A Prospective Cohort Study of Stability in Preferred Place of Death Among Patients With Stage IV Cancer in Singapore

Chetna Malhotra, MBBS, MD, MPH^{1,2,*}; Ling En Koh, BSc^{1,2,*}; Irene Teo, PhD^{1,2,3}; Semra Ozdemir, PhD^{1,2}; Isha Chaudhry, MSc^{1,2}; and Eric Finkelstein, PhD, MHA,^{1,2} on behalf of the COMPASS Study Team[†]

ABSTRACT

Background: Advance care planning (ACP) involves documentation of patients' preferred place of death (PoD). This assumes that patients' preferred PoD will not change over time; yet, evidence for this is inconclusive. We aimed to assess the extent and correlates of change in patients' preferred PoD over time. **Materials and Methods:** Using data from a cohort study of patients with advanced cancer in Singapore, we analyzed preferred PoD (home vs institution including hospital, hospice, and nursing home vs unclear) among 466 patients every 6 months for a period of 2 years. At each time point, we assessed the proportion of patients who changed their preferred PoD from the previous time point. Using a multinomial logistic regression model, we assessed patient factors (demographics, understanding of disease stage, ACP, recent hospitalization, quality of life, symptom burden, psychologic distress, financial difficulty, prognosis) associated with change in their preferred PoD. **Results:** More than 25% of patients changed their preferred PoD every 6 months, with no clear trend in change toward home or institution. Patients psychologically distressed at the time of the survey had increased likelihood of changing their preferred PoD to home (relative risk ratio [RRR], 1.02; 95% CI, 1.00–1.05) and to an institution (RRR, 1.06; 95% CI, 1.02–1.10) relative to no change in preference. Patients hospitalized in the past 6 months were more likely to change their preferred PoD to home (RRR, 1.56; 95% CI, 1.07–2.29) and less likely to change to an institution (RRR, 0.50; 95% CI, 0.28–0.88) relative to no change in preference. **Conclusions:** The present study provides evidence of instability in the preferred PoD of patients with advanced cancer. ACP documents need to be updated regularly to ensure they accurately reflect patients' current preference.

J Natl Compr Canc Netw 2022;20(1):20–28
doi: 10.6004/jnccn.2020.7795

Background

Patient-centeredness is an important indicator of health-care quality.^{1,2} At the end of life (EoL), patient-centeredness involves respecting patients' wishes to die at their preferred place. Advance care planning (ACP) is a widely advocated strategy to discuss and document patients' preferred place of death (PoD). This allows EoL care to be delivered at a place congruent with patients' preferences.³

Reliance on such predocumented preferences, however, is based on the assumption that patients' preferred PoD is stable over time and thus mirrors their preference at the time of making EoL care decisions. Although most patients prefer to die at home,⁴ a systematic review of the literature showed that 20% of patients changed their preferred PoD over time.⁵ However, some studies involved a very short period of follow-up of <2 months,^{6–8} whereas others only assessed patients' preferred PoD opportunistically or retrospectively from medical records after the patients' deaths.^{9–11} No study has prospectively reviewed patient preferences at regular intervals over an extended period of time. To date, no quantitative studies have been conducted to assess what factors trigger a change in preferred PoD. Consequently, uncertainty remains regarding whether the preferred PoD recorded in an ACP document drafted some time ago is accurate at the time an EoL decision is made.

We aimed to address this gap by conducting a prospective cohort study among patients with advanced cancer to assess the stability in their preferred PoD over time. Assessing stability in preferences among patients with advanced cancer is important, because treatment advances have increased survival rates in oncology, and patients are likely to be living longer after their diagnosis and after an ACP documentation.¹²

We assessed preferred PoD every 6 months for up to 24 months or until patient death. We also assessed factors associated with patients' preferred PoD and changes in their preference. Studies have shown that patients

¹Lien Centre for Palliative Care, and ²Program in Health Services and Systems Research, Duke-NUS Medical School; and ³Division of Supportive and Palliative Care, National Cancer Centre Singapore, Singapore.

*These authors are co-first authors.

Compass Study Team members (supplemental eAppendix 1; available with this article at JNCCN.org).

See [JNCCN.org](https://www.jnccn.org) for supplemental online content.

experiencing discomfiting symptoms may express different EoL care preferences compared with when they are symptom-free.¹³ People experiencing a certain emotional state also have difficulty predicting what they might experience in another emotional state, a phenomenon referred to as a “hot–cold empathy gap.”¹⁴ This leads to an inability to predict what one may want in the future (projection bias) and is likely to result in an instability in preferred PoD over time. Based on this and previous literature on EoL preferences,^{15–19} we hypothesized that preferred PoD and the stability of that preference will be associated with time-varying factors, including patients’ psychologic distress, symptom burden, quality of life (QoL), prognosis, understanding of disease stage, previous hospitalization, and financial difficulty. If found to be associated with change in patients’ preferred PoD, these indicators could serve as triggers for healthcare providers to reassess patients’ preferences. We also assessed the association with sociodemographics and ACP/advance directive (AD) completion. A secondary aim of our study was to investigate whether patients with a stable preferred PoD achieve greater congruence between preferred and actual PoD. The results will inform healthcare providers on the accuracy of patients’ preferred PoD documented in their ACP and identify indications for its review.

Materials and Methods

Study Design and Participants

We used data from COMPASS (Cost of Medical Care of Patients with Advanced Serious Illness in Singapore), a prospective cohort study. Details of that study are published elsewhere.²⁰ Patients were recruited between July 2016 and March 2018 from medical oncology outpatient clinics at 2 public hospitals in Singapore. Eligibility criteria included diagnosis of stage IV solid malignancy, age ≥ 21 years, Singapore citizenship or permanent residence, cognitive ability to self-report (determined through medical records or Abbreviated Mental Test administered to participants aged ≥ 60 years), and ECOG performance status ≤ 2 (to allow a period of follow-up before death or the end of the study period).

Data Collection and Variables

After written consent was obtained, a face-to-face survey was administered using a portable electronic device at recruitment. Repeat surveys were conducted in the clinic or at the patient’s home every 6 months for up to 24 months or until the patient’s death. Surveys were conducted in patients’ preferred language (English, Chinese, or Malay).

Outcome Variable

We assessed patients’ preferred PoD using the question, “If you had a choice, where would you like to be during the last days of your life?” Responses were categorized as home; institution, including hospital, hospice, and nursing home; and unclear preference.

Change in preferred PoD was assessed by comparing preferences between 2 successive time points. For instance, we assessed change in patients’ preference from 12 to 18 months, but if data were missing at 12 months, then we assessed change in preference from 6 to 18 months. We categorized change in preferred PoD as change to home, change to an institution, change to unclear preference, and no change.

Independent Variables

At baseline, patients self-reported their sociodemographics (age, sex, race, marital status, education). At each time point, we assessed patients’ understanding of their disease stage by asking, “Do you know the current stage of your cancer?” Those responding “advanced stage (IV)” were deemed correct, and those responding “early stage (I, II, or III)” or “don’t know” were deemed incorrect. Patients also self-reported ACP/AD completion status, hospitalization during the past 6 months, QoL (Functional Assessment of Cancer Therapy–General; theoretical range, 0–108),²¹ psychologic distress (measured using total score from the Hospital Anxiety and Depression Scale; theoretical range, 0–42),²² symptom burden score, and financial difficulty. Patients rated their symptoms (pain, shortness of breath, constipation, weight loss, vomiting, swelling, dryness of mouth and throat, lack of energy, nausea, any other) experienced in the past week on a Likert scale of 0 to 4 (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, 4 = very much), and this was summed for a total symptom burden score (theoretical range, 0–40). This list of symptoms was taken from the Functional Assessment of Chronic Illness Therapy–Palliative Care (FACIT–Pal).²³ We assessed financial difficulty by asking patients how well the amount of money they had enabled them to cover the cost of treatment, take care of their daily needs, and buy those little “extras.” Responses were coded as either 1 for very well, 2 for fairly well, or 3 for poorly, and summed (theoretical range, 3–9). This measure of financial difficulty has been shown to have good consistency, reliability, and construct validity.²⁴

Patients’ date and place of death were assessed from medical records or obtained from their caregivers. Their actual prognosis at the time of the survey was assessed as mortality within next 6 months, calculated based on their date of death.

Table 1. Patient Baseline Characteristics

Characteristic	n (%)
Total, N	466
Age, median (range), y	61 (22–92)
Sex	
Male	211 (45.3)
Female	255 (54.7)
Race	
Chinese	368 (79.0)
Malay	63 (13.5)
Indian and other	35 (7.5)
Marital status	
Married	338 (72.5)
Not married (separated/widowed/divorced/ never married)	128 (27.5)
Highest education level attained	
No formal education and primary school	167 (35.8)
Secondary/Vocational school	158 (33.9)
Junior college/polytechnic/diploma	66 (14.2)
University and above	75 (16.1)
Advance care plan/advance directive status	
Completed	46 (9.9)
Not completed	386 (82.8)
Don't know	34 (7.3)
Patient understanding that cancer is advanced/stage IV	
Yes	340 (73.0)
No	123 (26.4)
Missing	3 (0.6)
Hospitalization during past 6 mo	
Yes	320 (68.7)
No	113 (24.3)
Missing	33 (7.1)

(continued)

Table 1. Patient Baseline Characteristics (cont.)

Characteristic	n (%)
Preferred place of death	
Home	299 (64.2)
Institution	58 (12.5)
Unclear preference	104 (22.3)
Missing	5 (1.1)
Cancer type	
Breast	79 (17.0)
Gastrointestinal	117 (25.1)
Genitourinary	64 (13.7)
Gynecologic	44 (9.4)
Head and neck	24 (5.2)
Respiratory	125 (26.8)
Musculoskeletal, skin, neurologic, unknown	13 (2.8)
Scores, median (range)	
Psychologic distress score ^a	4 (0–39)
Quality of life score ^b	91.3 (23.3–108)
Financial difficulty score ^c	6 (3–9.0)
Symptom burden score ^d	4 (0–28)

^aMeasured using the Hospital Anxiety and Depression Scale.^bMeasured using the Functional Assessment of Cancer Therapy–General scale.^cAmount of money needed to cover cost of treatment, take care of daily needs, and buy “extras.”^dSymptoms from the Functional Assessment of Chronic Illness Therapy–Palliative Care.

Statistical Analysis

We described the proportion of patients who changed their preferred PoD from their previous survey and from baseline. To test the association between each independent variable listed (age, sex, race, marital status, highest education, patients' correct understanding of their disease stage, ACP/AD completion status, any hospitalization during the past 6 months, QoL, psychologic distress, symptom burden, financial difficulty, prognosis, and time of survey) and our 2 outcomes—patients' preferred PoD at the concurrent time point and change in patient preference from previous survey—we first conducted univariable multinomial logistic regression models clustered by patient identifier. Independent variables found to be statistically significant

at type III *P* value <.20 were included in the multivariable multinomial logistic regression models. Regression models were clustered by patient identifier to account for clustered standard errors due to lack of independence between repeated measures. Because of collinearity between independent variables, the models used a backward stepwise selection approach. We conducted a post hoc estimation of variance inflation factor to assess multicollinearity between the independent variables.²⁵

For the subsample of patients who died during the study, we used a chi-square test to assess whether stability in preference (ie, no change in preference during the study period) was associated with greater congruence between patients' last reported preferred PoD and actual PoD. STATA, version 15.1 (StataCorp LLC) was used for analyses.

Results

We approached 1,042 eligible patients, 600 (57.6%) of whom consented to participate. Of these, 87 responded to only the baseline survey due to either death (n=79) or loss to follow-up (n=8). Four patients never responded to the preferred PoD question, and 43 responded to the

Figure 1. Preference for place of death over time.

question at a single time point only and at no subsequent follow-up visits, and were therefore excluded from the analysis. The final analytic sample included 466 patients who answered at least 2 surveys. Of these, 98%, 80%, 64%, and 43% answered surveys at 6, 12, 18, and 24 months, respectively. The 134 patients excluded from the analysis were similar to those in our analytic sample (n=466) in terms of age and sex. Table 1 shows patient baseline characteristics.

Hospital was the preferred place for an institutional death (Figure 1). Because few patients preferred hospice and nursing home at all time points, these categories were combined with hospital to indicate a preference for an institutional death.

Every 6 months, more than one-fourth (27%–33%) of patients changed their preferred PoD (Figure 2A). Fifty-five percent of the patients surveyed at 24 months had changed their preferred PoD from baseline (Figure 2B). There was no clear trend in direction of change over time (Figure 2A).

Predictors of Preferred PoD

Table 2 shows that in the univariable analysis, preferred PoD was significantly associated (type III $P < .20$) with age, sex, race, marital status, education, psychologic distress (range, 0–39; Cronbach's $\alpha = 0.77$), QoL (range, 23.3–108; Cronbach's $\alpha = 0.74$), symptom burden (range, 0–28), ACP/AD status, understanding of disease stage, and time of survey. These independent variables were then added into the backward stepwise regression model. After this procedure, the final multivariable model included the independent variables sex, race, marital

status, education, psychologic distress, QoL, ACP/AD status, understanding of disease stage, and time of survey. This model showed that Malay patients were less likely than Chinese patients to prefer an institutional death (relative risk ratio [RRR], 0.11; 95% CI, 0.05–0.29) and to have an unclear preference (RRR, 0.21; 95% CI, 0.12–0.38) relative to a home death. Conversely, female patients (RRR, 1.84; 95% CI, 1.14–2.98), those with higher psychologic distress (RRR, 1.04; 95% CI, 1.00–1.08), those with a correct understanding of their cancer being at an advanced stage (RRR, 2.22; 95% CI, 1.16–4.27), and those who had completed an ACP/AD (RRR, 1.84; 95% CI, 1.09–3.10) were more likely to choose an institution as their preferred PoD relative to home.

Predictors of Change in Preferred PoD

In the univariable analysis, change in preferred PoD was significantly (type III $P < .20$) associated with age, race, marital status, psychologic distress, QoL, symptom burden, ACP/AD status, and hospitalization in the past 6 months (Table 3). These independent variables were then added into the backward stepwise regression model. The final multivariable model included the independent variables age, race, psychologic distress, ACP/AD status, and hospitalization in the past 6 months. This model showed that Malay patients were less likely than Chinese patients to change their preferred PoD to an institution (RRR, 0.26; 95% CI, 0.09–0.73) or to unclear preference (RRR, 0.47; 95% CI, 0.25–0.88) relative to no change in preference. Patients who had completed an ACP/AD were more likely to change to an unclear preferred PoD

Figure 2. Proportion of patients (A) who changed preferred place of death from previous time point and (B) with ≥ 1 change in preference from baseline.

(RRR, 1.83; 95% CI, 1.22–2.76) relative to no change in preference. Those psychologically distressed at the time of the survey were more likely to change their preferred PoD to home (RRR, 1.02; 95% CI, 1.00–1.05) or to an institution (RRR, 1.06; 95% CI, 1.02–1.10) relative to no change in preference from previous time point. Patients hospitalized in the past 6 months were more likely to change their preference to home (RRR, 1.56; 95% CI, 1.07–2.29) and less likely to change to an institution (RRR, 0.50; 95% CI, 0.28–0.88) relative to no change in preference. We did not observe any multicollinearity in both multivariable models (variance inflation factor, <2).

Association Between Stability in Patient Preference and Dying at the Preferred PoD

A total of 109 patients died during the study period, 41% of whom died at their last reported preferred PoD. There

was no significant association between stability in patient preference (ie, no change in preference during the study period) and congruence between patients' actual PoD and their last reported preferred PoD (chi-square, 0.74; $P=.39$).

Discussion

Our results highlight that not everyone preferred to die at home (64% preferred to do so at baseline) and that patients' preferred PoD varied, depending on their sex, race, ACP/AD completion, and understanding of their disease stage. This echoes findings in previous studies.²⁶

In Singapore, palliative care services are provided by hospitals (outpatient and inpatient) and by hospices (home care, day care, inpatient). Home hospice care is the only service provided free of charge,²⁷ which may be a reason why most patients prefer a home death. MediShield Life (a public health insurance that covers

Table 2. Factors Associated With Preferred Place of Death^a (N=466)

Factor	Univariable RRR (95% CI)			Multivariable RRR (95% CI)	
	Unclear Preference ^a	Preference for an Institutional Death ^a	Type III P Value	Unclear Preference ^a	Preference for an Institutional Death ^a
Age	1.02 (1.00–1.04)	1.00 (0.98–1.02)	.03		
Female sex (Ref: male)	0.79 (0.57–1.09)	1.72 (1.11–2.67)	.00	0.77 (0.54–1.09)	1.84 (1.14–2.98)
Race (Ref: Chinese)			.00		
Malay	0.21 (0.12–0.36)	0.14 (0.06–0.31)		0.21 (0.12–0.38)	0.11 (0.05–0.29)
Others	0.55 (0.32–0.95)	0.60 (0.26–1.38)		0.52 (0.29–0.95)	0.32 (0.13–0.74)
Married (Ref: not married ^b)	0.69 (0.49–0.97)	0.57 (0.36–0.90)	.02	0.65 (0.45–0.93)	0.64 (0.39–1.06)
Highest education level attained (Ref: no education/primary school)			.21		
Secondary/Vocational school	0.79 (0.54–1.14)	0.90 (0.54–1.52)			
Junior college/polytechnic/diploma	0.57 (0.33–0.97)	1.26 (0.65–2.47)			
University and above	0.64 (0.39–1.06)	0.92 (0.47–1.79)			
Psychologic distress ^c	1.01 (0.99–1.03)	1.05 (1.02–1.08)	.01	1.01 (0.99–1.03)	1.04 (1.00–1.08)
Quality-of-life score ^d	0.99 (0.99–1.00)	0.98 (0.97–0.99)	.01		
Financial difficulty score ^e	0.99 (0.90–1.09)	0.92 (0.82–1.03)	.30		
Symptom burden score ^f	1.01 (0.99–1.03)	1.04 (1.01–1.06)	.01		
Advance care planning/advance directive status (Ref: not completed)			.05		
Completed	1.25 (0.87–1.80)	1.96 (1.22–3.16)		1.40 (0.95–2.08)	1.84 (1.09–3.10)
Don't know	0.70 (0.35–1.38)	1.15 (0.52–2.54)		0.66 (0.32–1.36)	1.23 (0.55–2.74)
Patient understanding that cancer is advanced/stage IV (Ref: no)	0.85 (0.57–1.28)	2.19 (1.20–4.01)	.01	0.93 (0.62–1.42)	2.22 (1.16–4.27)
Mortality within next 6 mo (Ref: no)	1.17 (0.77–1.77)	1.41 (0.89–2.24)	.32		
Hospitalization during past 6 mo (Ref: none)	0.91 (0.68–1.21)	0.93 (0.63–1.38)	.78		
Time of survey (Ref: baseline)			.00		
6 mo	1.08 (0.83–1.41)	1.01 (0.75–1.36)		1.09 (0.81–1.45)	0.92 (0.65–1.29)
12 mo	0.89 (0.66–1.19)	1.00 (0.71–1.34)		0.85 (0.62–1.17)	0.83 (0.59–1.17)
18 mo	1.03 (0.74–1.43)	1.70 (1.22–2.34)		0.92 (0.63–1.34)	1.21 (0.81–1.79)
24 mo	0.74 (0.48–1.12)	1.57 (1.07–2.29)		0.68 (0.41–1.12)	1.11 (0.70–1.74)

Abbreviation: RRR, relative risk ratio.

^aRef: preference for home death.^bWidowed/Divorced/Separated/Never married.^cMeasured using the Hospital Anxiety and Depression Scale.^dMeasured using the Functional Assessment of Cancer Therapy–General scale.^eAmount of money needed to cover cost of treatment, take care of daily needs and buy “extras.”^fSymptoms from the Functional Assessment of Chronic Illness Therapy–Palliative Care.

hospitalizations) pays for hospital admissions but not inpatient hospice admission.²⁸ This may have contributed to more patients preferring to die at a hospital rather than at an inpatient hospice.

Our results show that Malay patients, all of whom were Muslims, were more likely to prefer a home death. This may be due to religious/ethnic customs regarding death and burial.^{29,30} For example, it is customary among Malay individuals for family members and children to visit a dying person at home and to offer prayers.^{29,30} Malay families also tend to be larger than Chinese and Indian families,³¹ which may translate to a stronger attachment to the family and home. Further qualitative research is needed to examine religious differences in preferred PoD.

Conversely, female patients may prefer an institutional death because of concerns that their male partners or children may be less able or willing to meet their care needs at home.^{32–34} Patients with better understanding of their disease stage or who have completed an ACP/AD were also more likely to choose an institution as their preferred PoD. This may be due to a better understanding of the demands of care as their illness progresses.

One of the advocated strategies to help patients achieve their preferred PoD is to discuss and document their preferences via ACP. However, our results demonstrate that patients' preferred PoD is unstable with no clear direction of change over time. As highlighted earlier, patients' preferences are influenced by emotions they are

Table 3. Factors Associated With Change in Preferred Place of Death^a (N=425)

Factor	Univariable RRR (95% CI)				Multivariable RRR (95% CI)		
	Change in Preference to Home Death ^b	Change in Preference to Institutional Death ^b	Change to Unclear Preference ^b	Type III P Value	Change in Preference to Home Death ^b	Change in Preference to Institutional Death ^b	Change to Unclear Preference ^b
Age	1.01 (0.99–1.03)	1.02 (1.00–1.04)	1.02 (1.00–1.03)	.18	1.00 (0.99–1.02)	1.01 (0.99–1.04)	1.01 (0.99–1.03)
Female sex (Ref: male)	0.93 (0.65–1.33)	1.00 (0.63–1.59)	0.77 (0.55–1.09)	.48			
Race (Ref: Chinese)				.04			
Malay	0.64 (0.37–1.09)	0.25 (0.09–0.71)	0.45 (0.24–0.83)		0.67 (0.38–1.17)	0.26 (0.09–0.73)	0.47 (0.25–0.88)
Others	1.21 (0.61–2.38)	0.76 (0.28–2.05)	1.23 (0.65–2.34)		1.23 (0.59–2.57)	0.91 (0.33–2.48)	1.34 (0.67–2.68)
Married (Ref: not married ^c)	0.81 (0.54–1.20)	0.69 (0.44–1.10)	0.69 (0.48–0.99)	.16			
Highest education level attained (Ref: no education/primary school)				.53			
Secondary/Vocational school	0.95 (0.63–1.44)	1.09 (0.63–1.86)	0.76 (0.50–1.14)				
Junior college/polytechnic/diploma	0.68 (0.38–1.23)	0.99 (0.49–2.02)	0.53 (0.29–0.96)				
University and above	0.86 (0.51–1.47)	0.76 (0.36–1.59)	0.86 (0.52–1.42)				
Psychologic distress ^d	1.03 (1.00–1.05)	1.05 (1.02–1.08)	1.02 (0.99–1.05)	.02	1.02 (1.00–1.05)	1.06 (1.02–1.10)	1.02 (0.99–1.05)
Quality-of-life score ^e	0.98 (0.97–1.00)	0.98 (0.97–1.00)	0.99 (0.98–1.00)	.01			
Financial difficulty score ^f	1.04 (0.93–1.17)	0.96 (0.84–1.08)	1.02 (0.92–1.14)	.70			
Symptom burden score ^g	1.02 (1.00–1.04)	1.04 (1.01–1.07)	1.01 (0.99–1.04)	.01			
Advance care plan/advance directive status (Ref: not completed)				.05			
Completed	0.97 (0.63–1.47)	1.52 (0.92–2.52)	1.60 (1.10–2.34)		1.00 (0.64–1.55)	1.54 (0.91–2.59)	1.83 (1.22–2.76)
Don't know	0.93 (0.35–2.46)	0.34 (0.04–2.51)	0.61 (0.18–2.02)		0.95 (0.35–2.59)	0.34 (0.04–2.81)	0.46 (0.11–1.93)
Patient understanding that cancer is advanced/stage IV (Ref: no)	1.08 (0.64–1.81)	1.48 (0.74–2.98)	0.99 (0.61–1.61)	.71			
Mortality within next 6 mo (Ref: no)	1.30 (0.77–2.21)	1.10 (0.54–2.21)	1.05 (0.60–1.84)	.80			
Hospitalization during past 6 mo (Ref: none)	1.75 (1.22–2.52)	0.62 (0.37–1.06)	0.93 (0.62–1.39)	.00	1.56 (1.07–2.29)	0.50 (0.28–0.88)	0.81 (0.54–1.23)
Time of survey (Ref: 6 mo)				.31			
12 mo	0.89 (0.57–1.38)	0.80 (0.44–1.46)	0.62 (0.40–0.98)	.31			
18 mo	0.82 (0.51–1.33)	1.51 (0.88–2.56)	0.69 (0.42–1.13)				
24 mo	0.95 (0.56–1.61)	1.14 (0.60–2.18)	0.80 (0.47–1.35)				

Abbreviation: RRR, relative risk ratio.

^aRef: no change in preference.^bRef: preference for home death.^cWidowed/Divorced/Separated/Never married.^dMeasured using the Hospital Anxiety and Depression Scale.^eMeasured using the Functional Assessment of Cancer Therapy–General scale.^fAmount of money to cover cost of treatment, take care of daily needs, and buy “extras.”^gSymptoms from the Functional Assessment of Cancer Therapy–Palliative Care.

experiencing at the time of making decisions, resulting in projection bias.¹⁴ This may explain why patients who were feeling distressed at the time of the survey were more likely to change their preferred PoD. Similarly, patients who have been hospitalized during the past 6 months may experience “hospital fatigue” due to loss of freedom, separation from family, and being subjected to frequent medical interventions, and thus may change their preference to a home death. A similar finding has been reported previously.¹⁸

Based on our results, we recommend that, apart from eliciting patients’ preferences, healthcare providers should also address the reasons why patients express a certain preference during ACP discussions. In particular, any recent hospitalizations and the presence of psychologic distress at the time of discussion should be further explored for possible influence on patients’ PoD preference. Conversations should be revisited frequently to assess whether patients express the same preference even when not in a state of distress; that is, that the elicited preference is stable and thus valid. To enable such frequent ACP conversations, patients should be able to conveniently have these discussions through online platforms or during routine consultations in hospitals or with primary care providers. Patients should also be reminded to review their documents at regular intervals. Without regular review, ACP documents will not serve as reliable indicators of patients’ preferred PoD.

Contrary to previous studies,¹⁶ we found that patients with an ACP/AD were more likely to change their preferred PoD to “unclear.” This finding may be due to a selection bias if patients with greater decisional conflict were more likely to seek an ACP/AD. A previous study by our team found that ACP only reduced patients’ decisional conflict in the short term but did not change their decisional conflict over a long term.³⁵ The present analysis, however, did not capture the time between ACP/AD completion and change to an unclear preference.

Notably, our secondary analysis showed that even among patients with stable preference, only 41% died at their last reported preferred PoD. Although we need to review ACP documents frequently to capture latest preference, it is important to understand why even patients with stable preference were not able to die at their preferred place. A possible reason could be that very few patients in our study had a documented ACP (21%). Future research should address this failure in patient-centered care.

The main strength of our study is the prospective nature of data collection at regular intervals over time using a large sample size with varied demographics. Our study also has limitations. First, because of local ethics regulations, information on patients who did not consent to participate in the study could not be collected. We were therefore unable to assess whether consented patients differed significantly from those who did not consent. Second, we could not ask patients directly where they would prefer to die. In an Asian context, cultural norms discourage asking direct questions concerning preferred PoD.³⁶ Instead, we asked patients where they would prefer to spend their last days of life. The ACP documents in Singapore similarly broach this question indirectly by asking where the person would like to be in the last few days of life.³⁷ Third, our results are limited to patients with cancer within Singapore. Future research should test the generalizability of our results to patients within different cultural contexts.

Conclusions

This study provides evidence of heterogeneity and instability in preferred PoD among patients with advanced cancer. The results suggest that patients’ preferred PoD recorded in ACP documents should be regularly reviewed to reflect change in their preference. Future research should assess reasons for incongruence between patients’ preferred and actual PoDs and design interventions to enable patients to die at their preferred PoD.

Submitted June 30, 2020; final revision received December 14, 2020; accepted for publication December 14, 2020.

Published online August 5, 2021.

Author contributions: Study concept: Malhotra, Koh. Data curation: Koh. Formal analysis: Koh, Chaudhry. Funding acquisition: Finkelstein. Investigation: COMPASS study team. Methodology: Malhotra. Project administration: COMPASS study team. Supervision: Malhotra. Writing – original draft: Koh. Writing – review and editing: Malhotra, Teo, Ozdemir, Chaudhry, Finkelstein.

Disclosures: The authors have disclosed that they have not received any financial consideration from any person or organization to support the preparation, analysis, results, or discussion of this article.

Funding: This work was supported by the Singapore Millennium Foundation and the Lien Centre for Palliative Care (LCPC-IN14-0003).

Correspondence: Chetna Malhotra, MBBS, MD, MPH, Lien Centre for Palliative Care, Duke-NUS Medical School, 8 College Road, Singapore 169857. Email: chetna.malhotra@duke-nus.edu.sg

References

1. World Health Organization. World Health Report 2000 – Health Systems: Improving Performance. Geneva, Switzerland: World Health Organization; 2000.
2. Hanefeld J, Powell-Jackson T, Balabanova D. Understanding and measuring quality of care: dealing with complexity. *Bull World Health Organ* 2017;95:368–374.
3. Department of Health and Social Care. End of Life Care Strategy: Promoting High Quality Care for All Adults at the End of Their Life. London, UK: Department of Health and Social Care; 2008.
4. Gomes B, Higginson IJ, Calanzani N, et al. Preferences for place of death if faced with advanced cancer: a population survey in England, Flanders, Germany, Italy, the Netherlands, Portugal and Spain. *Ann Oncol* 2012;23:2006–2015.
5. Gomes B, Calanzani N, Gysels M, et al. Heterogeneity and changes in preferences for dying at home: a systematic review. *BMC Palliat Care* 2013;12:7.
6. Townsend J, Frank AO, Fermont D, et al. Terminal cancer care and patients’ preference for place of death: a prospective study. *BMJ* 1990;301:415–417.

7. Hinton J. Which patients with terminal cancer are admitted from home care? *Palliat Med* 1994;8:197–210.
8. Evans R, Finucane A, Vanhegan L, et al. Do place-of-death preferences for patients receiving specialist palliative care change over time? *Int J Palliat Nurs* 2014;20:579–583.
9. Leff B, Kaffenbarger KP, Remsburg R. Prevalence, effectiveness, and predictors of planning the place of death among older persons followed in community-based long term care. *J Am Geriatr Soc* 2000;48:943–948.
10. Agar M, Currow DC, Shelby-James TM, et al. Preference for place of care and place of death in palliative care: are these different questions? *Palliat Med* 2008;22:787–795.
11. Ali M, Capel M, Jones G, et al. The importance of identifying preferred place of death. *BMJ Support Palliat Care* 2019;9:84–91.
12. Jemal A, Ward EM, Johnson CJ, et al. Annual report to the nation on the status of cancer, 1975–2014, featuring survival. *J Natl Cancer Inst* 2017;109:djx030.
13. Chochinov HM, Tataryn D, Clinch JJ, et al. Will to live in the terminally ill. *Lancet* 1999;354:816–819.
14. Loewenstein G. Hot-cold empathy gaps and medical decision making. *Health Psychol* 2005;24(Suppl):S49–56.
15. Thomas C, Morris SM, Clark D. Place of death: preferences among cancer patients and their carers. *Soc Sci Med* 2004;58:2431–2444.
16. Auriemma CL, Nguyen CA, Bronheim R, et al. Stability of end-of-life preferences: a systematic review of the evidence. *JAMA Intern Med* 2014;174:1085–1092.
17. Malhotra C, Hu M, Malhotra R, et al. Instability in end-of-life care preference among heart failure patients: secondary analysis of a randomized controlled trial in Singapore. *J Gen Intern Med* 2020;35:2010–2016.
18. Ditto PH, Jacobson JA, Smucker WD, et al. Context changes choices: a prospective study of the effects of hospitalization on life-sustaining treatment preferences. *Med Decis Making* 2006;26:313–322.
19. Fried TR, Van Ness PH, Byers AL, et al. Changes in preferences for life-sustaining treatment among older persons with advanced illness. *J Gen Intern Med* 2007;22:495–501.
20. Teo I, Singh R, Malhotra C, et al. Cost of Medical Care of Patients with Advanced Serious Illness in Singapore (COMPASS): prospective cohort study protocol. *BMC Cancer* 2018;18:459.
21. Cella DF, Tulskey DS, Gray G, et al. The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. *J Clin Oncol* 1993;11:570–579.
22. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983;67:361–370.
23. Lyons KD, Bakitas M, Hegel MT, et al. Reliability and validity of the Functional Assessment of Chronic Illness Therapy–Palliative Care (FACIT-Pal) scale. *J Pain Symptom Manage* 2009;37:23–32.
24. Malhotra C, Harding R, Teo I, et al. Financial difficulties are associated with greater total pain and suffering among patients with advanced cancer: results from the COMPASS study. *Support Care Cancer* 2020;28:3781–3789.
25. Hair JFJ, Anderson RE, Tatham RL, et al. *Multivariate Data Analysis*, 3rd ed. New York, NY: Macmillan; 1995.
26. Higginson IJ, Sen-Gupta GJ. Place of care in advanced cancer: a qualitative systematic literature review of patient preferences. *J Palliat Med* 2000;3:287–300.
27. Lien Centre for Palliative Care, Duke-NUS Medical School. SG Pall eBook. Accessed March 18, 2021. Available at: <https://www.duke-nus.edu.sg/lcpc/resources/sg-pall-ebook-disclaimer/sg-pall-ebook/about-sg-pall-ebook>
28. Tai J. Offer coverage for end-of-life care: experts. *The Straits Times*. October 15, 2015. Accessed March 18, 2021. Available at: <https://www.straitstimes.com/singapore/health/offer-coverage-for-end-of-life-care-experts>
29. Gatrad AR. Muslim customs surrounding death, bereavement, postmortem examinations, and organ transplants. *BMJ* 1994;309:521–523.
30. Sheikh A. Death and dying—a Muslim perspective. *J R Soc Med* 1998;91:138–140.
31. Singapore Department of Statistics. Population trends, 2018. Available at: <https://www.singstat.gov.sg/>
32. Grande GE, Addington-Hall JM, Todd CJ. Place of death and access to home care services: are certain patient groups at a disadvantage? *Soc Sci Med* 1998;47:565–579.
33. Sutherland N, Ward-Griffin C, McWilliam C, et al. Discourses reproducing gender inequities in hospice palliative home care. *Can J Nurs Res* 2018;50:189–201.
34. Allen SM. Gender differences in spousal caregiving and unmet need for care. *J Gerontol* 1994;49:S187–195.
35. Malhotra C, Sim D, Jaufeerally FR, et al. Impact of a formal advance care planning program on end-of-life care for patients with heart failure: results from a randomized controlled trial. *J Card Fail* 2020;26:594–598.
36. Choi KS, Chae YM, Lee CG, et al. Factors influencing preferences for place of terminal care and of death among cancer patients and their families in Korea. *Support Care Cancer* 2005;13:565–572.
37. Tan WS, Bajpai R, Ho AHY, et al. Retrospective cohort analysis of real-life decisions about end-of-life care preferences in a Southeast Asian country. *BMJ Open* 2019;9:e024662.

See [JNCCN.org](https://www.jnccn.org) for supplemental online content.

Supplemental online content for:

A Prospective Cohort Study of Stability in Preferred Place of Death Among Patients With Stage IV Cancer in Singapore

Chetna Malhotra, MBBS, MD, MPH; Ling En Koh, BSc; Irene Teo, PhD; Semra Ozdemir, PhD; Isha Chaudhry, MSc; and Eric Finkelstein, PhD, MHA

J Natl Compr Canc Netw 2022;20(1):20–28

eAppendix 1: COMPASS Study Team

eAppendix 1. COMPASS Study Team.

Hum Yin Mei Allyn
Noreen Chan
Yin Bun Cheung
Soh Mun Chin
Rebecca A Dent
Richard Harding
Lee Lai Heng
Patricia Soek Hui Neo
Ravindran Kanesvaran
Nesaretnam Barr Kumarakulasinghe
Rahul Malhotra
Huei Yaw Wu
Grace Meijuan Yang
Alethea Chung Pheng Yee