

1           **Evaluation of experiences and attitudes of patients**  
2           **towards patient portal enabled access to their health**  
3           **information or medical records – A Qualitative Study**

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NOTE: This preprint reports new research that has not been certified by peer review and should not be used to guide clinical practice.

## 20 **Abstract**

21 The demand for patient centred care and patient engagement in their healthcare has driven  
22 patient portal introduction. The widespread adoption and use of patient portals, however,  
23 has been a rather slow process in the United Kingdom (UK). Hence, a limited number of  
24 studies have explored patient perceptions and experiences of general portal use which forms  
25 a foundation for successful implementation of a portal. This study, therefore, focuses on the  
26 experiences and attitudes of patients regarding use of patient portals and access to their  
27 health information. It further explores various factors perceived by patients that may  
28 influence portal use and uptake. These patient experiences were gathered through semi-  
29 structured interviews of 13 participants and the data collected was subjected to analysis  
30 using the grounded theory approach. The overall findings from this study highlights positive  
31 patient perceptions of portal use. Nevertheless, it demonstrates various areas of  
32 improvement essential to ensure successful implementation and acceptance of patient  
33 portals in the future.

34

## 35 **Authors summary**

36 Patient portals have become a globally popular tool used in the healthcare sector due to its  
37 potential to increase patient engagement which is considered essential to provide patient  
38 centred care. Similarly, the use of patient portals in the UK has increased, with different  
39 providers making this service available to patients. Patients are the key target users of patient  
40 portals, however, there is limited research that focuses on understanding patients'  
41 perspective of using a patient portal and accessing their health information. The majority of  
42 the existing studies have either evaluated providers or healthcare professionals' perspective

43 of patient portal implementation or explored patient experiences of using patient portal  
44 tailored to cater individuals with specific health conditions. Therefore, our aim was to  
45 explore patients' perception of patient portals and their experiences of accessing their health  
46 information or medical records through one. Our research has captured various factors that  
47 has influenced portal use among patients and the impact of health information access on  
48 patients and their care process. Additionally, it has identified scope for future development  
49 and discussed factors that could potentially improve patient portal implementation and drive  
50 portal use and uptake among patients.

51

## 52 **Introduction**

53 There is an increased demand for patient centered care and patient engagement. This has  
54 resulted in a demand by both providers and patients to increase the role of consumers in their  
55 healthcare and decision making [1]. This and several social and human factors like  
56 healthcare expenditure, demand for home-based care, and lack of an adequate number of  
57 medical workers have led to the active implementation of patient portals [1]. Patient portals  
58 are tools that allow patients to access their health information and medical records [2-4].  
59 These are services that are managed by a provider and are linked to a patient's electronic  
60 health record [5, 6]. It allows patients to enter or retrieve their health information, therefore  
61 increasing patient participation [5, 7]. Patient participation in turn has the potential to  
62 improve care outcomes [5, 8].

63 Patient Access and myGP are patient portals used by some surgeries in the United Kingdom  
64 (UK) which provide patients with features like appointment booking, ordering repeat  
65 prescriptions, messaging, and viewing medical records [9, 10]. The NHS app is a more  
66 recent service in the country and has functions similar to the Patient Access portal while

67 supporting additional features like the mandatory COVID-19 vaccination proof, setting  
68 organ donation preference, and checking symptoms [11, 12]. However, uptake of patient  
69 portal services, access to medical records and linked services in the UK is limited and its  
70 widespread incorporation has been a slower process compared to many first world countries  
71 [9].

72 Many studies associated with patient portals have included both portals and personal health  
73 records interchangeably in their study, although they vary in terms of their ownership and  
74 features [6, 13]. This has led to a failure in drawing clear differentiation between patient  
75 portals and personal health records while concluding findings [6]. Additionally, although  
76 patient portals are developed to increase patient engagement in their healthcare, there is a  
77 lack of importance given to understanding their experiences and expectations of using a  
78 portal [7]. The majority of studies have either focused on practitioners or providers  
79 perspectives of the impact of patient portal implementation [14] or have evaluated the impact  
80 of disease-specific or vendor-specific portals [9, 15]. The successful implementation of a  
81 patient portal however requires that experiences of all stakeholders, including those of  
82 patients using varying portal services be evaluated [14]. This study, therefore, aims to assess  
83 the experiences and attitudes of patients in the UK towards patient portal enabled  
84 engagement, access to medical records and linked information, and involvement in their care  
85 process.

86

## 87 **Methods**

### 88 **Methodology**

89 A qualitative study was conducted to evaluate the experiences of patients towards patient  
90 portal enabled engagement with their medical records and health information. A qualitative  
91 method was used as it aids in generating in-depth information of patient experiences by  
92 allowing patients to explain their perceptions in their own words rather than subjecting them  
93 to provide limited answers through a survey or structured questionnaire [16].

### 94 **Study design**

#### 95 **Participants and recruitment**

96 Adult (> 18 years old), UK Resident, and English-speaking users of either the ‘myGP’,  
97 ‘Patient Access’ or ‘NHS App’, with access to their health records or health information  
98 were targeted. Recruitment was initiated by posting an advert containing brief details of the  
99 study on various social media platforms and discussion forums. Interested participants were  
100 asked to contact the researcher by either emailing or filling an expression of interest  
101 registration form. An email containing the participant information sheet and the consent  
102 form was sent to the registered individuals who met the inclusion criteria (n=24). Individuals  
103 who consented (n=15) were further invited for a Zoom interview. 15 participants were  
104 interviewed at their convenience and 13 were included in the study (2 were excluded as they  
105 subsequently failed to meet the inclusion criteria).

#### 106 **Data collection**

107 The information was gathered by conducting semi-structured interviews. A semi-structured

108 interview was chosen as research states that it is the most suitable method for exploring  
109 experiences and perceptions, as it involves asking open ended questions and its flexibility  
110 allows building rapport with the participant [17]. The semi-structured interview was based  
111 on the study aim and existing literature on patient portals. The interview guide was  
112 developed based on the guidance provided in a study [18] and comprised general questions  
113 regarding the topic to aid participants to adapt to the context of the interview. It was then  
114 followed by core questions exploring the key aim of the research and supported by follow-  
115 up questions where necessary [18]. The interview was conducted via Zoom due to its ease  
116 of use, cost-effectiveness, security, data storage features, and the requirement to maintain  
117 social distancing in effect at the time of the research. [19].

## 118 **Data analysis**

119 The interviews were manually transcribed by the researcher, and the data were analysed  
120 using Grounded Theory (GT), as it has an inductive nature that allows for greater  
121 interpretation of healthcare experiences [20]. The constructivist GT approach was employed  
122 as it allows the researcher to engage in the creation of theories and therefore strikes a balance  
123 between participants and the researchers views in the findings [21]. Additionally, it provides  
124 the researcher with the ability to generate novel and comprehensive theories while  
125 maintaining the originality of the data collected [21, 22].

126 The constructivist grounded theory method comprises initial coding followed by focused  
127 coding and theoretical coding, respectively [23]. Line by line coding was employed for the  
128 initial coding of data as it provides more scope for critical evaluation of data and therefore  
129 aids in the generation of many questions to explore new concepts [24]. During the coding  
130 process, in-vivo codes comprising specific terms used by participants were used to preserve  
131 the meaning conveyed by participants. This is identified as an essential component of

132 constructivist GT to prevent bias or extensive incorporation of the researcher’s perceptions  
133 and feelings into the participant data [24, 25].

## 134 **Ethical considerations**

135 This study was approved by the Swansea University Medical School Research Ethics and  
136 Governance Committee (SUMS RESC project ref number 2021-0065).

## 137 **Results**

### 138 **Theme 1: Patient portal and patient interaction**

#### 139 **Portal service**

140 An equal number of participants used the Patient Access and the NHS App respectively.  
141 Some had access to both the services. Participants who used Patient Access had the service  
142 for more than a year. Whereas a majority had registered with the NHS portal only in the past  
143 6 months. The use of the NHS App was mostly driven by the need to retrieve COVID-19  
144 vaccination proof. For example, patients stated “*The NHS app, [used] only recently since I*  
145 *heard about its introduction for the travel pass primarily*” (P10), and “*I’ve only had the NHS*  
146 *app since COVID*” (P07).

#### 147 **Portal features**

148 A broad range of features were available to participants (patients) via patient portals. These  
149 features included ordering repeat prescriptions, booking appointments, and accessing  
150 medical information like health records, test reports, consultations, immunisation, and  
151 medical history. The features available were different for participants using different portal  
152 services and varied depending on the surgery. Participants highlighted this variation and one  
153 stated, “*In this [NHS App] also you can see consultation, but I did not see much*

154 *detail [compared to another portal service]” (P10). Another added, “I think I’m supposed to*  
155 *be able to book appointments with my GP [General Practitioner] but I actually can’t...I think*  
156 *our GP just doesn’t use that function” (P08).*

157 Additionally, the commonly used features varied among participants. A participant  
158 stated, “*For patient access, the main things I used for were appointment booking at my GP”*  
159 *(P07), whereas another said, “The patient access I use it mainly for the repeat prescription*  
160 *and for sending requests [medication]” (P12).*

161 Participants displayed poor awareness of all the features available to them through the  
162 portal, some highlighted this by stating “*I can’t remember which all features it has but the*  
163 *main reason I use it is to order my prescription every few months due to a medical condition”*  
164 *(P03), and “I can look at repeat prescriptions but...because I haven’t had anything*  
165 *prescribed for a really long time, so I’m not as aware of that as a function” (P08),*  
166 *respectively.*

## 167 **Patients' portal experience**

168 Participant perceptions of patient portals were unanimously positive. They expressed that  
169 the portal made health services and information access automated, easy, efficient, and  
170 immediate. Additionally, they described patient portals as a means to minimise elaborate  
171 conversations and unnecessary interactions with healthcare staff. One stated that “*its’s*  
172 *[patient portal] brilliant, because If I can get away with not having to ring my doctor surgery,*  
173 *then that is an absolute bonus for me” (P14). Another reported, “it [using the portal] was*  
174 *the best experience I’ve had of trying to deal with the GP and manage medicine and stuff*  
175 *like that” (P08).*



## 176 **Theme 2: Factors influencing patient portal use**

### 177 **General Practitioner (GP) recommendation and patient choice**

178 In most cases, patient portals were recommended to participants by their GP for use of  
179 specific functionalities like appointment booking or medication refills. One stated “*it was*  
180 *then suggested [by the surgery] to make appointments*” (P10). Although, participants  
181 became aware of the service from recommendation by the GP surgery, the majority voiced  
182 that ultimately it was their independent choice to register to the service, by expressing  
183 “*I was happy to like use apps all the time so I was familiar so I would have probably chosen*  
184 *that even though my GP hadn't suggested it*” (P07), and “*it was my*  
185 *independent choice and no one forced me to use*” (P01), respectively. Additionally,  
186 participants added that the use of the service did not feel obligatory as the conventional mode  
187 of access were still available and one stated, “*it didn't seem like I was being forced to [use*  
188 *the service] by my surgery or anything like that. So, I am still aware that there are telephone*  
189 *services available for people who may not have a smartphone or not want to use the app for*  
190 *whatever reason*” (P09). However, some participants explained that they had no choice or  
191 limited choice of services to choose from, and one stated “*my GP surgery only used the*  
192 *Patient Access app...so there was no choice, and the NHS app is the only app that gives you*  
193 *access to your results and the COVID pass so there was no choice. I had to get both*” (P03).

### 194 **Perceived benefits and information need**

195 Participants' realisation of the potential benefits of the service aided their portal uptake and  
196 use. They recognised the ability of patient portals to enhance the speed and efficiency of  
197 their healthcare processes. They identified that portals enabled having all the services  
198 presented to them at their fingertips, thereby, making access available to them at their

199 convenience and out of GP working hours. One mentioned, “*it’s [portal] a good deal, better*  
200 *than holding on for an hour or more trying to get through to the receptionist*” (P05).

201 Additionally, increased healthcare and information needs motivated use, this was evident  
202 from participants statements like, “*I was very much like wanting to know as soon as possible*  
203 *when the results came in, so that was sort of what spurred it [use] initially...I would say, I*  
204 *don’t use it often but if something is wrong with me at a particular time then I’ll be using it*  
205 *again*” (P08).

## 206 **Pandemic and digital shift**

207 With the COVID-19 pandemic and several healthcare services moving online, portal use,  
208 specifically the use of the NHS App among participants increased. One participant  
209 emphasised that “*It [portal use] is partly to do with the pandemic...was trying to get all the*  
210 *information because in a pandemic it makes you realise that I need to sort out and make*  
211 *sure that all my healthcare is okay*” (P02). Another added, “*the NHS App gives you*  
212 *the option to have a vaccine passport, so that’s automatically a reason to use something like*  
213 *that*” (P14).

## 214 **Theme 3: Patient portal enabled health information access and** 215 **its impact**

### 216 **Patient emotions**

217 Participants had a positive experience of accessing their health records, test reports, and  
218 other health information via portal services. They were pleased to have this service available  
219 through their portal. Initial access to their health information spurred feelings of keen interest  
220 and curiosity among the participants. These emotions further developed to feeling informed,

221 reassured, in control, less dependent, and more confident. A participant stated “*I think it is*  
222 *more interesting really. There was nothing, in particular, I wanted to look up*” (P05), and  
223 another added, “*I suppose it was quite freeing in a way or like it gives you a degree of*  
224 *independence from the doctors*” (P08). Alternatively, there were also feelings of shock and  
225 surprise among some participants after viewing old and forgotten health information and  
226 one expressed “*I really liked it, it was quite interesting and it's quite surprising, it's a bit*  
227 *strange seeing everything you've had wrong with you in the list and it's quite daunting*”  
228 (P08).

## 229 **Healthcare process**

230 A majority of the participants expressed that portal enabled access to health information and  
231 records had a positive impact on their healthcare process, while some stated that it made  
232 little or no significant difference to their care. One explained that “*It's not that just because*  
233 *you can see your health information, disease or whatever condition, it doesn't mean that*  
234 *you then become aware of your health...I would say it hasn't made any difference by having*  
235 *access*” (P10). Many participants highlighted that access to their health information made  
236 them newly aware of their medical history or allowed them to recall forgotten health  
237 information, with one mentioning “*long time ago I had an allergy to penicillin, that was*  
238 *recorded which I myself had forgotten*” (P13). Additionally, access to health records allowed  
239 patients to easily compare and identify previous treatments that have worked. It further  
240 helped by bridging any communication gaps and language barriers and enabled patients to  
241 be more proactive, involve in shared decision making, and make informed healthcare  
242 choices. One participant stated “*Some of the things the doctors said I didn't fully understand.*  
243 *But with the app, I can look at it myself*” (P12), a second added “*I find that really*  
244 *reassuring I've got the level same access level as they [doctors] do*” (P14).

## 245 **Conventional versus portal supported health information access**

246 While expressing how portal access made a difference from the conventional method of  
247 receiving and accessing health information, participants emphasised that portal access is  
248 comparatively faster, and serves immediate information needs. They highlighted that it  
249 makes information access easier and meaningful with all health information available at one  
250 place, thus, preventing scattering of health records and aiding the generation of longitudinal  
251 health data. Additionally, participants appreciated the ability of the service to allow them to  
252 access and interact with their health data at a time and place of their convenience. These  
253 views are evident from participants stating, *“It’s much more efficient, it’s much easier, it’s*  
254 *quicker, it’s done in my time and in my speed at my convenience”* (P05), *“It’s more*  
255 *convenient rather than getting updates from different places like mail messages or*  
256 *whatever”* (P01), and *“Through the app, you can just access it on your own terms, no one is*  
257 *trying to prompt you”* (P02), respectively.

## 258 **Patient perceived drawbacks**

259 Participants identified varying threats of having access to health information and records via  
260 their patient portal. Key concerns included an obsession of viewing records, and the potential  
261 risk of self-diagnosis. One pointed that *“I think having access to your own records will lead*  
262 *to people jumping to wrong conclusions about their records, whereas on the other hand, it*  
263 *might require them to see a GP but because you have access to your records you might be*  
264 *less inclined”* (P02).

265 Additionally, participants acknowledged data security and privacy issues. A significant  
266 number, however, had little or no privacy concerns. This was due to their confidence in  
267 either the service provided by the NHS, their devices security system, or both. Many

268 believed that a strong password was key to ensuring data security. This was evident with  
269 participants stating, “*I have no concerns because...I think National Health is being quiet,*  
270 *the data protection and all that, they take that, you know seriously (sic).*” (P13), and “*it’s*  
271 *just a case of being able to make a good password*” (P09). On the other hand, a few were  
272 apprehensive of potential hacking but were willing to make trade-offs, either due to the  
273 absence of confidential information present within their records or due to their perceived  
274 benefits of patient portals. A participant expressed “*I am not worried because I don’t think*  
275 *there is anything on there that I am worried about anyone seeing or using it*” (P02).

## 276 **Theme 4: Patient portal adaptability and ease of use**

### 277 **Information interpretation**

278 Most of the participants reported that the health information presented to them via their  
279 portal was comprehensible and provided detailed information of their diagnosis or treatment.  
280 Some believed that the interpretability of the information depended on the type of report,  
281 and level of individuals medical knowledge. This was further reflected among participants  
282 as they expressed that although they managed to understand the information presented, they  
283 experienced some level of difficulty in interpreting the medical terms and stated that they  
284 relied on colloquial and supported explanations to interpret the data. For example, a  
285 participant stated, “*I obviously don’t understand the medical term but if the word normal is*  
286 *used that I will think that is okay*” (P04). Many also mentioned relying on google and other  
287 resources to research and understand complex information.

### 288 **Technological literacy**

289 None of the participants expressed having trouble in navigating through the given patient  
290 portal, however, they voiced their concern regarding the limited accessibility of portals for

291 the disabled and the older population with poor technological literacy. One participant  
292 stated, *“To me, I would say there are no downsides, but I can see that as a problem for*  
293 *people who have no help, no knowledge of how to use the system”* (P10), and another added,  
294 *“I think this [patient portal] is more towards the younger generation than the older ones”*  
295 (P13).

## 296 **Theme 5: Expectations and future developments**

### 297 **Patient expectation**

298 Several participants had no initial expectations from patient portals and accessing health  
299 records, as they registered to the service out of curiosity or to use it specifically for repeat  
300 prescriptions or appointment booking. A participant expressed *“I had no expectation, to*  
301 *begin with, I didn’t know what to expect so I think it has met my expectation”* (P13), and  
302 another stated, *“At first, I was curious, and I’ve accessed some fairly old documents going*  
303 *back to 1993... It was an interesting read, and I am glad I saw those letters”* (P05). They  
304 were fascinated to see various features, their health information, and medical history in their  
305 patient portal. All participants considered the service reliable in general, but this perception  
306 varied for different features. Additionally, one pointed that *“it is still dependent on human*  
307 *input, so it is as reliable as you consider a human”* (P02), and another added that the service  
308 reliability depended on the GP surgery providing it. Furthermore, some had suggestions for  
309 future improvement. A participant emphasised this by stating *“So far it has met my*  
310 *expectations. Obviously going forward there is a lot of room for improvement”* (P12).

### 311 **Future developments**

312 Some of the key suggestions of portal improvements among participants included obtaining  
313 more information access via patient portals, and incorporation of additional features that can

314 further aid their healthcare process. Many voiced the need for establishing consistency of  
315 service and portal features offered across GP surgeries and increased promotion of portal  
316 services to enhance portal use and adoption. These were explicitly stated by participants as  
317 *“I don’t understand why all GPs don’t use it. I think if all surgeries used it, it would be a lot*  
318 *easier for people to understand because it would just be one process for everyone”* (P07),  
319 and *“I did speak to a few of my friends and not many people seem to be using it [patient*  
320 *portal], I don’t think it is heavily promoted. So, I think marketing a bit more”* (P13).

321

## 322 **Discussion**

323 The participants in this study used the NHS App, Patient Access service, or both. None of  
324 them used the myGP service: this could be due to poor promotion of the service in the  
325 participants practice as highlighted in a study by Ryan et al [26] or due to promotion of  
326 alternative services. A broad range of features were available to participants through the  
327 NHS and the Patient Access portals, including ordering repeat prescriptions, booking  
328 appointments, viewing medical records, test results, and accessing consultation documents.  
329 However, the features available and used by each participant varied, depending on the portal  
330 service used and their registered General Practitioner (GP) surgery. The variation of features  
331 within the same portal service is due to the surgery being responsible for deciding what  
332 portal services are accessible to their patients [27, 28]. Additionally, most of the participants  
333 displayed poor awareness of various features within their patient portal, therefore, leading  
334 to non-use. This results when there is a lack of communication and guidance provided to  
335 patients by the providers [29, 30]. Patients are usually provided with details of setting up an  
336 account and logging in, whereas information given on features is not elaborate [4]. Portal

337 introduction must, therefore, be accompanied by adequate patient training and guidance to  
338 enable effective use of the service [4].

339 Majority of the participants in this study revealed that their GP recommended the respective  
340 portal service, which is known to play a significant role in patient portal adoption and use  
341 [7]. Although portal services were recommended, participants expressed having an open  
342 choice to register for the service. Hence, their continued portal use was influenced by their  
343 voluntary interest and perceived benefits of the service, which are considered as key factors  
344 essential for long term use of a portal [31-33]. Additionally, the use of the NHS App among  
345 participants was strongly influenced by its feature which allowed them to access their  
346 COVID-19 vaccination proof. This outcome is in accordance with a study [29], which  
347 highlights that in many cases patient portal use is a result of a reactive process to either a  
348 policy or a process.

349 Overall, among the participants, booking appointments and ordering repeat prescriptions  
350 were the most widely used features within a portal, whereas, accessing health records and  
351 test results were a result of curiosity or response to the availability of the service. This is  
352 consistent with previous research findings [9, 34]. Alternatively, studies by Rodriguez [35]  
353 and Moll et al. [36] reported that accessing medical records and viewing test results were  
354 the most used features of the portal. This difference in findings could be a result of varying  
355 medical and health information needs among portal users. For example, in this study the  
356 appreciation of the ability to access health records and information via a portal was directly  
357 proportional to the healthcare needs of the participants. This finding is consistent with  
358 previous studies which have noted that individuals' health, discharge, and medication status  
359 influence portal use [29,36-40].



360 Irrespective of their health status, participants had positive experiences of viewing their  
361 health information, medical records, or test results. They reported feeling confident, in  
362 control, aware, and informed of their health and care process. This response is consistent  
363 with previous studies [34, 36, 41]. Furthermore, participants expressed feeling reassured by  
364 being able to access information which earlier only their healthcare practitioners had access  
365 to. Some also cited that portal access helped bridge language and communication barriers  
366 with the providers. This equivalent access and enhanced information communication  
367 prevent patients from feeling powerless and ignored [42], which in turn can aid in  
368 safeguarding their emotional well-being which can otherwise be negatively influenced by  
369 caring neglect [43].

370 In addition to expressing these emotions, participants noted several benefits of accessing  
371 their health information and records. They expressed becoming aware of their medical  
372 history, and allergies which they previously had no knowledge of or had forgotten. This  
373 awareness aids in ensuring patient safety by minimising the risk of patient allergies and  
374 history being ignored during treatments [38]. Access to medical history further allowed  
375 participants to compare different treatments, identify progress and patterns, and make  
376 informed choices in their ongoing or upcoming care. A similar benefit was voiced in a study  
377 by Fisher, Bhavnani, and Winfield [40].

378 Furthermore, accessing health information and records via a portal was deemed easy, quick,  
379 and efficient by the participants. They valued the ability of portals to make seeking  
380 emergency medical assistance easier, with all necessary health information and history  
381 easily accessible. Individuals travelling frequently considered this as one of the most  
382 beneficial aspects of electronic access, since it allowed them to easily share health  
383 information with different care providers and healthcare services. This in turn can enhance

384 care coordination, save time and resources otherwise spent on conducting repetitive  
385 consultations and tests [44]. Additionally, participants reported that electronic access to their  
386 health information helped to keep them on track of their healthcare timeline by keeping them  
387 up to date regarding their treatments, immunisation, medication, and therefore ensured  
388 receiving medical attention when necessary. This outcome is useful as in most cases there  
389 is a lack of clarity regarding who is responsible for test result dissemination, thereby  
390 resulting in serious safety implications for patients due to the potential failure to follow up  
391 [45].

392 Participants in this study identified patient portals as more beneficial compared to the  
393 conventional modes of accessing health information as they not only catered for their health  
394 information needs but also provided multiple services. This could be one of the drivers to  
395 portal use as a study [39] suggests that access to records alone is not viewed as a useful  
396 service by patients but this feature supported by options like appointment booking,  
397 messaging, and ordering prescription intrigued patients. Additionally, it allowed having all  
398 resources and data in one place and prevented scattering of information. Participants further  
399 emphasised their appreciation regarding the possibility of accessing information at a time  
400 and pace suitable to them. Similar admiration is reflected among patients in a study by  
401 Zanaboni et al [46]. Furthermore, participants were not very concerned regarding their  
402 ability to interpret the health data presented to them. Although many reported difficulties in  
403 understanding medical terminologies which is considered essential for interpreting medical  
404 information [47], the ability to view their health information in accordance with their  
405 convenience aided their data interpretation. Some reported looking up the internet and  
406 researching as methods used to aid their interpretation. On the other hand, some responses  
407 reflected that they did not make an effort to understand the information in depth, instead  
408 referred to informal and simple terms to ensure the reports are normal.

409 The majority of the participants displayed awareness regarding data privacy, but it was one  
410 of the least expressed concerns. Among users of the NHS app, this response was majorly  
411 due to trust in services provided by the NHS, therefore, suggesting the influence of product  
412 branding which was demonstrated as one of the strengths of the NHS app by Beaney et al  
413 [48]. The lack of concern was also influenced by participants perception of the level of  
414 sensitivity of their medical information within their portal. On the other hand, some  
415 participants were willing to make trade-offs. This aligns with findings of a study [49] which  
416 noted that irrespective of their privacy concerns, patients are keen to use patient portals and  
417 access their health information as they believe that the benefits of the service outweigh any  
418 potential harm or drawbacks.

419 No participants in this study exhibited personal negative experiences of portal use.  
420 Nevertheless, they expressed their concerns about how a portal could negatively impact a  
421 certain set of people. The most expressed concern was, patient portals potential to stem  
422 disparity by limiting access to old, disabled, and individuals with poor health and  
423 technological literacy. This risk holds true in a study [31] that reported lower portal  
424 acceptance among the older and vulnerable groups as a result of poor health literacy or  
425 resistance to change. Alternatively, another study [50] identified that older adults registered  
426 to one or more portals irrespective of their technological literacy, therefore, highlighting  
427 their interest in using a portal. This suggests that increased provider encouragement, support,  
428 and training can prevent these individuals from being alienated from the service [32, 51].  
429 Furthermore, there were concerns that access to health information and medical history via  
430 patient portals might result in paranoia and obsession among some individuals. Similarly,  
431 physicians in a study [52] expressed concern that access to health information could fuel  
432 hypochondria among users.

433 Despite these general concerns, the services offered by these portals met majority of the  
434 participants expectations. The access to health information feature was beyond the initial  
435 expectation of most of the participants. Nevertheless, many expressed keen interest in  
436 obtaining more health information and details of their medical records. This demand is  
437 persistent among patients across various studies [53-55], therefore, promising future success  
438 of portal implementation and adoption.

439

## 440 **Limitations**

441 This study has some limitations. Firstly, this research explores the perception of patient  
442 portal users only in the UK. This therefore could limit generalisability of these findings to  
443 patient portal users on a global scale, as patient perceptions of portal use are strongly  
444 influenced by service provider and product branding, which vary across geographical  
445 boundaries. However, findings suggesting approaches to drive portal use, uptake, and health  
446 information access by patients are generic and independent of the service provider and can,  
447 thus be applied globally. Secondly, the process used to recruit participants through social  
448 media adverts could have limited participation of individuals inactive on these platforms or  
449 those with minimal access to the internet. Thirdly, some Zoom interviews were interrupted  
450 by the individuals' video conferencing set up which could have restricted them from  
451 providing elaborate answers. The impact of these on the study results however are minimal,  
452 as 13 participants which is considered as the minimum number required to achieve saturation  
453 in an interview-based study were included [56]. Additionally, Zoom offered the advantage  
454 of effectively accessing participants while managing the limited time and resources that were  
455 available for the study.

456

## 457 **Conclusion**

458 Findings from this study contribute towards understanding patients' experiences of  
459 accessing health information through patient portals. It was evident from the findings that  
460 portal use among patients is influenced by the service provider and portal features. Whereas  
461 their perceptions of accessing health information are influenced by their health situation and  
462 information needs. Although these perceptions were collectively positive, there is scope for  
463 future development. A key area of improvement is the need for establishing consistency of  
464 portal service offered across surgeries. This can aid familiarity and usability of the service,  
465 therefore, avoiding confusion among patients. Additionally, there is a need for increasing  
466 awareness of the service, its available features and providing patients with the necessary  
467 support in the form of training and encouragement to enable uniform access and use.

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