level of anxiety and depression was found in 44% of clients of dietitians since the COVID-19 pandemic [16]. This level is higher than the 35% reported by Robb et al. in adults with depression [17], but less than the 60% reported for self-isolation and a diminished metal health since COVID by Grey et al. [18]. It appears that the pandemic has increased levels of anxiety, self-isolation, and depression since strict rules and social distancing enforcement have contributed to lower mental health status [19, 20]. These changes are of concern in the COVID-19 era, as these can exacerbate psychiatric disorders, substance abuse and the incidence of suicide [21].

Approximately one-fourth of participants reported that their clients/patients were snacking and gaining weight since the pandemic [22]. This figure was lower than that cited by Sánchez-Sánchez et al. (37%) [23], but similar to Flanagan et al. (27%) during COVID [24].

In this study food insecurity was reported by 16% of the clients of the RDs (Figure 3). This value is lower than overall 23% in the U.S.; but this 23% figure represents an increase from the 11% reported pre-COVID [25, 26]. It is plausible that the lack of employment and reduced wages may be intensifying food insecurity during COVID times [25].

Pandey et al. has described how society and most workplace settings have had an enormous change in using the internet extensively to date [27]. This trend is supported in this research through qualitative responses of 166 dietitians (64%) who indicated that their use of the internet in practice has substantially increased since COVID-19. Previously, Shpilko et al. investigated topics and sources of nutrition information in faculty members of academic settings; their findings were comparable to this research. Primary areas of importance to RDs were chronic disease (49%) and weight loss (27%). Our results found that inflammation and eating disorders also were topics of interest to dietitians [28].

The major focus of practice in RDs prior to COVID-19 is similar to that reported by Slawson et al. in 2013. These included: weight loss, chronic disease, eating disorders, and gut health/microbiome [29]. So it appears that the topics of interest in nutrition in dietetics have not changed since the onset of COVID-19, but methods of practice have shifted.

In the United Kingdom in 2001 Kirk et al. reported on reasons why dietitians used the internet, including communication (51%), personal use (9%), and research (83%) [30]. In this research in the U.S. RDs used the internet approximately the

same amount for communication (53%), but much less for research (9%) since the pandemic started compared to pre-COVID.

Challenges reported for internet use in RDs in the present study were nutrition and food misinformation, as well as technical difficulties. The habitual challenge of misinformation reported by dietitians included clients not seeking reliable sources of information, excess of undocumented websites, difficulty finding concise answers, financial endorsements, oversaturation of not evidence-based information, inability of consumers to distinguish between truthful and false nutrition information, everyone has the opportunity to share nutrition information on the internet despite professional credentials, and plethora of dramatized stories about food, nutrition and ingredients.

But these same concerns were also true in studies reported by Kirk et al. in 2001 [30], Wansink et al. in 2015 [31] and Probst et al. in 2019 [32]. Thus, the main **uses** of the internet do not seem to have changed with COVID. In Australia in 2021 Kelly et al. evaluated the digital use in dietetic practice and barriers of clients. A total of 60% participants worked in various practice settings, and 66% had access to internet in dietetic practice. The greatest barriers cited were technical problems, difficulty to collect anthropometric measurements of patients, and identification of clinical signs of malnutrition [33]. Yet, these impediments were not quantified, only acknowledged. In our study, the percent of dietitians (61%) who worked in different practice areas was similar, yet all RDs in this research had access to the internet. Technical difficulties were reported by 21%, and 9% were concerned about lack of personal interactions with clients.

A strength of this research is the information about change in dietetic practice by RDs since the onset of the COVID-19 pandemic. Limitations are its cross-sectional design which limits the ability to establish causation. Also, the information was self-reported, leading to a low response rate. But this is common when surveys administered on internet platforms survey have questions that are self-reported [34]. Ideally, the questionnaire could have been sent also to the clients of dietitians for answers to be posted anonymously, but this was not within the scope of this research. Finally, this research was unable to investigate the impact on diet quality and anthropometrics with the greater cooking at home in clients of dietitians.

Conclusion

This investigation observed that the COVID-19 pandemic has shifted dietetics to online practice, greater use of the internet in general and increased the levels of anxiety and isolation in clients of dietitians. However, the major focus of practice remains unchanged and younger dietitians with advanced degrees used the internet the most. However, it is believed some changes will only be temporary. In the future, it is hopeful that dietitians will find creative ways to work with clients remotely to assess needs and minimize the barriers of food insecurity. Post COVID-19 studies should focus on discerning how the dietetics profession has responded to the new normality, and how methods used during the pandemic increased the effectiveness of dietetic practice. Future studies should also aim to investigate the impact on diet quality and anthropometrics.

Acknowledgements

The Bess Heflin Centennial Professorship was the source of funding for this investigation.

References

1. Zhu N, Zhang D, Wang W, Wenling Wang, Xingwang Li, Bo Yang et al. (2020) A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 382: 727-733. [View Article]
2. Johns Hopkins University (2020) Johns Hopkins University Coronavirus Resource Center. [View Article]
3. Amin S. (2020) The psychology of coronavirus fear: Are healthcare professionals suffering from corona-phobia? *Int J Healthc Manag* 13: 249-256. [View Article]
4. Matos RADC, Akutsu RDCCDA, Zandonadi RP, Ada Rocha, Raquel Braz Assunção Botelho (2020) Wellbeing at Work before and during the SARS-COV-2 Pandemic: A Brazilian Nationwide Study among Dietitians. *Int J Environ Res Public Health* 17: 1-15. [View Article]
5. Chapple LAS, Fetterplace K, Asrani V, Aidan Burrell, Emma J. Ridley et al. (2020) Nutrition management for critically and acutely unwell hospitalised patients with coronavirus disease 2019 (COVID-19) in Australia and New Zealand. *Nutrition & Dietetics* 77: 426-436. [View Article]
6. Miller CA, Guidry JP, Dahman B, Maria D. Thomson (2020) A tale of two diverse Qualtrics samples: information for online survey researchers. *Cancer Epidemiol Biomarkers Prev* 29: 731-735. [View Article]
7. Correll, J, Mellinger C, McClelland GH, Charles M.Judd (2020) Avoid Cohen's 'small', 'medium', and 'large' for power analysis. *TiCS* 24: 200-207. [View Article]
8. Hinkin TR. (1998) A brief tutorial on the development of measures for use in survey questionnaires. *ORM* 1: 104-121. [View Article]
9. Wagner III WE (2019) Using IBM® SPSS® Statistics for Research Methods and Social Science Statistics. Sage Publications; [View Article]
10. Uyanık GK, Güler N. (2013) A study on multiple linear regression analysis. *Procedia-Social and Behavioral Sciences* 106: 234-240. [View Article]
11. Peng CYJ, Lee KL, Ingersoll GM. (2002) An introduction to logistic regression analysis and reporting. *J Educ Res* 96: 3-14. [View Article]
12. Donnelly R, Keller H. (2021) Challenges Providing Nutrition Care During the COVID-19 Pandemic: Canadian Dietitian Perspectives. J *Nutr Health Aging* 1: 1-2. [View Article]
13. Wolfson JA, Leung CW, Richardson CR. (2020) More frequent cooking at home is associated with higher Healthy Eating Index-2015 score. *Public Health Nutr* 23: 2384-2394. [View Article]

14. Monfared E, Vahedi M, Haghgoo HA. (2021) COVID-19 Endangers the Health of Society by Disrupting Social Participation, Home Integrations, and Productive Activities. *Research Square* 1: 1-18. [View Article]

15. Barkley JE, Lepp A, Glickman E, Greg Farnell, Jake Beiting et al. (2020) The acute effects of the COVID-19 pandemic on physical activity and sedentary behavior in university students and employees. *Int J Exercise Sci* 13**:**1326-1339. [View Article]

16. Czeisler MÉ, Lane RI, Petrosky E, Joshua F. Wiley, Aleta Christensen et al. (2020) Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *Morbidity and Mortality Weekly Report* 69: 1049-1057. [View Article]

17. Robb CE, de Jager CA, Ahmadi-Abhari S et al. (2020) Associations of social isolation with anxiety and depression during the early COVID-19 pandemic: a survey of older adults in London, UK. *Frontiers in Psychiatry* 1: 1-12. [View Article]

18. Grey I, Arora T, Thomas J, Ahmad Saneh, Pia Tohme et al. (2020) The role of perceived social support on depression and sleep during the COVID-19 pandemic. *Psychiatry Res* **293,** 1-6. [View Article]

19. Dean DJ, Tso IF, Giersch A, Lee HS, Tatiana Baxter et al. (2021) Cross-cultural comparisons of psychosocial distress in the USA, South Korea, France, and Hong Kong during the initial phase of COVID-19. *Psychiatry Res* 295: 1-7. [View Article]

20. Kim HHS, Jung JH. (2021) Social isolation and psychological distress during the COVID-19 pandemic: A cross-national analysis. *The Gerontologist* 61: 103-113. [View Article]

21. Sher L. (2020) The impact of the COVID-19 pandemic on suicide rates. *QJM* 113: 707-712. [View Article]

22. Butler MJ, Barrientos RM. (2020) The impact of nutrition on COVID-19 susceptibility and long-term consequences. *Brain, Behavior, and Immunity* 87: 53-54. [View Article]

23. Sánchez-Sánchez E, Ramírez-Vargas G, Avellaneda-López Y, Orellana-Pecino, Esperanza García-Marín et al. (2020) Eating habits and physical activity of the Spanish population during the COVID-19 pandemic period. *Nutrients* 12: 1-12. [View Article]

24. Flanagan EW, Beyl RA, Fearnbach SN, Abby D Altazan, Corby K Martin et al. (2020) The impact of COVID-19 stay-at-home orders on health behaviors in adults. *Obesity* 29: 438-445. [View Article]

25. Nagata JM, Seligman HK, Weiser SD. (2020) Perspective: the convergence of coronavirus disease 2019 (COVID-19) and food insecurity in the United States. *Advances in Nutrition* 1: 1-4. [View Article]

26. Schanzebach DPA (2020) How much has food insecurity risen? Evidence from the Census Household Pulse Survey 2020. https://www.ipr.northwestern.edu/documents/reports/ipr-rapid-research-reports-pulse-hh-data-10-june-2020.pdf (accessed February 2021).

27. Pandey N, Pal A. (2020) Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice. *Intl J Information Management* 55: 1-5. [View Article]

28. Shpilko I. (2011) Assessing information-seeking patterns and needs of nutrition, food science, and dietetics faculty. *Library & Inform Sci Res* 33: 151-157. [View Article]

29. Slawson DL, Fitzgerald N, Morgan KT. (2013) Position of the Academy of Nutrition and Dietetics: the role of nutrition in health promotion and chronic disease prevention. *J Acad Nutr and Diet* 113: 972-979. [View Article]

30. Kirk S, Cade J, Greenhalgh A. (2001) Dietitians and the internet: are dietitians embracing the new technology? *J Human Nutr and Diet* 14: 477-484. [View Article]

31. Wansink B. (2005) Position of the American Dietetic Association: food and nutrition misinformation. *J Am Diet Assoc* 106: 601-607. [View Article]

32. Probst YC, Peng Q. (2019) Social media in dietetics: Insights into use and user networks. *Nutr Diet* 76: 414-420. [View Article]

33. Kelly JT, Collins PF, McCamley, K. L. Campbell J, S. Roberts et al. (2021) Digital disruption of dietetics: are we ready?. *J Hum Nutr Diet* 34: 134-146. [View Article]

34. Hardy III JH, Gibson C, Carr A, Nikki Dudley, Alison Carr et al. (2020) Quitters would not prosper: Examining the relationship between online assessment performance and assessment attrition behavior. *Int J Select Assess* 1: 1–10. [View Article]

Citation: Zamora AB, Freeland-Graves JH (2021) How has COVID-19 pandemic changed dietetic practice? A cross-sectional approach. J Nutr Diet Pract. 5(1): 001-007.