

Communication and relational factors supporting the willingness to initiate palliative care in advanced cancer: a factorial vignette survey

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Summary

BACKGROUND AND STUDY AIMS: Guidelines recommend early initiation of palliative care alongside anticancer therapy. However, ongoing treatment is often associated with delayed referral to palliative care. Factors that positively influence the initiation of palliative care have been studied in the past, but there is a gap in research regarding the individual degree of influence these factors have on the willingness to initiate palliative care. Therefore, we explored the degree of influence of 11 different factors on willingness to initiate palliative care, focusing on communicational and relational aspects.

METHODS: We conducted a factorial survey among 1572 members of the Swiss public. Participants were presented with vignettes designed to explore willingness to start palliative care. A response format ranging from -5 to +5 was provided. Vignettes were analysed using mixed-effects regression models.

RESULTS: The physician having enough time for the conversation, the provision of detailed and understandable information, and an expression about continuity of care led to the strongest increase in willingness. There was also an increase in willingness when treatment recommendations were based on experience and patient preferences, as well as with self-disclosure, the expression of sadness by the physician, work experience, a prior patient-physician relationship and older patient age.

CONCLUSION: This study offers insight into the decision-making process regarding the initiation of palliative care at an advanced stage of disease progression. Supportive communication practices and expressions of understanding for the other led to a higher willingness to start palliative care. These aspects should be considered in discussions about advanced cancer in clinical practice, as well as emphasised in medical education.

Introduction

There often comes a time in the advanced stages of cancer when further systemic anticancer therapy with curative intent may do more harm than good. There is growing evidence that systemic anticancer treatment provided during the later stages of illness, encompassing more than the final weeks of life, often the last months of life, is a quality-of-care issue [1, 2]. Chemotherapy and immunotherapy at the end of life have been associated with a diminished overall quality of life, increased frequency of emergency room admissions, in-hospital deaths and poorer access to palliative care [1, 3-9]. In contrast, multiple studies have shown that patients who receive only symptom-directed palliative care in their last weeks, as well as patients who receive palliative care early on in their disease, have better life quality [3, 10-13]. Clinical guidelines recommend that palliative care should be integrated early, alongside active cancer treatment, to support symptom control and help patients decide when to forego systemic therapy when the expected benefits have become negligible [1-6].

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Despite these recommendations, studies consistently show that systemic anticancer therapy is frequently provided during the advanced stages of illness, ranging from the final months to the last weeks and days of life [5, 6, 9, 21-23]. Discussions about stopping treatment are frequently linked to the initiation of palliative care, with evidence suggesting that ongoing cancer therapy tends to delay palliative care referrals [9, 24-26]. Even when palliative care is provided alongside disease-modifying therapy, meaningful conversations about discontinuing treatment, and about the timing and nature of hospice care, typically occur only when the patient's condition deteriorates significantly [27]. This turning point tends to prompt more definitive hospice planning and the formal cessation of disease-directed treatment [27]. Several studies have suggested multifactorial causes of such overtreatment at the end of life, including both physician- and patient-related factors [24, 28-33]. However, a key element for shaping the final decision seems to be the patient's expectations and earlier communication about goals of care with their treating team [34, 35].

Prior research shows that patients who have end-of-life discussions with their physicians, as well as patients who understand the terminal nature of their disease, are more likely to choose palliative care and less likely to receive chemotherapy shortly before death [11, 36]. Further, the physician's communication skills are also central, as inadequate communication has been associated with higher prescriptions of third- and fourth-line chemotherapy [4, 37]. Other factors influencing end-of-life decisions or the initiation of palliative care include early discussions about the possibility of palliative care [31, 32], ensuring continuity of care [19-21, 25], older patient age [38], perceived empathy [39, 40] trust [29], and treatment recommendations [29, 41, 42]. These findings suggest that decisions about the initiation of palliative care arise from the interplay of multiple factors. However, little is known about the relative contribution of these factors to the willingness to initiate palliative care.

Given the above considerations, there is a growing need to better understand which specific factors, and combinations of factors, facilitate the initiation of palliative care. To address this gap, we conducted a factorial survey, using hypothetical vignettes with systematically varied factors. This method assumes that opinions and judgements are not shaped by a single factor, but by the interaction of multiple dimensions, which lead to a "single, coherent judgement" [43], making it especially valuable for evaluating decision-making processes and testing theories [44, 45]. By integrating survey features with those of multidimensional experiments, factorial surveys make it possible to evaluate the influence of individual factors on a specific outcome [43], while presenting respondents with realistic scenarios that require them to make trade-offs across several dimensions. Using this approach, we explored how relational, communication and demographic factors individually affect willingness to initiate palliative care.

Methods

Study design

We conducted a factorial survey with members of the Swiss public in which we systematically varied 11 different factors targeting relational dynamics, physician communication, as well as sex and age, to better understand how they influenced participants' willingness to initiate palliative care. To simulate real-life decisions, members of the general public can be considered "analogue patients" when asked to imagine themselves in the situation described. Research shows that their assessments of physician communication closely align with those of actual patients, suggesting that analogue patients can serve as a valid proxy for real patient perspectives [46-49]. While hypothetical scenarios using analogue patients cannot fully replicate the emotional weight of real-life decisions, factorial survey methods allow the systematic examination of how specific communicational and relational features shape decision-making judgements under controlled conditions, independent of individual clinical circumstances.

Factorial surveys present respondents with fictional scenarios in the form of vignettes. Within each vignette, there are several factors, also called dimensions (e.g. age or sex). The factors are manipulated and vary along a spectrum of so-called levels (e.g. for the dimension "age", levels may include: young, middle-aged, old). The more factors and levels there are, the higher the number of possible combinations and therefore the bigger the vignette universe. Several vignettes grouped together are called a deck or block [43-45].

The survey was available online in German, French and Italian using the software Qualtrics. The survey was originally developed in English, in collaboration with two physicians experienced in palliative care, and subsequently translated by native speakers using forward and backward translation. It was then pretested using a convenience sample (n = 15), ensuring that individuals from German-, Italian- and French-speaking populations provided feedback.

The survey consisted of the factorial survey questionnaire (vignettes), sociodemographic items and the Control Preference Scale [50], which assesses individuals' preferred role – active, passive or collaborative – in making important medical decisions affecting them (see table S1 in the appendix). The study was assessed by the Bern Cantonal Research Ethics Committee, which determined that the study did not require a full ethics application (BASEC-Nr. Req-2022-01349). Electronic informed consent was obtained from all individuals included in the study. This study was part of a larger study looking at the following outcomes: willingness to start palliative care, trust, professionalism, compassion and empathy.

Dependent and independent measures

The dependent measure was the participants' willingness to initiate palliative care, and was assessed after each vignette (example of vignette in next section) with the following question: *"If you were the patient... how willing would you be to follow the recommendation to stop chemotherapy and start palliative care based on the impression you gained from this physician during this interaction?"* A response format ranging from -5 (*No, not at all*) to +5 (*Yes, absolutely*), with a neutral midpoint (0), was used to capture the participants' judgement. Although current guidelines recommend early integration of palliative care alongside active treatment [14-18], the vignette was designed to mirror a common clinical scenario in which the initiation of palliative care is often only considered after withdrawing treatment or in the advanced stages of the disease [9, 24-26]. This explicit decision point was chosen to reduce ambiguity and systematically assess the influence of communication and relational factors on willingness to initiate palliative care.

In this study, the 11 factors (independent measures) were chosen based on an extensive literature search and the professional judgement of physicians with palliative care experience to represent relevant dimensions hypothesised to influence the willingness to initiate palliative care (table 1). All variations of all factors could be combined with one another, resulting in 55,296 possible vignettes ($= 3 \times 2 \times 2 \times 3 \times 4 \times 2 \times 2 \times 2 \times 6 \times 4 \times 2$) that comprised the vignette universe [51]. The selection of these 11 factors was grounded in established theoretical and empirical considerations. Factors reflecting relational aspects of care (prior relationship, continuity of care) were included because continuity and familiarity may facilitate transitions in care goals [19, 21, 52-54]. Communication-related features (clarity, length, self-disclosure, sadness, treatment recommendations) were incorporated given evidence that empathic and transparent dialogue can help reduce potential barriers to initiating palliative care discussions [55-59]. Physicians' years of experience was selected in light of research suggesting that clinician expertise can shape decision-making in advanced illness [60, 61], while demographic variables (age, sex) were included to account for documented variation in treatment preferences across patient groups [e.g. 62].

Table 1: Factors and their levels (independent measures) with corresponding vignette wording.

Factor	Levels	Vignette wording
Experience of physician	Early-career	5 years of experience
	Mid-career	15 years of experience
	Late-career	over 25 years of experience
Sex of physician	Male	
	Female	
Sex of patient	Male	
	Female	
Age of patient	Young adult	35 years old
	Middle-aged adult	55 years old
	Old adult	80 years old
Prior patient-physician relationship	No relationship	Is meeting the physician for the first time
	Short relationship	Has known the physician since this recent hospitalisation
	Long relationship	Has known the physician since the beginning of the illness
Clarity of information	Brief and technical	Only brief explanations of the disease and prognosis with complicated and technical language that the patient finds hard to understand
	Detailed and understandable	Detailed and clear explanations of the disease and prognosis that the patient seems to understand well
Self-disclosure	No	(Blank)
	Yes	The physician tells the patient that his/her father had the same illness and understands how difficult the situation is
Length of conversation	Short	Little to no time to listen to the patient or to answer questions
	Long	Enough time to listen to the patient and to answer questions
Treatment recommendation	No	Based on the information given, the patient needs to decide by himself/herself if chemotherapy should be continued and palliative care started
	Yes, without a reason	They should stop chemotherapy and start palliative care
	Yes, based on experience	Based on their experience, their recommendation is to stop chemotherapy and start palliative care
	Yes, based on patient preference	Based on the wishes expressed by the patient during the conversation, their recommendation is to stop chemotherapy and start palliative care
Expression of sadness	No	(blank)
	Yes, in words	The physician expresses how sad it makes him/her to give this bad news
	Yes, in words + tears	The physician expresses how sad it makes him/her to give the bad news and tears up
Continuity of care	No	He/she will lose contact with the patient, because they will be referred to a different team of physicians
	Yes	He/she will remain available for the patient, despite the fact that a new team of physicians will now be involved in their care

Note: "(blank)" denotes sections that were not displayed in the vignettes.

A vignette example

For illustrative purposes, each dimension is shown in **bolded italics** in the following vignette example: "Imagine observing an interaction between a **female, 80-year-old** patient and a **male** physician with **more than 25 years of experience**. The patient **has known the physician since this recent hospitalisation**. In communicating that the patient has only about a year to live, the physician gives **detailed and clear explanations of the disease and prognosis, which the patient seems to understand well**. After the physician **has taken enough time to listen to the patient and to answer questions**, the physician tells the patient that **based on the information given, the patient needs to decide by herself if chemotherapy should be discontinued and palliative care started**. The physician **expresses how sad it makes him to give this bad news and tears up**. Before the end of the consultation, the physician lets the patient know that **he will remain available for the patient, despite the fact that a new team of physicians will now be involved in her care.**"

Study participants

The study population consisted of members of the general public. Participants had to be at least 16 years of age to be eligible for the study. We applied quotas for age, sex and language (German, French and Italian, which are the national languages of Switzerland) to ensure representativeness. The recruitment and data collection process took place from April to June 2023. Recruitment was

done in collaboration with gfs.bern, a service provider that specialises in population-based analyses, surveys and data models. gfs.bern forwarded the email with the survey to a panel of possible participants. Calculating a response rate was not possible because of the applied quota sampling.

Statistical analysis

The total possible number of 55,296 scenarios was reduced to 1000 vignettes using an SAS (Statistical Analysis System) macro (%MktEx [63]), applying a fractionalised D-efficient (Determinant-efficient) design (D-efficiency = 98.87) [63, 64]. For the factors *prior patient-physician relationship*, *treatment recommendation* and *expression of sadness*, levels were balanced, meaning positive and negative (i.e. 'no' or blank) levels of a factor appeared with the same frequency [43, 65]. The 1000 vignettes were then grouped together in sets of five, resulting in 200 decks. The grouping was also done using an SAS macro (%MktBlock [63]). The respondents were randomly and evenly distributed among those decks. The sequence of the vignettes was not randomised. The units of analysis, as usual in factorial surveys, were the vignettes and not the individual participants [43, 66]. To ensure that each vignette had sufficient statistical power, each deck (consisting of five vignettes) had to be rated by at least five participants. Thus, a minimum of 1000 participants was necessary for the study to be carried out correctly. Since each participant had to answer five vignettes, clustered observations were generated, potentially leading to intrarater correlation, which was accounted for using multilevel models with random effects using STATA (version 16.1). To test the significance of differences in levels, when neither was considered the reference value, a chi-squared (χ^2) test was performed. Missing values were listwise deleted. A significance level of $\alpha = 0.05$ was used in this study.

Results

Respondent characteristics

A total of 1572 people participated. Before judging the five vignettes, participants answered sociodemographic questions. The sex distribution was balanced. Sixty percent of the participants had a higher education degree, and a large number of people (43%) had no religious affiliation. The mean age was about 51 years, with a standard deviation of about 18 years (table 2).

Table 2: Respondent characteristics.

Variable		Participants, n (%)
Sex	Female	808 (51.4%)
	Male	756 (48.1%)
Mean age (standard deviation)		50.6 (17.64)
Language	German	1027 (65.3%)
	French	429 (27.3%)
	Italian	75 (4.8%)
	Other	41 (2.6%)
Nationality	Swiss	1435 (91.3%)
	Other	136 (8.7%)
Religion	Protestant Reformed	422 (26.8%)
	Roman Catholic	405 (25.8%)
	Muslim and Islamic communities	9 (0.6%)
	Jewish religious communities	5 (0.3%)
	Other churches and religious communities	46 (2.9%)
	No religious affiliation	682 (43.4%)
Education	No school qualification	2 (0.1%)
	Mandatory schooling	28 (1.8%)
	Vocational training	319 (20.3%)
	Matura (Swiss High School Diploma)	255 (16.2%)
	Higher education	946 (60.1%)
	Other	21 (1.3%)
Worked in healthcare: yes		324 (20.6%)
	Physician	29 (1.84%)
	Nurse	101 (6.42%)
	Other medical personnel	92 (5.85%)
	Other	102 (6.49%)
Chronic disease of self or someone close		529 (33.65%)

Vignette characteristics

A total of 7860 vignettes were analysed. Of these, 7250 (92.24%) vignettes were answered and 610 (7.76%) were not answered.

Across all vignettes, the number 0 was selected most often (17%). Overall, positive ratings (+1 to +5), leaning towards the initiation of palliative care, were selected more frequently (cumulative percentage: 44.88%) than negative ratings (-5 to -1) leaning towards the continuation of chemotherapy (cumulative percentage: 36.69%) (figure S1 and table S2 in the appendix).

Willingness to initiate palliative care

Factors that were found to lead to a statistically significant increase in self-judged willingness to initiate palliative care were: physician experience, patient age, prior patient-physician relationship, clarity of information, self-disclosure, conversation length, expression of sadness, continuity of care as well as recommendations based on experience or patient preference (table 3 and figure 1). The overall coefficient of determination (R^2) was 0.187.

The strongest predictors were: sufficient time for the conversation ($\beta = 1.603$, 95% CI: 1.505–1.700, $p < 0.001$) and the provision of detailed and understandable information ($\beta = 1.510$, 95% CI: 1.412–1.608, $p < 0.001$), followed by ensured continuity of care ($\beta = 0.941$, 95% CI: 0.843–1.039, $p < 0.001$). Compared with no recommendation, treatment recommendations based on patient preference ($\beta = 0.658$, 95% CI: 0.521–0.796, $p < 0.001$) and physician experience ($\beta = 0.163$, 95% CI: 0.025–0.301, $p = 0.021$) were associated with greater willingness to initiate palliative care, with recommendations based on patient preference having a significantly stronger effect ($\chi^2_{(1)} = 33.27$, $p < 0.001$).

Greater physician experience, the presence of a prior patient-physician relationship (independent of duration; $\chi^2_{(1)} = 1.19$, $p = 0.275$), physician self-disclosure and emotional expression (particularly sadness expressed in words with tears) were each associated with increased willingness to initiate palliative care (all $p < 0.001$). Older patient age was also associated with higher willingness compared to younger age ($\beta = 0.452$, 95% CI: 0.332–0.572, $p < 0.001$).

No significant effects were observed for middle-aged patients, patient or physician sex, or treatment recommendations provided without justification (all $p > 0.05$).

Table 3: Results of multilevel regression models with random effects for all 11 tested factors on willingness to initiate palliative care.

Factors		Coefficient (β)	z	p-value
Experience of physician	Early-career (ref. value)	0		
	Mid-career	0.205	3.34	0.001
	Late-career	0.345	5.65	<0.001
Sex of physician	Female (ref. value)	0		
	Male	-0.026	-0.51	0.607
Sex of patient	Female (ref. value)	0		
	Male	-0.004	-0.08	0.934
Age of patient	Young adult	0		
	Middle-aged adult	0.041	0.68	0.497
	Old adult	0.452	7.40	<0.001
Prior patient-physician relationship	No relationship (ref. value)	0		
	Short relationship	0.218	3.56	<0.001
	Long relationship	0.295	4.84	<0.001
Clarity of information	Brief and technical (ref. value)	0		
	Detailed and understandable	1.510	30.25	<0.001
Self-disclosure	No self-disclosure (ref. value)	0		
	Yes, self-disclosure	0.319	6.38	<0.001
Length of conversation	Short	0		
	Long	1.603	32.07	<0.001
Treatment recommendation	No recommendation (ref. value)	0		
	Yes, without reason	-0.046	-0.65	0.516
	Yes, based on experience	0.163	2.31	0.021
	Yes, based on patient preference	0.658	9.38	<0.001
Expression of sadness by the physician	None (ref. value)	0		
	Yes, in words	0.293	4.80	<0.001
	Yes, in words and tears	0.548	8.90	<0.001
Continuity of care	No continuity of care (ref. value)	0		
	Yes, continuity of care	0.941	18.82	<0.001

The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. The reference value ("ref. value"), in all cases the "smallest" possible level of a factor variation or its complete absence, was set at 0. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. This table makes no statements on whether the difference in levels which are both not considered reference value is statistically significant. Results are based on 7250 judgements (table 3). Numbers were rounded to three decimal places.

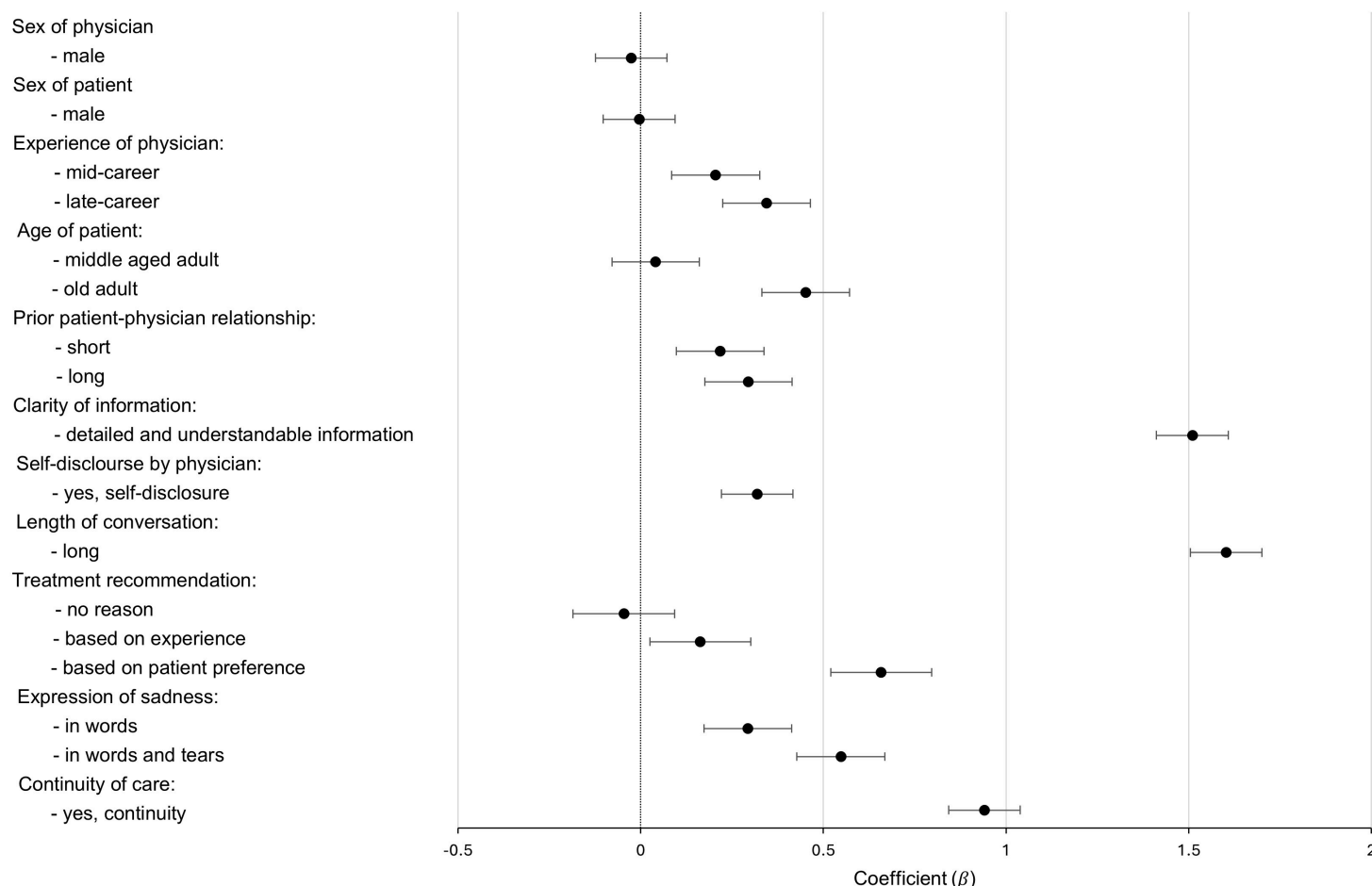


Figure 1: Results of mixed-effects models for willingness to cease chemotherapy and start palliative care. The y-axis depicts the factors and corresponding levels. Reference values (always $\beta = 0$) are not shown. The x-axis depicts the coefficient (β) and thus the increase in the participants' judgement for their willingness to start palliative care measured on a scale from -5 (no, not at all) to +5 (yes, absolutely), leaving all other factors unchanged. This figure makes no statement as to whether the difference between the levels is statistically significant. The horizontal bars indicate 95% confidence intervals. Results are based on 7250 judgements.

Subgroup analysis and extended model

A subgroup analysis among participants who had received a recommendation from their physician tested whether the model would still identify the same significant predictors. Compared with the full sample, all predictors remained significant except for mid-career physician ($p = 0.102$) and having a short prior relationship with the physician ($p = 0.053$), which were no longer statistically significant (detailed comparisons can be found in table S3 in the appendix).

Additional analyses showed that when participant characteristics (age, sex, language, education, chronic illness) were included in the model, age had a small negative effect on willingness to initiate palliative care ($\beta = -0.01$, 95% CI: -0.0202–-0.0087, $p < 0.01$) and French-speaking participants showed significantly higher willingness to initiate palliative care ($\beta = 0.733$, 95% CI: 0.511–0.954, $p < 0.01$). The original predictors remained significant after adding these participant characteristics (a detailed description of the model can be found in table S4 in the appendix).

Preferred type of involvement in decision-making

Of the 1572 participants, 1551 answered the Control Preference Scale, with most participants preferring an active role (49.13%, $n = 762$), followed by a collaborative role (45%, $n = 698$), while only a minority preferred a passive role (6%, $n = 91$). A subgroup analysis, looking at Control Preference Scale categories, found no change in the main observed trends. However, several of the less influ-

ential factors were found not to be statistically significant in the subgroup preferring a passive involvement (tables S5-S7 in the appendix). These findings should be interpreted with caution as they might have been a result of low statistical power due to the small size of this subgroup [67-69].

Discussion

We explored the influence of communication and relationship-centred factors on the willingness to initiate palliative care, using a factorial survey approach. Among the most influential were those related to expressions of support and understanding for the other.

Supportive communication practices, specifically taking time for the conversation, providing detailed and understandable information, as well as an expression of continuity of care, were particularly influential in raising willingness to initiate palliative care. These findings echo results from prior studies emphasising the importance of continuity of care and early discussions about the initiation of palliative care and cessation of curative therapy [30-32]. For example, higher scores of continuity of care at the end of life have been found to be associated with fewer intensive interventions at the end of life, such as chemotherapy [70], and to improve life quality for cancer patients [71]. By employing a nationwide factorial survey design, our findings provide even more compelling evidence by quantifying the contribution of these aspects to decision-making.

In line with the importance of continuity of care, a pre-existing patient-physician relationship also increased willingness to initiate palliative care and cease chemotherapy. Prior research has found that a pre-existing relationship positively influences trust [72-74], which may be particularly valuable in the context of discussions about chemotherapy discontinuation or initiation of palliative care. However, we found no connection between the length of the pre-existing patient-physician relationship and willingness to cease chemotherapy and initiate palliative care: even a brief prior relationship raised willingness to initiate palliative care. This second finding contrasts with prior studies linking trust and relationship duration [72-74]. A possible explanation for this difference could be our focus on hospital-based, rather than outpatient, patient-physician relationships.

Our study also demonstrated the positive influence of showing understanding through self-disclosure of personal information and the expression of sadness by the physician. Empathy, compassion and other indicators of understanding have been shown to be important throughout palliative care consultations [39, 75], to probe the initiation of end-of-life talk [40] and to even influence cancer patient outcomes [75]. The topic of physician self-disclosure in particular has gained increasing attention and it seems to enhance perceived empathy [76], but there are also concerns that it may inadvertently shift the focus away from the patient [77, 78] or be a boundary violation [79]. Physician expression of sadness through crying in response to a patient's situation has been similarly debated; while some see such responses as demonstrations of compassion and empathy, others argue that they may be perceived as unprofessional [80]. A study found that depending on context, palliative care clinicians use their own emotions to connect to patients and their relatives (78).

Treatment recommendations also influenced willingness, particularly when the recommendation was based on patient preference. Prior research has shown that recommendations generally have a strong influence on patients' decisions [29, 41, 42, 81, 82]. In comparison, recommendations based on experience alone were only marginally influential, and those without explanation were not influential at all.

Lastly, we found physician experience and older patient age to be linked to an increase in willingness to initiate palliative care. The influence of age on cancer treatment has been widely documented: younger patients are more likely to receive intensive treatment near the end of life, despite limited survival benefit after adjustment for confounding factors [83, 84]. Similar patterns have also been observed in Swiss studies [23, 85]. However, large-scale retrospective analyses also indicate that while older patients tend to receive less aggressive cancer treatment near the end of life, they are also less likely to receive hospital-based palliative care [86].

Implications

Our findings have several implications for clinical practice and future research. First, considering the positive influence of a pre-existing relationship, it may be beneficial for hospital-based physicians to have at least one prior encounter with the patient before having discussions about initiating palliative care or chemotherapy cessation. Regarding the nature of recommendations, our re-

sults imply that recommendations not grounded in patient preferences may be insufficient; patients require greater support and understanding in order to feel encouraged to make decisions about their future care. This finding aligns with the predominance of active and collaborative decision-making preferences, as measured by the Control Preference Scale, in our sample.

Although the vignette depicted a late-stage decision point in which palliative care was introduced alongside chemotherapy discontinuation, earlier and concurrent integration of palliative care is recommended by current guidelines [14–18]. Our findings should therefore not be interpreted as supporting late initiation, but rather suggest that the identified factors may be particularly important earlier in the disease trajectory, when these discussions should first arise.

Furthermore, the results suggest that self-disclosure and expression of emotion play a meaningful role and merit closer examination in research, clinical training and practice. At the same time, particular attention should be given when discussing treatment goals with younger patients, mainly to ensure that they feel supported, to address potential misconceptions about palliative care, and to help prevent possible overtreatment. Finally, the complexity and emotional weight of these conversations make it clear that there is a need for targeted training, which should be both integrated into medical education and sustained through continuous professional development and institutional support [87].

Study limitations

Firstly, across all vignettes, the number 0 on the rating scale was chosen most frequently, likely reflecting the complexity of the decision and participants' uncertainty when responding. In addition, the vignette depicted a scenario in which the initiation of palliative care was proposed alongside chemotherapy discontinuation. While this does not align with best-practice models advocating early palliative care integration [14–18], the design reflects a frequent clinical reality in which recommendations to initiate palliative care continue to be made late in the disease trajectory, typically when discontinuing treatment. Ongoing systemic therapy has been repeatedly associated with late referrals to palliative care services [9, 24–26]. More importantly, the clarity of the withdrawal of the chemotherapy allowed us to study willingness to start palliative care in a situation where reluctance would be high, thus intentionally providing a clear, unambiguous decision point necessary for the factorial survey design. Importantly, even in this difficult scenario, several physician behaviours significantly increased willingness to start palliative care. Furthermore, this survey was conducted among analogue patients (members of the public instructed to imagine themselves as patients) and not among clinical patients, which may limit external validity. Yet, existing research suggests that their evaluations largely overlap, indicating that analogue patients may serve as reliable proxies (44–47). Generalisability beyond Switzerland may be limited due to differences in health-care structures, cultural attitudes towards end-of-life care and palliative care integration in other contexts. Moreover, as with all vignette studies, it was not possible to measure behaviour itself but only behavioural intention [43], and hypothetical scenarios cannot fully capture the complexity of real clinical situations. Thus, the factors examined in this study were not exhaustive. The explained variance ($R^2 = 0.187$), while not uncommon for social and behavioural research and consistent with a moderate effect size [88], suggests that additional contextual factors (e.g. institutional or economic) contribute to willingness to initiate palliative care and warrant further investigation. Despite these limitations, the factorial survey design combined with a large, population-based sample allowed systematic examination of multiple interacting factors that would be difficult to isolate in real clinical settings.

Conclusion

This study underscores the importance of communication and relational factors influencing willingness to initiate palliative care. Overtreatment remains a significant issue, and discontinuation of anticancer therapy is still frequently linked to the initiation of palliative care despite guideline recommendations for earlier integration. Because patients ultimately prefer to make decisions about their care, it is essential that they feel supported and confident when considering palliative care.

Our findings show that willingness to initiate palliative care is strongly shaped by factors including sufficient time for discussions, clear and comprehensible information, continuity of care, and recommendations aligned with patient preferences. By clarifying the relative influence of these factors, this study contributes to a clearer understanding of decision-making in advanced illness and highlights key areas that should be considered in medical training and clinical practice.

Data sharing statement

Data is available on request.

Notes

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Potential competing interests

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Table S1 Control-Preference-Scale (CPS) categories and answer options.

CPS categories	Answer options
Passive role	- Important treatment decisions should be made by the physician alone, without the patient being involved. - The physician should have the last word on important treatment decisions after listening to the patient's opinion.
Active role	- Important decisions should be made by the patient alone. - The patient should have the last word on important treatment decisions, after listening to the physician's recommendation/opinion.
Collaborative role	- Important treatment decisions should be made by the physician and patient as equal partner.
Missing value	- I haven't thought about this question yet.

Table S2 Distribution of judgements across all vignettes.

Rating	Frequency	Percent	Valid	Cumulative percentage
-5 (no, not at all)	783	9.96	10.80	10.80
-4	418	5.32	5.77	16.57
-3	530	6.74	7.31	23.88
-2	503	6.40	6.94	30.81
-1	426	5.42	5.88	36.69
0	1336	17.00	18.43	55.12
+1	673	8.56	9.28	64.40
+2	783	9.96	10.80	75.20
+3	777	9.89	10.72	85.92
+4	618	7.86	8.52	94.44
+5 (yes, absolutely)	403	5.13	5.56	100.00
Total	7250	92.24	100.00	
Missing	610	7.76		
Total	7860	100.00		

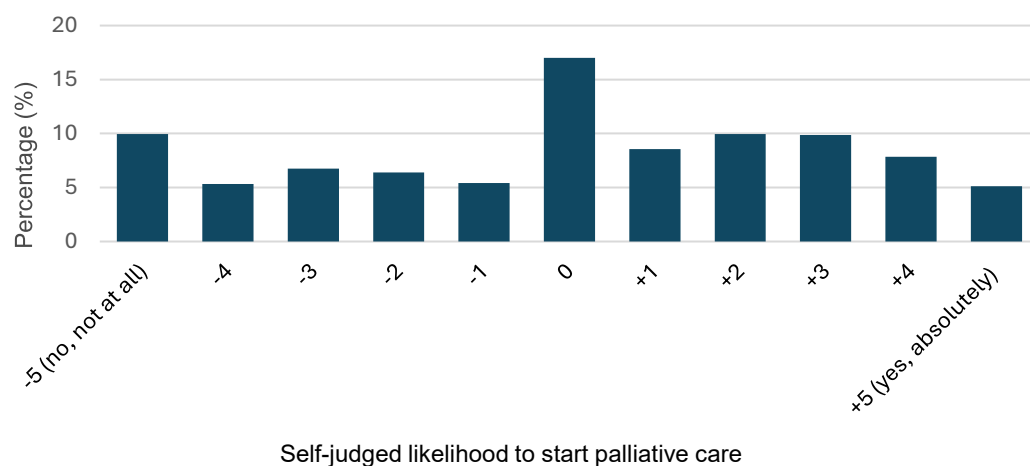
Figure S1 Distribution of answers to the question how likely participants would be to stop chemotherapy and start palliative care across all vignettes.

Table S3 Analysis for the “had recommendation” subgroup

Factors	Original		Subset with recommendations	
	b	p	b	p
Experience of physician				
- - Early-career (ref. value)	0	.	0	.
- - Mid-career	0.203	0.001	0.152	0.102
- - Late-career	0.346	<0.001	0.421	0
Sex of physician				
- - Female (ref. value)	0	.	0	.
- - Male	-0.027	0.584	-0.045	0.558
Sex of patient				
- - Female (ref. value)	0	.	0	.
- - Male	-0.027	0.584	-0.045	0.558
Age of patient				
- - Young adult	0	.	0	.
- - Middle-aged adult	0.041	0.497	0.098	0.298
- - Old adult	0.452	<0.001	0.527	0
Prior patient-physician relationship				
- - No relationship (ref. Value)	0	.	0	.
- - Short relationship	0.219	<0.001	0.179	0.053
- - Long relationship	0.293	<0.001	0.396	0
Clarity of information				
- - Brief and technical (ref. value)	0	.	0	.
- - Detailed and understandable	1.513	<0.001	1.548	<0.001
Self-disclosure				
- - No self-disclosure (ref. value)	0	.	0	.
- - Yes, self-disclosure	0.316	<0.001	0.306	<0.001
Length of conversation				
- - Short	0	.	0	.
- - Long	1.605	<0.001	1.599	<0.001
Treatment recommendation				
- - No recommendation (ref. value)	0	.	0	.
- - Yes, without reason	-0.047	0.505	0	.
- - Yes, based on experience	0.162	0.022	0.221	0.010
- - Yes, based on patient preference	0.657	<0.001	0.694	<0.001
Expression of sadness by the physician				
- - None (ref. value)	0	.	0	.
- - Yes, in words	0.293	<0.001	0.238	0.009
- - Yes, in words and tears	0.548	<0.001	0.600	<0.001
Continuity of care				
- -No continuity of care (ref. value)	0	.	0	.
- Yes, continuity of care	0.94	<0.001	1.006	<0.001

Note. Results of multilevel regression models with random effects for all of the tested 11 factors on willingness to stop chemotherapy and start palliative care in the CPS-subgroup that had indicated a preference for an active role. The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. Reference value (ref. value) being always the ‘smallest’ possible level of a factor variation. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. Results are based on 3’659 judgements. Numbers were rounded to three decimal places.

Table S4 Analysis including participant characteristics.

Factors	Original		Including participant characteristics	
	b	p	b	p
Experience of physician				
- - Early-career (ref. value)	0	.	0	.
- - Mid-career	0.203	0.001	0.208	0.001
- - Late-career	0.346	<0.001	0.349	0
Sex of physician				
- - Female (ref. value)	0	.	0	.
- - Male	-0.027	0.584	-0.027	0.593
Sex of patient				
- - Female (ref. value)	0	.	0	.
- - Male	-0.027	0.584	-0.001	0.981
Age of patient				
- - Young adult	0	.	0	.
- - Middle-aged adult	0.041	0.497	0.040	0.509
- - Old adult	0.452	<0.001	0.454	<0.001
Prior patient-physician relationship				
- - No relationship (ref. Value)	0	.	0	.
- - Short relationship	0.219	<0.001	0.217	<0.001
- - Long relationship	0.293	<0.001	0.302	<0.001
Clarity of information				
- - Brief and technical (ref. value)	0	.	0	.
- - Detailed and understandable	1.513	<0.001	1.515	<0.001
Self-disclosure				
- - No self-disclosure (ref. value)	0	.	0	.
- - Yes, self-disclosure	0.316	<0.001	0.319	<0.001
Length of conversation				
- - Short	0	.	0	.
- - Long	1.605	<0.001	1.608	<0.001
Treatment recommendation				
- - No recommendation (ref. value)	0	.	0	.
- - Yes, without reason	-0.047	0.505	-0.043	0.539
- - Yes, based on experience	0.162	0.022	0.160	0.024
- - Yes, based on patient preference	0.657	<0.001	0.657	<0.001
Expression of sadness by the physician				
- - None (ref. value)	0	.	0	.
- - Yes, in words	0.293	<0.001	0.287	0
- - Yes, in words and tears	0.548	<0.001	0.543	<0.001
Continuity of care				
- -No continuity of care (ref. value)	0	.	0	.
- Yes, continuity of care	0.94	<0.001	0.944	<0.001
Participant Gender				
- Female			-0.091	0.358
Age participant			-0.014	<0.001
Language				
- German (ref. value)			0	.
- French			0.733	0.000
- Italian			0.300	0.195
- Other			0.395	0.202
Education				
- No school qualification			1.126	0.400

- Mandatory school	-0.262	0.513
- Vocational training (ref. value)	0.000	.
- Matura	0.182	0.273
- Higher vocational school	-0.023	0.884
- Higher education/University	0.096	0.478
- Other	-0.907	0.043

Chronic illness

- No (ref. value)	0	
- Yourself	-0.041	0.799
- Someone close to me	0.013	0.916

Note. Results of multilevel regression models with random effects for all of the tested 11 factors on willingness to stop chemotherapy and start palliative care in the CPS-subgroup that had indicated a preference for an active role. The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. Reference value (ref. value) being always the 'smallest' possible level of a factor variation with one exception in education due to small groups. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. Results are based on 7'208 judgements. Numbers were rounded to three decimal places.

Table S5 Analysis for the passive CPS-subgroup

Factors	Coefficient (β)	z	p-value
Experience of physician			
- Early-career (ref. value)	0		
- Mid-career	-0.042	-0.16	0.875
- Late-career	0.156	0.59	0.554
Sex of physician			
- Female (ref. value)	0		
- Male	0.281	1.31	0.192
Sex of patient			
- Female (ref. value)	0		
- Male	-0.218	-1.01	0.310
Age of patient			
- Young adult	0		
- Middle-aged adult	0.364	1.38	0.168
- Old adult	0.691	2.61	0.009
Prior patient-physician relationship			
- No relationship (ref. Value)	0		
- Short relationship	0.332	1.25	0.210
- Long relationship	0.126	0.47	0.635
Clarity of information			
- Brief and technical (ref. value)	0		
- Detailed and understandable	1.696	7.92	<0.001
Self-disclosure			
- No self-disclosure (ref. value)	0		
- Yes, self-disclosure	0.115	0.53	0.596
Length of conversation			
- Short	0		
- Long	1.090	5.04	<0.001
Treatment recommendation			
- No recommendation (ref. value)	0		
- Yes, without reason	0.276	0.93	0.353
- Yes, based on experience	0.397	1.31	0.190
- Yes, based on patient preference	0.792	2.62	0.009
Expression of sadness by the physician			
- None (ref. value)	0		
- Yes, in words	-0.086	-0.33	0.744
- Yes, in words and tears	0.721	2.73	0.006
Continuity of care			
- No continuity of care (ref. value)	0		
- Yes, continuity of care	0.787	3.63	<0.001

Note. Results of multilevel regression models with random effects for all of the tested 11 factors on willingness to stop chemotherapy and start palliative care in the CPS-subgroup that had indicated a preference for a passive role. The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. Reference value (ref. value) being always the 'smallest' possible level of a factor variation. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. Results are based on 455 judgements. Numbers were rounded to three decimal places.

Table S6 Analysis for the active CPS-subgroup

Factors	Coefficient (β)	z	p-value
Experience of physician			
- Early-career (ref. value)	0		
- Mid-career	0.285	3.24	0.001
- Late-career	0.423	4.87	<0.001
Sex of physician			
- Female (ref. value)	0		
- Male	-0.023	-0.32	0.751
Sex of patient			
- Female (ref. value)	0		
- Male	-0.006	-0.09	0.929
Age of patient			
- Young adult	0		
- Middle-aged adult	-0.095	-1.09	0.277
- Old adult	0.327	3.76	<0.001
Prior patient-physician relationship			
- No relationship (ref. Value)	0		
- Short relationship	0.218	2.50	0.012
- Long relationship	0.355	4.07	<0.001
Clarity of information			
- Brief and technical (ref. value)	0		
- Detailed and understandable	1.323	18.68	<0.001
Self-disclosure			
- No self-disclosure (ref. value)	0		
- Yes, self-disclosure	0.324	4.55	<0.001
Length of conversation			
- Short	0		
- Long	1.615	22.66	<0.001
Treatment recommendation			
- No recommendation (ref. value)	0		
- Yes, without reason	0.017	0.17	0.868
- Yes, based on experience	0.176	1.76	0.079
- Yes, based on patient preference	0.631	6.30	<0.001
Expression of sadness by the physician			
- None (ref. value)	0		
- Yes, in words	0.255	2.92	0.003
- Yes, in words and tears	0.475	5.43	<0.001
Continuity of care			
- No continuity of care (ref. value)	0		
- Yes, continuity of care	0.843	11.82	<0.001

Note. Results of multilevel regression models with random effects for all of the tested 11 factors on willingness to stop chemotherapy and start palliative care in the CPS-subgroup that had indicated a preference for an active role. The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. Reference value (ref. value) being always the 'smallest' possible level of a factor variation. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. Results are based on 3'810 judgements. Numbers were rounded to three decimal places.

Table S7 Analysis for the collaborative CPS-subgroup

Factors	Coefficient (β)	z	p-value
Experience of physician			
- Early-career (ref. value)	0		
- Mid-career	0.146	1.58	0.114
- Late-career	0.299	3.23	0.001
Sex of physician			
- Female (ref. value)	0		
- Male	-0.061	-0.81	0.419
Sex of patient			
- Female (ref. value)	0		
- Male	0.013	0.17	0.862
Age of patient			
- Young adult	0		
- Middle-aged adult	0.159	1.72	0.086
- Old adult	0.555	6.03	<0.001
Prior patient-physician relationship			
- No relationship (ref. Value)	0		
- Short relationship	0.202	2.18	0.029
- Long relationship	0.271	2.96	0.003
Clarity of information			
- Brief and technical (ref. value)	0		
- Detailed and understandable	1.687	22.36	<0.001
Self-disclosure			
- No self-disclosure (ref. value)	0		
- Yes, self-disclosure	0.355	4.70	<0.001
Length of conversation			
- Short	0		
- Long	1.664	22.05	<0.001
Treatment recommendation			
- No recommendation (ref. value)	0		
- Yes, without reason	-0.145	-1.35	0.176
- Yes, based on experience	0.111	1.03	0.301
- Yes, based on patient preference	0.698	6.61	<0.001
Expression of sadness by the physician			
- None (ref. value)	0		
- Yes, in words	0.387	4.22	<0.001
- Yes, in words and tears	0.617	6.62	<0.001
Continuity of care			
- No continuity of care (ref. value)	0		
- Yes, continuity of care	1.041	13.80	<0.001

Note. Results of multilevel regression models with random effects for all of the tested 11 factors on willingness to stop chemotherapy and start palliative care in the CPS-subgroup that indicated a preference for a collaborative role. The coefficient depicts the difference between the reference value in comparison to other levels of the same factor. Reference value (ref. value) being always the 'smallest' possible level of a factor variation. Coefficients indicate the willingness to start palliative therapy measured on a rating format ranging from -5 to +5 leaving all other factors unchanged. Results are based on 3'490 judgements. Numbers were rounded to three decimal places.