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# An online randomized controlled trial and survey of behavioural factors influencing patients' willingness to attend a video consultation

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**Objectives.** To examine whether the phrasing of a hospital appointment invitation influences patient preference to attend in person or by video. The study also explores patient capabilities, opportunities, and motivations to attend video consultations.

**Design.** A randomized controlled trial followed by a cross-sectional survey.

**Methods.** Participants (1,481 total, 780 females) were residents of the United Kingdom who self-identified as being diagnosed with a chronic disease. Participants considered one of three hypothetical invitations. In one group, participants were invited to attend in person. Those in another group were invited to attend by video. These participants could either accept the invitation or request the other option. In the final 'active choice' group, participants were asked to choose to attend either in-person or by video appointment. Then, all participants responded to open- and closed-ended items about attending video consultations.

**Results.** When the default option was in person, 25% of participants chose video consultation, compared with 41% in the active choice group (RR = 1.65, 95% CI: 1.37–1.99, $p < .001$) and 65% in the default video group (RR = 2.60, 95% CI: 2.20–2.96, $p < .001$). Closed-ended responses suggested that younger patients and those with previous experience were more likely to prefer video consultations. Most open-ended responses contained themes about opportunities, followed by motivations and then capabilities.

**Conclusions.** Patients are more likely to express a preference to attend by video when video is the default option. The real-world effectiveness of this intervention is more likely to be realized where hospitals also support patient capabilities, opportunities, and motivations.



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## Statement of contribution

***What is already known on this subject?***

- Use of video consulting for hospital outpatient appointments has increased over the COVID-19 pandemic.
- Changing the default option influences patient choices across a wide variety of scenarios, for example, organ donation and healthy eating.
- Many theoretically and empirically supported behaviour change techniques exist to enhance patients' capabilities (physical and psychological), opportunities (physical and social), and motivations (reflective and automatic) to take up new behaviours, like attending video consultations.

***What does this study add?***

- Inviting people to attend a video consultation (instead of an in-person consultation) increases the proportion to express a preference to attend by video.
- Few participants know whether their hospital offers video consultations.
- Nearly half of the participants believed the advantages of attending an appointment by video outweigh the disadvantages; thus, patient preference alone offers little reason to maintain an in-person default.

## Background

The National Health Service's (NHS) Long-Term Plan (2019) aims to future-proof its service for the decade ahead. A major component of this plan encourages greater use of digital technologies. The onset of the COVID-19 pandemic accelerated efforts to increase video consulting (Christakis, 2020), and, in March 2020, hospital trusts were offered funded access to a video consultation platform (Rapson, 2020). While video consultations are not appropriate for every appointment, for example, those that require in-person tests, there are many appointments for which they are, for example, those that discuss treatment options, treatment progress, or test results (Car, Koh, Foong, & Wang, 2020). There is already evidence that video consultations can support patients with long-term conditions (Hansen, Perrild, Koefoed, & Zander, 2017; Ignatowicz et al., 2019; Katz et al., 2017; Robinson, Branham, Locklear, Robertson, & Gridley, 2015), and those patients who have experienced video consultations express more favourable attitudes towards them (Leng, MacDougall, & McKinstry, 2016). However, offering video consulting at scale will require complex modifications to existing systems that support diverse patient needs (Greenhalgh et al., 2018; Greenhalgh, Wherton, Shaw, & Morrison, 2020). The current study examines a simple change that hospitals can make to increase patients' willingness to attend video consultations.

To increase patients' willingness to attend video consultations, hospitals could change the way an invitation to attend an outpatient appointment is presented: instead of inviting patients to attend in person, they could invite them to attend by video. The way patients are invited to attend can be called the 'default'. Defaults are pre-set options that take effect if the individual does not request an alternative (Thaler & Susnstein, 2008). Maintaining the status quo often does not involve mental or physical activity, and hence, it becomes easiest to 'go with the flow of pre-set options' (Dolan et al., 2012). For example, people tend to stick with previously selected health insurance plans even as new options become available with more favourable premiums and deductibles (Samuelson & Zeckhauser, 1988). When people are asked to select between two insurance options in an online task,

they tend to select the one labelled as the pre-existing health insurance policy (Krieger & Felder, 2013).

Changing the default can have large effects across a wide variety of patient choices (Hummel & Maedche, 2019), for example, whether people agree to be organ donors (Johnson & Goldstein, 2003) or choose to purchase healthy foods (Peters et al., 2016). The difference in people's choices across conditions with different pre-set options is called the 'default effect' (Jachimowicz, Duncan, Weber, & Johnson, 2019). Broadly, explanations for the default effect are based on the assumption that human preferences are constructed rather than pre-existing. At least three psychological mechanisms are thought to underlie the power of defaults, including endorsement (believing the proposed default is recommended), endowment (believing that moving away from the default option would entail a loss), and ease (taking up the proposed default is simpler than refusing it) (Dinner, Johnson, Goldstein, & Liu, 2011; Jachimowicz et al., 2019). Changing invitations from inviting patients to attend 'in person' to 'by video' may create a new endorsed mode of attendance that is easier to accept. As many hospitals already send appointment invitations, adjusting the text in them is a simple light-touch and low-cost adjustment, which could be referred to as a nudge (Dolan et al., 2012). However, any changes resulting from this nudge may be fleeting where hospitals do not support patients' further needs.

The behavioural support that patients need will often involve bridging the digital divide (Watts, 2020), for example, to help those who do not know how to use their computer well (a capability factor), those who do not have the necessary Internet access (an opportunity factor), and those who do not believe that a video appointment can improve their health (a motivation factor) (British Psychological Society (BPS) Behavioural Science and Disease Prevention Taskforce, 2020). Previous studies suggest that older adults may experience more of these barriers (Eberly et al., 2020; Lam, Lu, Shi, & Covinsky, 2020; Leng et al., 2016) and that patients with multiple diagnoses may experience significant motivational barriers (Donaghy et al., 2019). Some of the behaviour change techniques most likely to overcome barriers related to patients' capabilities, opportunities, and motivations are already known (Michie et al., 2013; Michie, van Stralen, & West, 2011). For example, patients' capabilities are more likely to be influenced by the 'behavioural rehearsal/practice' technique than 'environmental restructuring' or 'action planning', which are better suited to increase patients' opportunities and motivations to attend, respectively (Michie et al., 2011). To meet diverse patient needs, the most effective interventions will likely be complex, in the sense that they include multiple techniques (Craig et al., 2008).

The current study explores behavioural factors that influence people's willingness to attend a hospital outpatient appointment by video. Our primary objective is to investigate the impact of changing the default attendance option in a hypothetical appointment invitation using a randomized controlled trial. We hypothesize that more people will prefer an appointment by video than in person when video is the default option. Our secondary objective is to explore other behavioural factors that influence their willingness to attend a video consultation.

## Methods

### *Study design/setting*

The online survey was designed using Qualtrics (2020) software and conducted in September and October 2020. Participants were recruited via Prolific Academic's panel.

Prolific Academic is an online platform where researchers can make their surveys available to participants from specific demographic backgrounds (Palan & Schitter, 2018). The survey contained two parts. The first part was a randomized controlled trial to examine whether reframing an invitation to attend an outpatient appointment (changing the default) influences patients' appointment preference. The second part was a cross-sectional survey, exploring patients' capabilities, opportunities, and motivations to attend a video consultation. The study was approved by the University of Warwick's Biomedical and Scientific Research Ethics Committee (ID: 110/19-20) and pre-registered on ClinicalTrials.gov (ID: NCT04536259). The anonymous data are available at the Figshare repository at https://figshare.com/articles/dataset/_An_online_randomised_controlled_trial_and_survey_of_behavioural_factors_influencing_patient_willingness_to_attend_a_video_consultation_/14822349/1.

### *Patient and public involvement statement*

In line with the United Kingdom's standard for public involvement, the chief investigator discussed the study design with four public contributors from diverse backgrounds before obtaining ethical approval (National Institute for Health Research, 2018). The contributors included people both younger and older than 55 years of age (as in our sample), carers of family members with chronic conditions, and people who themselves experience chronic conditions. All contributors believed that the methods were suitable and that this research was valuable and timely. Their insights helped the research team reword items to make them more accessible for a lay audience. After the initial data analysis, the chief investigator met with and asked the same contributors to highlight the most valuable finding, suggest avenues for dissemination through patient networks, and generate directions for future research.

### *Sample size calculation*

The sample size was calculated for a comparison of two proportions using the power two proportion command in Stata SE v16.1 as outlined in the pre-registered protocol. We sought to detect differences between participant choices from the in-person invitation default, because this condition is closest to many pre-existing appointment defaults in hospital settings. To detect a conservative 10% increase (from 45% to 55%) for participants accepting an invitation to a video outpatient appointment across the three invitation groups, with 90% power and an alpha of 0.025 (Bonferroni's alpha correction for three groups), a sample size of 619 participants in each invitation group was necessary, at least 1,857 total participants. Note that 10% is a conservative effect-size estimate, as a previous meta-analysis of default interventions found a 27% average increase favouring the default option across a range of health and non-health domains (Jachimowicz et al., 2019).

### *Participants*

Eligible participants self-identified as being residents of the United Kingdom, being male or female (sex assigned at birth), and being diagnosed with a chronic disease such as diabetes, heart disease, and stroke. Recruitment was stratified by sex and age, such that up to 500 participants from each of the following categories could take part: males 18–54 years old, females 18–54 years old, males 55 years and older, and females 55 years and older. We opted to dichotomize age to ensure that a similar number of older participants

were placed in each group. Stratified categories were based on pre-screening questions participants completed when registering on Prolific Academic. On the first day of recruitment, there were less than 500 active participants registered on Prolific Academic in some categories. While there were 675 males 18–54 years old and 1,608 females 18–54 years old, there were only 241 males 55 years and older, and 337 females 55 years and older. Therefore, from the first day of recruitment, under-recruitment in males and older demographics were expected. Participants provided their informed consent before advancing to the survey. Those who completed the survey received 1 GBP (Great British Pound) for their time.

### *Measurements*

*Randomized controlled trial items*

The randomized controlled trial items appear in Figure 1. Participants first read an informative text about video consultations, stating that: 'Video consultations allow patients to have follow-up appointments from home over a secure video and audio link

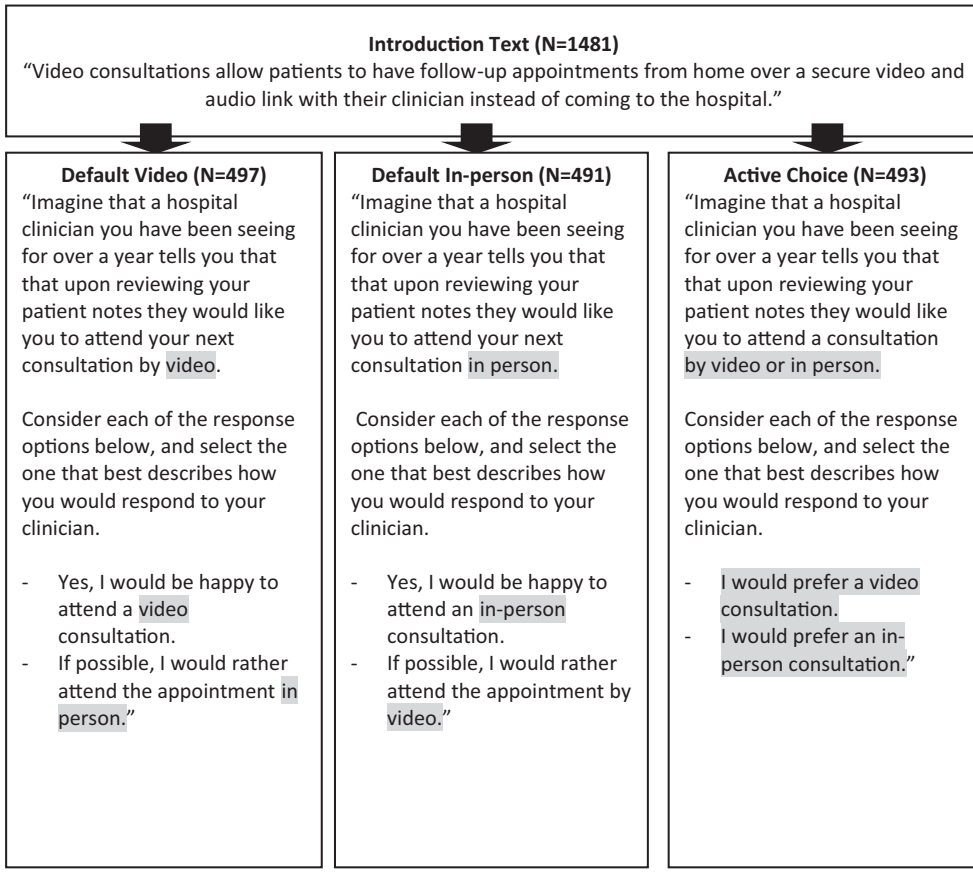


**Figure 1.** Items in the randomized controlled trial portion of the survey. *Note*: Text is highlighted in the above figure to draw attention to between-group differences. Text was not highlighted when participants completed the survey.

with their doctor, instead of coming to the hospital'. Then, participants were randomly assigned to one of three groups and asked to: 'Imagine that a hospital clinician you have been seeing for over a year tells you that that upon reviewing your patient notes they would like you to attend your next consultation [text varied across groups]'. Participants in the default video group were invited to attend by video. Participants in the default in-person group were invited to attend in person. Lastly, participants in the active choice group were invited to select how they would like to attend without a default, either by video or in person. Participants could express their preference to attend by video or in person by selecting either option presented in a random order.

#### *Cross-sectional survey items*

The cross-sectional survey items are available in Appendix S1. The open-ended items asked participants to write two advantages and two disadvantages of video consultations over in-person consultations in free-text boxes. Then, participants stated how strongly they agreed with the statement: 'The advantages of video consulting outweigh the disadvantages' using a Likert scale, where one represented 'strongly agree' and five represented 'strongly disagree'. Next, participants responded to 10 closed-ended items related to their capabilities, opportunities, and motivations to attend a video consultation using 'Yes' and 'No' response options. These close-ended items were informed by Huijg et al. (2014) validated survey, and some items were negatively worded.

#### *Additional items*

The final portion of the survey included background questions. Participants were asked how many hospital outpatients they had attended in the last 12 months and how many were video consultations. They indicated which chronic disease(s) they were diagnosed with (diabetes, heart disease, stroke, other [optional free text], or prefer not to say), what country they lived in, and their ethnic group. Lastly, participants were asked to: 'Imagine that you could attend your next hospital outpatient appointment using any of the options below. Please rank order the options, from 1 (most preferred) to 5 (least preferred)'. The options appeared in a random order, including 'in-person', 'video', 'telephone', 'text messaging', and 'email'.

### ***Randomization and blinding***

To randomize participants into one of the three groups, Qualtrics computer randomizer was set to evenly present, an option that uses the Mersenne Twister pseudorandom number generator with a block size of three. While participants could not be blinded to their invitation group, they were not made aware of the other groups. Researchers were never aware of participants' assigned groups at the point of data collection or random assignment because this was handled automatically by Prolific Academic and Qualtrics.

### ***Statistical methods***

Analyses were completed in Stata SE v16.1. Participant baseline characteristics were summarized using numbers and percentages or means and standard deviation.

*Randomized controlled trial analyses*

The primary analysis compares the percentage of participants who expressed a preference to attend the appointment by video across the three groups (Default Video, Default In-Person, and Active Choice), adjusting for sex and age group (stratifying variables in the randomization). Subgroup analysis was completed by sex and age group. Interactions were evaluated using the Wald test. An additional fully adjusted analysis was also completed, adjusting for sex (male or female), age group (under 55 or 55 and older), diagnostic complexity (experiencing one diagnosis or multiple diagnoses), and previous experience with video appointments (never or at least one video appointment). In a sensitivity analysis, the effect of age in years was assumed linear. For binary outcomes, a generalized linear model with a binomial distribution and log link was used to estimate risk ratios, and a generalized linear model with a binomial distribution and identity link was used to estimate the risk difference (Fox, 2016). Results from inferential tests are reported with 95% confidence intervals.

*Cross-sectional survey analyses*

For the close-ended items, the percentage of participants who indicated each item as being a facilitating factor was examined. Negatively worded items were reverse scored. The mean rank orders (along with the standard deviations) are provided for five appointment options, including in-person, video, telephone, text messaging, and email. Spearman's rho correlation coefficient was used to assess the relationship between participants' rank order for video consulting and their preference stated in the RCT, along with that correlation's 95% confidence interval using Fieller, Hartley, and Pearson's (1957) method.

For the open-ended items, participant responses were placed into Excel. Then, the response order was randomized, blinding researchers to participant group and to whether the response type was an advantage or disadvantage. Next, two researchers independently coded each response as relating most strongly to capabilities, opportunities, motivations (as defined in Michie et al., 2011), or none. Disagreements were resolved via consensus discussions. Initial reliability was described using Cohen's Kappa statistic, and the percentages of responses coded as each COM-B component as advantages and disadvantages were provided. Lastly, for the item asking participants whether the advantages of video consulting outweighed the disadvantages, the percentage of participants indicating some degree of agreement, some degree of disagreement, and neither agreeing nor disagreeing was provided.

## Results

The survey was completed by 1,481 participants of which 53% identified as female ($N$ = 780) and 67% as 55 years old or greater ($N$ = 1,000). Participants were allocated across the three invitation groups similarly: 497 (34%) to the default video group, 491 (33%) to the default in-person group, and 493 (33%) to the active choice group.

Table 1 contains the baseline characteristics of participants across the groups. Most participants ($N$ = 1,253, 85%) had attended at least one hospital outpatient appointment in the previous 12 months, but few ($N$ = 165, 11%) had attended an appointment by video. 546 ($N$ = 37%) participants reported being diagnosed with diabetes, 191 (13%) with heart disease, and 61 (4%) with stroke. 673 (45%) participants wrote in another

**Table 1.** Participant demographics across invitation groups

| | Default video | Default in-person | Active choice |
|---|---|---|---|
| Participants in analyses | 497 | 491 | 493 |
| Stratified characteristics | | | |
| Female | 260 (52%)[a] | 259 (53%) | 261 (53%) |
| <55 years old | 332 (67%) | 333 (68%) | 335 (68%) |
| One diagnosis | 363 (73%) | 335 (68%) | 355 (76%) |
| No previous video consultations | 443 (89%) | 439 (89%) | 434 (88%) |
| Age | | | |
| Age in years (*SD*) | 28.1 (14.7) | 28.2 (14.7) | 28.2 (15.0) |
| Country of residence | | | |
| England | 398 (80%) | 416 (85%) | 434 (88%) |
| Scotland | 61 (12%) | 37 (8%) | 45 (9%) |
| Wales | 27 (5%) | 23 (5%) | 11 (2%) |
| Northern Ireland | 11 (2%) | 15 (3%) | 3 (1%) |
| Ethnicity | | | |
| Asian/Asian British | 28 (6%) | 18 (4%) | 24 (5%) |
| Black/African/Caribbean/Black British | 7 (1%) | 11 (2%) | 12 (2%) |
| Mixed/Multiple ethic groups | 9 (2%) | 12 (2%) | 9 (2%) |
| White | 447 (90%) | 443 (90%) | 440 (89%) |
| Other | 4 (1%) | 6 (1%) | 6 (1%) |
| Prefer not to say | 2 (0%) | 1 (0%) | 2 (0%) |
| Diagnoses | | | |
| Diabetes | 194 (39%) | 173 (35%) | 179 (36%) |
| Heart Disease | 58 (12%) | 74 (15%) | 59 (12%) |
| Stroke | 19 (4%) | 26 (5%) | 16 (3%) |
| No. Hospital outpatient appointments in previous 12 months | | | |
| Total, mean (*SD*) | 2.4 (1.8) | 2.4 (1.8) | 2.3 (1.9) |
| By video, mean (*SD*) | 0.2 (0.6) | 0.2 (0.8) | 0.2 (0.7) |

*Note.* [a]Percentages may not add to 100 due to rounding.

diagnosis, such as 'Crohn's disease' ($N$ = 87, 6%), 'asthma' ($N$ = 78, 6%), or 'cancer' ($N$ = 46, 3%). Ninety-nine participants did not provide information about their diagnoses and were not included in the fully adjusted analysis. The percentage of participants residing in each country and identifying with each ethnicity roughly aligns with the 2011 United Kingdom population census (Office for National Statistics, 2011).

### *Randomized controlled trial results*

Participant preference to attend the consultation by video was influenced by what invitation they considered. In the default in-person group, 25% ($N$ = 122/491) of participants chose video consultation over in-person consultation, compared with 41% ($N$ = 202/493) in the active choice group and 65% ($N$ = 321/497) in the default video group, see Table 2. The likelihood of choosing to attend by video was estimated to be 65% higher (RR = 1.65, 95% CI: 1.37–1.99, $p < .001$), and the absolute difference was 16 percentage points higher (RD = 16pp, 95% CI: 10–22, $p < .001$), for participants in the active choice group compared with the default in-person group, adjusting for age group and sex. The likelihood of choosing to attend consultation by video is over two-fold higher

(RR = 2.60, 95% CI: 2.20–3.07, $p < .001$), and the absolute difference is 40 percentage points higher (RD = 40pp, 95% CI: 34–45, $p < .001$) for participants in the default video group compared with the default in-person group, adjusting for age group and sex. The results for subgroup analysis by sex and age group are reported, and the tests for interactions between invitation group with sex and age group were not statistically significant, see Table 2. Results were broadly similar after covariate adjustment, the fully adjusted model, for age group, sex, diagnostic complexity, and previous video consultation, see Appendix S1. In a further sensitivity analysis, we find that treating age as a continuous variable did not influence the results.

### *Cross-sectional survey results*

Appendix S1 provides details on participant responses to the close-ended items about their capabilities, opportunities, and motivations. The largest barriers suggested for each factor are described here. Regarding the capability items, 66% of participants ($N$ = 978/1,481) did not know if their hospital offered video consultations. Regarding the opportunity items, 66% of participants ($N$ = 983/1,481) could not recall other people speaking favourably about video appointments. Lastly, regarding motivations, 26% ($N$ = 393/1,481) did not believe their clinicians could provide them with good care via an online appointment and 18% ($N$ = 285/1,481) expressed privacy concerns. The percentage of younger participants endorsing items as facilitating factors was on average 7% (Range = 3–13 per item) higher than older participants. Additionally, the percentage of participants who previously attended a video consultation endorsing items as facilitating factors was on average 14% (Range = 2–58) higher than those with no had not. Participants rank-ordered the in-person appointment option the most preferred (mean rank = 1.83, $SD$ = 1.21), closely followed by video (2.24, $SD$ = 1.12), and then telephone (2.66, $SD$ = 0.89), email (3.82, $SD$ = 0.96), and text message (4.47, $SD$ = 0.83). Participants' ranked preference for video consulting was significantly correlated with their preference stated in the RCT, $r_s$ (1,481) = .43, (95% CI = 0.44–0.53, $p < .001$).

There was substantial agreement between the reviewer codes for the open-ended items, k(5924) = .74 (95% CI = 0.72–0.76, $p < .001$), and only 3% of responses were coded as none. Opportunity was the most often applied code, with 71% of advantages and 55% of disadvantages being coded as opportunities. The main advantages for this component revolved around there being no need to travel and no parking costs. For example, one participant said that: '*I would not have to make an hour's bus journey to the hospital*'. Another participant reflected that attending by video would mean that: '*I would not have to drive 45 mins each way, and pay to park, and wait around*'. Other participants mentioned that video consultations saved them time, for example, one participant stated that they: '*Wouldn't need to organise childcare or time off work*'. The main disadvantages included that a physical examination was not possible and not having sufficient Internet access. For example, a participant noted that: '*They [the consultant] can't physically examine me or take my blood pressure*'. Another stated that their: '*Doctor would be unable to check specific symptoms, e.g., palpitate abdomen, listen to chest, etc.*'. Regarding their limited Internet access, a participant expressed that: '*I do not own either a PC, a laptop, a tablet, or even a TV, and video calls using mobile data allowance are expensive*'.

Motivation was the next most frequently applied code, with 25% of advantages and 36% of disadvantages being coded as motivations. Advantages often included there being a lower risk of communicable infections, for example, '*no risk to be infected by a virus*' and

**Table 2.** Risk ratios and risk difference of preference for video consultation over in-person consultation by default choice group, adjusted for age group and sex

| | Invitation group | | | Estimated intervention effects | | | |
|---|---|---|---|---|---|---|---|
| | In-person default | Active choice | Video default | Active choice[a] | | Video default[a] | Video default[a] |
| | No. participants prefer video consultation/group total (%) | | | Percentage point difference (95% CI) *p*-value | Risk ratio (95% CI) *p*-value | Percentage point difference (95% CI) *p*-value | Risk ratio (95% CI) *p*-value |
| All participants | 122/491 (25%) | 202/493 (41%) | 321/497 (65%) | 16 (10 to 22) $p < .001$ | 1.65 (1.37 to 1.99) $p < .001$ | 40 (34 to 45) $p < .001$ | 2.60 (2.20 to 3.07) $p < .001$ |
| By gender | | | | | | | |
| Male | 53/232 (23%) | 94/232 (41%) | 160/237 (68%) | 18 (9 to 26) $p < .001$ | 1.77 (1.34 to 2.35) $p < .001$ | 45 (37 to 53) $p < .001$ | 2.96 (2.30 to 3.80) $p < .001$ |
| Female | 69/259 (27%) | 108/261 (41%) | 161/260 (62%) | 15 (7 to 23) $p < .001$ | 1.55 (1.21 to 1.99) $p = .001$ | 35 (27 to 43) $p < .001$ | 2.32 (1.86 to 2.91) $p < .001$ |
| By age group | | | | | | | |
| <55 years | 85/333 (26%) | 145/335 (43%) | 211/332 (64%) | 18 (11 to 25) $p < .001$ | 1.70 (1.36 to 2.11) $p < .001$ | 38 (31 to 45) $p < .001$ | 2.49 (2.04 to 3.04) $p < .001$ |
| ≥55 years | 37/158 (23%) | 57/158 (36%) | 110/165 (67%) | 13 (3 to 23) $p = .013$ | 1.54 (1.09 to 2.19) $p = .016$ | 43 (33 to 53) $p < .001$ | 2.85 (2.10 to 3.85) $p < .001$ |

*Note*. [a]Compared with in-person default group, the reference group; and adjusted for age group and sex for all participants (and either age or sex for the subgroup estimates). *p*-value for tests of interaction: 0.260 for gender (risk difference); 0.320 for gender (risk ratio); 0.284 for age group (risk difference), and 0.2407 for age group (risk ratio).

'*no risk of spreading infection*'. Disadvantages involved the less personal nature of a video call compared with an in-person consultation. One participant thought that video consultations would be: '*less personal, the video may make it feel that the doctor may not want to see you*'. Another participant reflected that: '*it seems very impersonal not talking face to face, and I would be loath to ask personal questions*'. While some participants mentioned privacy as an advantage, for example, *'[You would be] free from other people seeing you at the surgery - privacy'*, privacy was also mentioned as a disadvantage. At times, these privacy concerns involved issues with data security, for example, one participant expressed that: '*I may not be comfortable to divulge a lot of information to the consultant via Zoom since I don't know how the data will be processed*'. Other times, these concerns involved issues with other people being present in their home during the call, for example, one participant expressed that: '*I would feel hesitant about discussing potentially private or embarrassing matters— I don't have much privacy at home in a small flat*'.

Capability was applied less frequently, with only 3% of advantages and 5% of disadvantages being coded as capabilities. Some participants thought that it might be an advantage if they could record the consultation to review later, for example, '*it [the consultation] could be recorded so you could look at it again if you forgot anything [the] consultant said*'. Disadvantages involved participants lacking technical skills to access a video call, for example, '*I am not very good with video links'* and *'I'm still quite uncomfortable using video in general*'. Some participants' chronic conditions made the option to attend a video consultation more attractive. One participant noted that: '*I have chronic pain so not having to travel would be an advantage*'. Another said that: *'I have chronic health problems and a hospital appointment can take days to recover from*'. However, some chronic conditions made video consultations more difficult, for example, '*I am profoundly deaf so struggle with video*'.

Nearly half (47%) of participants somewhat or strongly agreed that the advantages outweighed the disadvantages, about a quarter disagreed (28%), and the remaining neither agreed nor disagreed (25%).

## Discussion

As hypothesized based on the literature, the current study found a large default effect, which reveals an important mechanism for engaging patients with health services in general and medical appointments in particular. When the invitation was to attend in person, the percentage of participants opting to attend by video was 25%. This percentage rose to 65% when the invitation proposed attending by video. Participants' expressed preferences offer little reason to maintain an in-person default. Nearly half of the participants believed the advantages of attending an appointment by video outweighed the disadvantages.

One strength of the current study is the number of participants with chronic conditions who took part, 1,481. This was achieved by recruiting participants from an online panel, which also poses a limitation in that our participants may be more digitally literate than the general public. That said, the use of Internet-enabled technologies is high. Ofcom's (2020) survey of media use across the United Kingdom (which is conducted using face-to-face methods) finds that 87% of people used the Internet in 2019, which has remained unchanged since 2014. The percentage of non-users increases with age. For people between 16 and 54 years old, the percentage of non-users is lower than 8%. In

contrast, the percentage of non-users at least 55 years old is greater than 16%. Thus, our findings for younger participants are more likely to generalize than our findings for older participants.

One weakness of the randomized controlled trial part of our study is its hypothetical nature. People's responses to hypothetical choices may change when confronted with the possibility of real-world consequences, and the magnitude of the default effect found in our study may decrease in the real world. However, experiments with hypothetical choices are commonly used to assess people's preferences for service options and such findings may support changes in practice (Mühlbacher & Johnson, 2016). The online survey methodology used here is commonly used to understand whether and when the default effect arises; for example, Johnson and Goldstein (2003) initial study about organ donation and Krieger and Felder's (2013) study about health insurance were conducted using similar methodologies. The current findings may be used to build the necessary foundation to support before/after studies or randomized controlled trials in the real world.

Encouragingly, the generalisability of our finding for the active choice group already has some support. In a 2020 observational study conducted in the Netherlands, patients with colorectal disease engaged in shared decision-making about how their follow-up appointment would occur, and 42% (22/50) chose video consultation (Barsom et al., 2020). This is similar to our active choice group in which 41% chose video. The consultations in the Netherlands' study were for discussing overall progress, test results, treatments, and complaints. Physical examinations for patients with colorectal disease are rare during follow-up consultations so were not a concern (Beaver et al., 2012). In contrast, not being able to receive a physical examination during a video consultation was a major barrier our participants expressed. This barrier was explored in a 2020 study conducted in the United Kingdom with patients who have diabetes, cancer, or heart disease (Shaw et al., 2020; also see Seuren et al., 2020). This study found that some physical examinations were possible, but that consultants may need training on how to give appropriate instructions, for example, on using lay language to describe technical procedures. If such tests are likely to be part of the video call, patients should be made aware of the tests and asked to prepare any materials they may need in advance. In some cases, patients may be trained to self-test during an in-person consultation before follow-up video consultations.

While changing the default in the appointment letter can increase the percentage of patients willing to attend by video, a policy change advocating a video default should only be rolled out if it is welfare-enhancing at the individual and social levels (Leggett, 2014). Many criteria could be used to assess 'welfare-enhancing', including impacts on population health, personal wealth, and even happiness. These criteria are alluded to in Thaler and Sunstein's (2008) *Nudge: Improving Decisions about Health, Wealth, and Happiness*. One argument supporting nudging is that where nudges frame choice options they are inevitable; therefore, we should implement those that enhance welfare (Sunstein, 2015). Some people may prefer that inevitable nudges arise without intention, but this is unlikely at best and reckless at worst: companies may choose defaults that benefit them at the expense of customers' health. Regardless, where nudges explicitly preserve freedom of choice, opponents' concerns should be ameliorated (Saghai, 2013; Schmidt & Engelen, 2020). In the current study, nearly half of our participants (47%) believed that the advantages of video consulting outweigh the disadvantages. The present findings suggest that providing patients with a choice may empower them to select the option that best

suits their needs. The video consulting default may help patients overcome initial resistance to selecting this option caused by the status quo bias.

A limitation of the cross-sectional survey is that it occurred after the randomized trial, so the hypothetical invitations may have influenced responses in the cross-sectional survey. This limitation is particularly noteworthy for the cross-sectional survey item that asked participants to rank order their preference for the following appointment options: in-person, video, telephone, text messaging, and email. Here, participants who previously expressed a preference for in-person over video, or vice versa, were likely to express the same preference order in their ranking, which could be due to stage or contextual influences on preferences (Podsakoff, MacKenzie, & Podsakoff, 2012). Having said that, our cross-sectional survey still picks out some diverse patient needs that affect patients' experiences with video consulting.

The cross-sectional survey responses were coded according to the capability, opportunity, and motivation components, because these components are already linked to the theoretically informed and empirically supported techniques best suited to influence them (Michie et al., 2011, 2013). For example, to increase patients' awareness and motivations to attend, hospitals could share other patients' positive experiences around video consultations (e.g., the 'information about other's approval' technique). For patients who lack technical skills, practice sessions could be offered before their first video appointment (e.g., the 'behavioural rehearsal/practice' technique). While initial demand for practice sessions may be high, offering practice sessions may empower patients to make a more informed choice (Lee, Frederick, & Ariely, 2006). To address privacy concerns, information could be provided to patients around data protection policies (e.g., the 'reduce negative emotions' technique).

Notably, some participants mentioned disadvantages that may render it impossible to attend, such as not having Internet access. In these cases, behaviour change techniques directed at the patient, like the 'restructuring the physical environment' technique, are likely infeasible: the NHS is not equipped to supply patients with better Internet access. Here, we suggest that the technique be applied to the invitation itself, such that patients are invited to express their concerns and are assured that the appointment can be rescheduled as an in-person appointment if preferred. Similar nudges have been used to reduce missed hospital outpatient appointments (Hallsworth et al., 2015). To avoid bothersome cycles of invites and rescheduling, hospital records would ideally be restructured in such a way as to indicate whether video consulting is appropriate for each patient before sending the invitation.

In conclusion, the use of video consultations for hospital outpatient appointments has rapidly expanded during the COVID-19 pandemic. Whether preferences to attend video consultations are sustained depends, at least in part, on how the invitation is presented as well as on whether additional behavioural factors are supported. By inviting patients to attend a video consultation and then supporting their capabilities, opportunities, and motivations to follow through with that invitation, hospitals can affect the proportion of patients attending different types of appointments.

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## Conflicts of interest

We have no known conflicts of interest to disclose.

## Author contributions

The research idea was conceived by KAS, LK, LQ, and RL, and KH helped formulate the randomized controlled trial component for statistical analyses. Funding was acquired by RL. The investigation was conducted and administered by KAS with supervision from RL. The statistical analyses were performed by LQ with supervision by KH. Qualitative coding was conducted by LK and KAS. LK, LQ, KH, IV, and RL all contributed to the preparation, creation, and presentation of this work. KS wrote the original draft manuscript and LK, LQ, KH, IV, and RL commented.

## Data availability statement

Pending acceptance for publication, all data that support the findings of this study will be openly available in the Figshare repository at https://figshare.com/articles/dataset/_An_online_randomised_controlled_trial_and_survey_of_behavioural_factors_influencing_patient_willingness_to_attend_a_video_consultation_/14822349.

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## Supporting Information

The following supporting information may be found in the online edition of the article:

**Appendix S1.** Materials.