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Video vignettes do not yield higher engagement compared to a written variant in a vignette experiment to test communication in healthcare

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ABSTRACT

Objectives: Experimental vignette designs are used to systematically test communication strategies in healthcare. To ensure validity, participants of such experiments need to optimally engage with the hypothetical scenario. Researchers have often favored video over written vignettes to maximize engagement, despite a lack of evidence for the superiority of videos. We sought further evidence to substantiate the choice for a vignette modality by testing the impact of video versus written vignette modality on engagement, perceived realism and anxiety among cancer patients and survivors.

Methods: We performed an experimental study using video and written vignettes of a hypothetical physician-patient consultation in hematologic oncology. Cancer patients and survivors were recruited through two panels and participated via an online survey. The primary outcome was *engagement,* assessed using (an adapted version of) the 'Video Engagement Scale' short form. Secondary outcomes were perceived realism and state anxiety.

Results: Mean engagement score ($N = 270$) was 3.44 ($SD=0.77$, potential range 1–5). Neither overall engagement scores, nor scores on the subscales 'Immersion' and 'Emotional impact' differed between video and written vignettes. No main effects were found for modality on perceived realism or state anxiety. Participant age, gender, and cancer history did not predict engagement, whereas source of recruitment (panel) did ($p < .05$).

Conclusions: Written vignettes appear equally realistic and immersive compared to video vignettes. Future research could establish whether written and video vignettes differentially affect other outcomes and whether innovative virtual reality-based vignette modalities, which enable more interactive experiences, yield higher engagement.

1. Introduction

High-quality communication is essential for healthcare professionals (HCP) to provide optimal care to patients. HCP communication can determine patients' perception of a consultation as well as patients' emotional well-being and behaviors like treatment adherence [1,2]. We need empirical evidence distinguishing effective from ineffective communication, to guide HCP in improving their consultation skills and facilitate patient-centered care. However, solid evidence on how HCP's communication affects patients is scarce, because obtaining causal evidence in clinical practice is challenging. Practically, establishing the impact of isolated elements of HCP's communication in naturally occurring interaction is difficult, as the effects of other communicative or contextual elements cannot be ruled out. Ethically, experimentally manipulating communication strategies in clinical practice could involve exposing patients to sub-optimal communication, which may have harmful consequences [3].

Experimental video vignettes designs overcome these problems through standardization, i.e., holding all content constant except for the specific communication elements under investigation [4]. Video

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vignettes are scripted scenarios of hypothetical healthcare interactions that closely resemble real-life situations [5]. Different variants of the same scenario are created across which all content and context is kept identical, while specific elements of communication are manipulated. The resulting vignettes are then presented to study participants, who are asked to imagine themselves in the position of the portrayed patient [4, 6]. These participants are referred to as 'analogue patients' [5], and function as proxies for real-life patients. Analogue patients can be disease-naïve individuals or patients with lived experiences regarding the condition portrayed in the scenario and can validly be included as proxies for patients in studies on communication, taking some precautions into account [7]. Outcomes to assess in analogue patients can be cognitive (e.g. information recall), affective (e.g. anxiety), evaluative (e.g., satisfaction with the consultation), and/or behavioral (e.g. intended life-style change).

To ensure the validity of experimental vignette designs, participants need to optimally engage with the vignette. To ensure maximal engagement, many researchers have favored video over written vignette mode to expose analogue patients to both audio and visual elements of the portrayed situation. For example, clinical practice can be maximally mimicked by recording video vignettes in real consultation rooms with actors wearing medical dress [8]. Videos, moreover, allow for including more aspects of communication, including non-verbal cues (e.g., eye-contact) or emotional facial expressions (e.g., crying), which could further enhance vignette realism and intensity [9]. Vocal cues and emphasis might further stimulate analogue patients' attention to the vignette. Thus, video vignettes are presumed to yield high engagement among analogue patients, which is substantiated with research so far [10–12].

However, whether high engagement is exclusive to vignettes using video modality has not yet been established. Such knowledge is relevant, as developing video vignettes can be labor intensive and may involve substantial costs [13]. Additionally, it may be difficult to standardize across video vignette variants in terms of facial expressions, whereas such experimental standardization is crucial. Written vignettes are easier and cheaper to create and modify compared to video vignettes, thus offering more flexibility when experimentally assessing the effects of communication e.g., [14,15]. The value of written vignettes has been debated because they are presumed to offer a less immersive experience compared to videos. Also, characters portrayed in written vignettes may be highly subject to the analogue patient's imagination, which leaves room for interpretation beyond the researcher's control. Yet, written vignettes may also have benefits: compared to video, analogue patients' evaluation of the content of a written vignette may be less affected by non-essential elements of the interaction (e.g., images or sounds) [16]. Moreover, analogue patients reading a written vignette can determine their own pace, which may improve their information uptake –although arguably a lack of control over the pace better resembles the experience of patients in actual medical interactions [17].

We previously tested how analogue patients' engagement with vignettes and other outcomes were affected by vignette modality, i.e., video, written or audio [18]. Analogue patients were disease-naïve students exposed to a vignette depicting a cancer bad news consultation. Contrary to expectations, vignette modality did not affect analogue patients' engagement with the vignette, nor did it predict their anxiety, trust, satisfaction or information recall. Although these results provide initial evidence that vignette format does not determine analogue patients' experiences, they warrant careful interpretation. The analogue patients were disease-naïve people who were predominantly young, highly educated, and female students. Whether vignette modality was equally irrelevant for engagement of analogue patients with lived experiences, could not be established. Therefore, further evidence is urgently needed regarding the impact of vignette modality on analogue patients' engagement and other outcomes, involving analogue patients who bear more resemblance to the portrayed patient. In this online experiment, we therefore test the impact of vignette modality, i.e., video vs. text, on engagement, perceived realism and anxiety among cancer patients and survivors acting as analogue patients. Perceived realism and anxiety can be considered proxies for engagement. Perceiving the vignette as realistic may be a prerequisite for engagement and being highly engaged in a vignette with emotional content is likely to induce some anxiety. Additionally, we explore whether analogue patients' characteristics (i.e., age, gender, cancer history, and recruitment) predicted engagement, irrespective of vignette modality.

2. Methods

2.1. Study design

This was an online experimental vignettes-based study using video and written vignettes. Vignettes depicted a hypothetical clinician-patient consultation. Participants were analogue patients – in this case (former)cancer patients, instructed to imagine themselves in the situation of the patient portrayed in the vignette [5,7]. In a between-subjects design, a clinician's communication approach regarding the discussion of online information was systematically manipulated based on previous research distinguishing the following four communication approaches: Resistance, Repairing, Co-Construction and Enhancement [19]. The experiment was primarily designed to test the effects of these different clinician communication styles on cancer patients' trust, satisfaction, and intentions to seek and discuss online information. In the current study, we aim to investigate differences between vignette modalities on analogue patient-reported outcomes. This resulted in a 4 (communication style: Resistance, Repairing, Co-Construction, Enhancement) x 2 (vignette mode: Video vs Written) between-subjects design with 8 conditions in total. Results regarding the effects of communication style on analogue patient-reported outcomes are reported elsewhere [20]. The current analysis addressed the effects of vignette modality (video vs. written).

Manipulation check questions were 8 self-created items (2 per communication approach condition), rated on a 5-point Likert scale (completely disagree to completely agree). An example item from the Resistance condition was: "The clinician discourages searching for information online". The manipulation check indicated consistent significant differences in scores *between* the clinician-centered conditions (Resistance and Repairing) and the patient-centered conditions (Co-construction and Enhancement). However, no significant differences (p-values ranging between.196 and 1.000) were found *among* the individual clinician-centered and patient-centered conditions. Therefore, we collapsed data across the four communication styles into a clinician-centered and patient-centered style, resulting in a 2 × 2 design. The study was approved by the medical ethics committee of Amsterdam University Medical Centers, location AMC (approval number 2023.0311).

2.2. Sample and procedure

We recruited analogue patients via two panels: (1) PanelCom (www.Panelcom.nl), initiated by our two research groups at the University of Amsterdam, comprising approximately 500 Dutch people with a current or previous cancer diagnosis willing to participate in medical communication research; and (2) PanelClix, containing > 100,000.00 online respondents, from which we selected people who met our inclusion criteria, i.e., cancer patients or survivors aged ≥ 18 with Dutch language proficiency and internet access. Analogue patients who indicated an interest in participation received further information and a link to the online survey. The survey encompassed e-informed consent and a baseline survey (T0), upon which analogue patients were randomized to read/view one of eight vignette variants. Finally, analogue patients completed a second survey (T1) assessing their responses to the vignette. Upon study completion, participants received a 10 € voucher (PanelCom) or online credits which they could convert into a monetary reward (PanelClix).

2.3. Vignette development

Vignette development has been described in detail elsewhere [20]. In summary, we conducted the following steps:

- **Creation of a basic script** by adapting an existing script used in previous research, which was based on real recorded consultations [21]. The *scenario* featured an outpatient consultation in oncological hematology, including a hematologist, female patient and the patient's daughter. The consultation entailed discussion of treatment for a recently diagnosed diffuse large B-cell lymphoma.
- **Creation of 4 script variations** regarding physician communication style, while keeping other parts of the script identical across script versions. As part of the clinician-centered communication style, one condition shows the clinician as generally resistant to online information (Resistance). In the other condition (Repairing), the clinician acknowledges the patients' online seeking behavior but warns the patient about online health information being inherently unreliable. As part of the patient-centered communication style, the clinician uses online health information to foster a shared understanding and discussion (Co-construction) or actively encourages the patient to search for information online and recommends reliable sources (Enhancement). See Appendix A for an overview of communication approaches and example manipulations. Five experts provided feedback on the adapted script and its variations, resulting in further modifications.
- **Pilot testing of the scripts** for manipulation success of the communication manipulations with cancer-naïve individuals (N = 24), i.e., a generic public found via a LinkedIn announcement. For practical reasons, participants were randomly exposed to two of the four written conditions (in a random order, resulting in 12 order options). By doing so, we kept the effort to participate limited, to obtain a large enough sample within a short time period. Based on pilot-test results, in the Resistance version the clinician's communication was made more resistant to the patient's online seeking behavior and the Repairing version was differentiated more clearly from Resistance.
- **Recording and testing of pilot videos** to assess realism of the videos and participant engagement. Two video variants were recorded (Resistance and Enhancement) and pilot-tested with 10 analogue patients recruited through PanelCom. Pilot participants were randomly exposed to one of the two versions, resulting in five participants per condition. Both versions were perceived as realistic (Resistance: M= 4.20, SD= 0.72; Enhancement: M= 3.95, SD= 0.72; 5-point scale). Engagement scores were acceptable (Resistance: M= 3.65, SD= 0.83; Enhancement: M= 3.29, SD= 0.44; 5-point scale).
- **Creation of final vignettes.** We created four variants of the *video vignette*, one for each communication style, by recording the finalized scripts. An experienced clinician portrayed the clinician, a professional actress played the patient, and a junior researcher figured as the patient's daughter. Video length ranged between 7:12–7:54 min. Subsequently, based on the script and the finalized videos, we created 4 corresponding *written vignettes* of approximately 1.5 pages each. The written vignettes entailed the literal text from the video scripts, adapted to additionally describe the non-verbal communication depicted in the videos.

2.4. Measures

Participants completed questionnaires immediately before (T0) and immediately after (T1) viewing/reading the vignette. Here, we report only the measures included in the current analyses.

- *Socio-demographic and medical characteristics* (T0) assessed were age, gender identity, educational level, and history of cancer (current or previous).
- *Primary outcome: Engagement with the vignette* (T1) was assessed with the 9-item short version of the Video Engagement Scale (VES-sf) [22,23]. Although the original VES-sf uses a 7-Point Likert scale, in the current study the response scale was modified to a 5-point scale for alignment with other included measures. Thus, items were answered on a 1 (*completely disagree*) to 5 (*completely agree*) scale. Item phrasing was adapted depending on the vignette modality (e.g., '*watching*' for video vs. '*reading*' for written vignettes). Item 1 of the VES-sf ('*while watching/reading, I was completely focused on the conversation*') serves as a screener item. Participants scoring 1 or 2 would be considered insufficiently involved and therefore removed from further analysis. The VES-sf consists of two dimensions: *Immersion* (4 items) and *Emotional impact* (4 items). We calculated mean scores for the two dimensions separately, and for all 8 items combined, with higher scores indicating higher engagement (Total scale Cronbach α =.89; Immersion subscale α =.83; Emotional impact subscale α =.77)
- *Secondary outcomes*:
  - o *Perceived realism of the vignette* (T1) was assessed using 3 items which were previously developed and used in other vignette research (response scale: 1 (*completely disagree*) to 5 (*completely agree*)) [11,24]. Phrasing was adapted to vignette modality. Scores were averaged across items, with higher means indicating higher perceived realism (α =.89).
  - o *State anxiety* (T1) was measured using the 6-item Dutch version of the State-Trait Anxiety Inventory short-form, state form (response scale: 1 (*not at all*) to 4 (*a lot*)) [25,26]. Scores were averaged over all items, with higher means indicating higher state anxiety (α =.84).

2.5. Data analysis

A-priori power analyses were based on the original primary study aims, i.e., testing the effects of communication style, as these contained the most conditions and would thus require the largest sample size. Power analyses indicated at least 179 participants were needed to detect a small to medium effect size of f = 0.25 in ANOVA, with 80 % power, α = .05 and df = 3 [27].

We checked for incompletes, realistic duration of reading/watching the vignette and quality of completion (i.e., all answer options the same and or all manipulation checks the same), and for the inclusion criteria age and medical history based on self-report. In addition, we examined scores on the screener item of the VES-sf. We examined randomization of participants over the two conditions, using a *t*-test for age and Chi-square tests for education (low, middle, high), gender, cancer history (currently having cancer, having had cancer) and panel (PanelCom *vs.* Panelclix). We tested the effect of vignette modality (video vs. written) on engagement (VES-sf total scale, and subscales separately) using independent samples t-tests. We also used independent samples t-tests to test effects of modality on secondary outcomes, i.e., perceived realism and state anxiety (STAI). We performed descriptive analyses and χ^2 tests to compare drop-out rates between the two modalities. Exploratory correlation analyses and t-tests or ANOVA were conducted to identify potential other predictors of engagement (VES-sf), irrespective of modality, including age, gender, education, cancer history, and panel. Follow-up ANOVA analyses were planned in case of any significant predictors, to test for interaction effects between modality and such predictors on engagement.

3. Results

3.1. Sample

The questionnaire was started 456 times and fully completed by 355 participants. Two individuals recruited via PanelCom (2/87; 2 %) and 53 (53/ 396; 14 %) recruited via PanelClix stopped the experiment at the presentation of the stimulus material; 41 in the video condition and 14 in the written condition. The latter difference was significant ($p < .001$), indicating that participants were more likely to cease participation when exposed to a video vs. written vignette. Of all participants who completed the questionnaire, data from 62 were excluded because of self-reported age < 18 and/or no history of cancer. Data from another two participants were removed because they had completed the questionnaire twice. Based on a data quality check (i.e., duration and quality of completion), another 9 participants were removed. Next, we removed 12 participants who scored low (i.e., 1 or 2) on the VES-sf screener item. The final sample comprised 270 participants.

3.2. Sample characteristics and randomization

Participants were on average 62 years old (range 20–87) and 55 % were female (see Table 1 for more sample descriptives). Regarding modality, 127 participants received the video-vignette (52 % clinician-centered and 48 % patient-centered communication style) and 143 received the written vignette (53 % clinician-centered and 47 % patient-centered communication style). We found no significant differences between participants in the two modality conditions regarding age ($t = -1.028$; $p = .31$), gender (X^2 (1; $N = 270$)= 0.12; $p = .73$), educational level (X^2 (2, $N = 270$)= 3.63; $p = .16$), history of cancer (X^2 (1, $N = 270$)= 0.02; $p = .89$), or panel (X^2 (1, $N = 270$)= 0.37; $p = .54$). Based on these findings we considered randomization across the modalities and communication styles successful.

3.3. The effect of vignette modality on outcomes

Table 2 shows descriptive statistics for our outcomes of interest. We found no main effect of modality on overall engagement ($t(268) = 0.089$; $p = .93$), nor on the subscales Immersion ($t(268) = 0.048$; $p = .96$) or Emotional impact ($t(268) = 0.124$; $p = .90$). In addition, no main effects were found on perceived realism ($t(268) = -1.575$; $p = .12$) or on state anxiety ($t(268) = 0.124$; $p = .90$).

A post-hoc power-analysis on overall engagement, based on the actual effect size found and the actual sample size, indicated statistical power of 51 % to detect a significant difference (effect size found: Cohen's d=.011, alpha=.05 and df= 268) [27]. This suggests that the study was underpowered to reliably detect a small difference.

3.4. Predictors of engagement, other than vignette modality

Exploration of potential predictors of engagement other than vignette modality –specifically, age, gender, education, cancer history and source of recruitment (panel)– yielded only significant differences based on the recruitment source. Differences were found in the total engagement score ($t(268) = 2.452$; $p < .05$) and the subscale Immersion score ($t(268) = 2.698$; $p < .01$), with PanelClix participants reporting higher engagement compared to PanelCom participants (Total score: M=3.51 (SD=0.77) vs. M= 3.26 (SD=0.76); Immersion score: M= 3.41 (SD=0.85) vs. M= 3.10 (SD=0.88)). No significant difference was found in scores on the subscale Emotional impact ($t(268) = 1.877$; $p = .062$). Because our primary interest in this methodological paper was in the main effect of modality, we did not pursue any further testing of interaction effects between modality and panel or other characteristics on engagement.

Table 1
Sample Descriptives.

		Total sample (n = 270)	Video vignette (n = 127)	Written vignette (n = 143)
		M (SD)	*M (SD)*	*M (SD)*
Age		61.6 (13.3)	60.8 (13.8)	62.4 (12.9)
		n (%)	*n (%)*	*n (%)*
Gender (female)		148 (54.8)	71 (55.9)	77 (53.8)
Education level	Low	46 (17.0)	19 (14.9)	27 (18.9)
	Middle	103 (38.1)	56 (44.1)	47 (33.0)
	High	121 (44.8)	52 (40.9)	69 (48.3)
Cancer history	Currently having cancer	67 (24.8)	32 (25.2)	35 (24.5)
	Previously having had cancer	203 (75.2)	95 (74.8)	108 (75.5)
Panel	PanelCom	76 (28.1)	38 (29.9)	38 (26.6)
	PanelClix	194 (71.9)	89 (70.1)	105 (73.4)

4. Discussion

In this experimental study, we found no differences in the effects of written versus video vignette modality on analogue patients' engagement, perceived realism of the vignette or state anxiety. These results corroborate previous evidence using students as analogue patients [18]. Hence, findings are consistent across two different experiments involving both disease naïve individuals, i.e., students [18], and people with lived disease experience. This has implications for researchers who want to systematically test the effects of HCP communication on patients. In an attempt to create a maximally immersive experience, researchers may so far have felt a need to create labor and cost intensive videos [13,28]. Our findings suggest that video vignettes may *not,* as previously assumed, be superior to written vignettes in ensuring immersive experiences. Hence, written vignettes may serve equally well to test effects of communication in healthcare.

Besides the vignette format, mode of delivery also encompasses *where* and *how* analogue patients are exposed to the vignette. We presented vignettes online to obtain a large sample within a restricted period of time. Inherently, our control over the setting in which participants completed the questionnaire was limited whereas it may have affected analogue patients' ability to immerse themselves in the depicted interaction. It can be argued that the more the setting resembles the observed interaction, the better analogue patients will be able to identify with the situation. For example, vignettes may be viewed or read individually in a real consultation room, or video-vignettes may be viewed in a cinematic setting to achieve maximal engagement [4]. When analogue patients complete the survey online in their private environment, they may be inclined to 'satisfice' their responses to the vignette [29], i.e., to process the vignette unfocused and carelessly (e.g., rapidly scrolling through the survey), as compared to a more controlled setting. Although we instructed participants to watch/read the vignette in a quiet environment and used a quality check to ensure at least minimal attention to the vignette, potential differences between the video or written version may nevertheless have been obscured by participants' lack of focus. Since experiments –including ours– are now often conducted online rather than in a controlled setting, research should establish how online versus offline vignette exposure affects engagement to support decision making about vignette modality and enhance interpretation of findings.

Additionally, stronger differences in engagement with video vs. written vignettes may be found in samples including more variable education levels. Although our sample was not very highly educated overall, the proportion of lower educated participants was relatively small. Research has shown that individuals with lower levels of education or limited digital literacy are less likely to participate in online surveys.

Future research could establish research participants' engagement levels when using innovative vignette modalities, particularly modalities enabling a more interactive experience such as virtual reality. A study in organizational science, comparing text-based, video and virtual reality based vignettes, found that participants exhibited greater

Table 2
Descriptive statistics (means and standard deviations) for all outcome measures, stratified by modality.

Modality	N	Engagement: Total score (VES-sf)[a]	Engagement: Immersion (VES-sf)[a]	Engagement: Emotional impact (VES-sf)[a]	Perceived realism[b]	Anxiety (STAI-S)[c]
		M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M(SD)*
Video	127	3.44 (0.81)	3.33 (0.89)	3.56 (0.81)	3.90 (0.81)	2.78 (0.59)
Written	143	3.43 (0.74)	3.32 (0.86)	3.55 (0.73)	4.04 (0.69)	2.77 (0.63)

Notes:
[a] VES-sf = Video Engagement Scale short form, potential score range: 1–5.
[b] Perceived realism, potential score range: 1–5.
[c] STAI-S = State-Trait Anxiety Inventory short version, 'state' form, potential score range: 1–4.

immersion in virtual reality-based vignettes as compared to text based vignettes [30]. Moreover, the use of virtual reality increased the effect on several participant reactions—particularly those with high emotional content. These findings suggest that virtual reality technology offers a promising avenue for developing ecologically valid vignette studies [30].

Future research may also investigate other variables that may differ between video and written vignettes, such as the interpretation of the depicted characters or setting, since a written vignette leaves more room for variation in this regard[16]. Additionally, it may be relevant to include indicators of participants' information processing, as these may differ between written and video vignettes, yielding variable effects on cognitive outcomes such as participants' understanding or recall of information. The modality effect, for example, refers to the idea that people learn information more deeply from audiovisual materials compared to written materials [31,32]. Of note, in our previous study involving students as analogue patients, we found no differential effect of vignette modality on recall [18].

In the current study, we found higher overall engagement among analogue patients recruited through PanelClix, compared to PanelCom. Members of PanelCom have signed up for the panel because of their interest in communication in health care. Some of them have participated regularly in similar studies, which sometimes involved vignettes. Members of PanelClix contribute to research in general; they are less likely to have participated in vignette studies related to healthcare. Consequently, participants recruited via PanelCom may have been be more critical about the content of the vignettes as compared to participants recruited via PanelClix and consequently became less engaged. The finding that more of the PanelClix members dropped out at the point where they had to watch the video vignette, suggests that they were less motivated than PanelCom members.

4.1. Strengths and limitations

A strength of this study is that we included a set of outcomes that together represent relevant dimensions of engagement, embodying concepts such as immersion and emotional impact [22]. Nevertheless, recruitment of participants through panels has inherent limitations. In addition to the previously mentioned sampling bias, we could not verify participants' actual cancer history or other self-reported characteristics. Additionally, the majority of respondents were recruited via PanelClix. They may be more liable to 'satisfice' their responses to earn their points for rewards, as compared to PanelCom participants who are generally not rewarded for their participation. We reduced this risk by checking for and excluding participants who completed participation in an unrealistically short time-frame. We used an online format for the survey. Since many vignette experiments are nowadays conducted online, this format reflects common research practice. Nevertheless, results could be further corroborated in offline study formats, other study populations (e.g., having other conditions or in another disease stages), and using different vignette content (e.g., more emotionally charged). Lastly, given the results of the post-hoc power analysis, we would have needed a much larger study sample to find a significant, albeit small difference between the conditions.

4.2. Practical implications

Our findings, combined with previous evidence [18], suggest that written vignettes can provide an efficient and cost-effective alternative to videos. This is in line with a recently proposed more pragmatic approach to vignette development [13]. Yet, researchers may prefer video over written vignettes, for example because of a specific interest in strong emotional expressions or non-verbal communication. Alternatively, researchers may opt for written vignettes because of limitations in the available budget. Additionally, there may be a need to allow participants using their own imagination or freedom to go at their own pace [17], both of which are better facilitated by written rather than video vignettes. Furthermore, using written vignettes instead of video vignettes could be useful when conducting pilot work, which may involve making a first selection out of multiple experimental conditions [18]. Written vignettes could also assist researchers in pilot-testing specific segments from a script prior to video development.

4.3. Conclusion

Written vignettes may be equally realistic and immersive compared to video vignettes. Hence, when participants engagement in vignette studies is needed, one may favor written vignettes over more expensive and time-consuming video vignettes. However, ultimately, the optimal modality may depend on the specific study aim and characteristics. Future research could establish whether innovative virtual reality-based vignette modalities enabling more interactive experiences, yield higher engagement.

CRediT authorship contribution statement

Tanja Henkel: Writing – review & editing, Project administration, Methodology, Formal analysis. **Julia C.M. van Weert:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Leonie N.C. Visser:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Chamoetal Zeidler:** Writing – review & editing, Project administration, Investigation, Formal analysis, Data curation, Conceptualization. **Smets Ellen:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization. **Annemiek Linn:** Writing – review & editing, Supervision, Funding acquisition. **Marij A. Hillen:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Conceptualization.

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Declaration of Competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Overview of communication approaches and examples of manipulations

Overarching communication approach	Clinician-centered		Patient-centered	
Communication approach	**Resistance**	**Repairing**	**Co-Construction**	**Enhancement**
General overview	Clinician is overall resistant to online information introduced by patient. The patient's only source of information should be the clinician.	Clinician believes that searching information online is inherently wrong because information is not reliable, but is aware that patients search information online. The clinician's role is to 'repair' the wrong information found online.	Clinician and patient communication is bi-directional. Clinician's goal is to create a shared reality in which the patient can introduce information found online. Clinician encourages searching information online and discussing this.	Clinician encourages the patient to search information online and empowers them by helping to differentiate between high and low quality online information.
Examples of manipulated clinician reactions per condition				
Patient mentions searching for online health information: *'I've been thinking about it a lot, of course. I even looked up information online'*	*The clinician looks doubtful and responds: 'Well Ms. Bertens, you'd better not look up this kind of information online. There are a lot of contradictory things and also nonsense on the internet. Forget what you have read, I will tell you the most important things today.'*	*The clinician looks doubtful and responds: 'Well Ms Bertens, it is generally better if you get this sort of information from me. There is some conflicting information online. I will tell you the most important things today.'*	*The clinician asks: 'O, what have you read?'*	*The clinician nods enthusiastically and asks: 'Good that you have already searched for information online. What information did you read?'*
Patient brings up specific information found online: *I read something about a scan?'*	*The clinician does not seem to hear the question, and continues her story: 'After the third course of treatment, we will take a CT scan to see if the treatment is working.'*	*The clinician replies: 'There are many types of scans. That is something they do not always mention online. What we do here is a CT scan. I think that's what you mean.'*	*The clinician nods and replies encouragingly: Yes, that's right, a CT scan. After the third course of treatment, we do a CT scan to see if the treatment is working.'*	*The clinician nods and replies encouragingly: Yes, that's right, a CT scan. You read that correctly. After the third course of treatment, we will do a CT scan to see if the treatment is working.'*
Concluding the conversation (main take-home message the clinician gives to the patient)	*'Coming back to the information you looked up on the internet, online information is often inaccurate and confusing. I wouldn't spend too much time on the internet, if I were you.'*	*'Coming back to the information you looked up on the internet: you have done that before, but it is difficult to find reliable information that applies to your situation. It is better if a specialist explains it to you rather than the internet.'*	*'Coming back to the information you looked up on the internet: very good that you did so before this appointment. You can find a lot of additional information online. Should you have any questions or doubts about what you find online at a later stage, we can revisit this in the next appointment.'*	*'Coming back to the information you looked up on the internet: very good that you visited kanker.nl* [often used Dutch website with information about cancer]. *That's a reliable website. Besides kanker.nl, there is also the website Hematon, which belongs to the hematology patient association. Personal blogs or forums are less reliable.' Patient nods, clinician smiles and continues: 'If you still have questions or doubts about the information you read online, we can revisit this at the next appointment.'*

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