

Patient and carer perspectives on the use of video consultations in the management of the ketogenic diet for epilepsy

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Author contributions

VBHB drafted the survey and all authors contributed to the design and finalisation of the survey questions. VBHB led on recruitment and analysed the data. The original draft was prepared by VBHB. All authors provided critical revision of the draft and approved the final version of the manuscript submitted for publication.

Abstract

Background: The COVID-19 pandemic resulted in a significant change in the way healthcare was delivered worldwide. During this time, a survey of Ketogenic Dietitians

Research Network (KDRN) members found that all respondents expected digital platforms for clinics and/or education to continue post-pandemic. As a follow up to this, we surveyed views about video consultations (VCs) of patients and carers of those following the ketogenic diet for drug-resistant epilepsy.

Methods: The SurveyMonkey™ survey was distributed on Matthews' Friends and KDRN social media platforms and emailed from five United Kingdom ketogenic diet centers to their patients/carers.

Results: Forty eligible responses were received. More than half of respondents (23, 57.5%) had attended a VC. Eighteen respondents (45%) would like to have VCs for most (categorised as approximately 75%) or all of their consultations. Half as many (9, 22.5%) would not any like video consultations. The most common benefits selected were saving travel time (32, 80%), less stress of finding somewhere to park and not having to take time off work (22, 55% each). Twelve (30%) responded that VCs lessened environmental impact. The most common disadvantages selected were not being able to get blood tests/having to make a separate consultation for blood tests (22, 55% overall), not being able to get weight or height checked/having to make a separate consultation for this and it being less personal/preferring face-to-face (17, 42.5% each). Three quarters (30 respondents) felt it would be very easy or easy to accurately weigh the patient when not attending an in-person consultation.

Conclusion: Our results suggest that many patients and carers would welcome the option of VCs as well as face-to-face consultations. Where possible and appropriate patients and their families should be offered both options. This is in line with the NHS Long Term Plan and the NHS response to climate change.

Keywords

Ketogenic diet
Drug-resistant epilepsy
COVID-19 Pandemic
Telemedicine
Telehealth
Patient experience

Abbreviations

KDT Ketogenic Diet Therapy
KDRN Ketogenic Dietitians Research Network
VC Video Consultation

1. Introduction

Ketogenic diet therapy (KDT) is a treatment option for children with drug-resistant epilepsy and the recommended treatment strategy for specific neurometabolic disorders [1]. The 2020 Cochrane review [2] found that children following a KDT are up to three times more likely to achieve seizure freedom and up to six times more likely to experience a 50% or

greater reduction in seizure frequency at 3-4 months compared to children given usual care. Adults following a KDT may be up to five times more likely to experience a 50% or greater reduction in seizure frequency compared to usual care [2]. There are 4 main types of KDTs, but all involve following a high fat and low carbohydrate diet. These are: (a) the classical ketogenic diet, where meals are set at a ratio of grammes of fat to the combination of protein and carbohydrate, e.g. 3:1 ratio, and all foods need to be weighed accurately; (b) modified ketogenic diet (MKD) or modified Atkins diet, where protein is more freely allowed but fat and carbohydrate intakes remain measured and weighed; (c) medium chain triglycerides (MCT) diet which uses up to 45% MCTs because MCTs produce more ketones than long chain triglycerides, and can enable a slightly higher carbohydrate allowance; (d) low glycaemic index diet where a slightly higher carbohydrate content is allowed (up to 50g) but all carbohydrates must have a glycaemic index below 50. In 2017, 754 patients were following a KDT in the UK and Ireland and 276 were on a waiting list for the diet [3], a 7-fold increase since 2000. The most used KDT was the classical ketogenic diet [3].

During the COVID-19 pandemic, there was an initial lockdown of the UK from 23 March 2020 to 15 June 2020, followed by various degrees of local lockdowns. Hospitals remained open throughout the pandemic, and, in some areas, there was redeployment of staff to support the acute requirements of the pandemic. Many outpatient services limited or stopped face-to-face clinics and many staff worked from home in an unprecedented response from hospital trust Information Technology departments and NHS Digital. NHS Digital enabled the deployment and supported the implementation of outpatient video consultation capabilities in 183 trusts and the deployment of Microsoft Teams to 1.2 million users across health and social care [4]. According to preliminary data, during the initial seven weeks of the COVID-19 lockdown in April and May 2020, there were 1.9 million remote outpatient consultations in England, representing 46% of all consultations [5].

Telemedicine is the broad term describing the use of telecommunication technology to provide a remote exchange of health information and includes (but is not limited to) VCs. A tertiary care paediatric epilepsy center in Argentina has had a telemedicine paediatric epilepsy program since 2013 [6]. Prior to the COVID-19 pandemic, two secondary-care paediatric KDT centers in Argentina [7] with patient populations with limited financial resources introduced the use of WhatsApp text messaging and video calling to improve support for parents. Centers in Italy had evaluated the use of email communication [8] and other centers had been developing different telemedicine applications, including a prototype Italian web-based and smartphone application for training and remotely monitoring patients [9], an Italian mobile app [10] for recipe creation and recording a variety of information including ketone levels, number of seizures and weight, and web-based information resources [10].

During the COVID-19 pandemic Armeno et al [6] used the experience of their telemedicine paediatric epilepsy program to adapt their paediatric KDT service to enable initiation and follow-up of the classical KDT at home, using Zoom, email, WhatsApp and telephone. Semprino et al continued to use WhatsApp [7], and KDT centers in the USA [11] and Italy [12] increased use of video and telephone consultations compared with pre-pandemic. This was also the finding of a survey of members of the Ketogenic Dietitians Research Network (KDRN) regarding the impact of the pandemic on their KDT services (unpublished data). Use of VCs increased from 22% pre-lockdown to 79% during the pandemic and only 16% did not expect to use any VCs post-pandemic. Conversely, face-to-face consultations reduced

during the initial lockdown and only 16% of respondents continued to use them as often as pre-pandemic. Eighty nine percent were already using telephone consultations but use increased at the time of the survey and 37% were using these to a greater extent than pre-pandemic. Thinking ahead to post pandemic compared with pre-lockdown, 68% expected to use VCs to a greater extent, 21% to use telephone consultations to a greater extent and 63% to use face-to-face to a lesser extent.

Dietitians noted some challenges and benefits associated with alternatives to face-to-face consultations. Obtaining ketogenic monitoring tests was the biggest challenge, cited by 95% of respondents, including delays and cancellations, difficulty accessing results if tests were carried out more locally to the patient and parents not wanting to attend for tests. Sixty eight percent were concerned about obtaining accurate weights and heights with more families relying on home measurements. One third felt there could be issues related to families accessing technology or digital literacy. However, respondents felt that VCs were useful for families who lived long distances from the center and that they had been able to provide useful live or recorded education videos or for not just parents but also schools, respite centers and for cookery demonstrations. All felt that virtual clinics and/or education sessions would be likely to continue after the pandemic.

As the views of patients and carers had not been captured with the earlier survey, we aimed to explore their views with an additional survey. In particular we were interested in the availability of and level of comfort with relevant technologies, with our main interest in VCs including how frequently they would like to have VCs in future, and what advantages and disadvantages they felt VCs had compared with face-to-face appointments.

2. Methods

2.1 Study design overview

Patients and carers of children, young people and adults in the UK following a KDT were invited to participate anonymously in an online survey seeking their views on use of VCs.

2.2 Survey instrument

An online survey was designed by the working group of the KDRN and approved by the Questionnaire Interview and Survey Group of the lead author's Trust for distribution using SurveyMonkey™ (Supplementary File).

The survey was adapted from a pre-existing one that had been used in the Trust of the lead author to collect patient views on video appointments in general during the COVID-19 pandemic. Further questions and options specific to KDT services and the aims of the survey were added. The 16 questions were a mixture of open and closed questions, including Likert scales. The first question was multiple choice and asked who was completing the survey (the patient on KDT, their carer or both together). Closed questions with multiple choice options were used to collect demographic information regarding the person completing the survey (age range, race or ethnicity, highest level of education achieved) and an open question asked for the center attended for management of KDT. Multiple choice questions collected responses regarding access to hardware (including broadband connection) used in telemedicine, whether the respondent had attended a VC, whether they received enough information beforehand, how frequently they would like VCs

in future care and the advantages and disadvantages of VCs. Some of these questions included a free text option for additional responses or comments. Likert scales enabled respondents to indicate how comfortable they felt using different types of telemedicine software, how easy it had been to access different systems and types of telemedicine applications, and how easy or difficult it would be for the person on the KDT to be weighed if not attending an in person appointment. The final question was open and requested feedback on their KDT service during or since the COVID-19 pandemic.

2.3 Participants and recruitment

All members of the KDRN were invited to distribute the survey to patients at their KDT center. Six centers expressed interest and five of these participated by emailing 175 of 188 patients with information about the study, its aim and purpose, and a link and QR code to the survey. A reminder was sent to the patients of one center. The survey was not sent to those who did not read English or who had not agreed to receive email correspondence from the dietitians. The survey link and QR code were shared on the KDRN Twitter page and Matthew's Friends, a UK charity that supports families following a KDT, via their social media platforms. Distribution took place between December 2021 and March 2022.

Respondents had to be based in the UK and either the respondent or the person under the care of the respondent had to be following a KDT for the treatment of drug-resistant epilepsy or metabolic condition where a KDT is a recognised treatment. There were no instructions advising which should complete the survey and they were not asked about the specific diagnosis of the person on KDT, or the type or duration of KDT. In the case of completion by the patient and caregiver jointly, the responses to the demographic questions were requested for whoever would normally speak with the team during appointments.

Participants were excluded if they attended centers outside the UK or ceased responding from the question regarding preference for mode of consultation in the future.

2.4 Statistical Analysis

Descriptive statistics were used to analyse the results of the survey and report on the demographic characteristics of the sample.

2.5 Additional data collection

After the survey had been distributed, the 5 participating centers were contacted about their use of video calls and face-to-face consultations at that time, and which was the most common type of ketogenic diet used in their center.

3. Results

3.1 Item responses

Fifty four people started the online survey. Ten did not complete it and 4 were from outside the UK. This left 40 responses included in the analysis. The majority of responses (31, 77.5%) were from those who identified their center as one of the five participating centers,

giving a mean response rate from respondents attending these centers of 17.7% (range for individual centers 12.1-40%). The overall response rate was approximately 5% [3].

Table 1 describes the demographic characteristics of the respondents. Thirty four (85%) described themselves as the carer. The majority (34, 85%) were aged between 35 and 54 years and most (46, 90%) described themselves as White. Fifty percent (20) were educated to degree level and a further 25% (10) to post-graduate level. The age of the person following the ketogenic diet was not collected but it is assumed that the majority were children based on the name of the hospital they attended (data not shown).

Table 1 Demographic characteristics of participants (n=40)

Participant characteristics	n (%)
<i>Survey completed by</i>	
Patient	5 (12.5)
Carer	34 (85)
Both together	1 (2.5)
<i>Age range of participant</i>	
25-34 years	1 (2.5)
35-44 years	19 (47.5)
45-54 years	15 (37.5)
55-64 years	4 (10)
Prefer not to say	1 (2.5)
<i>Ethnicity</i>	
Asian / British Asian	1 (2.5)
Black / British Black	1 (2.5)
Mixed	1 (2.5)
White	36 (90)
Prefer not to say	1 (2.5)
<i>Highest level of education of participant</i>	
GCSEs or equivalent	4 (10)
A levels or equivalent	5 (12.5)
Degree level	20 (50)
Post graduate level	10 (25)
None of the above	1 (2.5)

3.2 Availability of and experiences with technology

More than half of respondents (23, 57.5%) had attended a VC and all but one of them felt they had received enough information on how to use the system (Table 2). Only one respondent did not have access to a home broadband connection and the majority had access to a computer (34, 85%), a smartphone (39, 97.5%) or a tablet device (37, 92.5%). The majority of respondents were comfortable or very comfortable with using mobile phone applications (37, 92.5%), video software (30, 75%) or online chat services (29, 72.5%). However, a sizeable proportion reported difficulties accessing a reliable mobile phone signal (15, 37.5%), email (14, 35%) or VC system, (12, 30%).

Table 2 Availability of and experiences with technology (n=40)

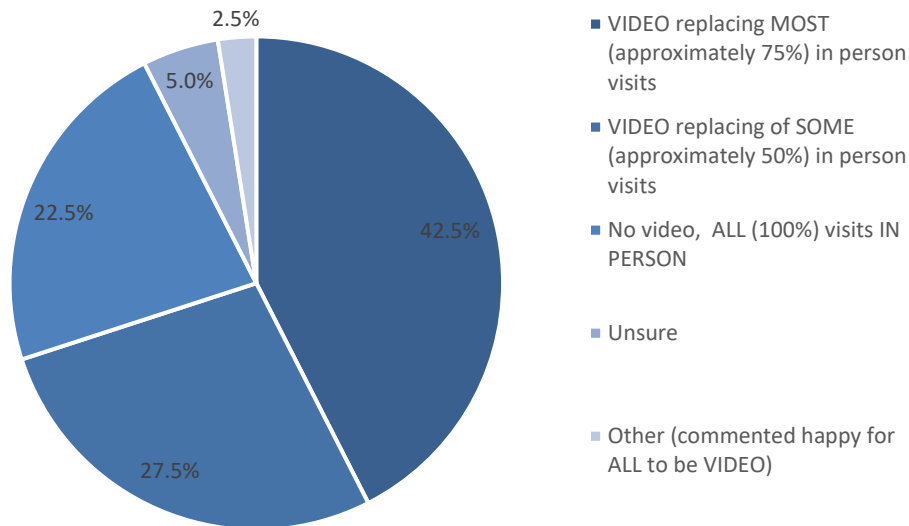
Question	Answer options	n (%)
<i>Have you ever had a video appointment with your ketogenic dietetic team, or medical team with a ketogenic dietitian present?</i>	Yes	23 (57.5)
	No	17 (42.5)
<i>Before your first video appointment, did you get enough information on how to use the video appointment system?</i>	Yes, definitely	19 (47.5)
	Yes, to some extent	3 (7.5)
	Not known	1 (2.5)
	Not applicable	17 (42.5)
<i>Do you have access to the following?</i>	A home broadband connection	39 (97.5)
	A computer	34 (85)
	A smartphone	39 (97.5)
	Tablet device	37 (92.5)
	All four technologies	32 (80)
	Broadband, computer, smartphone	1 (2.5)
	Broadband, smartphone, tablet	4 (10)
	Broadband, smartphone	1 (2.5)
	Broadband, tablet	1 (2.5)
Computer, smartphone	1 (2.5)	
<i>How comfortable are you with using the following technologies?</i>	(a) Mobile phone applications	
	Not at all comfortable 1	1 (2.5)
	2	1 (2.5)
	3	1 (2.5)
	4	7 (17.5)
	Very comfortable 5	30 (75)
	(b) Video software	
	Not at all comfortable 1	1 (2.5)
	2	3 (7.5)
	3	6 (15)
	4	6 (15)
	Very comfortable 5	24 (60)
	(c) Online chat services	
Not at all comfortable 1	2 (5)	

		2	4 (10)
		3	4 (10)
		4	8 (20)
	Very comfortable	5	21 (52.5)
	No response		1 (2.5)
<i>How easy has it been for you to access and use these technologies?</i>			
	(a) Telephone with a reliable signal		
	Easy	1	23 (57.5)
		2	1 (2.5)
		3	1 (2.5)
		4	1 (2.5)
	Difficult	5	14 (35)
	(b) Email		
	Easy	1	25 (62.5)
		2	0
		3	1 (2.5)
		4	1 (2.5)
	Difficult	5	13 (32.5)
	(c) VC system		
	Easy	1	13 (32.5)
		2	5 (12.5)
		3	1 (2.5)
		4	2 (5)
	Difficult	5	10 (25)
	Not used		9 (22.5)
	(d) Tutorial videos		
	Easy	1	7 (17.5)
		2	4 (10)
		3	2 (5)
		4	1 (2.5)
	Difficult	5	4 (10)
	Not used		21 (52.5)
	No response		1 (2.5)
	(e) Virtual live group education session		
	Easy	1	8 (20)
		2	2 (5)
		3	2 (5)
		4	2 (5)
	Difficult	5	5 (12.5)
	Not used		20 (50)
	No response		1 (2.5)

3.3 Preference for future consultations

A minority of respondents (9, 22.5%) preferred all future consultations with the KDT team to be in person (Figure 1). Nearly half (18, 45%) would like to have VCs for most or all of their future consultations, and 11 (27.5%) would like to have video for some of them.

Figure 1 Preference for proportion of consultations with KDT team to be by video versus in person (n=40)

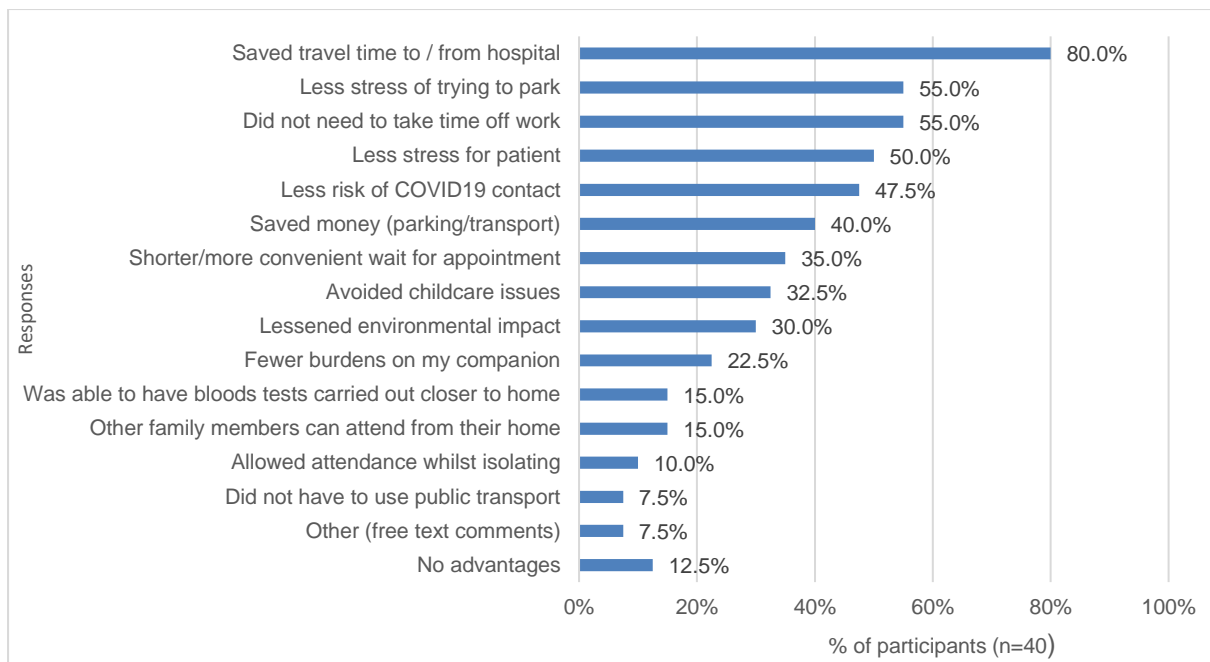


3.4 Benefits and disadvantages of VCs

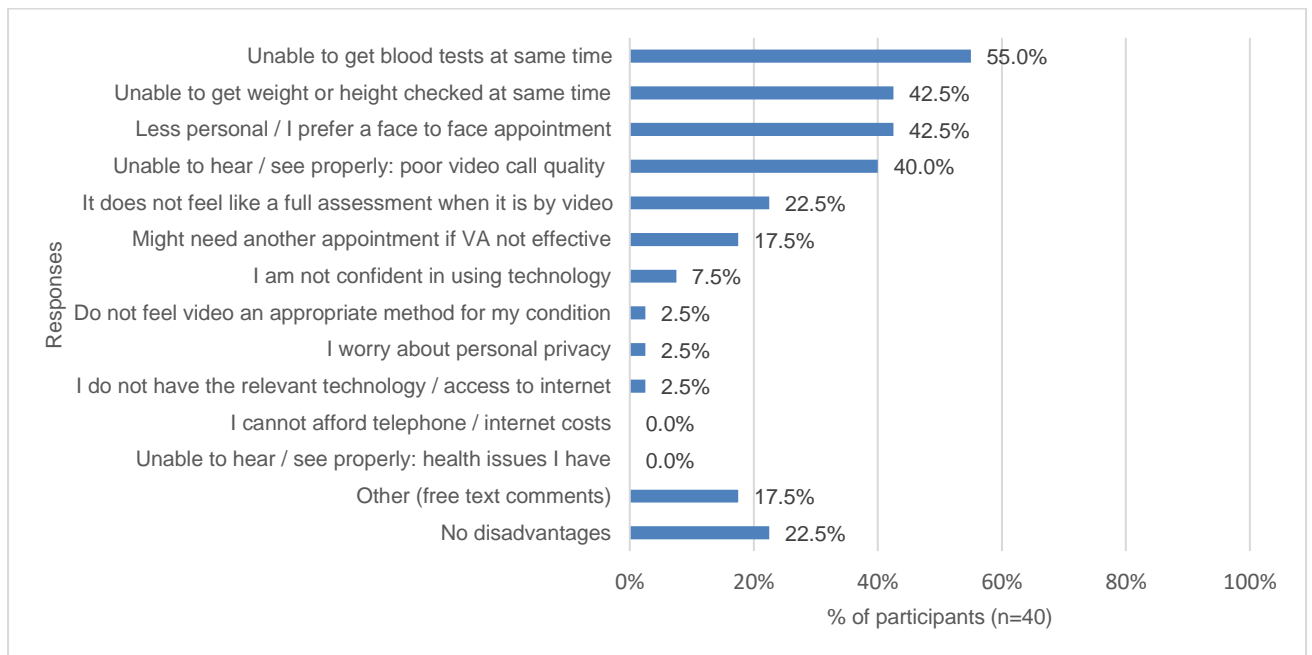
The most commonly reported potential advantages of VCs were saving travel time (32, 80%), less stress of finding somewhere to park (22, 55%) and not having to take time off work (22, 55%; Figure 2 (a)). However, the challenges associated with VCs included were not being able to get blood tests or having to make a separate appointment for blood tests (22, 55%; Figure 2 (b)), not being able to get weight or height checked or having to make a separate appointment for this (17, 42.5%) and it being less personal or their preference being for face-to-face (17, 42.5%).

Figure 2 (a) Advantages of VCs (b) Disadvantages of VCs (n=40)

(a)



(b)



Abbreviation: VA Video appointment

3.5 Use of video calls within KDT services

Two centers, both covering a large geographical area, used a mixture of face-to-face and VCs, particularly for those with long distances to travel. Two other centers were reserving

VCs for education and training sessions in the early stages of diet implementation but usually tried to co-ordinate appointments with the MDT, which were all face-to-face. The fifth center had not ruled out VCs but there had been no concerns or hesitations raised when patients were asked to attend face-to-face. They felt that if parents had declined a face-to-face consultation they would have facilitated a VC, but they were not actively offering the choice at that time.

3.6 Type of diet used within KDT services

The most commonly used KDT in four the participating centers was the classical diet, in line with the UK as a whole, but one of the centers used MKD most commonly in patients following an oral diet, and classical for those receiving nutrition via a feeding tube, with approximately half their patients feeding orally and half via feeding tube.

4. Discussion

As digital services were expected to be used by ketogenic dietitians post-COVID-19, this survey sought to explore how people in the UK view VCs. In general, patients and carers would like to access VCs for some of their future consultations, but a significant minority would prefer to continue with all face-to-face.

Armeno et al [6] also had a positive response to the use of alternatives to face to face appointments. Adapting their pre-existing telemedicine paediatric epilepsy program to contact families by Zoom, email, WhatsApp and telephone during the COVID-19 pandemic enabled the initiation at home and follow up of the classical KDT in children aged 1-18 years. Their observational study compared 18 patients in the telemedicine group with 19 following the conventional outpatient start (4 consecutive days in the hospital metabolic unit, contact by face-to-face visits, email and telephone). There were no significant differences in onset of ketosis, efficacy of KDT at 3 or 6 months, adverse effects, total time on KDT or discontinuation rates. They did find a significant difference in time of the team spent on initiation of the diet and total number of consultations. A caregiver satisfaction survey was sent only to the telemedicine group and had a 55.5% response rate. It showed that all families thought online consultations were helpful when starting the diet, felt supported by the team, felt educational materials (Powerpoint presentations) were useful and felt positive about online training to avoid going to hospital. 90% of families responded that telemedicine was effective, 50% that educational videos would have been helpful and 30% that the online training was stressful, though there was no comparison with results in the conventional outpatient group.

Many of those with drug-resistant epilepsy experience other co-morbidities that may make travelling to appointments challenging and stressful. This might include cerebral palsy, intellectual disabilities (from mild to severe), and behavioural and sensory problems [13,14]. This may make VCs appealing and reduced patient stress was noted as an important advantage to having VCs.

It is not surprising that 40% of respondents indicated that saving money was an advantage to VCs. In 2019, families where a child has a disability faced average extra costs of £581 per month [15], and in 2022 adults with a disability were almost three times as likely to live in material deprivation than the rest of the population (34 per cent vs 13 per cent) [16].

Some have long distances to travel and it is understandable that many in this situation would prefer to have access to VCs. This was demonstrated by one respondent who would prefer to have most consultations by video and shared their experience: *“Because it’s a 140 mile round trip, I have to pay diesel, lose a day’s wage as self-employed and my daughter loses a whole day of school.”* Notably, 19 (95%) respondents from the two participating centers who cover large geographical areas gave the advantage of saving travel time and 13 (65%) of them of reduced stress trying to park suggesting that for some of those attending centers such as these the practical benefits outweigh disadvantages. Similarly, Bhatt and Whitehouse [17] estimated that mean petrol costs of £8.72 per patient and 75 minute travel time was saved with 552 adult neurosurgical patient virtual reviews over a 2 month period during the initial COVID-19 lockdown.

Kossoff et al [11] described case reports where a KDT was commenced in children using VCs as part of the initiation (3 cases) and monitoring immediately post-initiation (4 cases), as well as briefly describing the use of follow-up VCs in 16 children established on a KDT and offering a second opinion via video on a child at another KDT center. They also described the use of VCs to see 9 new adult patients and follow up a further 28 adults. They noted that VCs more easily enabled participation of other parties into consultations, as did Blenkinsop et al [18] in their review of the use of telemedicine in an adult epilepsy service in the UK, and six (15%) of our respondents. This is a key benefit for families where the person with epilepsy can have complex needs with multiple agencies and carers involved. One respondent in this present survey who would like to have most consultations virtually shared how video calling enabled parents and their adult daughter in a specialist college to both join concurrently: *“Ketodietician (sic) in [city A], parents in [city B], daughter currently in [city C] (college)”*.

The environmental benefit of reducing travel to consultations was stated by a significant minority but should not be underestimated in the current climate where the green agenda is becoming increasingly important. The NHS aims to become the world’s first net zero health service [5] and notes that “climate change undermines the foundations for good health.” Digitally enabled care models and channels will significantly reduce travel and journeys to physical healthcare locations and can contribute to this aim, with patient travel to and from the NHS in England estimated to contribute 1.23 megatonnes of carbon dioxide equivalents (CO₂e) in 2019 [19]. Blenkinsop et al [18] calculated the marginal carbon emission savings from enforced telemedicine for a specialist adult epilepsy clinic during the COVID-19 pandemic. They estimated a carbon saving of 35000-40000 kg (35-40 tonnes) CO₂e from 1567 consultations for 1277 patients over a 6.5 month period, with telemedicine representing at most around 0.5% of the carbon costs associated with face-to-face clinics.

The majority of respondents had adequate access to technology and were comfortable with digital platforms. Technical challenges related to poor internet connections and inability to connect to the virtual platform were noted by Ferraris et al [12] in their experience of using VCs during the COVID-19 pandemic, and a sizeable minority of our respondents were concerned about that. People living in rural areas are less likely to have high speed internet

access, making VCs more difficult, but home broadband connection speeds are increasing across the UK and in March 2022 more than 91% of homes with broadband had a superfast package compared with 75% in November 2019 [20].

Other disadvantages to VCs were practical issues regarding other tests that would be carried out at the hospital, namely blood tests and weight or height measurements. These were also identified as challenges in the aforementioned KDRN survey (unpublished), with delays in blood tests and difficulty accessing results of tests taken locally resulting in increased workload. Weights were particularly challenging in those using wheelchairs where weighing options can be more limited. However, the majority of respondents felt they would be able obtain a weight for the patient for a VC.

The importance of patient/carer choice was highlighted by a significant minority feeling that a disadvantage of VC appts are that they are less personal or they preferred a face-to-face consultation. One parent stated that "*my child is more likely to comply when seeing a real person*", and therefore they preferred to have all consultations in person. In contrast, Trace et al [21], who conducted an inductive qualitative framework analysis of semi-structured telephone interviews regarding a specific VC for 12 children with chronic kidney disease, found that school-aged children engaged positively and reported a desire for future VCs. Parents were keen for VCs to continue alongside attending in person. Matthews and Wong [22], in their survey of parents and children and young people in North Wales with Attention Deficit Hyperactivity Disorder, found that although virtual medication reviews were used successfully, their respondents expressed a greater preference for in-person consultations. Several carers in the present survey mentioned the importance of the clinician being able to see the difference in the child as the reason why they wanted to have at least some consultations in person.

Despite the challenges of VCs, the majority of our respondents were willing to have some of their future consultations in this way. This is in line with the results of a survey in Argentina evaluating use of WhatsApp for message and video calls before and during the pandemic where 72.2% of the 54 families surveyed would recommend using telemedicine in any situation [7]. However, there is the possibility that this feeling may change over time, as identified by Scott et al [23] in their follow-up international survey of use and perception of telemedicine in people with Type 1 Diabetes. Although there remained a high level of satisfaction with remote consultations, 45% percent of respondents in 2021 were likely to consider remote consultations instead of in-person consultations in the future, significantly lower than the 75% in the initial survey a year earlier ($P < 0.001$).

It was a surprise to have such a high proportion of participants who had not yet had a VC, given the survey was carried out during or shortly after final pandemic restrictions had been lifted in the UK. One possible explanation is that clinicians in KDT services in some centers had returned to offering only face-to-face consultations. This was the case in one of the participating centers, and Ferraris et al expressed this view as their preference [12]. Another possible explanation is that, where KDT centers offered the choice of VC or in person, the patient or carer preference was to attend in person.

The NHS Long Term Plan [24], published pre-pandemic in 2019, expected that 10 years later the NHS would offer 'Digital First' for most service users and declared that within 5 years digitally-enabled outpatient care would be mainstream across the NHS. The pandemic

implemented that 5-year plan in weeks [5]. Health professionals and patients had to quickly adapt to the 'new norms' of healthcare during the pressures of a pandemic. Moving forward health professionals should ensure people receive the necessary support to engage with video calling, especially if video calling will continue. There is a risk that clinicians have reverted to prior practice by default rather than embrace the technological opportunities that the pandemic delivered. The International League Against Epilepsy has recommended that telemedicine should become a permanent and integral part of epilepsy care worldwide based on its effectiveness and the level of satisfaction with its use during the COVID-19 pandemic [25].

4.1 Strengths and limitations

Our survey was the first UK-wide attempt to explore the views about video consultations of patients and carers of those following the ketogenic diet.

Although the survey was developed by clinical experts in KDTs, it was unvalidated. The survey was hosted online and, as such, risked excluding those with difficulties in accessing or using technology; these individuals may be less likely to prefer VCs. Interviews or translated surveys would have helped overcome our potential exclusion of individuals with poor English reading skills. The responses were mostly from five participating KDT centers and therefore are not representative of all those following KDTs in the UK.

5. Conclusion

In conclusion, patients or carers of those following a KDT reported many advantages to VCs. As long as there is appropriate consideration of monitoring tests and anthropometry, offering both video and face-to-face consultation options may best support patients following a KDT in the current climate. Use of VCs can contribute to efforts to reduce the carbon footprint of the NHS and form part of its response to climate change, as well as being in line with the NHS Long Term Plan.

TRANSPARENCY DECLARATION All authors affirm that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

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Leicester Royal Infirmary, Royal Aberdeen Children's Hospital and Leeds Children's Hospital).

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