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Choices and challenges in end-of-life care and decision-making: a nationwide cross-sectional study in Bangladesh

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Abstract

Background End-of-life (EoL) care is the final phase of life (typically the last year when death is imminent), distinct from but related to palliative care, which provides broader support for serious illness. In many low- and middle-income countries, including Bangladesh, end-of-life care remains underdeveloped. Cultural norms, socio-economic disparities, limited palliative care infrastructure, and lack of healthcare provider training further complicate informed decision-making at EoL. This study aimed to evaluate EoL care awareness, preferences, and decision-making factors among critically ill older adult patients in Bangladesh.

Methods This cross-sectional study was conducted from September 2024 to February 2025 across eight administrative divisions of Bangladesh, involving 1,270 patients aged ≥ 50 years with chronic or advanced illnesses, including hospitalized patients aged ≥ 18 years with life expectancy < 1 year from private ($n = 368$), public ($n = 439$), and community ($n = 463$) settings. Divisional hospitals provided hospital-based data, while three randomly selected sub-districts per division ensured proportional community representation. Data was collected using structured questionnaires adapted from validated international tools, capturing socio-demographics, and end-of-life (EoL) awareness, preferences, and experiences. Predictors of end-of-life preferences were examined using multiple logistic regression analysis.

Results Only 6.93% had health insurance, with just 1.7% in community settings. Palliative care awareness was highest in private hospitals (70%), followed by public (31%) and community settings (7.1%) ($p < 0.01$). Advance care planning awareness and documentation were lowest in community patients ($p < 0.01$). Older adults (≥ 60 years) were more likely to prefer home care (OR = 2.96, $p = 0.004$), avoid hospitalization (OR = 17.55, $p < 0.001$), and choose home death (OR = 10.29, $p < 0.001$). Greater understanding of palliative care (OR = 7.38, $p < 0.001$) and hospice comfort (OR = 25.26, $p < 0.001$) strongly predicted documentation of end-of-life preferences. Family openness varied widely (private: 81%, public: 21%, community: 7.1%). Proxy appointment was significantly associated with prior discussions (AOR = 4.11), while trust in healthcare providers reduced the likelihood (AOR = 0.39).

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Conclusion Profound disparities in end-of-life awareness and preferences exist across healthcare settings in Bangladesh, driven by socio-economic, cultural, and institutional factors. Efforts must prioritize patient choice through enhanced communication, culturally sensitive advance care planning, and expanding home-based palliative options to honor care preferences at the end of life.

Keywords End-of-life care, Palliative care, Decision-making, Critically ill adult patients, Bangladesh

Introduction

End-of-life (EoL) care plays a pivotal role in healthcare, focusing on providing comfort, dignity, and support to individuals nearing the end of their lives. The practice of end-of-life care varies across regions, shaped by differences in healthcare systems, cultural attitudes, and available resources [1]. In high-income countries like the United States, the United Kingdom, and Australia, end-of-life care is well-integrated into the healthcare system. For instance, in the U.S., Medicare facilitates a robust hospice care system that prioritizes quality of life (QoL) for terminally ill patients, rather than pursuing curative treatments 2019[1]. However, challenges remain in end-of-life such as over-medicalization, socio-economic disparities, and a need for better integration of palliative care [2]. Cultural factors also influence end-of-life care, with many Western cultures favoring autonomy and informed decision-making through advance care planning and shared decision-making [3].

In contrast, low- and middle-income countries (LMICs) face challenges in providing end-of-life care, due to limited healthcare resources and a focus on acute care rather than palliative care [4]. In these regions, cultural taboos around death and the lack of advance care planning can impede effective end-of-life care [5]. In many Asian cultures, families may shield patients from their prognosis, believing it to be in their best interest, which further complicates end-of-life decision-making [6].

In Bangladesh, the elderly population is increasing, with over 1.53 crore individuals aged 60 and above, constituting approximately 9.28% of the national total [7]. This demographic shift places increasing pressure on the healthcare system, which primarily focuses on acute and curative care, with minimal infrastructure for palliative and end-of-life services [8]. There is a clear gap between the healthcare needs of older adults and the availability of appropriate services tailored to support end-of-life care.

The trend toward nuclear families, rapid urbanization, and shifting social norms have contributed to an increase in institutional living arrangements such as old-age homes. In these settings, aggressive medical interventions are often administered, sometimes at odds with patients' personal wishes for a peaceful and dignified death [9]. Family members in Bangladesh frequently act as the primary caregivers and decision-makers in end-of-life scenarios. However, their emotional preparedness to handle terminal illness decisions is limited, especially in the absence of systemic support and trained professionals in palliative care [10].

Despite the limited number of old-age homes and insufficient government provisions for senior citizens, some non-governmental organizations and private initiatives are attempting to incorporate palliative care into Bangladesh's healthcare system [11]. Still, patients' preferences regarding place of death- whether at home, hospital, or institution are often constrained by the lack of home-based care options, inadequate professional guidance, and restricted autonomy in medical decision-making [12]. These limitations result in dissatisfaction, disempowerment, and unmet needs at the end of life. This study aims to examine these complex socio-cultural, institutional, and ethical factors influencing end-of-life care decisions for critically ill elderly patients in Bangladesh, with a focus on understanding individual choices and systemic challenges. In this study, we distinguish palliative care (a broader approach to improve quality of life in serious illness) from end-of-life care (the final phase, typically the last year of life when death is imminent). While related, they are not interchangeable.

Methodology

Study design

This cross-sectional study, conducted from October 2024 to February 2025, assessed end-of-life (EoL) care preferences and decision-making in critically ill adults in Bangladesh. The study aimed to explore socio-cultural, economic, and institutional factors influencing EoL care practices, perceptions, and challenges experienced by patients, families, and healthcare providers.

Study area and population

The study was conducted across all eight administrative divisions of Bangladesh: Dhaka, Chittagong, Rajshahi, Khulna, Barishal, Rangpur, Sylhet, and Mymensingh. These divisions were selected to capture variations in socio-economic conditions, cultural practices, and healthcare infrastructure. Bangladesh currently has limited hospice facilities, with fewer than ten NGOs and hospitals offering formal palliative services, mostly concentrated in Dhaka [8, 11]. No government-funded hospice services exist. Data collection took place in community-level as households & old age homes, private hospitals and public hospitals. Community-level data were obtained from 24 subdistricts, with three subdistricts randomly selected from each division. Hospitals included four specialized private facilities in Dhaka, two private hospitals outside Dhaka, three public hospitals in Dhaka, and eight divisional public medical college hospitals. Four old-age homes in Dhaka, Gazipur, and Jamalpur were also included.

Sampling techniques

The study adopted a stratified sampling technique to ensure proportional representation from each administrative division based on the elderly population size. Within each division, elderly individuals were selected using random sampling from sub-district registries, hospital lists, and community databases. In addition, stratified sampling reduces variability within strata and leading to precise estimates of prevalence compared to simple random sampling. Sample size $n_0 = Z^2 \cdot p \cdot (1 - p)/e^2{}_{*D}$, Where n_0 is initial sample size, Z is the Z-score from normal table (Z = 1.96 for 95% level of significance), p is the population proportion (p is 0.093 from Population and Housing Census, 2022) [7], e is the margin of error (consider e = 2.5) and D is the design effect (consider D as 2).The required sample size for the study estimated, $n_0 = 1037$; however, this study collect data from 1270 (i) to ensure statistically robust estimates for each division, as 130 is the minimum requirement calculated using Cochran's formula for a single population proportion with a 0.093 prevalence, (ii) to reduce margin of error and improving precision for smaller populations, (iii) to balances the design effect and minimizing the potential clustering bias within each stratum. The division of required sample size and collected sample size is shown in the supplementary Table 1.

Inclusion and exclusion criteria

The inclusion criteria encompassed individuals aged 50 years or older with chronic illnesses, hospitalized patients aged 18 years or older with a life expectancy of less than one year due to severe disease progression, and cancer patients in advanced stages. For community-based sampling, respondents were selected from household surveys and residents of old-age homes, verified through local health authority records and caregiver interviews. Patients unwilling to provide informed consent, individuals unable to share required divisional or medical data, patients in emergency or unstable conditions unsuitable for interviews were excluded. All chronic illnesses and advanced disease stages were rigorously verified through physician notes, relevant diagnostic reports, medical certificates indicating disease severity or life expectancy, patient medical histories, and corroborating statements from patients, caregivers, or attending healthcare professionals.

Respondents and data collection tools

The respondents comprised patients who met the inclusion criteria. Providers refer to formal healthcare professionals- physicians, nurses, and allied health staff, rather than family caregivers. To obtain quantitative data, one structured questionnaires was developed based on internationally recognized instruments, including the National End of Life Survey (Ireland) [13], the Pallium Canada Palliative Medicine Survey [14], and the Australian Commission on Safety and Quality in Health Care's Clinician Surveys [15].As no standardized survey tool existed for national-level studies on end-of-life care in LMICs, these instruments were synthesized and modified to create a contextually appropriate and adaptable tool suitable for both this study and future research in LMIC settings. The final questionnaire was designed to capture patients' and families' socio-demographic characteristics, awareness of end-of-life care options, satisfaction with decision-making processes, and perceived financial and emotional burdens. Questionnaire added as supplementary file 1 for future such research in LMICs. The synthesis was conducted by a multidisciplinary team including palliative care specialists, public health researchers, and clinicians. Translation followed WHO-recommended procedures: forward translation into Bengali by two bilingual experts, reconciliation by panel review, and back-translation into English by an independent translator. Pilot testing with 25 patients across community and hospital settings ensured comprehensibility. Discrepancies were resolved by consensus. For clarity, in this study the following operational definitions were applied: 'Socio-economic awareness' refers to patient recognition of financial resources and systemic barriers influencing care; 'End-of-life documentation' denotes written or verbal advance care planning, including wills or directives; 'influence of cultural norms' captures perceived impact of traditional beliefs on medical decisions; 'Rituals at End-of-life' refers to religious or cultural practices patients wished to observe at the final stage of life; and 'discrimination' refers to patients' perception of differential treatment or reduced access to services, medication, or attention from staff due to their limited financial resources or inability to afford private care.

Data collection procedure and quality control

Data collection was conducted by healthcare professionals and trained field workers and from old-age homes, community areas, and hospitals. Field workers used Google Forms to record responses, streamlining the process and reducing costs. Responses were subsequently transferred to Google Sheets for organization and preliminary cleaning. Cross-verification involved three steps: (i) review of submitted Google Forms data by team leads; (ii) random re-contact of 10% respondents for data consistency; and (iii) weekly supervisor meetings to resolve inconsistencies. Given the sensitive nature, data collectors were trained in empathetic interviewing. They were public health graduates with prior experience in patient interviewing. Training in empathic interviewing was conducted by a multidisciplinary team comprising a palliative care specialist, a clinical psychologist, and three public health specialists. This training ensured competency in empathic communication and the ethical handling of sensitive topics. Participants could skip questions or withdraw at any time. Refusal rate was 2.7% (35 of 1305 approached), mainly due to emotional discomfort. Incomplete or inconsistent responses were excluded, resulting in a final dataset of 1,270 valid responses from 1305 initial responses representing 463 from community settings, 368 from private hospitals, and 439 from public hospitals. Interviews were conducted directly with patientsand on average, each interviews required 30–40 min to complete, depending on patient condition and willingness to elaborate. Family members were not permitted to act as proxies unless the patient suffered from severe cognitive impairment or speech disability, in which case proxy responses were carefully documented ($n = 27$, 2.1%). This approach ensured that the data predominantly reflected patients' own perspectives while accommodating unavoidable clinical limitations. Graphical presentation is given in Fig. 1 and details are given in supplementary Table 2.

Analysis

Collected data were analyzed using SPSS version 23.0. Descriptive statistics were used to summarize demographic characteristics and other quantitative variables. Stratified analyses were performed to highlight differences in end-of-life decision-making processes across divisions, healthcare settings, and population subgroups. A chi-square test of independence was conducted to examine the association between the categorical variables, using Pearson's Chi-Square and Likelihood Ratio tests to assess statistical significance.Additionally, regression analyses were conducted to identify predictors and assess the strength of associations between key independent variables and outcomes related to end-of-life care, controlling for potential confounders.

Results

Of 1,270 respondents, median age was 61 years (IQR 54–69), 55% male. Cancer (64% hospital; 25% community), stroke (27%), and hypertension (39%) were leading conditions. Table 1 summarizes baseline profiles showing significant demographic and health differences were observed across healthcare settings. Older adults (≥60 years) comprised the majority in community (73.2%) and public hospitals (62.6%), while private hospitals had a younger patient base (68.8% aged 40–59 years, $p < 0.01$). Gender distribution showed a male predominance in all settings, though women were more represented in public hospitals (46%, $p = 0.03$).

Education levels varied drastically; 53% of community patients had no formal education, compared to only 3.3% in private hospitals ($p < 0.01$). Higher education was most common in private hospitals (62.3%), while it remained low in public (9.6%) and community (0.8%) settings. Most private hospital patients were married (95%), whereas widowhood was more prevalent in the community (53%) ($p < 0.01$).

Cancer was the leading cause of admission in private (79%) and public hospitals (64%), while stroke and hypertension were more common in the community ($p < 0.01$). Community patients had higher rates of residence in hospices (48%), whereas most public (92%) and private (83%) hospital patients lived with family ($p < 0.01$).

Healthcare access was limited for community patients, with 49% rarely visiting healthcare facilities ($p < 0.01$). Insurance coverage was extremely limited (overall 6.9%; community 1.7%). This lack of coverage exacerbated financial hardship, shaping preferences for home care and avoidance of hospitalization.

Awareness and understanding of end of life (EoL) care

While 70% of private hospital patients understood the concept of palliative care, only 31% in public hospitals and 7.1% in the community shared this awareness ($p < 0.01$). Similarly, 77% of private hospital patients were aware of end-of-life care options, compared to just 28% in public hospitals and 5.6% in the community ($p < 0.01$). Healthcare providers played a key role in raising awareness, with 99% of private hospital patients and 88.5% of public hospital patients citing them as a source, whereas only 65.4% in the community relied on healthcare professionals ($p < 0.01$) (Table 2).

Visually, Fig. 2 displays the large disparities in palliative care/end-of-life awareness and the corresponding end-of-life documentation rates across care settings; awareness is markedly higher in private hospitals and lowest in community settings, which parallels higher documentation in private settings.

Despite the importance of end-of-life discussions, only 5% of community members had spoken about their preferences compared to 69% in private and 49% in public hospitals ($p < 0.01$). Most private hospital patients (95%) discussed end-of-life care with healthcare providers, while in public hospitals, discussions with family were more common (17.7%).

Awareness of advance care planning was significantly lower in community settings (2.8%) than in private (70%) and public (27%) settings ($p < 0.01$). Knowledge levels of end-of-life care varied significantly ($p < 0.01$), with 51% of

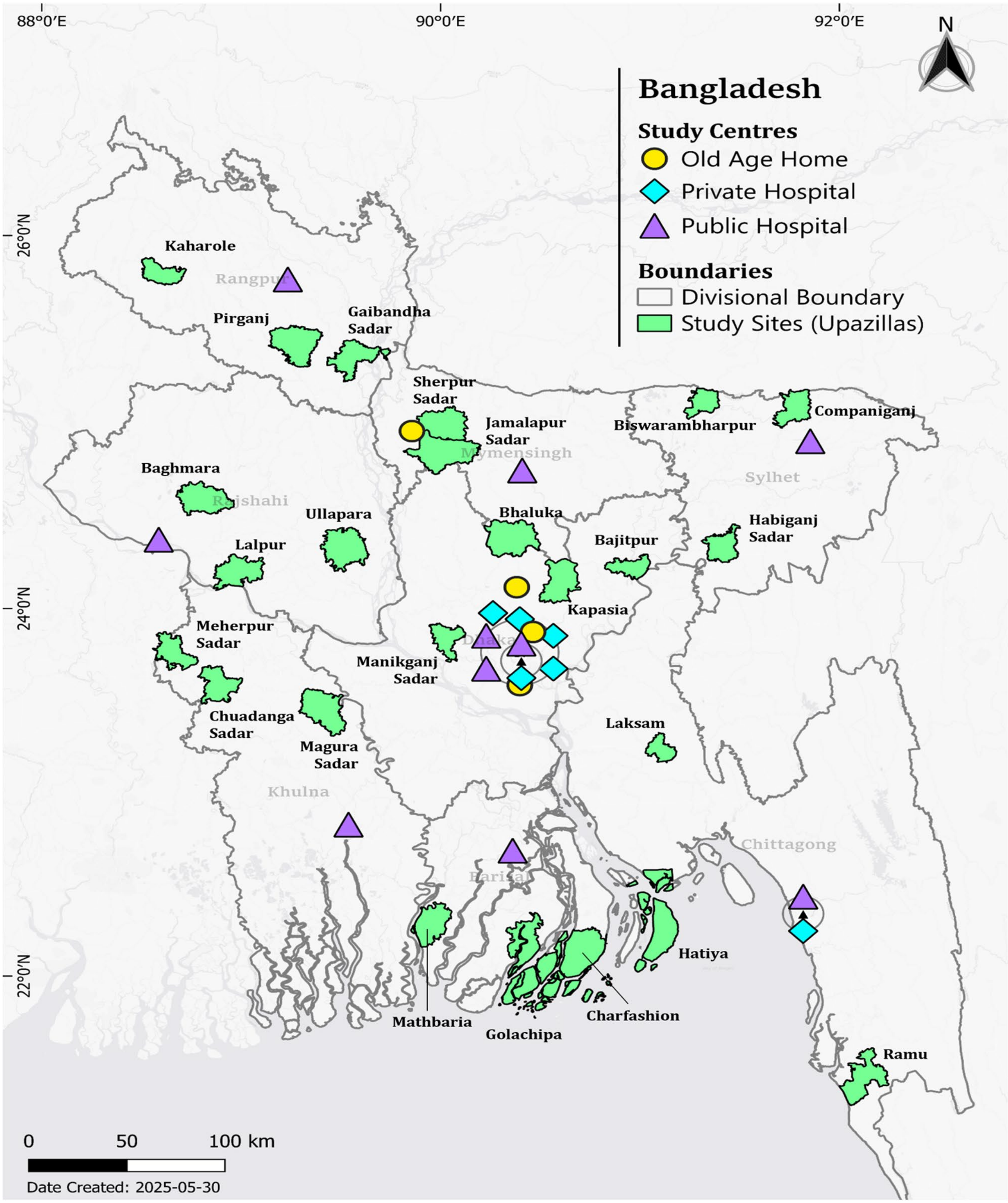


Fig. 1 Distribution of study area in Bangladesh map

Table 1 Profile and health background of respondents

Characteristics	Community ($n = 463$)	Private ($n = 368$)	Public ($n = 439$)	p value
Age of the Patient				
< 40 years	2 (0.4%)	2 (0.5%)	6 (1.4%)	< 0.01
40–59 years	122 (26.3%)	253 (68.8%)	158 (36%)	
> 60 years	339 (73.2%)	113 (30.7%)	275 (62.6%)	
Gender of the Patient				
Female	174 (38%)	151 (41%)	203 (46%)	0.03
Male	289 (62%)	217 (59%)	236 (54%)	
Education Level				
No formal education	244 (53%)	12 (3.3%)	62 (14%)	< 0.01
Primary	140 (30%)	18 (4.9%)	104 (24%)	
Secondary	52 (11%)	44 (12%)	149 (34%)	
Higher secondary	22 (4.8%)	66 (18%)	80 (18%)	
Graduation and above	4 (0.8%)	228 (62.3%)	42 (9.6%)	
Marital Status				
Married	179 (39%)	351 (95%)	337 (77%)	< 0.01
Widowed	244 (53%)	12 (3.3%)	99 (23%)	
Others	40 (8.6%)	5 (1.4%)	3 (0.7%)	
Cause of Admission (Multiple responses)				
Stroke	126 (27%)	15 (4.1%)	55 (13%)	< 0.01
CVD	79 (17%)	22 (6.0%)	103 (23%)	< 0.01
Cancer	115 (25%)	289 (79%)	280 (64%)	< 0.01
COPD	48 (10%)	8 (2.2%)	14 (3.2%)	< 0.01
Diabetes	113 (24%)	5 (1.4%)	54 (12%)	< 0.01
HTN	180 (39%)	22 (6.0%)	105 (24%)	< 0.01
Liver diseases	42 (9.1%)	8 (2.2%)	90 (21%)	< 0.01
kidney diseases	57 (12%)	25 (6.8%)	113 (26%)	< 0.01
Dementia/Any psychiatric disorder	71 (15%)	6 (1.6%)	80 (18%)	< 0.01
Other	2 (0.4%)	0 (0%)	4 (0.9%)	0.169
Living Situation				
Alone	80 (17%)	4 (1.1%)	25 (5.7%)	< 0.01
In hospice/Old age home	222 (48%)	4 (1.1%)	3 (0.7%)	
In hospital (more than 3months)	9 (1.9%)	53 (14%)	5 (1.1%)	
With family	152 (33%)	307 (83%)	406 (92%)	
How many children do you have?				
1	8 (1.7%)	12 (3.3%)	5 (1.2%)	< 0.01
2	100 (22%)	213 (58%)	253 (59%)	
3	145 (32%)	101 (28%)	115 (27%)	
4 or more	187 (41%)	38 (10%)	47 (11%)	
No children	20 (4.3%)	3 (0.8%)	8 (1.9%)	
What is your religious affiliation?				
Islam	437 (94%)	327 (89%)	316 (72%)	< 0.01
Hinduism	22 (4.8%)	29 (7.9%)	88 (20%)	
Christianity	4 (0.9%)	9 (2.4%)	28 (6.4%)	
Buddhism	0 (0%)	3 (0.8%)	7 (1.6%)	
How often do you participate in religious activities?				
Daily	137 (30%)	292 (80%)	185 (43%)	< 0.01
Weekly	150 (32%)	35 (9.6%)	176 (41%)	
Monthly	145 (31%)	30 (8.2%)	53 (12%)	
Rarely	29 (6.3%)	8 (2.2%)	13 (3.0%)	
Never	1 (0.2%)	1 (0.3%)	0 (0%)	
Do you have any health insurance?	8 (1.7%)	8 (2.2%)	72 (16%)	< 0.01
How often do you visit a healthcare facility?				

Table 1 (continued)

Characteristics	Community ($n = 463$)	Private ($n = 368$)	Public ($n = 439$)	p value
Daily	5 (1.1%)	16 (4.3%)	1 (0.2%)	< 0.01
Weekly	31 (6.7%)	167 (45%)	142 (32%)	
Monthly	173 (37%)	81 (22%)	238 (54%)	
Never	3 (0.6%)	1 (0.3%)	4 (0.9%)	
Rarely	229 (49%)	13 (3.5%)	41 (9.3%)	
Now admitted	22 (4.8%)	90 (24%)	13 (3.0%)	

community respondents rating their knowledge as very poor, compared to 8.2% in private hospitals and 27% in public hospitals. Awareness of living wills remained low across all settings but was slightly higher in public hospitals (11%) than in private (5.2%) or community settings (4.1%) ($p < 0.01$).

Preferences and wishes forend of life (EoL) care

Only 18.4% of community respondents had considered their end-of-life preferences, compared to 33% in private and 34% in public hospitals ($p = 0.247$). Documentation of end-of-life care wishes was significantly higher in private hospitals (26%) than in community (11%) and public (12%) settings ($p < 0.01$).

The majority of respondents preferred being informed about their medical condition at end-of-life, with private (86%) and public (80%) hospital patients expressing this preference more than those in community settings (45%) ($p < 0.01$). Similarly, a higher proportion of private (85%) and public (82%) hospital patients wished to be informed if their condition was terminal, compared to only 35% in the community ($p < 0.01$).

Preferences regarding end-of-life care settings differed significantly. While 88% of private hospital respondents preferred to stay at home as long as possible, only 65% of community respondents and 64% of public hospital patients shared this view ($p < 0.01$). The preference to avoid hospitalization at end-of-life was highest in private hospitals (84%), compared to 51% in community and 53% in public settings ($p < 0.01$). Primary end-of-life concerns varied by setting ($p < 0.01$). Pain management was the most significant concern in private hospitals (84%) and community settings (42%), while financial burden was a key concern in public hospitals (33%). Being with family at end-of-life was prioritized by 61% of public hospital respondents, while 89% of private hospital patients emphasized pain-free care ($p < 0.01$).

Preferred locations for end-of-life care also showed variation ($p < 0.01$). A majority (69%) of private hospital respondents preferred home care, whereas 73% of public hospital patients opted for hospital-based care. Preferences for receiving all possible treatments, even with uncertain benefits, were highest in private hospitals (65%), followed by public (45.8%) and community settings (8.4%) ($p < 0.01$).

Comfort care was favored over aggressive treatment in all settings, with the highest preference in community settings (96.5%), followed by private (93.2%) and public hospitals (84.7%) ($p < 0.01$). Spiritual care was considered unimportant by 38% of public hospital respondents, compared to 5.4% in private and 11% in community settings ($p < 0.01$). Rituals at end-of-life were more common in private hospitals (61%) than in community (19%) or public (24%) settings ($p < 0.01$).

Preferences for place of death also varied ($p < 0.01$). Home death was most preferred by private hospital respondents (75%), compared to 46% in public hospitals and 38% in community settings. Requests for CPR (37%) and mechanical ventilation (37%) were more common in public hospitals than in private (6.5% and 8.2%) and community settings (17% and 15%) ($p < 0.01$).

Organ donation discussions were more frequent in public (21%) and private (10%) hospitals than in community settings (5%) ($p < 0.01$). Support for euthanasia was highest in private hospitals (26%), followed by public (21%) and community (14%) settings ($p < 0.01$), which reflects emerging social attitudes in Bangladesh, similar to trends documented in some Muslim-majority countries undergoing social change. Similarly, physician-assisted suicide was supported more in private hospitals (26%) than in community (25%) and public (20%) settings, though the difference was not statistically significant ($p = 0.07$).

Stakeholders in end-of-life decisions

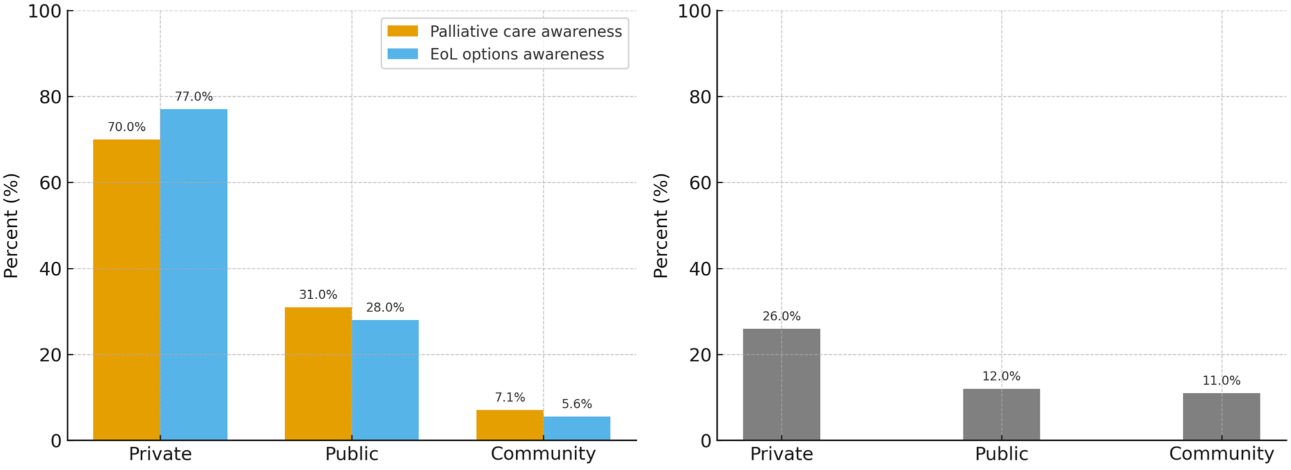
Healthcare providers were the most trusted decision-makers overall, with 73% of respondents in community settings, 50% in private facilities, and 53% in public hospitals preferring them. Conversely, family members played a more significant role in private settings (43.5%) compared to public (30.5%) and community-based care (22.5%) ($p < 0.01$). Legal representatives were least involved, particularly in public hospitals (0.7%). Notably, only a small proportion had appointed a healthcare proxy, with the lowest prevalence in public hospitals (4.3%) and slightly higher in private (8.5%) and community settings (7.8%) ($p < 0.01$) (Table 3).

Table 2 Awareness, preferences, and wishes for end-of-life (EOL) care of respondents

Characteristics	Community (*n* = 463)	Private (*n* = 368)	Public (*n* = 439)	*p* value
Awareness and Understanding of End of Life (EOL) Care				
Do you understand the concept of palliative care?	33 (7.1%)	257 (70%)	135 (31%)	< 0.01
Are you comfortable with the idea of hospice care?	183 (39.5%)	269 (73%)	117 (27%)	< 0.01
Are you aware of end-of-life (EOL) care options?	26 (5.6%)	285 (77%)	122 (28%)	< 0.01
If yes, what sources have informed your awareness?				
Family/Friends	7 (26.9%)	1 (0.35%)	8 (6.6%)	< 0.01
Healthcare providers	17 (65.4%)	282 (99%)	108 (88.5%)	
Other	2 (7.7%)	2 (0.7%)	6 (4.9%)	
Have you discussed end-of-life care preferences with anyone?	23 (5.0%)	253 (69%)	213 (49%)	< 0.01
If yes, with whom?				
Family	16 (69.6%)	8 (3.1%)	20 (17.7%)	< 0.01
Friends	1 (4.3%)	2 (0.8%)	3 (2.7%)	
Healthcare providers	6 (26.1%)	240 (95%)	77 (68.1%)	
Other	0 (0%)	3 (1.1%)	13 (11.5%)	
Are you aware of advance care planning?	13 (2.8%)	256 (70%)	117 (27%)	< 0.01
How would you rate your knowledge about end-of-life care?				
Very poor	234 (51%)	30 (8.2%)	117 (27%)	< 0.01
Poor	203 (44%)	137 (37%)	165 (38%)	
Average	24 (5.2%)	125 (34%)	57 (13%)	
Good	1 (0.2%)	74 (20%)	92 (21%)	
Very good	0 (0%)	2 (0.5%)	0 (0%)	
Have you ever heard of a living will?	19 (4.1%)	19 (5.2%)	50 (11%)	< 0.01
Preferences and Wishes for End of Life (EOL) Care				
Have you thought about your preferences for end-of-life care?	85 (18.4%)	121 (33%)	150 (34%)	0.247
Have you documented your end-of-life care wishes?	51 (11%)	96 (26%)	53 (12%)	< 0.01
Do you wish to be kept informed about your medical condition at the end of life?	207 (45%)	316 (86%)	353 (80%)	< 0.01
Would you want to know if your condition is terminal?	163 (35%)	313 (85%)	361 (82%)	< 0.01
Do you wish to remain at home as long as possible?	301 (65%)	325 (88%)	283 (64%)	< 0.01
Do you wish to avoid hospitalization at the end of life?	236 (51%)	308 (84%)	234 (53%)	< 0.01
What are your primary concerns regarding end-of-life care?				
Pain management	194 (42%)	308 (84%)	187 (43%)	< 0.01
Emotional support	195 (42%)	33 (9.0%)	86 (20%)	
Financial burden	66 (14%)	19 (5.2%)	147 (33%)	
Family burden	7 (1.5%)	8 (2.2%)	12 (2.7%)	
Other	1 (0.2%)	0 (0%)	7 (1.6%)	
What is your most important wish at the end of life?				
Being with family	115 (25%)	24 (6.5%)	268 (61%)	< 0.01
Pain-free	275 (59%)	329 (89%)	160 (36%)	
Religious/spiritual support	73 (16%)	14 (3.8%)	8 (1.8%)	
Other	0 (0%)	1 (0.3%)	3 (0.7%)	
Where would you prefer to receive care at End of Life				
Home	177 (38%)	254 (69%)	114 (26%)	< 0.01
Hospice/Old age home	241 (52%)	7 (1.9%)	6 (1.4%)	
Hospital	43 (9.3%)	104 (28%)	319 (73%)	
Other	2 (0.4%)	3 (0.8%)	0 (0%)	
Do you prefer to have all available treatments even if the benefits are uncertain?	39 (8.4%)	240 (65%)	201 (45.8%)	< 0.01
Would you prefer aggressive treatments or comfort care at the end of life?				
Aggressive treatments like Ventilation, CPR, NG Nutrition, Pain management and/or others	16 (3.5%)	25 (6.8%)	67 (15.3%)	< 0.01
Comfort care	447 (96.5%)	343 (93.2%)	372 (84.7%)	
How important is spiritual care at the end of life?				

Table 2 (continued)

Characteristics	Community (*n* = 463)	Private (*n* = 368)	Public (*n* = 439)	*p* value
Not important	51 (11%)	20 (5.4%)	165 (38%)	< 0.01
Somewhat important	275 (59%)	113 (31%)	234 (53%)	
Very important	137 (30%)	235 (64%)	40 (9.1%)	
Do you want specific rituals performed at the end of life?	86 (19%)	224 (61%)	106 (24%)	< 0.01
How important is it to have family around at the end of life?				
Not important	160 (35%)	10 (2.7%)	83 (19%)	< 0.01
Somewhat important	204 (44%)	42 (11%)	231 (53%)	
Very important	99 (21%)	316 (86%)	125 (28%)	
What is your preferred place of death?				
Home	178 (38%)	276 (75%)	200 (46%)	< 0.01
Hospice/Old Home	229 (49%)	3 (0.8%)	3 (0.7%)	
Hospital	56 (12%)	89 (24%)	236 (54%)	
Do you want to receive CPR if your heart stops?	80 (17%)	24 (6.5%)	164 (37%)	< 0.01
Are you open to receiving mechanical ventilation?	70 (15%)	30 (8.2%)	161 (37%)	< 0.01
Would you prefer to receive artificial nutrition and hydration?	95 (21%)	192 (52%)	169 (38%)	< 0.01
Have you discussed organ donation?	23 (5.0%)	37 (10%)	90 (21%)	< 0.01
Given your health condition, do you believe that euthanasia should be legal in this country?	63 (14%)	96 (26%)	90 (21%)	< 0.01
Given your health condition, do you believe that physician assisted suicide should be legal in this country?	116 (25%)	96 (26%)	87 (20%)	0.07



(A) Awareness of palliative and EoL care

(B) EoL documentation rates

Fig. 2 Awareness of palliative care and EoL options, and EoL documentation rates, by care setting

Family dynamics and support

While 86% of private hospital patients felt supported, this dropped to 68% in public hospitals and just 14% in community settings ($p < 0.01$). Family openness in discussing end-of-life care was also highest in private settings (81%) but was significantly lower in community (7.1%) and public settings (21%) ($p < 0.01$). Additionally, family conflict regarding end-of-life decisions was most prevalent in public hospitals (51%) compared to community (33%) and private facilities (5.2%) ($p < 0.01$). Feelings of isolation were reported by 59% in community settings, 43% in public hospitals, and only 7.3% in private facilities ($p < 0.01$).

Family involvement in day-to-day care also showed stark differences. While 42% of community respondents reported no family involvement, this figure was significantly lower in public hospitals (19%) and private facilities (3%) ($p < 0.01$). Preference for family participation in end-of-life care was highest in private (88%) and public hospitals (84%), compared to only 19% in community settings ($p < 0.01$).

Cultural and ethical considerations

Cultural beliefs heavily influenced end-of-life care preferences, particularly in private (82%) and public settings (72%), compared to 40% in community care ($p < 0.01$). The

Table 3 Stakeholders, support, and socio-cultural factors in end-of-life (EOL) care

Characteristics	**Community (m = 463)**	**Private (m = 368)**	**Public (*n* = 439)**	***p* value**
Stakeholders in End-of-life Decisions				
Who do you believe should be involved in EOL decisions?				
Family	104 (22.5%)	160 (43.5%)	134 (30.5%)	< 0.01
Healthcare providers	221 (47.7%)	153 (41.6%)	297 (67.7%)	
Legal representatives	134 (28.9%)	55 (14.9%)	3 (0.7%)	
Other	4 (0.9%)	0 (0%)	5 (1.1%)	
Have you appointed a healthcare proxy or power of attorney?	36 (7.8%)	31 (8.5%)	18 (4.3%)	< 0.01
Who do you trust the most to make healthcare decisions on your behalf?				
Parent	3 (0.6%)	9 (2.4%)	3 (0.7%)	< 0.01
Children	69 (15%)	96 (26%)	90 (21%)	
Spouse	49 (11%)	80 (22%)	113 (26%)	
Healthcare provider	340 (73%)	183 (50%)	232 (53%)	
Other	2 (0.4%)	0 (0%)	1 (0.2%)	
Family Dynamics and Support				
Do you feel your family is supportive of your EOL preferences?	62 (14%)	313 (86%)	293 (68%)	< 0.01
Are family members willing to discuss EOL care openly?	33 (7.1%)	299 (81%)	94 (21%)	< 0.01
Is there any family conflict regarding EOL decisions?	154 (33%)	19 (5.2%)	224 (51%)	< 0.01
Do you feel isolated from your family?	271 (59%)	27 (7.3%)	188 (43%)	< 0.01
How involved are family members in your day-to-day care?				
Not at all	195 (42%)	11 (3.0%)	80 (19%)	< 0.01
Somewhat	239 (52%)	258 (70%)	266 (63%)	
Very involved	28 (6.1%)	99 (27%)	74 (18%)	
Would you prefer family involvement in EOL care decisions?	88 (19%)	322 (88%)	359 (84%)	< 0.01
How involved would you like family to be in your care decisions?				
Fully involved	40 (8.7%)	225 (62%)	64 (15%)	< 0.01
Minimally/somewhat involved	281 (61%)	135 (37.5%)	348 (83%)	
Not involved	141 (31%)	5 (1.4%)	10 (2.4%)	
How often do family members visit or care for you?				
Always	10 (2.2%)	9 (2.5%)	44 (10%)	< 0.01
Often	59 (13%)	190 (52%)	90 (21%)	
Sometimes	125 (27%)	152 (42%)	189 (44%)	
Rarely	114 (25%)	13 (3.6%)	95 (22%)	
Never	154 (33%)	2 (0.5%)	7 (1.6%)	
Cultural and Ethical Considerations				
Do cultural beliefs influence your EOL care preferences?	183 (40%)	303 (82%)	317 (72%)	< 0.01
Is openly discussing death appropriate in your culture?	162 (35%)	54 (15%)	165 (38%)	< 0.01
Are there cultural rituals or practices important to you at the end of life?	210 (45%)	299 (81%)	220 (50%)	< 0.01
Do you feel societal pressure regarding your EOL decisions?	191 (41%)	107 (29%)	321 (77%)	< 0.01
Do you feel discussing EOL care goes against cultural norms?	88 (19%)	31 (8.4%)	150 (34%)	< 0.01
Does your religion specify certain EOL practices?	195 (42%)	201 (55%)	308 (70%)	< 0.01
How does your religion influence your EOL care preferences?				
Significantly	73 (16%)	187 (51%)	144 (33%)	< 0.01
Moderately	315 (68%)	161 (44%)	233 (53%)	
Slightly	63 (14%)	17 (4.6%)	49 (11%)	
Not at all	12 (2.6%)	3 (0.8%)	13 (3.0%)	
Are you open to discussing EOL preferences with a spiritual advisor?	232 (50%)	298 (81%)	92 (21%)	< 0.01
Do cultural norms influence family involvement in your care?	99 (21%)	228 (62%)	279 (64%)	< 0.01
Would you consider non-traditional therapies in EOL care?	202 (44%)	56 (15%)	33 (8.0%)	< 0.01

Table 3 (continued)

Characteristics	Community (m = 463)	Private (m = 368)	Public (*n* = 439)	*p* value
Socio-Economic and Financial Factors				
Do you feel that your socio-economic status influences your end-of-life care options?	330 (71%)	350 (95%)	368 (84%)	< 0.01
Do you believe you have sufficient financial resources to cover end-of-life care needs?	56 (12%)	299 (81%)	55 (13%)	< 0.01
Are financial concerns a major factor in your end-of-life decision-making process?	333 (72%)	276 (75%)	358 (82%)	< 0.01
Have financial constraints affected your choice of end-of-life care?	245 (53%)	220 (60%)	81 (18%)	< 0.01
Have you ever delayed seeking end-of-life care due to financial challenges?	288 (62%)	261 (71%)	330 (75%)	< 0.01
Are family members contributing financially to your end-of-life care?	267 (57.7%)	316 (86%)	270 (61.5%)	< 0.01
Do you have access to financial support, including community or government assistance, for end-of-life care?	159 (34%)	30 (8.2%)	173 (39%)	< 0.01
Have you considered fundraising or charity support to manage end-of-life care expenses?	35 (7.6%)	22 (6.0%)	22 (5.1%)	0.278
Do you have health insurance that covers end-of-life care?	30 (6.5%)	22 (6.0%)	37 (8.4%)	0.340
Are you currently receiving any government assistance for your healthcare needs?	34 (7.3%)	14 (3.8%)	14 (3.2%)	0.008
Have you experienced any discrimination in healthcare settings due to your economic status?	293 (63.3%)	223 (60.6%)	304 (69%)	0.029
Healthcare Provider Training, Support, and Involvement				
Do healthcare providers openly discuss end-of-life care options with you?	81 (17.5%)	339 (92%)	184 (42%)	< 0.01
Do you feel healthcare providers respect your cultural beliefs in EOL care decisions?	349 (75%)	345 (94%)	343 (78%)	< 0.01
Are healthcare providers sensitive to your emotional needs during EOL discussions?	337 (73%)	346 (94%)	359 (82%)	< 0.01
How often do healthcare providers communicate EOL care options with patients?				
Always	21 (4.5%)	3 (0.8%)	3 (0.7%)	< 0.01
Often	80 (17%)	97 (26%)	43 (9.8%)	
Sometimes	148 (32%)	255 (69%)	195 (44.4%)	
Rarely	208 (45%)	9 (2.4%)	190 (43.3%)	
Never	6 (1.3%)	4 (1.1%)	8 (1.8%)	
How confident are you in healthcare providers' ability to manage EOL care?				
Very confident	93 (20%)	22 (6.0%)	20 (4.6%)	< 0.01
Confident	196 (42%)	323 (88%)	143 (33%)	
Neutral	170 (37%)	14 (3.8%)	30 (6.8%)	
Not confident	4 (0.9%)	9 (2.4%)	246 (56%)	
Do healthcare providers clearly explain EOL care procedures and options?	94 (20.3%)	341 (93%)	125 (28%)	< 0.01
Are your personal wishes documented and respected by healthcare providers?	104 (22.5%)	332 (90%)	121 (28%)	< 0.01
Do you believe healthcare providers are adequately trained in EOL care?	81 (17.5%)	185 (50.2%)	93 (21%)	< 0.01
Would you like to see more palliative care specialists involved in EOL services?	340 (73%)	280 (76.1%)	368 (84%)	< 0.01
Are there challenges you've faced in receiving adequate support from healthcare staff for EOL care?	333 (72%)	222 (60%)	328 (75%)	< 0.01

appropriateness of explicitly discussing 'death' (the act of dying itself) varied, with only 15% of private patients considering it acceptable, compared to 35% in community and 38% in public settings. In contrast, when asked about discussing 'End-of-life care' (treatment and care choices in the final stage of life), most respondents participated in the discussion, indicating that while patients may accept conversations on care planning, direct talk about death remains culturally sensitive. Societal pressure regarding end-of-life choices was most commonly reported in public settings (77%) compared to community (41%) and private care (29%) ($p < 0.01$). Religious influence was substantial, with 55% in private hospitals and 70% in public hospitals acknowledging religious guidance in end-of-life decisions, compared to 42% in community care ($p < 0.01$). Additionally, 81% of private hospital patients were open to discussing end-of-life preferences with a spiritual advisor, compared to 50% in community and 21% in public settings ($p < 0.01$).

Socio-economic and financial factors

Socio-economic status significantly influenced end-of-life care access, with 95% in private settings, 84% in public hospitals, and 71% in community settings acknowledging its impact ($p < 0.01$). Financial concerns were a major factor in decision-making for 72% in community settings, 75% in private hospitals, and 82% in public hospitals ($p < 0.01$). However, access to financial support varied, with 39% in public hospitals receiving assistance, compared to 34% in community and only 8.2% in private facilities ($p < 0.01$). Notably, 63.3% of community patients reported experiencing discrimination due to economic status, compared to 60.6% in private settings and 69% in public hospitals ($p = 0.029$).

Healthcare provider training, support, and involvement

Communication about end-of-life options was most frequent in private hospitals, with 92% of respondents reporting discussions, compared to 42% in public settings and just 17.5% in community care ($p < 0.01$). Respect for cultural beliefs in end-of-life care was highest in private settings (94%) and slightly lower in public (78%) and community settings (75%) ($p < 0.01$). Emotional support from providers was also highest in private hospitals (94%), followed by public (82%) and community settings (73%) ($p < 0.01$).

Confidence in healthcare providers' ability to manage end-of-life care was strikingly different across settings. Only 6% in private hospitals and 4.6% in public hospitals were very confident, compared to 20% in community settings. However, 88% in private settings reported being confident overall, compared to 42% in community settings and just 33% in public hospitals ($p < 0.01$).

In Table 4, patients aged over 60 years were significantly more likely to prefer home as their place of care (OR = 2.96, $p = 0.004$) and place of death (OR = 10.29, $p < 0.001$), and to avoid hospitalization (OR = 17.55, $p < 0.001$). However, those aged 40–59 years were less likely to desire all treatment options (OR = 0.44, $p = 0.006$) and more likely to have documented end-of-life wishes (OR = 2.94, $p = 0.019$). Lower education levels were consistently associated with reduced preferences for home-based care and death (e.g., primary education OR = 0.24 and OR = 0.30 respectively, both $p < 0.001$), while graduates had a higher likelihood of avoiding hospitalization

Table 4 Multiple logistic regression analysis of predictors influencing End-of-Life care preferences and Documentation

Predictor		Preference for Place of Care (OR, 95% CI, *p*)	Preference for Place of Death (OR, 95% CI, *p*)	Avoid Hospitalization (OR, 95% CI, *p*)	Willingness for All Treatment (OR, 95% CI, *p*)	Documentation of EOL Wishes (OR, 95% CI, *p*)
Age of the Patient	< 40 years	1.59 (0.88–2.85), $p = 0.124$	5.38 (3.02–9.58), $p < 0.001$	14.30 (7.51–27.23), $p < 0.001$	0.52 (0.29–0.91), $p = 0.022$	2.04 (0.84–4.94), $p = 0.116$
	40–59 years	1.61 (0.89–2.93), $p = 0.116$	6.74 (3.65–12.43), $p < 0.001$	21.56 (10.90–42.63), $p < 0.001$	0.44 (0.24–0.79), $p = 0.006$	2.94 (1.19–7.22), $p = 0.019$
	> 60 years	2.96 (1.42–6.17), $p = 0.004$	10.29 (4.98–21.25), $p < 0.001$	17.55 (7.88–39.05), $p < 0.001$	1.27 (0.64–2.54), $p = 0.493$	0.54 (0.15–1.94), $p = 0.345$
Education Level	No or Primary Education	0.24 (0.16–0.37) $p < 0.001$	0.30 (0.20–0.46) $p < 0.001$	2.07 (1.39–3.10) $p < 0.001$	0.41 (0.27–0.63) $p = 0.000$	1.21 (0.60–2.46) $p = 0.587$
	Secondary Education	0.16 (0.10–0.26) $p < 0.001$	0.23 (0.15–0.37) $p < 0.001$	1.78 (1.17–2.69) $p = 0.006$	1.60 (1.07–2.40) $p = 0.022$	0.51 (0.24–1.09) $p = 0.081$
	Higher Secondary Education	0.16 (0.089–0.30) $p < 0.001$	0.99 (0.54–1.83) $p = 0.981$	1.75 (0.98–3.11) $p = 0.057$	1.90 (1.10–3.28) $p = 0.021$	0.55 (0.23–1.32) $p = 0.183$
	Graduation and above	0.19 (0.10–0.37) $p < 0.001$	0.30 (0.15–0.59) $p = 0.001$	4.08 (2.07–7.10) $p < 0.001$	0.92 (0.50–1.70) $p = 0.782$	0.19(0.08–0.48) $p < 0.001$
Marital Status	Married	2.29 (0.67–7.85) $p = 0.189$	2.34 (0.63–8.63) $p = 0.202$	1.30 (0.33–5.11) $p = 0.711$	2.35 (0.60–9.28) $p = 0.223$	0.20 (0.05–0.78) $p = 0.021$
	Divorced and others	0.31 (0.09–1.12) $p = 0.074$	0.33 (0.09–1.24) $p = 0.100$	0.83 (0.21–3.37) $p = 0.798$	1.45 (0.36–5.93) $p = 0.602$	0.22 (0.05–0.93) $p = 0.039$
Understanding of Palliative Care		7.38 (3.04–17.88), $p < 0.001$	2.89 (1.27–6.60), $p = 0.012$	0.28 (0.123–0.63), $p = 0.002$	1.49 (0.73–3.04), $p = 0.272$	0.92 (0.39–2.17), $p = 0.849$
Comfort with Hospice Care		1.58 (1.04–2.41), $p = 0.034$	3.46 (2.27–5.26), $p < 0.001$	9.63(6.23–14.87), $p < 0.001$	2.17 (1.49–3.17), $p < 0.001$	25.26 (12.96–49.22), $p < 0.001$
Awareness of EOL Options		13.98 (6.64–29.44), $p < 0.001$	2.57 (1.26–5.23), $p = 0.009$	0.87 (0.42–1.80), $p = 0.711$	3.68 (1.92–7.04), $p < 0.001$	2.69 (1.28–5.67), $p = 0.009$
Awareness of Advance Planning		1.21 (0.51–2.87), $p = 0.661$	1.09 (0.46–2.58), $p = 0.847$	2.96 (1.19–7.37), $p = 0.019$	1.85 (0.85–4.04), $p = 0.122$	0.83 (0.34–2.07), $p = 0.696$
Self-Rated Knowledge		0.01 (0.01–0.03), $p < 0.001$	0.01 (0.00–0.01), $p < 0.001$	0.14 (0.07–0.29), $p < 0.001$	0.05 (0.03–0.105), $p < 0.001$	100.489 (43.006–234.802), $p < 0.001$
Discussed EOL Preferences		0.07 (0.04–0.15), $p < 0.001$	1.06 (0.58–1.93), $p = 0.848$	4.29 (2.07–8.94), $p < 0.001$	1.46 (0.85–2.49), $p = 0.166$	0.36 (0.17–0.76), $p = 0.007$

(OR = 4.08, $p < 0.001$) but were less likely to have end-of-life documentation (OR = 0.19, $p < 0.001$).

Marital status was associated with documentation patterns; married individuals were less likely to have documented their end-of-life wishes (OR = 0.20, $p = 0.021$), with similar associations for divorced/other statuses (OR = 0.22, $p = 0.039$). Among knowledge and perception-related factors, greater understanding of palliative care was significantly associated with preference for home care (OR = 7.38, $p < 0.001$), place of death (OR = 2.89, $p = 0.012$), and reduced hospitalization (OR = 0.28, $p = 0.002$). Comfort with hospice care significantly predicted all five outcomes, including avoidance of hospitalization (OR = 9.63, $p < 0.001$), willingness for all treatments (OR = 2.17, $p < 0.001$), and end-of-life documentation (OR = 25.26, $p < 0.001$). Awareness of end-of-life options and self-rated knowledge had strong associations with nearly all outcomes, notably with extremely high odds for end-of-life documentation (OR = 2.69 and OR = 100.49 respectively, both $p < 0.01$). Discussion of end-of-life preferences with family or providers was significantly associated with lower preference for home care (OR = 0.07, $p < 0.001$), increased avoidance of hospitalization (OR = 4.29, $p < 0.001$), and more likelihood of end-of-life documentation (OR = 0.36, $p = 0.007$).

Table 5 Multiple logistic regression of factors associated with End-of-Life care preferences among patients

Predictor	Preference for Place of EOL Care (OR, 95% CI, p)	Preference for Treatment Type (OR, 95% CI, p)	Preference for Informed Decision (OR, 95% CI, p)
Age of the Patient			
< 40 years	1.02 (0.47–2.25), $p = 0.957$	7.03 (2.83–17.49), $p = 0.000$	1.71 (0.48–6.05), $p = 0.408$
40–59 years	1.98 (1.00–3.93), $p = 0.051$	8.30 (3.76–18.32), $p < 0.001$	0.67 (0.31–1.49), $p = 0.327$
> 60 years	1.58 (0.83–3.00), $p = 0.166$	29.74 (13.00–68.03), $p < 0.001$	0.76 (0.36–1.60), $p = 0.471$
Education Level			
No or Primary Education	2.46 (1.19–5.09), $p = 0.016$	7.51 (2.56–22.01), $p < 0.001$	0.09 (0.04–0.24), $p < 0.001$
Secondary Education	0.62 (0.32–1.19), $p = 0.146$	1.98 (0.84–4.65), $p = 0.116$	0.32 (0.13–0.83), $p = 0.019$
Higher Secondary Education	0.36 (0.19–0.68), $p = 0.002$	0.61 (0.24–1.53), $p = 0.288$	0.23 (0.09–0.60), $p = 0.003$
Graduation and above	0.86 (0.45–1.63), $p = 0.644$	0.88 (0.35–2.21), $p = 0.791$	0.54 (0.20–1.46), $p = 0.224$
Marital Status			
Married	1.29 (0.28–6.03), $p = 0.745$	2.32 (0.37–14.53), $p = 0.368$	1.64 (0.31–8.61), $p = 0.562$
Divorced and others	1.69 (0.90–3.16), $p = 0.103$	2.10 (0.99–4.46), $p = 0.053$	0.72 (0.37–1.40), $p = 0.332$
Current Residence			
Alone or Old Age Home	0.08 (0.04–0.18), $p < 0.001$	9.56 (2.59–35.24), $p < 0.001$	0.48 (0.21–1.07), $p = 0.073$
In Hospice	0.01 (0.00–0.02), $p < 0.001$	32.47 (12.44–84.76), $p < 0.001$	0.51 (0.24–1.07), $p = 0.076$
In Hospital	4.08 (1.97–8.47), $p < 0.001$	0.53 (0.24–1.17), $p = 0.115$	0.16 (0.07–0.34), $p < 0.001$
Socio-Economic for EOL	36.02 (15.52–83.58), $p < 0.001$	3.52 (1.03–11.97), $p = 0.044$	0.14 (0.06–0.32), $p < 0.001$
Family Conflict with EOL	2.70 (1.61–4.54), $p < 0.001$	15.49 (8.34–28.78), $p < 0.001$	0.11 (0.06–0.23), $p < 0.001$
Financial Concerns in EOL	0.09 (0.04–0.18), $p < 0.001$	10.94 (3.51–34.12), $p < 0.001$	0.98 (0.44–2.19), $p = 0.967$
Cultural Beliefs EOL	0.63 (0.37–1.07), $p = 0.088$	0.11 (0.05–0.24), $p < 0.001$	0.21 (0.12–0.36), $p < 0.001$
Religion Influences EOL	2.98 (2.00–4.45), $p < 0.001$	2.43 (1.43–4.14), $p = 0.001$	1.25 (0.79–1.99), $p = 0.340$
Healthcare Facility Visits	6.10 (3.51–10.60), $p < 0.001$	1.53 (0.77–3.06), $p = 0.228$	0.18 (0.10–0.31), $p < 0.001$
Confidence in Healthcare Providers for EOL	0.16 (0.10–0.26), $p < 0.001$	1.12 (0.56–2.22), $p = 0.753$	1.78 (1.03–3.08), $p = 0.037$

In Table 5, patients aged over 60 years showed significantly higher odds of preferring aggressive treatment types during end-of-life (EOL) care compared to those under 40 years (OR = 29.74; $p < 0.001$). Educational attainment revealed a positive association with informed decision-making preferences; patients with no or primary education were significantly less likely to prefer being informed about their end-of-life care compared to those with higher education. Similarly, individuals residing in hospitals were more likely to prefer hospital-based end-of-life care (OR = 4.08; $p < 0.001$), while those living in old age homes or hospices were less likely to do so (OR = 0.08 and OR = 0.01 respectively, both $p < 0.001$).

Socio-economic awareness was significantly associated with preference for place of care (OR = 36.02, $p < 0.001$), treatment type (OR = 3.52, $p = 0.044$), and inversely related to informed decision-making (OR = 0.14, $p < 0.001$). Family conflict during end-of-life significantly increased preferences for both institutional care and aggressive treatment while decreasing interest in being informed. Religious influences and regular healthcare facility visits showed associations with higher likelihood of preferring institutional end-of-life care, while financial concerns, cultural beliefs, and lack of confidence in healthcare providers were associated with reduced preferences for home-based care and informed decisions. Confidence in healthcare providers, notably, was positively associated with the preference for informed decision-making (OR = 1.78; $p = 0.037$).

Patients who had discussed their end-of-life care preferences with others were over four times more likely to appoint a proxy (AOR = 4.11; 95% CI: 2.39–7.06; $p < 0.001$), indicating a possible role of open communication in proxy appointment. However, given the small absolute numbers appointing a proxy, these associations should be interpreted with caution and may reflect statistical instability rather than firm causal patterns (Table 6).

Table 6 Significant predictors associated with proxy appointment for End-of-Life care decisions

Predictor	Proxy Appointment Exp(B) (95% CI), *p*
Trust in Healthcare Decision Maker	0.39 (0.25–0.59), $p < 0.001$
Discussed EOL Care Preferences	4.11 (2.39–7.06), $p < 0.001$
Preference for Family Involvement in EOL Decisions	0.85 (0.55–1.30), $p = 0.452$
Cultural Norms Influence Family Involvement	0.93 (0.60–1.42), $p = 0.721$

Preference for family involvement in decisions (OR = 0.85, $p = 0.452$) and influence of cultural norms (OR = 0.93, $p = 0.721$) were not statistically significant. This implies that cultural or familial expectations alone may not be strong enough drivers for designating a proxy unless paired with personal discussions or concerns about healthcare autonomy.

Discussion

Our study contributes novel insights from a low-income South Asian context, emphasizing how socio-cultural dynamics, system-level gaps, and resource limitations shape end-of-life choices. It affirms the need for locally tailored approaches to address both institutional barriers and family-driven decision-making in Bangladesh. Significant disparities in access to and awareness of palliative care services highlight the broader challenges faced by low- and middle-income countries (LMICs). While high-income countries (HICs) have established frameworks for end-of-life care, including hospice and palliative care services, Bangladesh remains in the early stages of integrating these essential services into its healthcare system [16]. The lack of structured end-of-life care, limited public awareness, and cultural and financial constraints underscore the urgent need for policy reforms and healthcare system improvements to address these gaps [17].

Globally, end-of-life care is recognized as a vital component of comprehensive healthcare, ensuring patients receive compassionate and dignified support in their final stages of life [18]. In HICs, palliative care is systematically integrated into national healthcare systems, providing equitable access to home-based, hospice, and hospital-based services through multidisciplinary approaches that emphasize patient autonomy and advance care planning [18]. However, in LMICs such as India, Nepal, Pakistan, and Bangladesh, end-of-life care remains underdeveloped due to the prioritization of curative treatments over palliative support, leading to fragmented services and inadequate pain management [19]. The absence of national palliative care policies in LMICs further exacerbates these challenges, particularly in public healthcare settings where resource constraints hinder institutional support [20]. We stratified analyses by care setting (community, public, private) because prior literature demonstrates that place of care strongly influences end-of-life preferences through differential access, provider communication, and resource availability [17, 22]. This study aligns with these global trends, revealing the increasing demand for palliative care in Bangladesh and the systemic barriers limiting its accessibility and quality.

This study also highlights significant variations in end-of-life care awareness across different healthcare settings in Bangladesh. Patients in private hospitals exhibited higher levels of awareness and understanding of end-of-life care compared to those in public hospitals and community settings. This discrepancy mirrors findings from other LMICs, where access to private healthcare facilities is associated with better patient education and informed decision-making [21]. However, the high cost of private healthcare services limits accessibility for the majority of the population, exacerbating inequities in end-of-life care [22]. Our findings further indicate that private hospital patients were generally younger, more educated, and likely from higher socio-economic strata. These baseline differences plausibly influenced higher awareness, stronger family involvement, and greater preference for being informed, compared to community participants, many of whom faced educational and financial disadvantages that constrained choice of place of death and openness to disclosure. The ‘so what’ of our findings is that disparities in awareness and access are not only descriptive but highlight missed opportunities for patient-centered planning. The ‘now what’ is the urgent need for targeted awareness campaigns, integration of palliative care into primary healthcare, and the development of a national framework to support advance care planning in Bangladesh.

In contrast, public hospital patients, despite frequent interactions with healthcare providers, reported lower awareness levels, suggesting deficiencies in patient education and communication regarding end-of-life options [23]. Our study demonstrated that awareness of end-of-life care was significantly associated with patients’ education levels, type of healthcare facility accessed, and urban residence, indicating persistent socioeconomic and geographic disparities. Patients attending private hospitals and those with higher education were more likely to be aware of end-of-life care services, consistent with previous literature indicating that healthcare access and literacy play crucial roles in health decision-making. These findings highlight the need for structured awareness programs to bridge the knowledge gap and enhance patient engagement in end-of-life decision-making.

The study’s findings on patient preferences for end-of-life care underscore the importance of patient-centered approaches. While most private hospital patients preferred to remain at home during their final stages, public hospital patients and community members expressed lower preferences for home-based palliative care. This trend reflects a lack of infrastructure and home-based palliative care services in Bangladesh, limiting patients' ability to choose their preferred setting for end-of-life care [24]. In our study, the predictors of patient preferences for end-of-life care at home, showing that prior awareness, familial support, and religious values were significant determinants. These findings reinforce earlier observations on the centrality of family and cultural contexts in shaping care preferences. This study also highlights that decision-making authority was predominantly family-centered, with limited patient autonomy. This underscores the influence of collective family decisions in Bangladesh's cultural context, aligning with regional trends in South Asia. These provide empirical strength to qualitative observations and affirm the pressing need for legal and educational interventions to promote patient-centered decision-making. Additionally, the strong influence of family members in decision-making, rather than the patients themselves, reveals cultural nuances that must be considered when designing interventions to improve end-of-life care [25]. Similar patterns have been observed in South Asian countries, where familial involvement is deeply ingrained in medical decision-making, often overshadowing patient autonomy [26].

Our study shows that informal channels (e.g., family, friends, and community) are the primary sources of information rather than formal education or physician-led counseling. This finding points to a critical gap in professional health communication and underscores the necessity of structured public health campaigns to disseminate accurate end-of-life information [27]. Integrating such education into routine clinical practice could enhance awareness and better prepare patients and families for timely decisions. Financial constraints present a major barrier to accessing quality end-of-life care, particularly for patients in public hospitals and community settings. In LMICs such as Bangladesh, the absence of financial support mechanisms, such as insurance or government-subsidized palliative care programs, forces families to bear substantial out-of-pocket expenditure, often leading to delayed or inadequate care and unnecessary suffering [28]. Unlike HICs, where government-funded hospice programs and insurance coverage for terminal illnesses alleviate financial burdens and enable care decisions based on medical needs rather than economic constraints [29], LMICs struggle with fragmented healthcare systems that leave many patients without adequate palliative support [30]. Addressing these disparities requires targeted policy reforms, government investments in palliative care infrastructure, and the introduction of subsidized programs and insurance schemes to support economically disadvantaged populations [31].

Another critical aspect revealed by this study is the limited role of advance care planning and healthcare proxies in Bangladesh. Despite global advocacy for advance directives and legal frameworks supporting patient autonomy in end-of-life decision-making, our findings suggest that these concepts are largely absent in the local healthcare system [32]. The reluctance to engage in advance care planning may stem from cultural beliefs that discussing death is taboo, as well as from the lack of formal legal mechanisms to support such decisions [33]. Promoting awareness and implementing legal provisions for advance directives can empower patients to make informed choices about their care, reducing the likelihood of unnecessary medical interventions at the end of life [30].

The role of healthcare providers in facilitating end-of-life decision-making was found to be crucial yet inconsistent. Physicians and nurses in private hospitals demonstrated greater involvement in discussing end-of-life options with patients and families compared to their counterparts in public hospitals. This discrepancy may be attributed to time constraints, lack of training, and resource limitations in public healthcare facilities [23]. Similar challenges have been reported in other LMICs, where inadequate palliative care training for healthcare professionals hinders effective communication and shared decision-making [34]. Integrating palliative care training into medical and nursing curricula, as well as providing continuing education programs for healthcare providers, can enhance their capacity to deliver compassionate end-of-life care [35].

Religious and cultural beliefs significantly influence end-of-life decision-making in Bangladesh. Unlike Western healthcare systems, where patient autonomy and advance care planning are central to end-of-life decision-making, familial authority often dictates medical choices in Bangladesh [32, 33]. This collective decision-making approach, prevalent in South Asian and Middle Eastern societies, frequently results in patient preferences being overlooked [25]. In countries where euthanasia and physician-assisted suicide are legal, such as the Netherlands, Canada, and Belgium, individuals have the right to make informed choices about their death, emphasizing personal autonomy [36–38]. However, in Bangladesh and most LMICs, as well as in Middle Eastern and Muslim-majority countries such as Pakistan, Egypt, Saudi Arabia, and Indonesia, such practices are prohibited, reflecting strong religious, cultural, and legal constraints against euthanasia and physician-assisted suicide [39–41]. These findings highlight the need for nuanced policy discussions on patient rights and ethical considerations in end-of-life care [42].

Limitations

Despite the valuable insights provided by this study, certain limitations must be acknowledged. The cross-sectional design limits the ability to establish causal relationships between factors influencing end-of-life decision-making. Additionally, self-reported data may be subject to recall bias and social desirability bias, particularly in discussions surrounding death and medical decision-making. Furthermore, the awareness and knowledge levels reported in this study were self-perceived and not validated through objective assessments, which may not fully reflect the respondents' actual understanding or competencies in end-of-life care.

The tools used for data collection, though adapted from internationally validated instruments and reviewed by experts, have not been psychometrically validated for the Bangladeshi population. We justify describing this as an initial step toward local contextualization because the tool underwent forward and back-translation, expert panel reconciliation, pilot testing in both community and hospital settings, and multidisciplinary review for cultural appropriateness. While these steps fall short of full validation, they provide a practical foundation for future psychometric testing in Bangladesh and similar contexts.

The study was also constrained by the lack of follow-up data to assess the long-term impact of end-of-life care interventions. The sample size was calculated based on population proportion rather than on the expected prevalence of key outcome variables, which may limit the statistical power for specific analyses.

Conclusion

This nationwide study offers critical insights into the multifaceted choices and challenges encountered by older adults navigating end-of-life care in Bangladesh. While a substantial proportion of respondents expressed a clear preference for home-based care, comfort-focused treatment, and the opportunity to be informed about their terminal condition, these choices were often associated with structural limitations, inadequate awareness, cultural sensitivities, and economic hardship. Notably, awareness and documentation of advance care planning were alarmingly low, particularly in community settings, where only a fraction of respondents had considered or documented their end-of-life care preferences.

Our findings further highlight that a deeper understanding of palliative and hospice care was strongly associated with the likelihood of documenting preferences, underscoring the pivotal role of knowledge and provider communication. Despite the strong cultural emphasis on family involvement, few respondents had formally appointed a healthcare proxy, revealing gaps in both legal frameworks and public discourse surrounding patient autonomy. Thus, beyond documenting disparities, this study points to actionable priorities: (i) capacity-building for providers to initiate culturally sensitive discussions, (ii) legal reforms to recognize advance directives, and (iii) community-based palliative models that expand home-based care options.

The challenges identified- limited access to home-based palliative care, uneven provider training, financial insecurity, and low public awareness pose formidable barriers to dignified and patient-centered end-of-life care. These must be addressed through integrated policy measures, including national strategies for palliative care, legal recognition of advance directives, professional capacity-building, and targeted public education campaigns.

To better uphold the principle of informed choice at the end of life, healthcare systems should consider transitioning from reactive, curative models to proactive, compassionate, and culturally sensitive approaches. By empowering patients and families with knowledge, resources, and legal protections, Bangladesh can move toward a more equitable and humane model of end-of-life care- one that not only honors personal dignity but also strengthens collective responsibility.

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

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Authors' contributions

M.M.H.S. conceptualized the study, curated the data, conducted the investigation, performed formal analysis, developed the methodology and visualization, wrote the original draft, and contributed to review and editing. I.J.D., P.R., and M.A.S. contributed to data curation and manuscript review and editing. T.R.A. and D.M. performed formal analysis and contributed to manuscript review and editing. M.K.H. contributed to methodology development, formal analysis, and manuscript review and editing. S.K. contributed to methodology, supervision, original draft writing, and review and editing. S.K. contributed to supervision, and manuscript review and editing. H.T.A.K. contributed to conceptualization, methodology, supervision, and manuscript review and editing. All authors reviewed and approved the final manuscript.

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Data availability

The data supporting the conclusions of this article are included within the article.

Declarations

Ethical approval and consent to participate

The study received ethical approval from the Research Ethics Committee of the Faculty of Health and Life Sciences, Daffodil International University, Dhaka, Bangladesh (Approval Reference: FHLSREC/DIU/2024/SMIG-71). Compliance with ethical standards, including participant safety, data confidentiality, and adherence to international guidelines was ensured. Participants were provided with a detailed information sheet in Bengali and English, outlining the study's purpose, procedures, risks, and benefits. Written informed consent was obtained from each participant prior to data collection. Participants were assured of confidentiality and anonymity and informed of their right to withdraw from the study at any time without repercussions. The study adhered to the ethical principles of the Declaration of Helsinki and ensured no coercion or exploitation of vulnerable groups.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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