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Preferences for Life-Sustaining Treatment and Artificial Nutrition in Advance Decisions: An Urban Population Study

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Abstract

The Patient Right to Autonomy Act (PRAA), enacted in Taiwan in 2019, allows individuals to establish advance decisions (ADs) through advance care planning (ACP). This law permits withholding or withdrawing life-sustaining treatment (LST) or artificial nutrition and hydration (ANH) under conditions such as irreversible coma, vegetative state, advanced dementia, or intolerable suffering. This study explores urban residents' preferences regarding LST and ANH in different clinical scenarios, variations in these choices, and the factors that influence them. A survey of legally formatted AD documents was conducted using convenience sampling. Participants were recruited from Taipei City Hospital, which has served as the main ACP pilot and demonstration center since the PRAA's implementation. Data were drawn from ADs and ACP consultation records, covering demographic and clinical variables such as age, gender, welfare status, medical conditions, caregiving experience, ACP consultation site, participation of relatives, and willingness to engage in ACP. Records from 2337 individuals were analyzed. Most participants consistently preferred to refuse both LST and ANH, though significant differences emerged between terminal illness and severe dementia scenarios. Many participants favored ANH as a temporary measure, and appointing a health care agent (HCA) was a common practice. Gender differences were notable: women more often declined LST and ANH, whereas men leaned toward accepting full or limited treatment. Age also influenced decisions, with younger individuals more likely to pursue treatment and designate an HCA, while older participants were more inclined to refuse interventions. Preferences for LST and ANH were shaped by awareness of clinical conditions as well as demographic and cultural factors. The findings highlight the complexity of end-of-life choices, the evolution of ADs, and the role of socio-demographics in shaping them. Future research should examine how preferences shift over time and how healthcare professionals approach LST and ANH decisions, particularly in neurological conditions.

Keywords: Advance decision, Artificial nutrition and hydration, Advance care planning, Life-sustaining treatment

Background

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Advance care planning (ACP) is a complex process that involves ethical principles, human values, medical technology, cultural and social norms, patient wishes, family expectations, legal frameworks, and the responsibilities of healthcare professionals [1–5]. In the past, withdrawing life-sustaining treatment (LST) or artificial nutrition and hydration (ANH) was often regarded as equivalent to murder in many societies [4]. This view largely stemmed from the absence of two

essential conditions: physician responsibility and patient autonomy [4]. Typically, the decision to withhold LST or ANH arises when recovery is unlikely or when patients are nearing the end of life (EoL) [2]. While the refusal of treatment is now widely acknowledged as a legitimate choice, it remains essential that patients themselves express these wishes. Family members' decisions can only be assumed to reflect the patient's preferences when the patient's perspective has been carefully considered [2, 6].

Taiwan has been at the forefront in Asia in promoting awareness and legislation around palliative care and ACP [4]. Over the past two decades, Taiwan, Japan, and South Korea have enacted laws regulating the withholding or withdrawal of LST and ANH [2, 4]. Compared with many Asian countries, Taiwan moved earlier by introducing two important EoL care laws. By contrast, nations such as the United States, the United Kingdom, Australia, and Canada had long established regulations permitting refusal of LST and ANH in EoL care.

The Hospice Palliative Care Act (HPCA), enacted in Taiwan in 2000, first allowed terminally ill patients to decline LST. Later amendments permitted family members or patients themselves to authorize withdrawal of treatment through a signed consent form. Nevertheless, these legal changes still did not fully protect patient autonomy. Physicians were not legally required to disclose diagnoses, communicate openly, or obtain patient consent [7]. As a result, decisions regarding LST withdrawal often rested with family members rather than patients [6, 8]. Furthermore, the HPCA applied only to terminally ill patients and excluded non-terminal individuals, such as those in a vegetative state or long-term coma dependent on respirators, leaving them without the option to refuse treatment [9]. These gaps led to the enactment of the Patient Right to Autonomy Act (PRAA) in December 2015.

The PRAA, which came into force on January 6, 2019, is the first patient-centered legislation of its kind in Asia. It grants individuals with full decision-making capacity the right to establish advance decisions (ADs) through ACP. Importantly, the Act obliges healthcare institutions and physicians to provide patients with accurate information regarding diagnoses, treatments, procedures, prescriptions, and prognoses, thereby strengthening informed decision-making.

Under the PRAA, patients with a valid AD may refuse or discontinue LST and ANH if they meet one of five conditions: terminal illness, irreversible coma, persistent vegetative state, severe dementia, or other medical conditions defined by the Ministry of Health and Welfare (MHW). These include incurable diseases, unbearable suffering, or lack of effective treatment options. Through ADs, patients are empowered to exercise medical autonomy by explicitly documenting their choices under such conditions.

In Taiwan, ADs are formal documents completed after ACP consultations. The MHW has approved ACP services in specific healthcare institutions, where multidisciplinary teams—including physicians, nurses, social workers, and counseling psychologists—guide individuals through discussions on medical, social, family, and psychological aspects. Signing an AD after counseling is voluntary. Counselors are required to undergo official training programs that cover PRAA regulations, ACP skills, and clinical case discussions.

A valid AD must follow the ACP procedure. LST includes interventions designed to extend life, such as cardiopulmonary resuscitation, ventilator support, dialysis, blood transfusion, liver support devices, and intensive antibiotic therapy. Specific examples include chest compressions, defibrillation, intubation, and mechanical ventilation.

In the United Kingdom, healthy individuals commonly emphasize "dying with dignity" as a central EoL preference [5]. By contrast, ACP engagement in East Asian countries remains relatively limited due to cultural attitudes [2]. There is little evidence on how healthy individuals in Asia perceive or choose to decline LST and ANH. Therefore, this study sought to explore AD preferences among urban residents in Taiwan one year after the PRAA's implementation, examine the consistency and variability of choices regarding LST and ANH under different clinical conditions, and identify factors influencing these preferences.

Methods

Participants and data collection

This study was approved by the Institutional Review Board of Taipei City Hospital (file number: TCHIRB-10808008-E), the primary institution designated by the Taiwanese government to implement the ACP policy. It represents one of the earliest large-scale investigations of ACP in Taiwan. In the first year of the Patient Right to Autonomy Act (PRAA), 11,317 individuals nationwide

participated in ACP consultations. Among them, 2,337 participants (over 20% of the national total) were from Taipei City Hospital, which achieved the highest completion rate in the country.

Of the hospital's seven branches, five recorded more than 1,300 signatories, establishing Taipei City Hospital as the leading center in promoting ACP and ADs in Taiwan. ACP services—including consultation, AD signing, and adding reminders on National Health Insurance ID cards—were provided across outpatient clinics, inpatient wards, and home visits.

Data were obtained from legally structured AD documents and ACP consultation records. Participants were adults (≥20 years) with full legal capacity who attended ACP consultations at Taipei City Hospital between January 6, 2019, and January 5, 2020. A total of 2,337 individuals underwent ACP consultations, and 2,198 completed an AD.

Research materials

The study reviewed ADs and ACP consultation records. During consultations, participants were asked to indicate their preferences for LST and ANH under five conditions: terminal illness, irreversible coma, persistent vegetative state, severe dementia, and unbearable/incurable diseases as defined by the Ministry of Health and Welfare (MHW).

Following ACP discussions, participants could sign ADs specifying their choices regarding acceptance or refusal of LST and ANH. For each scenario, the options included:

1. No decision made.
2. Refusal of LST/ANH.
3. Acceptance of LST/ANH for a limited time, with the appointed healthcare agent (HCA) authorized to withdraw treatment during that period.
4. Delegating the decision to an HCA.
5. Full acceptance of LST/ANH.

ACP records also captured demographic and background data, including gender, age, welfare status, medical conditions, family caregiving experience, consultation site, involvement of second-degree relatives, and motivation for participating in ACP. Reported reasons included:

1. Having a disease.
2. Being unmarried.
3. Desire for a dignified death.
4. Influence from media reports or campaigns.
5. Planning for end-of-life arrangements.
6. Having a sick family member.
7. Not wanting to burden relatives with decision-making.
8. Avoiding being a burden to the family.

Data analysis

We examined differences in LST and ANH preferences across the five clinical conditions, assessed consistency in choices, and analyzed the relationship between socio-demographic factors and treatment preferences. Data were analyzed using SPSS version 22.0 (IBM Corp., Armonk, NY). Descriptive statistics summarized categorical, ordinal, and normally distributed continuous variables. Consistency was measured with Kappa coefficients. Statistical tests included the McNemar-Bowker test, chi-square test, Fisher's exact test, independent-sample t-test, and bivariate and multivariate logistic regressions. For regression analysis, participants who accepted LST/ANH (fully or time-limited) and those who delegated decisions to an HCA were grouped into one category, excluding those who refused or made no decision.

Results

Distribution of LST and ANH preferences

A total of 2,337 participants expressed their preferences for LST and ANH across the five clinical conditions **(Table 1)**. The proportion refusing all LST ranged from 87.5% to 90.9%. About 7.2% did not make a decision, while 4.2% and 3.6% opted for time-limited treatment in cases of terminal illness and unbearable/incurable disease, respectively.

For ANH, refusal rates ranged from 87.6% to 90.7%, with 7.2% undecided. Acceptance of time-limited ANH was reported by 4.0% of participants for terminal illness and 3.5% for unbearable/incurable disease. Overall, preferences for LST and ANH followed similar patterns, showing strong consistency across the five conditions.

Table 1. Advance Directives for Life-Sustaining Treatment and Artificial Nutrition/Hydration Preferences Across Five Clinical Conditions

Condition	Terminal Illness	Irreversible Coma	Persistent Vegetative State	Severe Dementia	Incurable Diseases
Life-Sustaining Treatment (LST)	n	%	n	%	n
Refuse all treatment	2045	87.5%	2096	89.7%	2124
Undecided	168	7.2%	168	7.2%	168
Delegate to HCA	23	1.0%	24	1.0%	20
Time-limited treatment	98	4.2%	48	2.1%	25
Accept all treatment	3	0.1%	1	0.0%	0
Artificial Nutrition/Hydration (ANH)	n	%	n	%	n
Refuse all treatment	2047	87.6%	2096	89.7%	2119
Undecided	167	7.1%	168	7.2%	168
Delegate to HCA	20	0.9%	23	1.0%	19
Time-limited treatment	93	4.0%	46	2.0%	27
Accept all treatment	10	0.4%	4	0.2%	4

Consistency and differences in LST and ANH preferences across five clinical conditions

Table 2 shows that participants' preferences for LST and ANH were highly consistent across the five clinical conditions (Kappa coefficients > 0.783 for LST and > 0.814 for ANH). Notably, the strongest agreement was observed in the scenarios of irreversible coma, persistent vegetative state, and severe dementia, with Kappa coefficients exceeding 0.9.

Table 2. Consistency of Preferences for Life-Sustaining Treatment (LST) and Artificial Nutrition/Hydration (ANH) Across Clinical Conditions

Preferences of LST	Terminal Illness	Irreversible Coma	Persistent Vegetative State	Severe Dementia	Incurable Diseases
Terminal Illness	-	0.804	0.783	0.812	0.850
Irreversible Coma	-	-	0.924	0.902	0.859
Persistent Vegetative State	-	-	-	0.916	0.817
Severe Dementia	-	-	-	-	0.849
Incurable Diseases	-	-	-	-	-
Preferences of ANH	**Terminal Illness**	**Irreversible Coma**	**Persistent Vegetative State**	**Severe Dementia**	**Incurable Diseases**
Terminal Illness	-	0.844	0.814	0.843	0.870
Irreversible Coma	-	-	0.914	0.900	0.866

Persistent Vegetative State	-	-	-	0.905	0.825
Severe Dementia	-	-	-	-	0.869
Incurable Diseases	-	-	-		

With respect to clinical conditions, preferences for LST and ANH within the same condition demonstrated strong consistency (Kappa coefficients ranging from 0.917 to 0.972, **Table 3**). Nonetheless, significant differences emerged between terminal illness ($\chi^2 = 12.581$, $p < 0.05$) and advanced dementia ($\chi^2 = 11.4$, $p = 0.05$). These differences appear to stem from a greater tendency to choose time-limited or continued treatment in terminal illness scenarios, whereas in cases of advanced dementia, participants more frequently preferred time-limited treatment or complete refusal of treatment.

Table 3. Consistency and Difference Tests for Life-Sustaining Treatment (LST) and Artificial Nutrition/Hydration (ANH) Across Clinical Conditions

Clinical Condition	Consistency Test[a]		Difference Test[b]	
	Kappa Coefficient	p-value	Paired Chi-Square	p-value
Terminal Illness (LST vs. ANH)	0.917	< 0.001	12.581	0.022
Irreversible Coma (LST vs. ANH)	0.971	< 0.001	4.143	0.529
Persistent Vegetative State (LST vs. ANH)	0.972	< 0.001	N/A	N/A
Severe Dementia (LST vs. ANH)	0.960	< 0.001	11.400	0.050
Incurable Diseases (LST vs. ANH)	0.969	< 0.001	3.077	0.545

Comparisons between clinical conditions and factors influencing LST or ANH choices

Table 4 presents comparisons across the five clinical conditions, revealing significant differences in preferences for time-limited treatment and delegating ANH decisions to an HCA.

For LST, a significant variation was observed ($\chi^2 = 68.215$, $p < 0.001$), with participants showing a stronger inclination toward time-limited treatment in cases of terminal illness (4.2% > 2.1%, 4.2% > 1.5%, 4.2% > 1.1%) and unbearable/incurable disease (3.6% > 2.1%, 3.6% > 1.5%, 3.6% > 1.1%).

Similarly, ANH preferences also showed significant differences ($\chi^2 = 53.172$, $p < 0.001$). Time-limited acceptance was more frequent in terminal illness (4% > 2%, 4.2% > 1.8%, 4.2% > 1.2%) and unbearable/incurable disease (3.5% > 2%, 3.5% > 1.8%, 3.5% > 1.2%).

In addition, a significant difference emerged in preferences for authorizing an HCA to decide on ANH ($\chi^2 = 21.77$, $p < 0.001$), primarily associated with irreversible coma and unbearable/incurable disease.

Overall, participants were more likely to favor time-limited LST and ANH in scenarios involving terminal illness or unbearable/incurable disease, while reliance on an authorized HCA for ANH decisions was more common in irreversible coma and unbearable/incurable disease conditions.

Table 4. Variations in Participants' Preferences for Life-Sustaining Treatment (LST) and Artificial Nutrition/Hydration (ANH) Across Five Clinical Conditions

Preferences	LST		ANH	
Wills of LST/ANH	χ^2	p-value	χ^2	p-value

Wish not to accept	2.483	0.643	1.973	0.741
Undecided	0.076	0.999	0.055	0.999
Authorized HCA to decide	2.196	0.700	21.77***	0.000
Time-limited treatment	68.215***	0.000	53.172***	0.000
Continue to accept treatment	2.000	0.736	4.121	0.390

Factors influencing LST or ANH choices: gender, age, and ACP progression

Significant associations were found between treatment preferences and variables such as gender, age, ACP setting, HCA appointment, and motivations for ACP participation, including family-related considerations **(Table 5)**.

Women and older participants were more likely to refuse both LST and ANH, whereas individuals under 40 showed a stronger tendency to accept treatment and delegate decisions to an HCA. Female caregivers, in particular, demonstrated a higher probability of refusing LST and ANH.

ACP consultations conducted in outpatient clinics accounted for significantly higher proportions across all LST preferences compared with other locations. Among those who refused, remained undecided, or chose to receive LST, a larger proportion had not appointed an HCA than those who had.

Finally, participants who wished to relieve family members of decision-making responsibilities or who sought not to become a burden to their families were more inclined to refuse both LST and ANH.

Table 5. Factors associated with preference of LST and ANH

Characteristic	Preference of LST								Preference of ANH							
	Refuse LST at five clinical conditions (*n* = 2004, 85.8%)		**Undecided instantly (*n* = 166, 7.1%)**		**Receive LST and authorize HCA (*n* = 167, 7.1%)**				**Refuse ANH at five clinical conditions (*n* = 2013, 86.1%)**		**Undecided instantly (*n* = 166, 7.1%)**		**Receive ANH and authorize HCA (*n* = 158, 6.8%)**			
	n	**%**	***n***	**%**	***n***	**%**	***p*-value**		***n***	**%**	***n***	**%**	***n***	**%**	***p*-value**	
Gender							**< 0.001**	[a] ***							**< 0.001**	[a] ***
Male	664	33.1%	65	39.2%	83	49.7%			665	33.0%	65	39.2%	82	51.9%		
Female	1340	66.9%	101	60.8%	84	50.3%			1348	67.0%	101	60.8%	76	48.1%		
Age																
Below 40 years	191	9.5%	20	12.0%	31	18.6%	**0.003**	[a] **	192	9.5%	20	12.0%	30	19.0%	**0.003**	[a] **
41–65	958	47.8%	84	50.6%	79	47.3%			964	47.9%	84	50.6%	73	46.2%		
Above 65 years	855	42.7%	62	37.3%	57	34.1%			857	42.6%	62	37.3%	55	34.8%		
Family caregiving experience							0.053	[a]							**0.044**	[a] *
No	900	59.9%	54	52.4%	80	68.4%			904	59.9%	54	52.4%	76	69.1%		
Yes	602	40.1%	49	47.6%	37	31.6%			605	40.1%	49	47.6%	34	30.9%		
Caregiver's gender							**0.036**	[a] *							**0.036**	[a] *
Male	164	27.2%	20	40.8%	15	40.5%			165	27.3%	20	40.8%	14	41.2%		
Female	438	72.8%	29	59.2%	22	59.5%			440	72.7%	29	59.2%	20	58.8%		

Welfare entitlement							0.438	[a]							0.235	[a]
General public (no welfare entitlement)	1760	87.8%	151	91.0%	145	86.8%			1771	88.0%	151	91.0%	134	84.8%		
With welfare entitlement (all)	244	12.2%	15	9.0%	22	13.2%			242	12.0%	15	9.0%	24	15.2%		
Disease severity							0.204	[a]							0.079	[a]
No self-reported diseases	1082	79.7%	73	73.0%	92	76.0%			1092	79.9%	73	73.0%	82	73.2%		
With diseases (clinical conditions related (all)	276	20.3%	27	27.0%	29	24.0%			275	20.1%	27	27.0%	30	26.8%		
Disease conditions- types of disease																
Cancers	113	9.5%	8	9.9%	8	8.0%	0.880	[a]	114	9.5%	8	9.9%	7	7.9%	0.873	[a]
stroke history or cardiovascular diseases	63	5.5%	8	9.9%	3	3.2%	0.143	[a]	63	5.5%	8	9.9%	3	3.5%	0.191	[b]
Mental diseases	57	5.0%	4	5.2%	8	8.0%	0.436	[a]	55	4.8%	4	5.2%	10	10.9%	0.058	[b]
Neurodegenerative diseases	39	3.5%	4	5.2%	6	6.1%	0.336	[a]	38	3.4%	4	5.2%	7	7.9%	0.068	[b]
Liver cirrhosis and any organ failure	36	3.2%	5	6.4%	4	4.2%	0.309	[a]	37	3.3%	5	6.4%	3	3.5%	0.294	[b]
The place ACP progressed							**0.034**	[b] *							**0.010**	[b] *
Hospital (outpatient clinic)	1918	95.7%	161	97.0%	154	92.2%			1929	95.8%	161	97.0%	143	90.5%		
Hospital (admission)	40	2.0%	0	0.0%	9	5.4%			40	2.0%	0	0.0%	9	5.7%		
Home	18	0.9%	2	1.2%	1	0.6%			17	0.8%	2	1.2%	2	1.3%		
Institution	28	1.4%	3	1.8%	3	1.8%			27	1.3%	3	1.8%	4	2.5%		
Participation of second-degree relatives							0.199	[a]							0.260	[a]
No	215	12.0%	18	14.6%	11	7.7%			215	11.9%	18	14.6%	11	8.1%		
Yes	1582	88.0%	105	85.4%	131	92.3%			1589	88.1%	105	85.4%	124	91.9%		
HCA appointment							**< 0.001**	[a] ***							**< 0.001**	[a] ***
No	1809	90.6%	127	81.9%	116	70.3%			1819	90.6%	127	81.9%	106	68.4%		
Yes	188	9.4%	28	18.1%	49	29.7%			188	9.4%	28	18.1%	49	31.6%		
Intention of ACP																
Own disease suffering	140	7.0%	13	7.9%	16	9.6%	0.431	[a]	139	6.9%	13	7.9%	17	10.8%	0.182	[a]

Being single	199	10.0 %	13	7.9%	13	7.8%	0.488	[a]	203	10.1 %	13	7.9%	9	5.7%	0.147	[a]
Expecting a good end with dignity	1342	67.1 %	104	63.0 %	102	61.4 %	0.207	[a]	1343	66.9 %	104	63.0 %	101	64.3 %	0.509	[a]
Prior life arrangement	1274	63.7 %	95	57.6 %	107	64.5 %	0.275	[a]	1280	63.7 %	95	57.6 %	101	64.3 %	0.277	[a]
Media reports and propagations	130	6.5%	10	6.1%	12	7.2%	0.907	[a]	130	6.5%	10	6.1%	12	7.6%	0.823	[a]
Suffering of family members	261	13.1 %	28	17.0 %	30	18.1 %	0.087	[a]	266	13.2 %	28	17.0 %	25	15.9 %	0.287	[a]
Do not wish family members to take responsibility for making decisions	912	45.6 %	74	44.8 %	55	33.1 %	**0.008**	[a] **	917	45.7 %	74	44.8 %	50	31.8 %	**0.004**	[a] **
Do not want to be a family drag	815	40.8 %	55	33.3 %	51	30.7 %	**0.009**	[a] **	818	40.7 %	55	33.3 %	48	30.6 %	**0.010**	[a] *

[a]Chi-square test, [b]Fisher exact test
*p < 0.05, **p < 0.01, ***p < 0.001

Correlation of gender, age, and consultation intention with refusal of LST and ANH

Significant associations were identified between refusal of LST/ANH and factors such as gender, age, and the consultation intention of not wanting family members to assume responsibility **(Table 6)**.

For LST, refusal was significantly correlated with being female (AOR = 1.679, p < 0.05), aged 41–64 years (AOR = 2.205, p < 0.01), aged ≥65 years (AOR = 2.630, p < 0.01), and citing the intention of avoiding family responsibility (AOR = 2.112, p < 0.01).

Similarly, refusal of ANH was significantly associated with being female (AOR = 1.673, p < 0.05), aged ≥65 years (AOR = 2.561, p < 0.01), and indicating the consultation intention of not wishing family members to take responsibility (AOR = 1.721, p < 0.05).

Table 6. Multivariate logistic regression—factors associated with preference of LST and ANH

Preference of LST	Reference group: Receive LST and authorize HCA								Reference group: Refuse LST at five clinical conditions							
	Model 1. Refuse LST (*n* = 2004)				Model 2. Undecided instantly (*n* = 166)				Model 3. Undecided instantly (*n* = 166)				Model 4. Receive LST and authorize HCA (*n* = 167)			
	Adjusted-OR	95%CI		*p*-value	Adjusted-OR	95%CI		*p*-value	Adjusted-OR	95%CI		*p*-value	Adjusted-OR	95%CI		*p*-value
Gender (ref.: male)																
Female	1.679	1.128	2.500	0.011	1.103	0.636	1.913	0.728	0.657	0.434	0.993	0.046	0.595	0.400	0.886	0.011
Age (ref.: below 40 years)																
41–65 years	2.205	1.282	3.793	0.004	2.621	1.093	6.281	0.031	1.188	0.569	2.483	0.646	0.454	0.264	0.780	0.004
Above 65 years	2.630	1.503	4.603	0.001	2.365	0.959	5.833	0.062	0.899	0.421	1.922	0.784	0.380	0.217	0.665	0.001
Caregiving experience (ref.: No)																
Yes	1.421	0.906	2.229	0.126	1.983	1.091	3.606	0.025	1.396	0.911	2.140	0.126	0.704	0.449	1.104	0.126
The place ACP progressed (ref.: outpatient clinic)																

Hospital admission/home/ institution	0.580	0.277	1.214	0.149	0.463	0.136	1.575	0.218	0.797	0.282	2.256	0.669	1.723	0.824	3.605	0.149
HCA appointment (Ref.: No)																
Yes	0.216	0.135	0.347	<0.001	0.368	0.178	0.761	0.007	1.699	0.915	3.157	0.093	4.620	2.884	7.399	<0.001
Intention of consultation—own disease suffering (ref.: No)																
Yes	0.789	0.414	1.505	0.472	0.844	0.327	2.181	0.727	1.070	0.502	2.279	0.861	1.267	0.664	2.418	0.472
Intention of consultation—disease suffering of family members (ref.: No)																
Yes	0.685	0.398	1.179	0.172	0.679	0.319	1.444	0.315	0.991	0.560	1.752	0.974	1.459	0.848	2.510	0.172
Intention of consultation—wish not family members to take responsibility for making decision (ref.: No)																
Yes	2.112	1.382	3.228	0.001	1.761	0.997	3.111	0.051	0.834	0.554	1.256	0.384	0.473	0.310	0.724	0.001

Preference of ANH	Reference group: Receive ANH and authorize HCA								Reference groups: Refuse ANH preference at five clinical conditions							
	Model 5. Refuse ANH at five clinical conditions (n = 2013)				Model 6. Undecided instantly (n = 166)				Model 7. Undecided instantly (n = 166)				Model 8. Receive ANH and authorize HCA(n = 158)			
	Adjusted-OR	95%CI		p-value	Adjusted-OR	95%CI		p-value	Adjusted-OR	95%CI		p-value	Adjusted-OR	95%CI		p-value
Gender (ref.: male)																
Female	1.673	1.076	2.603	0.022	1.607	1.018	2.537	0.042	0.961	0.523	1.764	0.897	0.598	0.384	0.930	0.022
Age (ref.: below 40 years)																
41-65 years	1.275	0.775	2.100	0.339	1.263	0.774	2.060	0.349	0.990	0.506	1.939	0.978	0.784	0.476	1.291	0.339
Above 65 years	2.561	1.350	4.857	0.004	0.884	0.370	2.110	0.781	0.345	0.122	0.974	0.045	0.391	0.206	0.741	0.004
Caregiving experience (ref.: no)																
Yes	1.266	0.774	2.071	0.348	0.811	0.505	1.302	0.386	0.641	0.332	1.235	0.184	0.790	0.483	1.292	0.348
Welfare entitlement (ref.: general public)																
Yes	0.970	0.467	2.016	0.936	0.361	0.138	0.944	0.038	0.372	0.116	1.193	0.096	1.031	0.496	2.141	0.936
Disease condition (ref.: no self-reported diseases)																
With diseases (clinical conditions related—all)	1.317	0.656	2.642	0.439	2.074	1.061	4.054	0.033	1.575	0.626	3.963	0.334	0.760	0.379	1.524	0.439
The place ACP progressed (ref.: hospital outpatient clinic)																
Hospital admission/home/ institution	0.464	0.203	1.060	0.068	3.075	0.407	23.212	0.276	6.630	0.780	56.358	0.083	2.156	0.944	4.927	0.068
HCA appointment (ref.: no)																
Yes	0.172	0.103	0.286	<0.001	0.443	0.233	0.843	0.013	2.580	1.208	5.509	0.014	5.824	3.494	9.709	<0.001
Intention of consultation—own disease suffering (ref.: no)																
Yes	0.792	0.353	1.780	0.573	1.442	0.498	4.174	0.500	1.819	0.507	6.532	0.359	1.262	0.562	2.834	0.573
Intention of consultation—disease suffering of family members (ref.: no)																
Yes	0.962	0.497	1.861	0.908	1.017	0.529	1.953	0.960	1.057	0.435	2.572	0.902	1.040	0.537	2.012	0.908
Intention of consultation—do not wish family members to take responsibility for making decisions (ref.: no)																
Yes	1.721	1.087	2.725	0.021	1.041	0.662	1.634	0.863	0.605	0.326	1.123	0.111	0.581	0.367	0.920	0.021

Discussion

This study revealed a consistent pattern in participants' willingness to refuse LST and ANH across five hypothetical clinical conditions, with over 90% opting for refusal. The highest refusal rates were observed in the permanent vegetative state, reflecting a strong preference against interventions in situations involving severe cognitive impairment. Similarly, high refusal rates were noted in cases of severe dementia and irreversible coma, while participants showed greater openness to time-limited treatment in scenarios involving terminal illness.

Historically, consideration of refusing LST has been primarily applied to terminal conditions, not to states such as permanent vegetative state, severe dementia, or irreversible coma [4]. Unlike terminally ill patients who generally retain decision-making capacity, individuals in these neurological conditions lack autonomy, prompting some countries to adopt proactive advance decision-making approaches to support patient-centered care [4]. In Taiwan, neurological conditions that were not traditionally considered terminal, including severe dementia and irreversible coma [10], have increasingly been recognized under the PRAA as qualifying conditions. These conditions are associated with high dependency, cognitive impairment, and reduced quality of life [11].

A nationwide Taiwanese study highlighted the substantial healthcare burden of dementia, with higher rates of hospitalization, ICU admissions, and prolonged stays compared with cancer patients [10]. Except for blood transfusions, dementia patients received LST and ANH more frequently than cancer patients. The use of ANH, including enteral tube insertion (72.6%), feeding (67.4%), mechanical ventilation (61.5%), endotracheal intubation (59.6%), CPR (33.9%), and hemodialysis (17.6%), was notably higher in Taiwan than in Europe, North America, and other Asian regions [10].

Participants in our study showed relatively higher acceptance of ANH as a time-limited measure and frequently delegated decisions to an HCA. For irreversible coma, a larger proportion preferred an HCA to make ANH decisions, whereas in severe dementia and terminal illness, time-limited ANH was more commonly accepted. In cases of unbearable/incurable disease, participants were more likely to authorize an HCA for ANH decisions.

Preferences for LST and ANH are influenced by culture, religion, traditions, personal values, institutional guidelines, and the dynamics of doctor–patient–family relationships [1, 12–14]. Previous studies have emphasized challenges in providing ANH at the end of life [15, 16]. Artificial nutrition may be needed for survival, comfort, or to maintain appearances for family [3, 17]. For patients in a coma or persistent vegetative state, ANH serves as a critical bridge until recovery is possible [16]. In late-stage dementia, the loss of appetite can cause emotional distress for relatives [16, 17]. Perspectives on ANH vary, with some viewing it as basic nursing care and others considering it a medical intervention lacking clear indications [3, 18].

Socio-demographic factors significantly influenced treatment preferences. Women were more likely to refuse both LST and ANH, whereas men tended to accept full or time-limited treatment. This gender difference aligns with prior studies on palliative care preferences [19–22]. Cultural narratives framing disease as a "battle" may encourage men to pursue treatment aggressively [19, 23], whereas societal norms allow women greater space to express vulnerability, seek help, and prioritize comfort [19, 24].

Most participants (over 73%) were generally healthy or had non-life-threatening chronic conditions, indicating that AD decisions were largely hypothetical. Age also played a significant role: participants under 40 preferred receiving treatment and delegating decisions to an HCA, those aged 40–65 often remained undecided, and participants over 65 tended to refuse treatment outright. This pattern is consistent with previous research showing a positive association between age and AD signing, with older individuals more likely to have DNAR orders or formal advance directives [25, 26].

Family-related factors

Two key family-related factors influenced participants' refusal of LST and ANH: reluctance of family members to assume responsibility and the decision not to appoint an HCA. These findings reflect common ACP challenges in Asian cultures, where family-centered considerations strongly shape medical decisions [6, 15]. Previous research has highlighted that ICU surrogates may experience emotional pressure from family members with conflicting views, which can affect decision-making [27]. With the implementation of the PRAA, greater emphasis on patient autonomy is expected, supporting

physicians in providing accurate diagnoses and engaging in direct communication with patients.

Research Limitations

This study focused solely on immediate preferences expressed during ACP consultations and did not capture subsequent changes in decisions or post-consultation discussions. Additionally, all participants were recruited from Taipei City Hospital, the primary trial and demonstration site for ACP in Taipei, which may limit the generalizability of the findings to other regions or institutions.

Implications

The results offer valuable insights for tailoring ACP consultation approaches, particularly regarding ANH, by accounting for social and cultural contexts. Flexible and culturally sensitive strategies can better address the needs of individuals who may initially resist ACP engagement. Future research could examine how medical preferences evolve with changes in health status, identify factors affecting the duration of time-limited treatments, and explore the attitudes of Taiwanese healthcare professionals toward withdrawal or withholding of LST and ANH in patients with neurological conditions.

Conclusion

This study investigated urban residents' preferences for LST and ANH across multiple clinical conditions. Overall, preferences were consistent, especially in scenarios involving irreversible coma, permanent vegetative state, and severe dementia. Differences emerged in terminal illness and extremely severe dementia, particularly regarding time-limited treatments and HCA decision-making. Participants were more likely to choose time-limited interventions for terminal illness and unbearable/incurable diseases. Gender, age, and ACP progression significantly influenced preferences: females and older individuals were more inclined to refuse treatment, whereas younger participants tended to authorize HCAs for decisions. Additional factors, including outpatient clinic-based ACP sessions, HCA appointments, and family-related intentions, were also associated with treatment preferences. The findings underscore the importance of considering individual, demographic, and cultural factors in advance care planning, emphasizing tailored approaches for effective end-of-life decision-making regarding LST and ANH among urban populations.

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