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Title

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Developing a consensus to support health and social care professionals and patients manage nutrition in the context of COVID-19 recovery.

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Developing a consensus to support health and social care professionals and patients manage nutrition in the context of COVID-19 recovery.

Keywords

Long COVID, Nutrition, Nominal group technique, nutritional guidelines

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Accepted Article

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## Abstract

**Background:** The long-term effects on people who have had COVID-19 affect nutrition and can be influenced by diet conversely. Specific nutritional guidelines however were scarce at the beginning of 2020 and empirical literature was also lacking. Conventional research methodologies needed to be adapted to review the available literature that could be relevant to the UK and policy documents as well as collect the views of health and care staff. The aim of this paper is to describe the method to develop consensus statements from experts to address the necessary nutritional support and what emerged from this.

**Methodology:** A Nominal Group technique was adapted to the virtual world, we purposefully selected a range of professionals (dietitians, nurses, occupational therapists among others) and patients with long term effects of COVID to present them with the most updated evidence and aim to reach key guidelines to address COVID-19 recovery.

**Findings:** We were able to reach consensus statements that were developed and reviewed by relevant healthcare staff at the front line to address the nutritional needs of patients recovering from COVID-19 and those suffering from its long term effects. This adapted Nominal Group Technique process led us understand that a virtual repository of concise guidelines and recommendations was needed. This was developed to be freely accessed by both patients recovering from COVID-19 and health professionals who manage them.

**Conclusions:** We successfully obtained key consensus statements from the adapted Nominal Group Technique, which showed the need for the nutrition and COVID-19

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knowledge hub. This hub has been developed, updated, reviewed, endorsed and improved across the subsequent two years.

### Highlights

- It is feasible to use a Nominal Group Technique in a virtual environment with a wide range of stakeholder groups
- Consensus statements are useful in the development of recommendations for nutritional support for COVID-19 recovery
- The online adapted technique enabled successful engagement with patients suffering with symptoms of long COVID (e.g. fatigue, brain fog, etc)

### Introduction

COVID-19 infection has left millions of people with symptoms after the acute infection sometimes for prolonged periods extending to months or even years, now referred to as post-covid or long covid. The best estimates for the proportion of people suffering long covid symptoms are 10-35% for people at home and up to 80% for those who were hospitalised <sup>[1]</sup>. Many of these symptoms affect nutritional status and can be addressed with dietary strategies <sup>[2-4]</sup>. Symptoms that may directly impact what and how much people eat include breathlessness, coughing, taste changes and gut symptoms. Other symptoms impact dietary intake indirectly, such as loneliness, depression and pain. Yet other symptoms may affect a person's ability to manage their diet and food purchases because of fatigue, 'brain fog' and social isolation.

At the start of the pandemic there was a need to provide evidenced-based concise advice to support both professionals and patients. The project described in this paper evolved during the pandemic to meet this need. Here we describe the consensus process used to create and develop a nutrition and COVID-19 recovery knowledge hub.

COVID-19 is a novel topic, where the body of evidence was poor or non-existent before 2020. To define the problem and reach a consensus for the most effective way to support

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nutritional professionals deliver the best care it was important to use a multidisciplinary perspective, enable a rapid and concise analysis, and take a systematic approach. It was also essential to conduct this research online to meet the restrictions of infection control. Nominal group technique (NGT) could be adapted to all these needs.

Given the lack of studies at the time delineating nutritional guidance for COVID-19 recovery an approach was needed that drew on a wide range of experts from different fields, who may need to provide nutritional advice or support. It was also essential to include the voice of the patient, to ensure that their concerns and experiences were addressed. A consensus process was needed to collate the varied views and opinions into practical information to support the nutritional care of this new disease. NGT has been used widely among healthcare professions to delineate clinical guidance <sup>[5]</sup>, validate assessment instruments <sup>[6]</sup>, produce judgment criteria for assessments <sup>[7]</sup> and determine treatment recommendations <sup>[8]</sup>.

This paper describes the process, using an adapted NGT and thematic content analysis, to reach consensus statements to aid nutritional support for adults in the UK recovering from COVID-19 during an unprecedented pandemic context.

## Methods

The University of Plymouth approved the project (REF: 20/2466). Informed consent was obtained from each panel member through an online questionnaire, which is the ethics committee's sanctioned method to obtain consent in non-face-to-face situations.

NGT aims to achieve a general agreement or convergence of opinion around a particular topic in a democratic fashion. It can be used for problem-solving, idea-generation, or determining priorities <sup>[9]</sup>. It is a structured approach to ensure balanced participation of all group members, avoiding power imbalances. It is designed to empower participants to voice their opinions which are then considered by the others. It comprises four key stages: silent generation, round robin, clarification and voting (ranking or rating) <sup>[10]</sup>.

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Silent generation gives panel members time to review and consider relevant information to the topic and generate their own ideas to express to the others in the round robin stage. Clarification involves all panel members having the chance to ask questions and discuss the issues to vote upon. Finally, voting is when each idea is ranked by all participants independently. The results from voting are presented for a final clarification in order to reach consensus <sup>[9]</sup>.

#### Selection of information

For the silent generation phase of NGT two essential sources of information were used to inform panel discussions <sup>[11,12]</sup>. Firstly, a survey of UK based dietitians <sup>[13]</sup> which showed that pathways of nutritional care for patients with COVID-19 had been developed and implemented, but not universally, and that dietitians had adapted to new ways of working to manage nutritional care in patients prior to and after discharge from hospital following COVID-19 infection. Secondly a rapid systematic review <sup>[11]</sup> that mapped the most updated evidence, guidelines or consensus statements on nutritional care for patients with COVID-19 or for similar respiratory diseases. It found that older patients are deemed at particular risk of malnutrition. Many expert groups recommended the use of nutritional management strategies applicable to other acute conditions. Traditional screening and implementation techniques need to be modified to ensure infection control measures were maintained. There was little evidence to support nutritional interventions or the nutritional management post-discharge to support long-term recovery. In addition to these two packages of work, more research and policy literature on COVID-19 recovery was sought through our professional networks (e.g. CHAIN, BDA, BAPEN).

This information was organised using the structure of the nutrition care process (assessment, diagnosis, planning Intervention, implementation, monitoring, evaluation <sup>[14]</sup>), as well as operational challenges, and presented to the panel members. The patient

panel received the same information but rephrased into lay language and information on operational challenges of service delivery was omitted.

Prior to sharing this information, the research team reviewed it and identified questions that could not be answered with research or policy evidence and needed a consensus from experts in the topic. The full list of questions can be found in supplementary information table A.

### Selection of participants

Two purposefully selected expert groups were recruited, one by professional background (those supporting people with COVID-19 from health and social care), and the second by experience (patients who have had COVID-19); both perspectives were of value in developing a resource<sup>[7]</sup>. Our operational definition of ‘professional’ was a health or social care professional caring for COVID-19 patients before and/or during the recovery stage. Additionally, some professionals also represented important stakeholders (e.g. BAPEN, BDA Specialist interest group). An expert by experience was someone who had suffered COVID-19 infection (regardless of testing, vaccination or onset status) or had cared (outside the clinical setting) for such a person.

The criteria for inclusion on the expert panels is shown in table 1. Both professionals and patients were recruited using an expression of interest sent out via social media or email (either via personal networks or in organisations’ communications). Professional groups targeted included occupational therapy, speech and language therapy, nursing, dietetics, physiotherapy, home carers, general practitioners and other third sector workers. Patients were recruited through established COVID-19 support groups (e.g. social media channels, websites or online groups). The aim was to ensure that the expert panels were diverse and representative of professionals who may potentially offer dietary advice or nutritional assessment in the care of patients with COVID, and a range of patients suffering COVID (e.g. males and BAME groups). We avoided duplicating representation

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from a particular professional group. We excluded professionals working in intensive care (as the most acute stage of the infection) focusing instead on rehabilitation and recovery phase.

We received 18 responses from professionals and 13 responses from patients; all were sent formal invitations to join the panels. They were asked to fill in a short online form providing basic demographic information and stating their experience and background in more detail to enable us to select a diverse group for the panels. Initially, joining the expert panels was voluntary and unpaid. However, by the third meeting we were able to secure funding to offer an honorarium to those who participated in the form of cash or voucher.

#### Adapted nominal group technique

An adapted form of NGT was used, comprising five stages (see figure 1). This was designed to enable the conduct of the groups online and incorporate two groups; professionals and patients.

A summary of the selected information (see previous section) was sent to panel members prior to the panel meeting. Sending this beforehand was particularly important for patients, many of whom suffered ‘brain fog’ and/or fatigue and needed additional time to ‘silently generate’ ideas. This adaptation of silent generation has been used before <sup>[6]</sup> and not only helped patients, but also supported professionals’ involvement, since many were under extreme clinical work pressures related to the pandemic. The questions each panel were asked to consider were similar but phrased appropriately for patients and professionals. For example; “How useful (and applicable to your situation) did you find the available information on dietary advice, and were there any gaps?” was asked to patients versus “What are the gaps in nutrition advice where nutrition is relevant?” asked to the professionals. Full details can be found in supplementary information table A.

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The panel meetings were held virtually (on zoom.us; Zoom Video Communications Inc, San Jose, USA), recorded (all participants provided consent) and stored securely to support analysis. The meeting started with a brief presentation describing the highlights of the selected information. Participants were then asked to consider the nominal question (see section on selection of information) and to prepare to share ideas during the ‘Round Robin’ phase. One of the authors chaired each panel and invited participants to share in turn. After the ‘Round Robin’ participants were invited to ask questions of each other’s ideas during the ‘Clarification’ phase. One of the authors kept notes and grouped ideas as they were expressed, and this grouping was also checked in the ‘Clarification’ stage. Participants were then asked to rank ideas according to what they considered most important and highest priority to be included in a nutrition support resource. Ranking was completed using Mentimeter.com (Mentimeter AB, Stockholm, Sweden) which enabled anonymous voting. The results were presented to all participants to start the ‘Discussion’ phase, but included only the top three ranked ideas, to then reach consensus for each nominal question. To help us develop consensus statements from the discussion, the recordings were listened to, transcribed and thematic content analysis completed.

#### Data analysis

We produced two sets of data; the results of the nominal group process including the voting and prioritisation, and recordings of the discussion of these findings held at subsequent meetings. The first was the series of ideas, ideas grouping and ranking results for each question. The second was a series of discussions to clarify the prioritised ideas and to reach consensus statements based on these. This data was analysed concurrently to data collection. The set of ideas described in ‘Round Robin’ stages were transcribed independently by two researchers (MH, YATH) and one team member (YATH) transcribed and thematically analysed the final discussions.

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Votes were quantitatively analysed according to McMillan <sup>[9,15]</sup> and Foth <sup>[16]</sup>; we found relative homogeneity in our patient and professional groups, who were asked similar questions but from different perspectives. To reach a consensus and following other authors <sup>[9,16,17]</sup>, we selected the top three ranked ideas to prompt discussions. These discussions enabled the formulation of consensus statements and then thematic analysis, using content analysis <sup>[18,19]</sup>, of the discussion recording enabled refinement to articulate the final consensus statements (see figure 1). The data analysis was iterative and informed the questions asked to both panels; the analysis slightly modified the questions after each panel and before the next. An example of this was a recurring theme within the patient panel; the lack of consistency of advice provided by healthcare professionals. After this analysis, a question was developed by the research team to ask the professional panel how they thought consistency in the advice could be achieved. In this way, the patient meetings informed what we asked to professionals and vice versa.

## Results

### Description of participants and panel meetings

Table 2 shows the characteristics of each panel. Of the 13 patients invited, three withdrew due to illness. Although efforts were made to recruit participants from high-risk groups (e.g. older, male, multiple morbidity and BAME) and carers as well as patients, our patient panel was relatively homogenous. Most were female, white British, contracted COVID-19 at the start of the pandemic, were highly educated, and middle aged. All patients had long COVID. This does not wholly represent those documented to suffer most severely with COVID, which are males, those with co-morbidities and older adults. Nevertheless, more recent evidence suggests that females are more likely to develop long COVID health issues <sup>[20]</sup>.

Of the 18 professionals invited, five withdrew due to competing commitments. This panel was professionally diverse with eight professional groups represented. We were

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unable, although we tried repeatedly, to get a general practitioner or physiotherapist, probably due to extreme work pressures at the time. We therefore, included additional dietitians, who had an obvious interest and expertise in the provision of nutritional care, to join the panel. Three panel members also had suffered COVID-19 infection and so had a patient perspective as well. The professionals were involved in caring for COVID-19 patients either directly, managing a service, researcher or involved in professional body response to the pandemic.

Panel meetings were held online between December 2020 and March 2021. Two professional panels were held first, then two patient panels, followed by a final professional and final patient panel. Our strategy to enable ‘Silent Generation’ by sending information before the meeting proved beneficial with various participants supporting this approach. Participants were given the chance to ask questions briefly at the start of each meeting to clarify any of the content before ‘Silent Generation’ commenced.

#### Selection of final consensus statements

We held a total of three virtual meetings per expert group, using the same methodology. These lasted between 90-150 minutes, enabling between one and three NGT cycles to be completed in each meeting. Each meeting was facilitated by one author, with two or more others observing and taking notes. The details of the questions discussed at each meeting and the ideas produced are shown in table A (supplementary information). Table 3 shows the final top ranked ideas from the final ranking exercise in each meeting. The purpose of the consensus process was to explore what resource could support the nutritional care of individuals with COVID-19 infection. These results shaped the creation and development of the Nutrition and COVID-19 Recovery Knowledge Hub.

## Discussion

At the start of the COVID-19 pandemic in the summer of 2020 little was known about the nutritional consequences of COVID-19. Nevertheless, many expert groups issued guidance and it was widely accepted that the risk of malnutrition was increased in many groups. This project attempts to draw together the evidence and advice available regarding COVID-19 and nutrition, by focussing on what was important to patients and professionals. As the project progressed post-covid syndrome or long covid emerged, and with the passage of time the scale and severity of this after effect has become apparent. The emergence of long-covid influenced the development of this project and the types of the information people wanted.

NGT has been followed under “normal” circumstances by researchers trying to identify priorities to manage certain population groups<sup>[17]</sup>, develop evidence-based guidelines for disease treatment<sup>[5]</sup>, selecting key attributes for a drug therapy<sup>[8]</sup>, to name a few examples. These studies have highlighted some limitations, such as obtaining a broad number of ideas, agreeing on controversial topics<sup>[17]</sup> and ranked priorities becoming obsolete<sup>[5]</sup>. Despite these limitations and as noted also by these authors, NGT was selected for the present study as a feasible, transparent, systematic, egalitarian and rapid method to obtain and rank ideas and opinions from a range of people about a number of issues which need a tailored approach and democratic decisions.

The adapted consensus process described here enabled professionals and patients to convene safely online and for the development of consensus statements to guide the development of a Nutrition and Covid-19 Recovery Knowledge Hub. The first stage of the NGT is to bring together the relevant information. In this situation there was little available due to the novel nature of the virus. We therefore also explored relevant information from other infectious diseases (e.g. Pneumonia). The rapid review<sup>[11]</sup> found a proliferation of guidelines for acute care but relatively limited information for

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community care. We also surveyed <sup>[12]</sup> the dietetic profession to understand what actions were being taken to support nutrition, and what the requirements were in practice. This focused our recruitment strategy on community and primary care healthcare professionals who were dealing with cases who remained at home or had continued symptoms after overcoming the acute phase. We also realised that many support groups were established for patients and those who responded were those suffering from long COVID.

The adapted process for NGT had the potential to enable a wide range of professionals and patients to join the research process. This will prove a major advantage in the future to bring much more disparate groups together, including those whose symptoms, geographic location, work pressures or economic situation would otherwise prevent or dissuade them from joining such a consensus process. This advantage is limited to those with the knowledge and confidence to use the available technology for this purpose. The pandemic has vastly increased the global population's awareness and abilities in this respect. Those without access to the available technology would continue to be excluded from online processes described here.

Data analysis is an iterative process and we observed how our original ideas evolved when presented to the two panels. The key finding from professional experts was that they agreed with the idea of developing a resource that benefits and supports them in advising and or signposting patients to nutrition and dietary resources. They also agreed it needed to be highly accessible, flexible, adaptable and based on the latest research and policy. Realistically this nutrition advice and information would be applied by non-nutrition expert health and social care workers in primary care, charities and care homes, including registered staff and support workers. Therefore, the consensus was that a toolbox with different approaches according to the patient was going to be the most effective resource to map out nutritional support.

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A key finding from the patient panel was that a large volume of misleading information on nutrition and diet was available and help was needed to find reliable trustworthy information. This further supported the idea of a flexible adaptable repository of quality information which could be accessed freely. Patients also agreed that accessing care for post-covid syndrome was challenging and the nutritional expertise of the healthcare professionals was frequently limited. Thus, the two panels achieved consensus on the type of resource required; a flexible offering which could support the needs of patients with widely differing symptoms and disease patterns, that was reliable and contained the best available evidence, and which support healthcare professionals to provide the right support.

We demonstrated the feasibility of using an adapted version of NGT to reach consensus rapidly, as well as to map out what information would be valuable for targeted audiences in the context of lockdowns. Our main research output (known as Nutrition and COVID-19 recovery knowledge hub) intends to be a source of evidence-based information for professionals working in the community or outpatients as well as patients. It is designed around the consensus statements derived from the panel discussions. This is a web-based resource freely available to meet the need for information.

The hub has been peer reviewed by both professionals and patients to enhance its acceptability and content. Patients and professionals completed a systematic review of the Hub content and structure using a questionnaire designed for the purpose. We targeted professionals who were unable to attend the panel meetings including general practitioners and physiotherapists. The research team also had critical discussions to amend sections before launching this hub and continues to implement a peer review process for new information. Six organisations endorsed the Hub demonstrating our processes met recognised standards.

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## Limitations

Our time and financial resources were constrained to the available funding and therefore limited; thus, coding and analysing was conducted by one researcher only. Patient recruitment was conducted mostly through electronic resources (email, social media) therefore we cannot say we included a representative sample of patients recovering from COVID-19. There were clear selection biases towards female gender, those suffering long covid, and those with high educational attainment and professional roles.

## Strengths

This project was a rapid response to an essential requirement during an unprecedented pandemic. We recruited a variety of health and care professionals with different roles and range of experiences to develop consensus statements and to review our final resource.

We used a systematic approach to review the evidence-base included in both the background information to our panels and our public Knowledge Hub.

NGT was selected given its flexibility to embrace a relatively new topic (drawing different ideas from different perspectives), combine steps, group ideas, varying numbers of participants, and it was the most time effective method to obtain rapid results. Other advantages are that group divergences or similarities can be compared, individual contributions are valued more than other methods<sup>[9]</sup> and it could be adapted to the pandemic context, where meetings were recommended to be held virtually. The NGT is an optimal method when there is a lack of a theoretical body of knowledge on a topic<sup>[7]</sup>, which is the case for the COVID-19 infection. Finally, we conducted an adapted version of the technique rigorously and in a transparent way.

## Conclusion

Following a robust methodology and systematic approach, we successfully applied nominal group technique to obtain consensus statements to guide optimal nutritional

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support for both healthcare professionals who care for COVID-19 sufferers in the recovery stage, and COVID-19 patients themselves.

#### Author contributions

AJ, EW, GF, JM and MH conceived the research idea and methods. AJ, EW, JM, MH and YATH participated at various moments and with different roles during the data collection process. YATH and MH followed all the data analysis process. YATH wrote the first draft and all authors provided comments. All authors reviewed and agreed the final manuscript.

#### References

1. Pavli A, Theodoridou M, Maltezou H. Post-COVID Syndrome: Incidence, Clinical Spectrum, and Challenges for Primary Healthcare Professionals - ScienceDirect [Internet]. 2021 [cited 2022 Mar 16]; Available from: [https://www.sciencedirect.com/science/article/pii/S0188440921000813?casa\\_token=Gz0CvyrRxuIAAAAA:OIX-ZMKT\\_28-ZucIWsV\\_id44ScxYCMRnqeenRRAerMsWYw3KqjEgyvkh0uSIdG-h0g50VOSWw](https://www.sciencedirect.com/science/article/pii/S0188440921000813?casa_token=Gz0CvyrRxuIAAAAA:OIX-ZMKT_28-ZucIWsV_id44ScxYCMRnqeenRRAerMsWYw3KqjEgyvkh0uSIdG-h0g50VOSWw)
2. Butler MJ, Barrientos RM. The impact of nutrition on COVID-19 susceptibility and long-term consequences. *Brain, Behavior, and Immunity* 2020;87:53–4.
3. Davis HE, Assaf GS, McCorkell L, Wei H, Low RJ, Re'em Y, et al. Characterizing Long COVID in an International Cohort: 7 Months of Symptoms and Their Impact. *medRxiv* 2021;2020.12.24.20248802.
4. Zabetakis I, Lordan R, Norton C, Tsoupras A. COVID-19: The Inflammation Link and the Role of Nutrition in Potential Mitigation. *Nutrients* 2020;12(5):1466.
5. Bond CM. The development of evidence-based guidelines for over-the-counter treatment of vulvovaginal candidiasis. :5.
6. Tully M, Cantrill J. Exploring the domains of appropriateness of drug therapy, using the Nominal Group Technique. 2002;24(4):4.
7. Bissell P, Ward PR, Noyce PR. Appropriateness measurement: application to advice-giving in community pharmacies. *Social Science & Medicine* 2000;51(3):343–59.
8. Hilgsmann M, van Durme, Geusens P, Dellaert, Dirksen, van der Weijden T, et al. Nominal group technique to select attributes for discrete choice experiments: an example for drug treatment choice in osteoporosis. *PPA* 2013;133.
9. McMillan SS, King M, Tully MP. How to use the nominal group and Delphi techniques. *Int J Clin Pharm* [Internet] 2016 [cited 2020 Nov 12]; Available from: <http://link.springer.com/10.1007/s11096-016-0257-x>

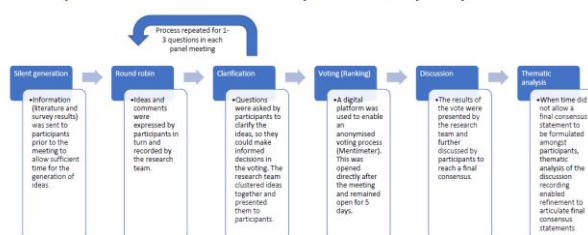
This article is protected by copyright. All rights reserved.



10. Delbecq A, Van de Ven A, Gustafson D. Group Techniques for Program Planning: A Guide to Nominal Groups and Delphi Process [Internet]. 2004 [cited 2022 Mar 16]; Available from: <https://sites.google.com/a/umn.edu/avandeven/publications/books/group-techniques-for-program-planning>
11. Latif J, Elizabeth Weekes C, Julian A, Frost G, Murphy J, Abigail Tronco-Hernandez Y, et al. Strategies to ensure continuity of nutritional care in patients with COVID-19 infection on discharge from hospital: a rapid review. *Clinical Nutrition ESPEN* [Internet] 2021 [cited 2021 Dec 1]; Available from: <https://www.sciencedirect.com/science/article/pii/S2405457721011244>
12. Lawrence V, Murphy J, Hickson M, Weekes CE, Julian A, Frost G. A UK survey of nutritional care pathways for patients with COVID-19 prior to and post-hospital stay. *J Hum Nutr Diet* 2021;34(4):660–9.
13. Lawrence V, Hickson M, Weekes E, Julian A, Frost G, Murphy J. A UK survey of nutritional care pathways for Covid-19 patients post hospital stay. *Journal of Human Nutrition and Dietetics* submitted.
14. Lawrence J. Model and process for nutrition and dietetic practice [Internet]. In: *Dietetic and Nutrition Case Studies*. John Wiley & Sons, Ltd; 2016 [cited 2021 Dec 1]. page 1–7. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119163411.ch1>
15. McMillan SS, Kelly F, Sav A, Kendall E, King MA, Whitty JA, et al. Using the Nominal Group Technique: how to analyse across multiple groups. *Health Serv Outcomes Res Method* 2014;14(3):92–108.
16. Foth T, Efstathiou N, Vanderspank-Wright B, Ufholz LA, Dütthorn N, Zimansky M, et al. The use of Delphi and Nominal Group Technique in nursing education: A review. *International Journal of Nursing Studies* 2016;60:112–20.
17. Drennan V, Walters K, Lenihan P, Cohen S, Myerson S, Iliffe S, et al. Priorities in identifying unmet need in older people attending general practice: a nominal group technique study. *Fam Pract* 2007;24(5):454–60.
18. Hsieh HF, Shannon SE. Three Approaches to Qualitative Content Analysis. *Qual Health Res* 2005;15(9):1277–88.
19. Clarke V, Braun V. Thematic analysis. *The Journal of Positive Psychology* 2017;12(3):297–8.
20. Gausman J, Langer A. Sex and Gender Disparities in the COVID-19 Pandemic. *Journal of Women’s Health* 2020;29(4):465–6.

Figure 1 Adapted Nominal Group Technique process

## Adapted Nominal Group Technique process



## Tables

TABLE 1. Inclusion and exclusion criteria for sitting on the expert panels required for the nominal group technique.

	Professionals	Patients
Inclusion criteria	<ul style="list-style-type: none"> <li>• Direct contact with patients recovering from COVID-19 or involved in the coordination of care for these patients</li> <li>• Belonged to a specialist or stakeholder group (e.g. BDA)</li> <li>• Availability for more than one virtual meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Had suffered COVID-19 infection or had cared for such a person</li> <li>• Symptoms started more than four weeks before the first panel (recovery phase)</li> <li>• Availability for more than one virtual meeting</li> </ul>
Exclusion criteria	<ul style="list-style-type: none"> <li>• When current experience was not directly with patients or was not involved in the recovery stage</li> <li>• Unavailable for meetings during months of December to March</li> </ul>	<ul style="list-style-type: none"> <li>• No access (by their own report) to an electronic device supporting online meetings and/or an unstable internet connection</li> <li>• Contracted the infection less than four weeks before the first meeting to prevent over burden people with a serious illness</li> </ul>

Table 2: The composition of the panels

Demographic	
<b>Patient Panel</b>	
Total number	10
Gender: F:M	8:2
Age range (years)	30-59
BAME (number)	2
Level of education	
College	1
University	4
Postgraduate	5
Carers or patients	2:8
Onset of COVID-19 Symptoms (earliest to latest)	February 2020 - April 2020
State financial support pre-pandemic*	1
<b>Professionals</b>	
Total number	13
Gender: F:M	12:1
Area of work <sup>&amp;</sup> :	
Academic	2
Acute	4
Community	7
Charity/patient advocate	2
Profession or health sector	
Nutrition and dietetics <sup>§</sup>	5
Nursing (representing BAPEN and RCN)	1
Occupational therapy	1
Speech and language therapy	1
Pharmacy	1
Psychology	1
Social care <sup>^</sup>	2
Patient representative <sup>%</sup>	1

\*housing benefit, pension credit, universal credit, etc. <sup>&</sup>Some participants had dual roles hence these numbers add up is higher than 13 <sup>§</sup>Leading the management of COVID-19 patients, prescribing support and older adults, representative of BDA, Nutrition support and other acute specialities, private practice including community and hospice care settings. <sup>^</sup>Food provision charity and care home representative.

<sup>%</sup>Had sat on panels as a patient representative for NICE, MRC, NIHR, UKRI

Table 3: The final questions asked to the panels to rank and their top ranked responses.

PROFESSIONAL PANEL		PATIENT PANEL	
Question	TOP ranked responses	Question	TOP ranked responses
<b>Select 3 ideas that you think are most clinically impactful and useful to include as part of the design of the pathway of Nutritional care</b>	<ol style="list-style-type: none"> <li>1. Outcomes should be patient-centred and holistic (more than just nutritional outcomes)</li> <li>2. Person-centred nutritional care (not just malnutrition risk)</li> <li>3. Self screening and Self assessment of nutritional risk and swallowing, (e.g. EAT-10)</li> </ol>	<b>Please prioritise and rank the following items regarding aspects of care related to Nutrition for COVID-19 recovery</b>	<ol style="list-style-type: none"> <li>1. Focus on finding and addressing underlying mechanisms (causes) instead of addressing symptoms</li> <li>2. Use a comprehensive battery of tests and methods (not only routine or traditional) to screen and assess symptoms that are linked to nutrition and diet</li> <li>3. Keep a record or (a user friendly) app focused on tracking symptoms' fluctuations (hourly or daily) to reach a decision on how to address them</li> </ol>
<b>Select 3 ideas that you think are most clinically impactful and useful to include as part of the implementation of the pathway of Nutritional care</b>	<ol style="list-style-type: none"> <li>1. Whole systems approach - role of champions in care homes and other settings</li> <li>2. Support to enable social care and the voluntary sector to deliver nutritional care</li> <li>3. Pathway implementation should incorporate best practice and evidence</li> </ol>	<b>Please prioritise and rank the following items regarding barriers for nutritional support in COVID-19 recovery</b>	<ol style="list-style-type: none"> <li>1. Health Practitioners offer contradictory and inconsistent advice and only a few advocate for patient care and referral</li> <li>2. There is little or no follow up to issues, tests, types of treatments (i.e. diets) and a symptomatic (and one at a time) approach</li> <li>3. Access to post (long) COVID clinics and virtual support is still limited</li> <li>4. Addressing your mental health concerns should be considered and linked to long COVID rather than treated as symptom and dismissing patients</li> </ol>
		<b>Please prioritise and rank the following items</b>	<ol style="list-style-type: none"> <li>1. All HCPs, particularly those seeing long COVID</li> </ol>

		<b>regarding strategies and enablers to nutritional support in COVID-19 recovery</b>	<p>patients, must apply national protocols, clear pathways and NICE guidelines, in a coordinated way</p> <p>2. To provide patients with reputable information on pathways, and advice to request and raise concerns with HCPs to delineate tailored health goals</p> <p>3. HCPs must be trained in nutrition and diet as preventive, treatment and complementary strategies</p> <p>4. All HCPs should be patient advocates and recognise a more holistic approach, including nutrition as foundation</p>
<b>What are the gaps where nutrition is relevant and how to address it?</b>	<ol style="list-style-type: none"> <li>1. A ‘pick and mix’ of practical advice for patients, carers, health &amp; support staff, e.g. support toolbox based on symptoms, situation, barriers etc.</li> <li>2. Joint problem-solving multi-professional discussions to direct decisions about nutritional requirements &amp; include cultural &amp; religious preferences</li> <li>3. HCPs and others (Age UK, social prescribers etc) to know what access they, patients and carers, have to signpost rather than relying on GPs</li> <li>4. Create a symptom-based, patient-led assessment, for HCPs</li> </ol>	<b>Please prioritise and rank the following items regarding issues to address for the resource to support nutritional care for COVID-19 recovery</b>	<ol style="list-style-type: none"> <li>1. To receive a more consistent health service for long COVID and nutrition than that currently offered.</li> <li>2. Explain the importance and frequency to assess vitamin levels and more support in monitoring this.</li> <li>3. Joint healthcare and make sure everything is registered in medical records.</li> <li>4. Follow myalgic encephalomyelitis (ME) guidelines and expertise, particularly for exercise and nutrition.</li> </ol>

	& non-HCPs, & resources to overcome nutritional issues & most individual bothersome symptoms		
<b>Essential questions from first HCP contact</b>	<ol style="list-style-type: none"> <li>1. Assess current food intake and ability to manage diet: <ul style="list-style-type: none"> <li>• Appetite and interest in eating</li> <li>• Actual food consumption</li> <li>• Taste changes and distortion</li> <li>• Use of nutritional supplements</li> <li>• Recipes for all kinds of situations (cannot cook, will not cook, etc)</li> <li>• Food accessibility</li> <li>• General challenges for eating and drinking</li> <li>• Previous underlying conditions affecting COVID-19 recovery</li> <li>• Current dietary and nutrition knowledge and preferences</li> <li>• Identifying poor nutrition and offer to add nutritional value to their current diets</li> </ul> </li> <li>2. Assessment of living situation. Do they have appropriate support for their</li> </ol>	<b>Rank these ideas according to what you think is the most important to offer consistent dietary advice</b>	<ol style="list-style-type: none"> <li>1. Consistent advice based on symptoms and diagnoses; empowering patients to know how to adjust diet in response to symptoms so patients can respond consistently</li> <li>2. Holistic patient centred approach, with a multi-disciplinary professional input.</li> <li>3. Consistency of messaging from HCP and operating in a consistent way (blood tests, frequency of monitoring etc)</li> </ol>

<p><b>How to ensure follow up with patients</b></p>	<p>nutritional care?</p> <ol style="list-style-type: none"> <li>1. Assess patients' abilities as well as expectations from health services</li> <li>2. By empowering and/or delegating social prescribers, dietetics assistant, healthcare workers, volunteers with knowledge that can work for patients' benefit</li> <li>3. Transferring some responsibility to pharmacy</li> <li>4. Signpost to support groups in the community or community organisations</li> <li>5. Tele health for some. Phone and video calls short but frequent to see how they get on</li> <li>6. To explicitly say what services can support them</li> <li>7. Patient to be able to re-refer themselves into a service</li> <li>8. Consider the key role of family to help keeping a symptom calendar or diary</li> <li>9. Use social media channels and apps (to provide prompts and friendly triggers across their recovery journey)</li> </ol>	<p><b>Select two topics that you think are most important to cover in a potential Q&amp;A session to dispel myths around nutrition and diet related to COVID-19</b></p>	<ol style="list-style-type: none"> <li>1. How can I decrease inflammatory reactions in my body through diet? Is it even possible?</li> <li>2. How can I link my diet with my symptoms and body reactions? (Tracking without obsessing)</li> <li>3. Key vitamins and how can we increase our levels?</li> </ol>
<p><b>Operational needs and care provision improved</b></p>	<ol style="list-style-type: none"> <li>1. Tiered approach according to risk assessment or screening?</li> <li>2. Review cycle</li> <li>3. Adapting</li> </ol>	<p><b>What would you have liked to be asked (by healthcare staff) regarding nutrition and diet</b></p>	<ol style="list-style-type: none"> <li>1. Healthcare practitioners to consider diet as influencing factor for COVID-19 recovery regardless of specialty</li> </ol>

	<p>resources for people with learning disabilities</p> <ol style="list-style-type: none"><li>4. Listening to patient desires and concerns, do not neglect due to age</li><li>5. Making time and show interest</li><li>6. Be mindful of cultural aspects of language and English diets</li><li>7. Assigned clear responsibility for follow up</li><li>8. Avoid medical jargon</li><li>9. Everything in partnership with patients</li></ol>	<b>for your COVID-19 recovery</b>	<ol style="list-style-type: none"><li>2. To ask about nutrition related symptoms (e.g. digestive symptoms) regardless of whether this is shown in tests</li><li>3. Conversations about what steps to take given symptoms and about nutritional care</li></ol>
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