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Tailoring the amount of treatment information to cancer patients' and survivors' preferences: Effects on patient-reported outcomes

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ABSTRACT

Objectives: Tailoring medical information to cancer patients' needs is recommended, but there is little guidance on how to tailor, and limited research exists about its effects. Tailoring to the amount of preferred information may be easily implementable in clinic and is tested here.

Methods: A video-vignette experiment was used to systematically vary video patients' information preferences (limited/extensive) and amount of provided information (additional/no additional). N = 253 cancer patients/survivors evaluated these video-recorded consultations, serving as analogue patients (APs), and completed outcome measures.

Results: Tailoring information to video patients' preferences had no effect on APs' evaluation of the consultation (satisfaction, trust). Yet, there was a main effect of APs' own information preferences: Those preferring extensive information recalled (MD = 5.8%) and recognized (MD = 3.5%) more information than those preferring limited information. Moreover, information provision mattered among APs who preferred limited information: They recognized even less if provided with extensive information. *Conclusions*: Tailoring to the amount of video patient's information preferences did not affect APs' evaluation of the consultation (satisfaction, trust), while APs' personal information preferences determined their recall and recognition of medical information. Practice implications: Information preferences should be assessed and tailored to in clinical practice. Overwhelming patients/survivors, who prefer limited information, should be prevented.

1. Introduction

Research has repeatedly shown that cancer patients' recall of medical information is poor [1–3], as they forget about 40–80% of information provided by their oncologist [1,4–6]. Nevertheless, many cancer patients wish to receive extensive treatment-related information [7–10], although some also prefer limited amounts of information [11–13]. The American Society of Clinical Oncology recommends that providers tailor information to individual patients' needs and preferences [14], but little guidance is provided about how to do so. Given the variation in how much information cancer patients prefer, tailoring to the amount of preferred medical information could be an easily implementable step in providing patient-centered care. However, research about the effects of tailoring the amount of provided medical information is limited.

Previous research indicated that if cancer patients receive less information than they prefer and/or if they generally seek extensive cancer-related information, they tend to be less satisfied with care [9,15,16]. In contrast, limited information provision can also protect patients' well-being (e.g., in case of poor prognosis [17,18]) and caution is advised to not overwhelm patients [19]. In general, patient-centered communication has consistently been related to greater patient satisfaction [20,21]. Tailoring the amount of information to patients' preferences is one way of providing patient-centered communication, and could ensure that patients receive information which is desired and relevant to them [22]. Such manner of communication could further be perceived as attentive and contribute to building a positive patient-provider relationship, which could also enhance trust in the provider. Yet, such associations remain largely untested and, to our knowledge, only one study specifically examined the effects of information tailoring on patient satisfaction. No significant effect was found [23], but information was tailored comprehensively (i.e., amount, type, and content of information), possibly obscuring effects of certain kinds of tailoring. Previous research further indicated that providing tailored information leads to better recall of medical information [24,25], potentially increasing patients' ability to make informed decisions. Overall, information tailoring could be a promising method to improve communication in healthcare and patient-reported perceptions, like satisfaction, trust, recall. However, the available evidence is scarce and this study aimed to systematically test the effects of tailoring the amount of medical information on such patient-reported outcomes using a videovignette design.

Systematically manipulating information provision to patients in clinical practice is difficult due to ethical and practical considerations. Therefore, video-vignette study designs are a practical and valid alternative [26–30]. Video vignettes are scripted scenarios of real-life (medical) consultations that require participants to imagine themselves being the patient in the video, serving as so-called "analogue patients" (APs [28]). For this study, we recruited cancer patients/survivors, serving as APs. All video vignettes showed the same conversation of a hematologist/oncologist who explained a

treatment plan to a newly diagnosed video patient. However, we systematically varied the video patients' information preferences (limited vs. extensive) and the amount of information that the provider presented (additional vs. no additional information), resulting in four different conditions: (a) tailoring to extensive information preferences of the video patient by providing additional information, (b) tailoring to limited information preferences by refraining from providing additional information, (c) no tailoring to extensive information preferences by not providing additional information, and (d) no tailoring by providing additional information although the video patient voiced limited information preferences. Thus, in conditions (c) and (d) the provider did the opposite of what the video patient requested (see also below). Importantly, it should be emphasized that when studying information tailoring in such a video-vignette design, there are two patients with information preferences: the video patient and AP. This creates not only a match/mismatch between the video patient and provider (as described above), but also a match/mismatch between the AP and provider (see Table 1). Both angles will be considered in this study.

First, we focused on tailoring to the video patient, based on the assumption that video-vignette designs require APs to imagine themselves being the patient in the video. We tested whether the four conditions (a) – (d) differed by how APs evaluated the video consultation (i.e., satisfaction with provided information, trust in provider; research question: RQ1). Second, we focused on APs' personal information preferences and tested whether a (mis-) match of APs' information preferences and provider information provision determined their evaluations of the video consultation (i.e., satisfaction, trust) and their recall of provided medical information (i.e., active recall, recognition; RQ2).

Methods

2.1. Design and participants

The presented data were part of a larger randomized controlled experiment (Fig. 1). Additional information about the full study protocol and development of vignettes has been published elsewhere [31]. All videos showed the same conversation, but the amount of provided information was manipulated in a 2 × 2 design. For example, in each condition the video patient was told that the treatment would involve immunotherapy. The provider then asked the video patient whether additional information about immunotherapy was desired. In half of the conditions, the video patient welcomed more information and in the other half the patient declined. Subsequently, the provider either presented additional information or not, resulting in the four conditions (a) – (d) as described above (see also Table 1).

The videos were embedded in an online survey. Participants were invited by mass emails through an online panel for patientprovider research (www.panelcom.nl) or a commercial online research platform (www.flycatcher.eu) specifically targeting cancer patients/survivors. Additionally, our survey was advertised on the homepages/social media profiles of patient support organizations (i.e., the Dutch Cancer Society [KWF], Hematon, and the Dutch Federation of Cancer Patient Organizations [NFK]). Adults with a current or prior cancer diagnosis, who could read and write Dutch were eligible to participate. Before starting the survey, participants were asked to provide informed consent online. Subsequently, they were asked to provide sociodemographic and cancer-related information (Table 2), before being automatically randomized to watching one of the four video vignettes. Subsequently, participants evaluated the video consultation and completed a series of questions assessing all outcomes. All procedures were approved by our institutional review board (W16_054#16.069).

A total of N = 309 participants were randomized to one of the video conditions and N = 253 cancer patients/survivors completed all measures (81.9%; Fig. 1). On average, they were 61.3 years

old (20–90 years) and <1-40 years post diagnosis (Md = 4.0 years, 10% were within the 1st year following diagnosis). Almost equal numbers of male and female patients/survivors participated (46.2% vs. 53.8%), who were mostly partnered/married (n = 195, 77.1%), highly educated (n = 120, 47.4%), and/or retired (n = 100, 39.5%, Table 2). Notably, participants differed from those who did not complete the survey (N = 174; Fig. 1) in such way that completers were younger (MD = 3.3 years; p = .003) and accordingly less likely to be retired (39.5% vs. 54.3%, p = .009).

[Table 1]

[Figure 1]

[Table 2

2.2 Measures

2.2.1. Information preferences

A study-specific single item was used to measure participants' preferences regarding the amount of medical information before they watched the video. They were asked to what extent they try to gain as much information as possible during a medical consultation, irrespective of whether this information may be complex or emotionally burdensome. If participants completely agreed with this statement, they were categorized as having extensive information preferences. If they indicated agreement to a lesser degree (absolutely not – somewhat), they were combined to having limited information preferences.

2.2.2. Perceived tailoring

A single item was used as manipulation check to assess whether APs perceived the video consultation as tailored to the video patient: *"On a scale from 1 – 10, to what extent do you think the provider tailored the amount of provided information to the specific needs of the patient?."*

2.2.3. Video engagement

The 15-item Video Engagement Scale (VES), a frequently-used and validated tool in video-vignette research, was used to check whether APs got involved/immersed themselves in the video [32]. It serves a quality check and items include statements about whether APs exclusively focused on the video, could connect with the video patient, or were touched by the video. Items were answered on a seven-point Likert scale (disagree – agree), and scores were averaged with higher scores indicating greater engagement. Cronbach's alpha was very high in this study (α = .96).

2.2.4. Satisfaction with provided information

Based on the EORTC QLQ-INFO25 questionnaire [33], five items were developed to assess satisfaction with the amount, content, relevance, clarity, and manner in which the information was conveyed (e.g., *Were you satisfied with the amount of information that the doctor provided?*). Answer categories included five-point Likert scale responses ranging from not at all satisfied – *very satisfied*, and average scores were calculated. Cronbach's α was high(α = .91).

2.2.5. Trust

The 5-item short version of the Trust in Oncologist Scale (TiOSSF [34]) was used to measure whether the provider was perceived as evoking trust. Each item was rated on a five-point Likert scale

ranging from completely disagree – completely agree. Mean scores were calculated and α was high (α = .91).

2.2.6. Recall of medical information

Two facets of recall (i.e., active recall and recognition) were measured based on the Netherlands Patient Information Recall Questionnaire [35]. Their development has been described in greater detail previously [31]. Active recall was measured with 14 open-ended questions inquiring about information presented in the video (e.g., video patient's type of cancer, type of treatment, potential side effects). Participants either typed their answer in an open-ended text box or indicated they did not know the answer. A detailed scoring scheme was developed and all answers were coded by two independent coders with an inter-rater reliability of 95.5%. If coders disagreed, final scoring was achieved through discussion. Participants could reach a maximum of 27 points if all answers were correct and provided enough detail, and scores were transformed into percentages.

Following active recall, the same 14 questions about the video consultation were presented in a multiple-choice format to measure recognition. Each question included three answer options and participants could gain one point for each correct answer, which was again transformed into percentages.

2.3. Statistical analyses

A priori power analyses indicated a required sample size of N = 240, with an alpha of .05, probability level of .80, and estimated effect sizes of .10–.25 for the dependent variables trust, satisfaction, recall [31]. Thus, with a final sample of N = 253, we had sufficient power to detect differences between the video conditions.

Preliminary checks were conducted to ascertain successful randomization by comparing APs' background characteristics between tailoring conditions, using χ2-, t-, or F-tests depending on the tested factors. Moreover, ANOVAs were used for manipulations checks by testing a) whether APs in the different tailoring conditions equally engaged with the video vignettes by comparing video engagement scores, and b) whether APs detected the presence/absence of tailoring by comparing perceived tailoring between conditions.

Addressing RQ1, ANOVAs were used to compare APs' satisfaction and trust between the four video conditions. To test RQ2, we re-grouped APs based on their personal information preferences and tested differences on all outcomes (satisfaction, trust, active recall, recognition) using ANOVAs with information preference (extensive vs. limited), provider information provision (additional vs. no additional information), and their interaction as fixed factors. Analyses were carried out in SPSS, version 25 and are accompanied by effect size calculations (partial eta2 or Cohen's d).

3. Results

3.1. Randomization and manipulation

Automated randomization was generally successful, given that APs in the different video conditions did not differ by sociodemographic or cancer-related characteristics (ps>.1), except for level of education (χ2(6) = 15.00, p = .020). Lower educated APs were less often randomized to either of the two non-tailoring conditions. Therefore, education was added as covariate to ANOVAs testing differences between the four tailoring conditions (a)-(d), RQ1.

APs equally engaged with the videos, as video engagement scores were similar across all tailoring conditions (M = 4.6–4.7, F (3,249) = 0.078, p = .972). Video manipulations were successful given that APs differed in their levels of perceived tailoring, F (3,249)=2.98, p = .032, h2 = .035. Specifically, APs

watching the non-tailoring condition (c): no tailoring to extensive information preferences, rated perceived tailoring the lowest (see Table 3).

[Table 3]

3.2. Tailoring to video patient

Testing RQ1 showed that APs in the four different tailoring conditions did not differ in their *satisfaction* with provided information ($F(3,247) = 1.45$, $p = .228$, $\eta^2 = .017$; Table 3). However, posthoc pairwise comparisons indicated that tailoring mattered if video patients preferred extensive information (a)&(c): APs' were significantly more satisfied if the provider indeed tailored by providing additional information (vs. satisfaction being lower if he did not, see Appendix). Notably, level of education was a significant covariate ($F(1,247) = 7.41$, p = .007, $\eta^2 = .029$). Lower educated Aps reported significantly higher satisfaction than highly ($M\Delta = 0.4$, $d = 0.5$) and mid-level ($M\Delta = 0.3$, $d = 0.4$) educated APs. At item-level it appeared that lower educated APs were more satisfied with the amount, content, and manner in which the provider presented information (*ps*<.026).

In further addressing RQ1, trust scores did not differ between tailoring conditions ($F(3,247) = 0.65$, $p = .583$, $\eta^2 = .008$; Table 3), but between APs' level of education ($F(1,247) = 5.94$, $p = .016$, $\eta^2 = .023$). Lower educated APs reported significantly greater trust in the provider than highly educated APs ($M\Delta = 0.4$, d = 0.5), while participants with a mid-level education fell in the middle.

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3.3. (Mis-)match with AP

The majority of APs ($n = 152$, 60.1%) reported preferring extensive medical information, whereas the rest was categorized as preferring limited information ($n = 101$, 39.9%). Testing a (mis-) match of APs' preferences and provider information provision (RQ2), showed that neither APs' information preferences, provider information provision, nor the interaction of both were related to APs' satisfaction with provided information or perceived trust in the provider (all *ps*>.300; Table 3).

APs' information preferences determined their active recall of medical information ($F(1,249) = 8.11$, $p = .005$, $\eta^2 = .032$), irrespective of whether the provider had presented additional information or not ($F(1,249) = 0.22$, $p = .638$, $\eta^2 = .001$; interaction term: $F(1,249) = 0.09$, $p = .767$, $\eta^2 = .0004$). Specifically, APs preferring extensive information recalled significantly more information provided in the video ($M = 57.8\%$) than participants with limited information preferences ($M = 52.0\%$; Table 3), accounting for 3.3% of the variance in recall scores (adjusted $R^2 = .021$). Similarly, APs' information preferences determined their recognition of provided information ($F(1,249) = 7.43$, $p = .007$, $\eta^2 = .029$). APs preferring extensive information recognized significantly more information correctly ($M = 90.5\%$) than APs preferring limited information ($M = 87.0\%$; Table 3). The main effect of provider information ($F(1,249) = 3.45$, $p = .063$, $\eta^2 = .014$) as well as interaction of APs' preferences and information provision ($F(1,249) = 2.24$, $p = .136$, $\eta^2 = .009$) were not significant and overall explained variance in recognition scores was 4.7% (adjusted $R^2 = .035$). Nevertheless, pairwise comparisons, testing simple effects, indicated that information provision mattered for APs preferring limited information ($F(1,249) = 4.70$, $p = .031$, $\eta^2 = .019$). Specifically, Aps preferring little information who received additional information recognized less information correctly ($M = 84.9\%$) than Aps preferring little information who indeed received no additional information ($M = 89.1\%$, see Appendix).

4. Discussion and conclusion

4.1 Discussion

This study demonstrated that tailoring the amount of medical information to video patients' expressed information preferences did not affect analogue patients' (APs) evaluation of the consultation (i.e., satisfaction, perceived trust). Yet, APs' personal information preferences determined their active recall and recognition of medical information, in such way that those wanting more information recalled more. In clinical practice, care providers could easily assess individual patients' information preferences and tailor to their needs. Importantly, simple effects indicated that among individuals who prefer limited information, presenting extensive information could be detrimental as they recognize even less of the presented information. Thus, overwhelming patients with more information than they desire should be prevented at any time.

Video manipulations were correctly detected, but tailoring did not influence evaluations of satisfaction and trust. We expected that responding to video patients' information preferences increases perceptions of providers' attentiveness and therefore yield more positive evaluations of the consultation. Yet, this is a rather subtle and indirect route, and differences in perceived tailoring were small, potentially accounting for missing effects. In addition, previous studies about patient satisfaction typically focused on patients' evaluations of their own provider [15], which is likely colored by previous experiences with this provider and contributing to (dis-)satisfaction, an aspect that does not apply to vignette studies. Moreover, we manipulated the amount of provided information, which may be more relevant for cognitive information processing rather than affect-related perceptions of satisfaction and trust. Interestingly, level of education was a significant covariate, showing moderately sized differences in satisfaction and trust between those with a low and high level of education. Such findings regarding trust are consistent with previous research [36], although the relationship between education and satisfaction remains vague. It was indeed indicated that patients with higher education seek more information [16,37]. This may imply that lower educated patients are more easily pleased with care or information provision, but findings are equivocal and underlying mechanisms remain unclear. Therefore, oversimplified conclusions about patients, based on their level of education, should not be drawn when communicating in clinical practice. Instead, more sensitive indicators of the ability to navigate the health care system, such as health literacy, may be considered.

Importantly, information preferences influenced APs' active recall and recognition of medical information. Patients or survivors who prefer little information may be overwhelmed and therefore remember less. Providers sometimes adopt a broadcasting communication style (i.e., trying to convey as much information as possible [38]), which should be prevented at any time. If providers do not check patients' understanding or consider their needs/preferences, extensive information provision will have little or even negative effects. Recent research concluded that providers barely tailor their information in clinical practice [23,39], while others indicated that providers tailor intuitively [40]. Yet, the specific mechanisms and which cues providers use to tailor to individual patients remain unclear and more research regarding the mechanisms and different components of information tailoring are needed.

This study adds to the limited literature on systematically varying information tailoring, as manipulating information provision in clinical practice is difficult, due to ethical reasons. Thus, our study design of using video vignettes is a useful and valid alternative [26–30], but such design also prevented tailoring to Aps preferences in real time, which remains a limitation of this type of studies. Consequently, there can also be a (mis-)match between the expressed preferences of the video and the analogue patient. Such mismatch is a generic methodological challenge of video vignette research and could not be addressed here. Overall, such design considerations fuel the discussion

about the utility of video vignette experiments for such research questions. Yet, we believe that the limitations of this approach, outweigh the ethical problems of manipulating information provision in clinical practice, as well as time-intense and sample-size issues when qualitatively discerning mechanisms of information provision in clinical practice. Nevertheless, future studies may improve their methods to reduce the gap between experimental and clinical methods, for example by utilizing more advanced technologies in experimental designs (e.g., virtual reality) or by comparing the communication of trained providers versus those providing care as usual in clinical settings (see also the Implication section below).

Moreover, this study included a considerable sample of more than 250 participants, but those who completed this study were younger than non-completers which may be an indication that our survey was rather demanding for older participants. Additionally, many participants were highly educated and future studies may randomize participants based on their level of education, to examine whether mechanisms and effects of tailoring may be different between groups. Finally, this study focused on varying the amount of medical information as one way of tailoring, while there are more, such as tailoring the presentation of information (e.g., verbal vs. written, text vs. figures), or tailoring affective responses to patients. These remain to be tested in the future.

4.2 Conclusion

Although APs correctly detected the video manipulations, information tailoring did not influence their evaluations of the video consultation (i.e., satisfaction and trust). It may be speculated that tailoring to video patients' preferences does not increase perceptions of patient-centeredness, and therefore did not positively affect evaluations of the viewed consultation. However, this may only be true in video-vignette designs, whereas satisfaction with own providers in real-life may indeed be influenced by appropriately responding to patients' information preferences. Yet, satisfaction with the own provider is most likely influenced by various factors, and it remains difficult to discern the precise effects of specific communication strategies, such as information tailoring. Importantly, APs' own information preferences determined their recall and recognition of information. While this finding is rather straightforward, it has direct implications for clinical practice:

4.3 Practice implications

Medical consultations in hematology/oncology tend to be long and filled with extensive information. This can be difficult for patients who desire or are only able to comprehend limited information, during a medical consultation or more generally. Providers should check patients' preferences and tailor the amount of provided information. For example, they could offer patients the option to return for a second consultation or take breaks in-between providing chunks of information, while repeatedly checking their patients' understanding.

If patients indicate preferences for limited information, providers may also explore patients' underlying reasons for such preferences. It could simply be to prevent confusion, but if anxiety is the source for preferring limited information, such anxiety should be addressed to optimize care. Increased anxiety has been found to be related to lower trust in providers [41] and limited information recall [42]. Finally, lower educated patients may require additional attention from providers, preferably in ways that are not stigmatizing, as health-related information needs and health literacy differ between individuals and across educational levels [43].

Finally, research implications include striving for more advanced methodologies to better relate to clinical issues. For example, future video vignette studies (especially if done online) could randomize participants more interactively based on their preferences (e.g., showing vignettes with extensive information to APs who desire much information). Moreover, utilizing more advanced technologies in the future (e.g., VR) could maximize engagement with video vignettes. Thereby, additional modes

of tailoring should also be tested (e.g., tailoring to emotional responses, tailoring to wishes for written information, etc.) as well as effects of tailoring on other patient-reported outcomes (e.g., treatment adherence).

Data statement

As part of consenting to the study, survey respondents were assured that raw data would remain confidential and would not be shared. Descriptive data on group level may be available upon request from the corresponding author.

CRediT authorship contribution statement

Vicky Lehmann: Formal analysis, Visualization, Writing - original draft, Writing - review & editing. Nanon H.M. Labrie: Conceptualization, Data curation, Investigation, Methodology, Project administration, Writing - review & editing. Julia C.M. van Weert: Conceptualization, Writing - review & editing. Sandra van Dulmen: Conceptualization, Funding acquisition, Writing - review & editing. Hanneke J.C.J.M. de Haes: Conceptualization, Writing - review & editing. Marie José Kersten: Conceptualization, Funding acquisition, Writing - review & editing. Arwen H. Pieterse: Conceptualization, Writing - review & editing. Ellen M.A. Smets: Conceptualization, Funding acquisition, Methodology, Supervision, Writing - review & editing.

Declaration of Competing Interest

None.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.pec.2019.09.024.

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Tables and figures

Table 1. Randomization of APs to (1) one of the tailoring conditions, and consequent (2) match/mismatch with own information preferences.

			PROVIDER	
			additional information provision	no additional information provision
(1)	VIDEO PATIENT	prefer extensive information	tailoring (a) $n = 66$	no tailoring (c) $n = 57$
		prefer limited information	no tailoring (d) $n = 64$	tailoring (b) $n = 66$
(2)	ANALOGUE PATIENT	prefer extensive information	match $n = 79$	mismatch $n = 73$
		prefer limited information	mismatch $n = 51$	match $n = 50$

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Figure 1. Inclusion and randomization of all participants.
**The full study protocol consisted of two experiments: 2/3 of participants (n = 309/470) were randomized to the presented experiment; comparisons to non-completers combined all early and late drop-outs (n = 174).*

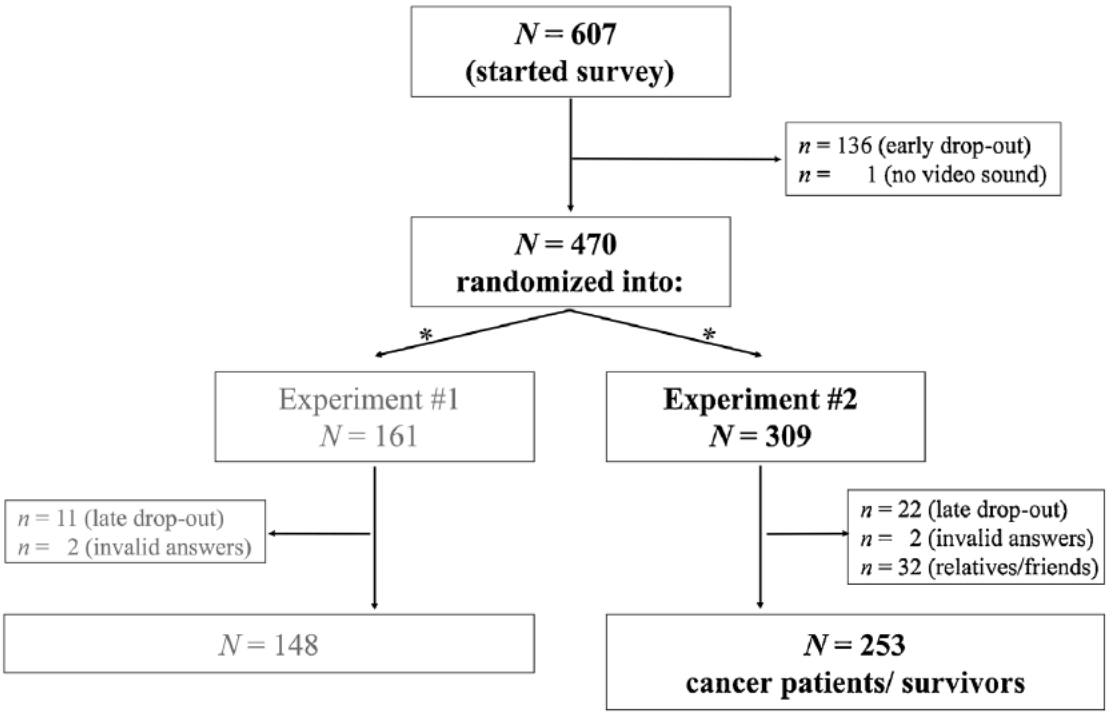

Table 2. Background factors of included cancer patients/survivors (N = 253).

	M (SD), range
Age, years	61.3 (11.7), 20–90
Age at diagnosis, years[a]	57.0 (12.1), 19–85
Time since diagnosis, years[a]	5.9 (6.4), 0–40
	N (%)
Sex	
female	136 (53.8%)
male	117 (46.2%)
Relationship status	
partnered/married	195 (77.1%)
single	58 (22.9%)
Level of education[b]	
low	49 (19.4%)
middle	83 (32.8%)
high	120 (47.4%)
Work status	
retired	100 (39.5%)
employed	88 (34.8%)
unemployed	65 (25.7%)
Cancer diagnosis[c]	
hematological	58 (22.9%)
breast	52 (20.6%)
gastro-intestinal	40 (15.8%)
urological	33 (13.0%)
skin	26 (10.3%)
other	41 (16.2%)

missing: [a]$n = 4$; [b]$n = 1$; [c]$n = 3$.
[b]low = vocational training or less, middle = continued education, high = college/university degree [44].

Table 3. Video evaluations and outcomes by tailoring conditions (RQ1) and by APs' information preferences (RQ2).

	tailoring to preferred		NO tailoring to preferred		APs' preferences for	
condition:	extensive information $n = 66$ (a)	limited information $n = 66$ (b)	extensive information $n = 57$ (c)	limited information $n = 64$ (d)	extensive information $n = 152$	limited information $n = 101$
perceived tailoring	6.6 (2.3) 1–10	6.5 (2.4) 1–10	5.4 (2.6)* 1–10	6.0 (2.7) 1–10	6.1 (2.7) 1–10	6.2 (2.3) 1–10
video engagement	4.6 (1.5) 1.3–7.0	4.7 (1.5) 1.4–7.0	4.7 (1.6) 1.3–7.0	4.7 (1.6) 1.4–7.0	4.7 (1.6) 1.3–7.0	4.7 (1.4) 1.4–7.0
primary outcomes						
satisfaction	3.5 (0.7) 2.0–5.0	3.3 (0.9) 1.6–5.0	3.1 (0.9) 1.4–4.8	3.2 (0.9) 1.0–5.0	3.3 (0.9) 1.0–5.0	3.2 (0.7) 1.6–4.6
trust	3.8 (0.9) 1.2–5.0	3.8 (0.7) 1.6–5.0	3.7 (0.9) 1.6–5.0	3.6 (0.9) 1.0–5.0	3.7 (0.9) 1.0–5.0	3.7 (0.7) 2.0–5.0
active recall, %					57.8 (15.8)** 7.4–92.6	52.0 (16.1)** 0–88.9
recognition, %					90.5 (9.2)** 57.1–100	87.0 (11.0)** 50–100

Note: scores for RQ2 are only presented by APs' information preferences (due to identified main effects).
* $p < .05$: condition (c) < (a), (b).
** $p < .01$.