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## **The usefulness of health education materials in GP waiting rooms: cross-sectional study**

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# 1 **ABSTRACT**

2 **Background:** Health education materials (HEMs) are widely used in general  
3 practice, however, little information is available on the variety of HEMs currently  
4 available to patients in the UK, or their preferences for accessing educational  
5 materials.

6 **Aim:** To assess patients' perceptions of HEMs, and the variety and accessibility of  
7 these materials.

8 **Design and setting:** Cross-sectional study conducted in general practices in  
9 Brighton and Hove.

10 **Method:** An anonymous questionnaire was distributed to patients in the waiting  
11 room (WR). Additionally, an audit was conducted to measure the variety of the  
12 HEMs. Results were analysed using binary multiple logistic regression.

13 **Results:** 556 participants (response rate 83.1%) from 19 practices took part. The  
14 mean age of participants was 49.3 years (SD  $\pm$ 18.9) and 64% were female.  
15 Perceived usefulness of HEMs was associated with reading in the WR, using written  
16 HEMs, and not having a university degree; noticeability was associated with reading  
17 in the WR, and being female; attractiveness was associated with not having a  
18 university degree and shorter waiting time. On average, WRs contained 72 posters  
19 covering 23 topics, and 53 leaflets covering 24 topics, with many outdated and  
20 poorly presented materials of limited accessibility.

21 **Conclusion:** This study found substantial variation in the amount, topicality and  
22 quality of material available in WRs. As most patients notice HEMs and find them  
23 useful, available technology could be better utilised to widen access to HEMs. The

24 introduction of WiFi to waiting rooms should provide an opportunity to update this  
25 area.

26

27 **Keywords:** patient education, health education, patient information, general  
28 practice, waiting room

29

### 30 **How this fits in**

31 Whilst existing research on the variety of HEMs currently available to GP patients in  
32 the UK is limited, this study found substantial variation in the amount, topicality and  
33 quality of HEMs, with many outdated and poorly presented materials. Patients notice  
34 HEMs and find them useful, however, investment and leadership are needed to  
35 improve, differentiate and widen access to HEMs. Effective patient education could  
36 help to reduce some of the current burden facing GPs through increasing self-  
37 management and appropriate use of healthcare services, whilst the introduction of  
38 WiFi into GPs is an opportunity to update health education in the waiting room, and  
39 remote consultations could be easily linked with online HEMs. As the  
40 movement towards practice federations continues, national and local producers of  
41 HEMs should target educational materials towards these groups, and federations  
42 should consider creating a role with specific training and responsibilities for patient  
43 education.

44

45

## 46 **INTRODUCTION**

47 Health education materials (HEMs) in the waiting room (WR) have been associated  
48 with increased knowledge and satisfaction, and decreased anxiety among  
49 patients,<sup>1,2</sup> and may help support informed decision-making and patients'  
50 involvement in their care.<sup>3-5</sup>

51 Health information needs to be evidence-based, acceptable, useful, comprehensible  
52 and relevant.<sup>6</sup> The subject of HEMs has been heavily researched, however, much of  
53 the available evidence in general practice (GP) is more than two decades old,<sup>7-10</sup> or  
54 focuses on individual interventions.<sup>11-15</sup> Little information is available on the variety of  
55 HEMs currently available to GP patients in the UK, or patient preferences for  
56 accessing educational materials.

57

58

## 59 **METHODS**

### 60 **Study design**

61 This study used a cross-sectional methodology to assess patients' opinions  
62 regarding the usefulness, noticeability and attractiveness of HEMs in GP WRs. The  
63 study also examined the variety and accessibility of these materials.

### 64 **Study setting**

65 The study was conducted in the WRs of GPs in Brighton & Hove. All GPs in Brighton  
66 & Hove were approached by email and telephone between February and May 2017.  
67 Between March and May 2017, one to three visits were made to each practice to

68 distribute the questionnaire and collect data. Practices were visited on different days  
69 of the week, in both morning and afternoon sessions

## 70 **Participants**

71 Patients were included if they were >18 years, had visited the GP location in the last  
72 6 months, and were able to complete the questionnaire independently and in  
73 English.

## 74 **Data sources**

### 75 The questionnaire

76 The questionnaire was based on previous literature,<sup>7,9,10,16</sup> and covered information  
77 in relation to: age; sex; ethnic background; sexual orientation; smoking status;  
78 highest level of education; disability; English as a first language; number of GP visits  
79 in the last 6 months; waiting time; use of health-related information; and activities in  
80 the WR (appendix 1). The questionnaire was piloted in 5 individuals who had visited  
81 their doctor in the last 2 weeks. Patients who had been in the waiting room for at  
82 least five minutes were approached to complete the anonymous questionnaire, and  
83 once eligibility had been confirmed, were asked to complete the questionnaire before  
84 they left the practice. Participant consent was implied by return of the questionnaire.  
85 The questionnaire took less than 10 minutes to complete.

### 86 The audit tool

87 Data were also collected on the variety, number and topics of HEMs available in the  
88 WRs; the accessibility of health information (assessed against relevant  
89 guidelines);<sup>17,18</sup> and the representativeness of the HEMs present (appendix 2). The  
90 number of different varieties of HEMs, and the topics represented by them, were  
91 recorded. Practice characteristics and free text comments from the researcher were

92 also collected. The audit was conducted at a time when no participants were  
93 completing questionnaires.

## 94 **Study size**

95 The sample size calculation for this study was based on a previous study.<sup>16</sup> Details  
96 of the sample size calculation are provided in appendix 3.

## 97 **Statistical analysis**

98 Data was analysed using SPSS v.24. Binary multiple logistic regression was used to  
99 examine which predictors were independently associated with the primary outcome  
100 measures. Likert scale responses to the statements assessing the primary outcome  
101 measures were merged to form two categories: 'agree' and 'did not agree'. Results  
102 were considered significant at the 5% level. The following variables were included in  
103 the model: age; gender; racial background; sexual orientation; smoking status;  
104 highest level of education; disability; English as a first language; number of GP visits  
105 in the last 6 months; waiting time before previous appointment; use of written,  
106 electronic, and face-to-face source of health-related information; and reading, using  
107 electronics, or doing nothing in the WR. Descriptive statistics were used to examine  
108 the variety, number, topics, and accessibility of HEMs in the WR. Missing data were  
109 included in the descriptive analysis of questionnaire responses and were excluded  
110 listwise in the regression model. Word clouds were generated using  
111 wordclouds.com.

112

113

## 114 RESULTS

115

### 116 Results from the questionnaire survey

#### 117 Study setting and participants

118 **Study setting:** Nineteen (14 single-site and 5 multi-site) of the 44 practices in

119 Brighton & Hove agreed to participate in the study (participation rate 43.2%).

120 Altogether, the survey was carried out in 27 WRs of the 19 practices. The mean

121 number of full-time equivalent (8 sessions per week) general practitioners was 3.96

122 (SD  $\pm 2.44$ ), and the mean number of registered patients per practice was 8162 (SD

123  $\pm 5412$ ).

124 **Response rate:** Altogether, 845 patients were approached, of whom 669 were

125 eligible and 568 agreed to take part. Of these, 556 questionnaires were completed,

126 giving a response rate of 83.1% of those eligible. Reasons for exclusion of potential

127 participants were: not having attended the practice in the last 6 months (n=86), being

128 unable to complete the questionnaire independently (n=34 - of whom 27 had poor

129 eyesight and/or had forgotten their spectacles), being under 18 years of age (n=11),

130 and other reasons (n=45). Reasons for declining to participate were: no reason given

131 (n=56), feeling that there was not enough time before their appointment (n=16), and

132 other reasons (n=29).

133 **Participant characteristics:** The mean age of participants was 49.3 years (SD

134  $\pm 18.9$ ) and 64% of participants were female. 91.6% of participants were white, and

135 87.5% of participants had English as their first language. On average, participants

136 spent 15.6 minutes (SD  $\pm 14.1$ ) in the WR, and the mean number of visits to the

137 practice in the last 6 months was 4.6 (range 0-180) (table 1).



138 **Usefulness, noticeability, and attractiveness**

139 The statement “I normally notice posters, leaflets and other information on display in  
140 the waiting room” was agreed with by 77.9% of participants and 68.4% agreed with “I  
141 find posters and/or leaflets in the waiting room useful”. Only 47.1% of participants  
142 agreed with the statement “The displays in the waiting room are well-designed and  
143 attractive” (table 2).

144 **Multivariate analysis**

145 Results from the multiple logistic regression are presented in table 3. Participants  
146 with university level education and above were significantly less likely to find HEMs  
147 useful [OR 0.33; 95% CI 0.16-0.67] compared to those who were less qualified.  
148 Additionally, patients who used written HEMs were more than twice as likely to find  
149 them useful [OR 2.21; 95% CI 1.31-3.74], and those who read in the WR were 1.8-  
150 times more likely to find HEMs useful [OR 1.83; 95% CI 1.14-2.94]. Noticeability was  
151 negatively associated with male gender [OR 0.58; 95% CI 0.34-1.00]. Patients who  
152 read in the waiting room were more likely to notice HEMs [OR 3.29; 95% CI 1.80-  
153 6.00]. Participants with a longer waiting time [OR 0.98; 95% CI 0.97-1.00], and those  
154 with university level education and above [OR 0.47; 95% CI 0.26-0.86] were  
155 significantly less likely to find HEMs attractive.

156

157 **Results from the audit**

158 **Number and topics of health education materials:** On average, there were 72  
159 posters covering 23 topics; and 53 leaflets covering 24 topics. The most commonly  
160 available topics of HEMs were relating to: service provision, patient involvement,  
161 cancer and screening, mental health, and safeguarding and abuse. Figure 1

162 presents word clouds displaying the frequency of topics present as posters, leaflets,  
163 or on television screens.

164 The mean review frequency for displays in the WR was 7.8 weeks (SD  $\pm$ 8.3 weeks),  
165 although this was stated by the practice staff rather than observed by the researcher,  
166 and 3 practices stated that the WR was never reviewed. The person most commonly  
167 responsible for reviewing and updating HEMs was the practice manager (57.9%).  
168 Others responsible included: administrative staff, patient participant groups,  
169 healthcare assistants, commercial leaflet companies, GPs, nurses, and nobody. In 9  
170 practices, more than one person was responsible. The researcher's written  
171 observations noted a large amount of out of date information (n=25 comments),  
172 blank displays, duplicated posters, closed leaflets pinned to noticeboards, out-of-use  
173 television screens (n=5), posters targeted at staff, and other poor utilisation of  
174 resources such as displaying matching posters and leaflets separately and using  
175 glossy laminate that reflects light making posters difficult to read (n=12 comments).

## 176 **Accessibility and design of health education materials**

177 The provision of HEMs in accessible formats was generally poor, with a mean score  
178 of 8.74/35 for posters, and 13.21/35 for leaflets. No posters were provided in braille,  
179 audio or video formats in any WR (all had a mean score of 1 on the audit tool), and  
180 very few leaflets were available in video format (mean score 1.13). In many cases,  
181 braille, audio or foreign language formats of leaflets were available to order from the  
182 producer but were not physically present in the WR. The mean design score was  
183 35.90/45 for posters, and 34.08/45 for leaflets. The highest scoring criterion for both  
184 posters and leaflets was *Bold types or colours used for headings or to accentuate*  
185 *meaning* (means 4.85 and 4.96 respectively). The lowest scoring criteria were

186 *Materials represent patient groups of varying age, gender, ethnicity, sexuality, and*  
187 *disability* for posters (mean 2.85) and *Font size 14 or more* for leaflets (mean 2.00).

188

## 189 **DISCUSSION**

### 190 **Summary**

191 To our knowledge, this is the first study to combine patient opinion with assessment  
192 of the availability and quantity of HEMs in GP WRs. We found a wide variety of  
193 HEMs available in the WR. Most patients found them useful and noticeable, although  
194 less than half found them well-designed and attractive. Usefulness was associated  
195 with reading in the WR, using written HEMs as a source of health information, and  
196 not having a university degree; whilst noticeability was associated with reading in the  
197 WR, and being female. Attractiveness was associated with not having a university  
198 degree and shorter waiting time. The quality of HEMs available was highly variable.  
199 WRs scored highly on the design components of the audit tool, however, there was  
200 poor provision of information in accessible and foreign language formats.

### 201 **Strengths and limitations**

202 This study involved nearly half of the GPs in Brighton and Hove (43%) and was  
203 successful in recruiting 556 patients from these practices, achieving a high response  
204 rate.

205 The questionnaire was piloted, and included patients visiting various professionals,  
206 so collected a range of viewpoints. Additionally, rather than focusing on a single form  
207 of information, this study included all HEMs in the WR, and to our knowledge, no  
208 other study has assessed the accessibility of HEMs in this way.

209 The sample size calculation for this study accounted for intra-cluster correlation and  
210 we used linear mixed model analysis to examine clustering of questionnaire  
211 responses by practice location (see additional data). The analysis suggested that  
212 there was minimal clustering of participant responses by practice.

213 Although the overall sample size was achieved, we failed to recruit the desired  
214 number of practices, which may have affected the power of the study. Roughly the  
215 same number of participants were recruited from each practice, irrespective of the  
216 size of the practice, which over-represents smaller practices. Also, all practices  
217 involved were from Brighton and Hove, so the findings may have some limitations  
218 regarding the generalisability to other settings. On the other hand, the sample size  
219 was large, a range of practices were included, and the participant characteristics  
220 were similar to those of the local population, so the findings of this study are likely to  
221 be generalisable to WRs in other locations.

222 The questionnaire was piloted but it was not validated. Furthermore, the eligibility  
223 criteria excluded first-time or infrequent attenders as they would not have experience  
224 to base their responses on, however, these groups are also targets for health  
225 education.

226 Finally, this study does not explore the effectiveness of HEMs at increasing  
227 knowledge and changing behaviours, although this has been evaluated elsewhere.

## 228 **Comparison with existing literature**

229 Over two-thirds of participants in our study agreed that they found posters and/or  
230 leaflets in the WR useful, which is double the proportion found by Moerenhout et al in  
231 2013.<sup>16</sup> Similarly to this study, reading in the WR or using written HEMs were  
232 positively associated with usefulness.<sup>16</sup> In contrast with this study, we found that

233 having a university degree was negatively associated with usefulness,<sup>16</sup> and despite  
234 previous findings that only 24.3% of leaflets in the UK meet recommended reading  
235 level criteria.<sup>19</sup> More than three-quarters of patients noticed HEMs in the WR which is  
236 similar to other studies from the UK.<sup>9, 10</sup> Men were less likely than women to notice  
237 HEMs, which could be related to lower health literacy in men.<sup>20</sup> The number of  
238 posters and leaflets present was higher than that reported in previous studies,  
239 although these studies took place outside of the UK.<sup>16,21,22</sup>

## 240 **Implications for practice**

241 Over half of participants in WRs with TV screens stated that they usually watched it.  
242 Despite substantial evidence that educational videos in the WR lead to positive  
243 outcomes<sup>13,23-27</sup> only half of all WRs contained a TV screen. Furthermore, in several  
244 WRs the screen was turned off, or playing commercial television or advertisements,  
245 and none played sound. TV screens are a potentially effective educational resource  
246 that currently seems underutilised.

247 In the WR, more participants reported using their mobile (52%) than any other  
248 activity and the internet (72%) was the second most common source of health  
249 information. As 81% of adults in the UK now own a smartphone, and 54% have  
250 access to 4G,<sup>28</sup> this represents a future target for WR educational interventions.  
251 Some HEMs contained a Quick Response (QR) code linking to a website with more  
252 information. In the future, this could be used to link to reliable online sources of  
253 health information. The provision of HEMs in accessible formats and foreign  
254 languages was extremely limited, despite patients' desire for this.<sup>13,21</sup> Also, almost no  
255 HEMs in alternative formats were physically present in the WR, although many were  
256 available on request from the producer of the HEM. A database in the WR could

257 provide translated materials and be linked to a print- or email-on-demand system.  
258 These technologies could be used to provide more effective, personalised, targeted  
259 health information.<sup>2</sup> As groups of practices work together to care for larger  
260 populations of patients and remote access to healthcare becomes more common,  
261 traditional health promotion strategies based around the face-to-face consultation  
262 may need to change. Online resources are easy to signpost patients to, and many  
263 GPs already have websites that could be used for this purpose. Electronic health  
264 education may allow a broad population of patients to access accurate, high quality,  
265 and potentially personalised health information at a time and place of their choosing,  
266 although this may not be suitable or preferable for all patients. For example, in 2017,  
267 the Office for National Statistics found that only 41% of adults aged over 75 had  
268 used the internet in the last 3 months.<sup>29</sup>

269 Despite practices reporting that the contents of WRs were reviewed regularly, there  
270 were many examples of out-of-date information. In one practice, it was nobody's  
271 responsibility to maintain and update the WR, and in many practices a variety of staff  
272 members were tasked with this, which may reflect a lack of importance attached to  
273 health education in the WR. This could be addressed by creating a role within the  
274 practice with responsibility for managing patient education and associated training  
275 for this. Most practices produced very few, if any, of their own HEMs, and many were  
276 provided by national or local charities and organisations. This suggests that the  
277 variable quality of the HEMs may not be due to the practices, but the producers and  
278 distributors of the information. One could argue that those responsible for displaying  
279 HEMs in their WR ought to assess their accuracy and quality before distributing them  
280 to patients, however, given the current pressures on general practice, it is unlikely  
281 that this is seen as a priority. Interventions to improve the quality of HEMs would be

282 best targeted at these bodies producing the majority of HEMs, rather than the  
283 practices that distribute them.

284

## 285 **CONCLUSION**

286 The use of HEMs in GP WRs seems to be a forgotten and under-resourced corner of  
287 health promotion, with little national or local oversight, and no mention of HEMs in  
288 QoF, CQC inspections, or GP contracts. There is substantial variation in the amount,  
289 topicality and quality of material available in WRs with a variety of people, or even  
290 nobody, responsible for the provision or updating of WR information in some  
291 practices. There also appears to have been little effort to systematically utilise  
292 available technology to widen access to information by linking into existing  
293 databases of validated information, differentiating information according to health  
294 literacy levels and/or the interests of the patient, and providing translated materials.  
295 Despite all this, most patients reported that they notice HEMS and find them useful,  
296 although it appeared that fewer patients find them to be well-designed and attractive.  
297 With the recent decision to provide free Wi-Fi in GP practices in England, it may be  
298 time to review the materials on offer in GP waiting rooms. There is also a need for  
299 more outcome-based research on the effectiveness of health information materials in  
300 this setting.

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### **Ethical approval**

A favourable ethical opinion and HRA Approval were obtained via IRAS (project ID: 217441). Institutional sponsorship was obtained from the University of Sussex and Brighton & Hove CCG gave their support for the study.

### **Competing interests**

All authors have completed the ICMJE uniform disclosure form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) and declare: KM received a Wolfson Foundation Intercollegiate Degree Research Fellowship of £5000 from the Royal College of Physicians for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

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## REFERENCES

1. Oermann MH. Effects of educational intervention in waiting room on patient satisfaction. *J Ambul Care Manage*. 2003; 26(2):150-8.
2. Friedman AJ, Cosby R, Boyko S, Hatton-Bauer J, Turnbull G. Effective teaching strategies and methods of delivery for patient education: A systematic review and practice guideline recommendations. *J Cancer Educ*. 2011; 26(1):12-21.
3. Wegwarth O, Kurzenhauser-Carstens S, Gigerenzer G. Overcoming the knowledge-behavior gap: The effect of evidence-based hpv vaccination leaflets on understanding, intention, and actual vaccination decision. *Vaccine*. 2014; 32(12):1388-93.
4. de Haan MC, de Wijkerslooth TR, Stoop E, Bossuyt P, Fockens P, Thomeer M et al. Informed decision-making in colorectal cancer screening using colonoscopy or CT-colonography. *Patient Educ Couns*. 2013; 91(3):318-25.
5. van Agt HM, Korfage IJ, Essink-Bot ML. Interventions to enhance informed choices among invitees of screening programmes-a systematic review. *Eur J Public Health*. 2014; 24(5):789-801.
6. Coulter A. Evidence based patient information: Is important, so there needs to be a national strategy to ensure it. *BMJ*. 1998; 317(7153):225-6.
7. Shank JC, Murphy M, Schulte-Mowry L. Patient preferences regarding educational pamphlets in the family practice center. *Fam Med*. 1991; 23(6):429-32.

8. Elliott BJ, Polkinhorn JS. Provision of consumer health information in general practice. *BMJ*. 1994; 308(6927):509-10.
9. Ward K, Hawthorne K. Do patients read health promotion posters in the waiting room? A study in one general practice. *Br J Gen Pract*. 1994; 44(389):583-5.
10. Wicke DM, Lorge RE, Coppin RJ, Jones KP. The effectiveness of waiting room notice-boards as a vehicle for health education. *Fam Pract*. 1994; 11(3):292-5.
11. Natt N, Klar E, Cheung I, Matharu P, Bordman R. Increasing organ donor registration in a primary care clinic. *BMJ Qual Improv Rep*. 2017; 6(1):u222401.w8341.
12. Shah A, Scogin F, Pierpaoli CM. Older adults' attitudes toward depression screening in primary care settings and exploring a brief educational pamphlet. *Int J Geriatr Psychiatry*. 2018; 33(1):e40-e48. Epub 2017 Apr 21.
13. Jawad M, Ingram S, Choudhury I, Airebamen A, Christodoulou K, Wilson Sharma A. Television-based health promotion in general practice waiting rooms in London: A cross-sectional study evaluating patients' knowledge and intentions to access dental services. *BMC Oral Health*. 2016; 17(1):24.
14. Eubelen C, Brendel F, Belche JL, Freyens A, Vanbelle S, Giet D. Effect of an audiovisual message for tetanus booster vaccination broadcast in the waiting room. *BMC Fam Pract*. 2011; 12:104.
15. Makoul G, Cameron KA, Baker DW, Francis L, Scholtens D, Wolf MS. A multimedia patient education program on colorectal cancer screening increases knowledge and willingness to consider screening among hispanic/latino patients. *Patient Educ Couns*. 2009; 76(2):220-6.

16. Moerenhout T, Borgermans L, Schol S, Vansintejan J, Van De Vijver E, Devroey D. Patient health information materials in waiting rooms of family physicians: Do patients care? *Patient Prefer Adherence*. 2013; 7:489-97.
17. Office for Disability Issues, Department for Work and Pensions. Accessible communication formats [Internet]. London: 2014 [accessed 2016 Sept 29]. Available from: <https://www.gov.uk/government/publications/inclusive-communication/accessible-communication-formats>
18. European Commission Enterprise and Industry Directorate-General. Guideline on the readability of the labelling and package leaflet of medicinal products for human use [Internet]. Brussels: 2009 [accessed 2016 Sept 29]. Available from: [http://ec.europa.eu/health/files/eudralex/vol-2/c/2009\\_01\\_12\\_readability\\_guideline\\_final\\_en.pdf](http://ec.europa.eu/health/files/eudralex/vol-2/c/2009_01_12_readability_guideline_final_en.pdf)
19. Protheroe J, Estacio EV, Saidy-Khan S. Patient information materials in general practices and promotion of health literacy: An observational study of their effectiveness. *Br J Gen Pract*. 2015; 65(632):e192-7.
20. von Wagner C, Knight K, Steptoe A, Wardle J. Functional health literacy and health-promoting behaviour in a national sample of british adults. *J Epidemiol Community Health*. 2007; 61(12):1086-90.
21. Beckwith N, Jean-Baptiste ML, Katz A. Waiting room education in a community health system: Provider perceptions and suggestions. *J Community Health*. 2016; 41(6):1196-203.
22. Gignon M, Idris H, Manaouil C, Ganry O. The waiting room: Vector for health education? The general practitioner's point of view. *BMC Res Notes*. 2012; 5:511.

23. Koperski M. Health education using video recordings in a general practice waiting area: An evaluation. *J R Coll Gen Pract.* 1989; 39(325):328-30.
24. Oermann MH, Webb SA, Ashare JA. Outcomes of videotape instruction in clinic waiting area. *Orthop Nurs.* 2003; 22(2):102-5.
25. Krouse HJ. Video modelling to educate patients. *J Adv Nurs.* 2001; 33(6):748-57.
26. Comite F, Gallagher TC, Villagra V, Koop CE. Patient education as medical intervention: A pilot study. *HMO Pract.* 1998; 12(1):17-23.
27. Tingey P, Khanafer M, Singh K, Thompson A, Le Riche N, Barra L et al. Social persuasion in rheumatology: A randomized trial of testimonials on television in the rheumatology clinic waiting room to increase attendance for multidisciplinary education. *Rheumatol Int.* 2014; 34(7):903-7.
28. Deloitte. Global mobile consumer survey 2016: UK cut [Internet]. London: 2016 [accessed 2016 Nov 19]. Available from: <https://www.deloitte.co.uk/mobileuk/>
29. Office for National Statistics. Statistical bulletin: Internet users in the UK: 2017 [Internet]. London: 2017 [accessed 2018 May 22]. Available from: <https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2017>

**Table 1:** Participant demographics

<b>Patient Characteristics</b>	
<b>Age in years (n=544)</b>	
Mean (SD)	49.27 ( $\pm$ 18.87)
Range	18 – 92
	<b>Number (%)</b>
<b>Gender (n=544)</b>	
Male	196 (36.0%)
Female	348 (64.0%)
<b>Ethnicity (n=549)</b>	
White	503 (91.6%)
Non-white	46 (8.4%)
<b>Sexual Orientation (n=543)</b>	
Heterosexual	470 (86.6%)
Non-heterosexual	73 (13.4%)
<b>Smoking Status (n=554)</b>	
Ever smoked	326 (58.8%)
Never smoked	228 (41.2%)
<b>Day-to-day activities limited by a long-term health condition (n=544)</b>	
Limited by disability	209 (38.4%)
No disability	335 (61.6%)
<b>Highest level of education (n=545)</b>	
No qualifications	113 (20.7%)
Below university level education	201 (36.9%)
Above university level education	231 (42.4%)
<b>Sources of health information (n=550)</b>	
Written HEMs	166 (29.9%)
Electronic HEMs	422 (75.9%)
Face-to-face information	447 (80.4%)
<b>Activity in the waiting room (n=550)</b>	
Reading	305 (54.9%)
Using electronic media	313 (56.3%)
Nothing or other	201 (36.2%)

**Table 2:** Patients use and perceptions of health education materials

<b>Statement</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Did not answer</b>
<b>I often talk to my doctor about information I have found from other sources</b>	8.1%	24.5%	28.4%	23.7%	12.1%	3.2%
<b>I normally notice posters, leaflets and other information on display in the waiting room</b>	18.9%	59.0%	11.7%	5.4%	1.3%	3.8%
<b>I often read the posters and/or leaflets on display in the waiting room</b>	13.7%	51.8%	18.0%	9.5%	2.3%	4.7%
<b>I usually understand the information in posters and/or leaflets in the waiting room</b>	24.5%	58.1%	11.5%	2.0%	0.5%	3.4%
<b>I find posters and/or leaflets in the waiting room useful</b>	18.3%	50.4%	25.0%	3.2%	0.9%	2.2%
<b>I often watch the TV screen and/or listen to audio resources in the waiting room</b>	5.9%	19.2%	9.5%	8.8%	2.5%	54.0%*
<b>The displays in the waiting room are well-designed and attractive</b>	9.0%	38.1%	36.7%	10.1%	0.7%	5.4%
<b>I can identify with the health education materials on display</b>	10.3%	44.4%	35.1%	5.6%	0.5%	4.1%
<b>Health education materials in the waiting room are valuable for improving my overall health and wellbeing</b>	11.7%	42.4%	34.2%	7.7%	0.7%	3.2%

\*Responses to this question were not included from practices without TV screens. No practices provided audio resources (not including background music or commercial radio stations).

**Table 3:** Logistic regression on perceptions of health education materials with patient-related variables

Independent variable	P-value	OR	95% CI for OR	
			Lower	Upper
<b>Usefulness</b>				
I find posters and/or leaflets in the waiting room useful				
Written HEMs	<b>0.003</b>	<b>2.214</b>	1.311	3.739
Reading in the WR	<b>0.012</b>	<b>1.834</b>	1.144	2.940
Education				
No qualifications	0.006			
Below university level	0.069	0.524	0.261	1.051
University level and above	<b>0.002</b>	<b>0.331</b>	0.164	0.669
<b>Noticeability</b>				
I normally notice posters, leaflets, and other information on display in the waiting room				
Gender (male)	<b>0.048</b>	<b>0.581</b>	0.340	0.995
Reading in the WR	<b>0.000</b>	<b>3.290</b>	1.804	6.000
<b>Attractiveness</b>				
The displays in the waiting room are well-designed and attractive				
Waiting time	<b>0.043</b>	<b>0.984</b>	0.970	1.000
Education				
No qualifications	0.048			
Below university level	0.128	0.625	0.342	1.144
University level and above	<b>0.015</b>	<b>0.470</b>	0.256	0.864

**Logistic regression including the following variables:** age, gender (male/female), racial background (white/non-white), sexual orientation (heterosexual/non-heterosexual), smoking status (ever smoked/never smoked), education (university level and above/below university level/no qualifications), disability (limited/not limited), English as first language (yes/no), GP visits in last 6 months, waiting time, written HEMs (yes/no), electronic HEMs (yes/no), face-to-face health information (yes/no), reading in the waiting room (yes/no), using electronics in the waiting room (yes/no), nothing/other in the waiting room (yes/no).

**Abbreviations:** CI, confidence interval; OR, odds ratio.

**Results in bold** indicate statistical significance ( $p < 0.05$ ).



1a. Poster topics



1b. Leaflet topics



1c. Television topics

Figure 1: Word clouds displaying topics of health education materials