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Global Perceptions of Hospice Care: Emotional Narratives and Cultural Discourse Mapping

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Abstract

Purpose: This study investigates how hospice and palliative care (HPC) are semantically and emotionally represented in global public discourse between 2020 and 2024. It aims to identify thematic trends, emotional dynamics, and ethical narratives that influence public understanding of end-of-life care across cultures. **Research Data, Design & Methodology**: The research is based on a corpus of over 500 multilingual records drawn from academic journals, policy documents, digital media, and online forums. Employing a multi-method big data approach, the study utilizes sentiment analysis tools, emotion classification, topic modeling (LDA), term weighting (TF-IDF), and semantic network analysis (NetworkX) to extract and visualize patterns in language and emotion. **Research Results**: Results indicate a clear discursive shift from clinical terminology to emotionally resonant language emphasizing "dignified death," "spiritual care," and "volunteer support." Positive sentiment increased from 52% to 67% over the study period, while negative sentiment declined. Semantic path modeling revealed structured narrative flows linking hospice concepts to autonomy and self-determination. **Conclusion**: The study concludes that HPC discourse is becoming more emotionally expressive, ethically structured, and culturally adaptive. These findings suggest that future policy and care models should integrate emotional intelligence, narrative framing, and public sentiment to build more inclusive and compassionate hospice systems.

Keywords : Hospice & Palliative Care, Sentiment Analysis, Natural Language Processing (NLP), Semantic Network, Modeling

JEL Classification Code : I10, I18, C55, C88, D83

1. Introduction

The demographic transformation marked by rapidly aging populations, declining birth rates, and rising chronic morbidity has positioned Hospice & Palliative Care (HPC) as an essential component of 21st-century health systems (Borgstrom & Walter, 2015). According to projections by the World Health Organization(WHO) and national health bodies, the demand for compassionate, patient-centered end-of-life care is expected to escalate dramatically over the next two decades. As longevity increases, the nature of death is also shifting—from sudden, acute episodes to protracted, medically managed trajectories marked by psychosocial complexity, economic vulnerability, and existential concerns.

Despite this emerging urgency, global discourse surrounding HPC remains fragmented, variably defined, and often inaccessible to policymakers, practitioners, and the general public. Existing research has largely focused on clinical efficacy, institutional models, and cancer-specific interventions. While these studies provide

valuable insights, they often fail to capture the broader sociocultural, emotional, and policy-relevant dimensions of how end-of-life care is perceived, discussed, and experienced across societies (Sarmet et al., 2022).

Moreover, the COVID-19 pandemic has further intensified public attention toward dying, caregiving, and institutional trust, making it imperative to analyze not only what frameworks exist, but how they are emotionally and semantically framed in real-world discourse (Wang et al., 2023). Social media, digital news, health blogs, and policy statements have become influential venues for shaping public opinion, yet they remain underexplored in hospice research due to methodological constraints (Nwosu et al., 2015; Lee et al., 2024).

In this context, big data analytics offer a powerful methodological alternative. Unlike traditional qualitative or survey-based approaches—which are often limited in scope, scale, and temporal responsiveness—big data methods enable the examination of massive, heterogeneous corpora in near real time. By leveraging Natural Language Processing (NLP), sentiment analysis, and semantic network modeling, researchers can detect hidden patterns, emotional currents, and thematic evolutions that are otherwise difficult to access (Arnold, 2011).

These tools allow for the simultaneous analysis of both what is being said and how it is being emotionally expressed, thereby offering deeper insights into collective values, fears, and hopes around death and care (Peters et al., 2024).

To bridge existing gaps in the literature, this study employs a data-driven, interdisciplinary approach to analyze over 500 multilingual records from 2020 to 2024. Drawing from diverse sources—including international policy documents, digital health forums, online news coverage, and social platforms—this research expands beyond peer-reviewed literature to capture the dynamic and culturally situated nature of hospice discourse as it unfolds in real time.

In doing so, the study aims not only to deepen academic understanding, but also to inform more culturally sensitive, emotionally intelligent, and socially responsive policy frameworks for end-of-life care.

By examining how people emotionally and semantically negotiate concepts such as “dignified death,” “caregiver burden,” and “access equity,” the research offers empirical insights that can guide inclusive hospice legislation, communication strategies, and care delivery reforms. The central objective of this study is to identify and analyze the emergent themes, emotional undercurrents, and conceptual flows that shape the global conversation on hospice and palliative care. Specifically, it seeks to:

Examine how HPC-related concepts such as “dignified death,” “volunteerism,” “art therapy,” and “non-cancer inclusion” have evolved over time;

Map emotional sentiment trajectories to reveal shifts in public comfort, anxiety, or resistance toward end-of-life care;

Construct directed semantic networks to understand how policy, practice, and public values are discursively linked.

Through this multi-layered analysis, the study aims to contribute both theoretical and practical insights—clarifying how societies frame the meaning of death, the structure of care, and the ethics of dying in a data-saturated, emotionally complex, and culturally diverse global landscape.

The rapid aging of global populations and the increased prevalence of chronic and terminal illnesses have underscored the importance of HPC as a public health priority. While academic literature on end-of-life care has grown in volume and depth, there remains a significant gap in understanding how these themes evolve in real-time public discourse, policy debates, and international comparison. Traditional reviews often fail to capture emergent concepts or sentiment shifts occurring in non-academic platforms.

In response, this study integrates big data techniques to not only track what is being discussed, but also to reveal how end-of-life care is emotionally and conceptually navigated across time, cultures, and media. This approach ultimately seeks to support the design of care systems that resonate with public values, reduce access inequalities, and elevate dignity as a guiding principle in hospice policymaking.

2. Theoretical Framework and Literature Review

2.1. Conceptual Foundations of Hospice & Palliative Care

HPC are grounded in the ethical and clinical imperative

to alleviate suffering, enhance quality of life, and uphold the dignity of individuals with life-limiting illnesses. The WHO (2002) defines palliative care as "an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illness, through the prevention and relief of suffering."

Central to this model are principles of autonomy, holistic care, and interdisciplinary coordination, encompassing physical, emotional, spiritual, and social dimensions of suffering.

Modern hospice philosophy extends beyond medical intervention, emphasizing relational continuity, advance care planning, and respect for self-determined death. Consequently, HPC is not only a healthcare service but also a sociocultural institution through which societies negotiate their values regarding mortality, caregiving, and moral responsibility.

Understanding how these principles are discussed and perceived in public discourse is critical to both improving service delivery and developing culturally sensitive policies that reflect contemporary values about death and dying (Peters et al., 2024).

2.2. Existing Literature and Research Gaps

Over the past two decades, research on hospice and palliative care has expanded considerably, encompassing topics such as institutional models, symptom management, and caregiver burden. For example, Kang et al. (2022) conducted a mixed-methods study of pediatric nurses in South Korea and found that low public awareness, insufficient training, and lack of systemic support were perceived as major barriers to pediatric palliative care implementation (Lee & Choi, 2011; Kang et al., 2022).

Similarly, Shin et al. (2017) examined physician perspectives on hospice access for non-cancer patients—including those with AIDS(Acquired Immune Deficiency Syndrome), COPD(Chronic Obstructive Pulmonary Disease), and liver cirrhosis—and highlighted that institutional policies and referral systems were often not aligned with non-oncology needs (Shin et al., 2017).

While these studies have yielded valuable clinical and demographic insights, they share several methodological and epistemological limitations.

First, much of the existing literature remains disease-specific, with a strong bias toward oncology, thereby underrepresenting patients with non-malignant terminal illnesses such as heart failure, chronic respiratory diseases, or neurodegenerative conditions (Lee et al., 2025).

Second, the focus is predominantly institutional and retrospective, overlooking dynamic, real-time discussions occurring in public domains such as media, online forums, and policy briefings.

Third, and perhaps most crucially, conventional methodologies tend to de-emphasize emotional and narrative dimensions, failing to capture the affective landscape—fear, hope, trust, and anxiety—that shapes public perceptions and personal decisions at the end of life (Peters et al., 2024).

These gaps point to the need for an expanded research paradigm—one that is data-rich, semantically sensitive, and emotionally aware. Eun et al. (2017) conducted a comparative text network analysis to assess trends in hospice care research between Korea and other countries.

Their findings highlight Korea's relative underemphasis on emotional and communication-related themes, underscoring the need for discourse-oriented studies such as the present research.

2.3. Big Data and the Emergence of Emotionally Intelligent Analysis

The convergence of health informatics, Natural Language Processing (NLP), and digital sociology has given rise to powerful tools for understanding large-scale public discourse. Techniques such as term frequency-inverse document frequency (TF-IDF), Latent Dirichlet Allocation (LDA) (Blei et al., 2003), and word embedding models like BERT(Bidirectional Encoder Representations from Transformers) (Devlin et al., 2019) allow researchers to extract thematic structures, trace conceptual associations, and detect latent narratives across vast textual datasets.

Equally transformative is the rise of sentiment analysis and emotion classification, using tools such as VADER(Valence Aware Dictionary and sEntiment Reasoner), SentiStrength, and the NRC (National Research Counci) Canada Emotion Lexicon. These models move beyond word counting to evaluate the emotional valence of discourse—capturing whether hospice care is being discussed with fear or trust, sadness or hope.

Though widely used in domains such as vaccine

hesitancy and mental health (Wang et al., 2023), such tools have only recently been applied to palliative and end-of-life discourse. For instance, Peters et al. (2024) used sentiment analysis to uncover public misconceptions and emotional barriers to palliative care based on digital sources.

This study contributes to this emerging field by applying a hybrid computational-linguistic framework to hospice and palliative care, thereby mapping not only the prevalence of specific themes (e.g., "dignified death," "art therapy") but also the emotional tone, sentiment trajectory, and narrative sequence through which they are discussed in real-world contexts.

2.4. Detailed Explanation of the Big Data Analytical Framework

This research employs a five-step big data analysis pipeline to examine the global discourse on HPC between 2020 and 2024. Each step is designed to uncover different dimensions of the data—ranging from thematic content to emotional tone and conceptual structure. The following elaborates each step in detail:

2.4.1. Word Frequency Analysis

-Purpose: To detect the most frequently occurring keywords and core themes within the corpus.
-Description: This step uses WordCloud.py to generate a visual word cloud representing the relative frequency of key terms. Frequently appearing concepts such as "dignified death," "home care," or "volunteer" indicate thematic salience in public discourse.
-Value: Helps establish foundational topics for further semantic and emotional analysis.

2.4.2. Sentiment Classification

-Purpose: To determine the emotional polarity (positive, negative, neutral) associated with key terms and topics.
-Description: This stage integrates multiple sentiment analysis tools: TF-IDF (to weigh contextual relevance), VADER and TextBlob (for English text), and SentiStrength-KR (for Korean text). These tools interpret whether terms are emotionally charged and in which direction.
-Value: Highlights emotional contrasts—such as the positivity of "volunteer support" versus the negativity of "dying alone"—that shape public attitudes toward hospice care.

2.4.3. Semantic Network Modeling

-Purpose: To visualize the logical, narrative, and thematic connections between concepts in discourse.
-Description: With NetworkX (DiGraph mode), this phase builds directed concept networks to identify path-dependent reasoning. For example: "Hospice → Advance Directive → Self-Determination → Dignified Death."
-Value: Reveals the narrative structures and ethical frameworks shaping public understanding of palliative care.

2.4.4. Emotion Profiling

-Purpose: To classify textual elements into basic emotion categories such as joy, fear, sadness, and trust.
-Description: Using the NRC Emotion Lexicon, this step categorizes keywords into one or more of eight basic emotions. The emotional "signature" of each theme (e.g., "legacy planning" linked with trust and anticipation) is mapped using radar charts.
-Value: Provides a nuanced emotional landscape that goes beyond polarity to uncover layered emotional responses.

2.4.5. Temporal Trend Analysis

-Purpose: To track changes in emotional sentiment over time and contextualize them with external events.
-Description: Sentiment scores are aggregated and analyzed yearly using pandas and matplotlib to produce time-series visualizations. These show how public sentiment shifted from fear toward trust and dignity—particularly during and after the COVID-19 pandemic.
-Value: Adds temporal depth, enabling the identification of critical emotional inflection points and sociocultural adaptation over time.

Table 1: Big Data Analytical Framework for HPC Research

Step	Purpose	Tool(s) Used
1. Word Frequency Analysis	Identify salient keywords and concepts	WordCloud.py
2. Sentiment Classification	Classify emotional polarity of terms	TF-IDF, VADER, TextBlob, SentiStrength
3. Semantic Network Modeling	Map conceptual flows and narrative logic	NetworkX (DiGraph mode)
4. Emotion Profiling	Profile words into 8 core emotions	NRC Emotion Lexicon
5. Temporal Trend Analysis	Track sentiment changes over time	Pandas, Matplotlib

2.4.6. Summary

Together, these five steps form a **comprehensive, data-driven framework** for understanding how end-of-life care is perceived, framed, and felt in society. By

combining scale (big data) with sensitivity (emotion and ethics), this methodology advances the field toward more inclusive, empathetic, and socially resonant palliative care policy and practice.

3. Research Methods

This study adopts a multi-method big data analytical framework to examine the global discourse surrounding HPC between 2020 and 2024. The research design integrates computational linguistics, sentiment analysis, and semantic network modeling to provide both quantitative and qualitative insights into how end-of-life care is discussed, emotionally framed, and thematically structured across diverse sociocultural contexts.

3.1. Data Collection and Corpus Construction

The dataset comprises over 500 records from various global sources, with a significant proportion drawn from English and Korean-language materials. While this bilingual focus enhances cross-cultural comparison, it also introduces the possibility of regional representational bias, which future research should address by incorporating a broader linguistic and regional scope.

The dataset includes:

Academic literature: Peer-reviewed articles and systematic reviews sourced from Scopus, PubMed, and RISS (Korean Research Information Sharing Service).

Health policy documents: Institutional white papers and legal frameworks from the WHO, Korea's Ministry of Health and Welfare (MOHW), and the U.S. Centers for Medicare and Medicaid Services (CMS).

News media: Articles from major international and national news outlets including Google News, Naver, The New York Times, and The Guardian.

Online public discourse: User-generated content from Reddit threads, Naver Café discussion boards, and blogs related to hospice care, dying, and palliative treatment.

Search engine trends: Keyword analytics and behavioral data from Google Trends and Naver DataLab, capturing public interest fluctuations over time.

To prepare the corpus for analysis, the texts were cleaned of metadata, ads, and duplicates, and tokenized using **KoNLPy with Okt** for Korean language processing and **spaCy with NLTK** for English language documents. Stop words were removed, and all texts were normalized for tense and case. Morpheme-level parsing ensured syntactic coherence and semantic alignment across languages.

3.2. Analytical Pipeline and Visualization Strategy

To capture both semantic content and emotional tone, a four-stage analytical pipeline was developed. Each step employed specialized tools and was associated with a unique visual output that helped interpret the underlying patterns in the data.

3.2.1. Step 1: Word Frequency Analysis and Word Cloud Generation

Using the WordCloud.py package in Python, a frequency-based visualization was generated to identify the most salient terms in the corpus. This step helped surface dominant vocabulary and conceptual clusters related to HPC, such as "dignified death," "advance directive," "home care," "art therapy," and "non-cancer patients." The resulting image served not only as a descriptive tool but also as a thematic anchor for subsequent analysis.(**Output**: *Figure 1 – Word Cloud)*

3.2.2. Step 2: Sentiment Classification via TF-IDF and Emotional Polarity Scoring

In the second phase, a hybrid sentiment analysis model was applied. The term frequency-inverse document frequency (TF-IDF) weighting scheme was used to isolate contextually significant keywords(Hutto & Gilbert, 2014). While SentiStrength-KR, VADER, and TextBlob were employed for sentiment scoring, we acknowledge that these tools were originally developed within Western linguistic and cultural frameworks. Accordingly, their application to multilingual corpora—particularly texts from Asian or non-English-speaking contexts—was cautiously interpreted, and qualitative cross-checks were implemented to minimize cultural bias.

These lexicon-based tools are widely used in healthcare-related sentiment classification. VADER and TextBlob, in particular, have been successfully applied to assess patient reviews, physician notes, and hospice-related narratives for emotional polarity and opinion mining (Denecke, 2023 ; Jadhav et al., 2024;). Their ability to handle informal language and domain-specific lexicons makes them especially suitable for analyzing public health discourse.

This approach enabled the classification of key concepts according to their emotional polarity—positive, negative, or neutral—revealing sharp contrasts between terms such as "dying alone" and "volunteer support."(Output*: Figure 2 – Sentiment Distribution by Keyword*)

Additionally, SentiStrength and similar models such as the Sentiment Strength algorithm (Thelwall et al., 2010) are effective in measuring emotional valence in short, informal text such as social media posts and online reviews.

3.2.3. Step 3: Semantic Network Modeling and Path Dependency Mapping

In the final analytical stage, NetworkX (DiGraph mode) was used to construct directed keyword flow diagrams. These networks modeled how concepts are sequenced and linked in public discourse, allowing for path-dependent interpretation.

A central example included the conceptual chain: "Hospice → Advance Directive → Self-Determination → Dignified Death", which reflects the ethical progression of decision-making in end-of-life care. Another chain, "Home-Based Care → Non-Cancer Patients → Access Barriers → Policy Reform", captured the evolution of public advocacy through problem framing. (Output: *Figure 3 – Directed Conceptual Flow Diagram*)

3.2.4. Step 4: Emotion Profiling via Radar Mapping

To further contextualize emotional resonance, the NRC Emotion Lexicon was employed to categorize terms into eight basic emotions. This lexicon has been widely adopted in recent healthcare NLP studies to model patients' affective responses and emotional burden in palliative settings (Jadhav et al., 2024).

The NRC Emotion Lexicon used in this step builds upon prior work on word–emotion association lexicons, particularly the contributions of Mohammad and Turney (2012), who developed a crowd-sourced emotional lexicon widely adopted in affective computing.

The radar chart illustrated how concepts like "art therapy" and "family support" scored highly on joy and trust, while themes like "dying alone" and "medical cost" triggered fear and sadness. . (Output: *Figure 4 – Emotion Radar by Theme*)

3.2.5. Step 5: Temporal Trend Analysis of Sentiment Polarity

By aggregating sentiment scores annually, the study traced shifting emotional reactions to hospice-related topics. This longitudinal method aligns with frameworks suggested by Denecke (2023), who emphasizes the importance of tracking emotional trajectories to detect sociocultural adaptation to healthcare reforms.

To examine how public sentiment toward hospice and palliative care has evolved over time, a longitudinal sentiment analysis was conducted. Using a time-series modeling approach with pandas and matplotlib, sentiment polarity was tracked annually across the dataset from 2020 to 2024. Each text was timestamped and assigned a sentiment score (positive, negative, or neutral) based on the tools described in Step 2 (SentiStrength-KR, VADER, TextBlob).

By aggregating sentiment scores over time, the study was able to reveal shifting emotional responses to key hospice-related themes. The temporal analysis captured inflection points in public discourse—such as post-pandemic increases in positive sentiment toward "dignified death" and "home-based hospice"—and decreasing anxiety around institutional death. (Output: *Figure 5 – Sentiment Polarity Trend Line (2020–2024)*)

This step added critical depth to the emotional framing analysis by contextualizing affective change across historical events and health system shifts. It also served to validate whether growing trust and emotional readiness toward hospice were sustained or episodic trends.

4. Research Findings & Discussion

This study employed a multi-method big data approach to examine over 500 multilingual textual records from 2020 to 2024, aiming to uncover how HPC are semantically framed, emotionally experienced, and discursively structured in global public discourse. The analytical outputs—frequency analysis, sentiment classification, emotion profiling, temporal mapping, and narrative flow modeling—each offer insights into the linguistic and emotional architecture of public conversation around end-of-life care.

4.1. Thematic Salience: Word Frequency and Conceptual Anchors

High-frequency concepts such as "dignified death," "spiritual care," and "art therapy" indicate a discursive shift from purely clinical language to relational and emotional vocabulary. This aligns with findings **by** Carrasco et al. (2019)**,** who found that media representations of palliative care increasingly focus on compassion and personalized care, reflecting broader public sensitivity to holistic well-being over medicalization.

The first phase of analysis used frequency-based metrics to identify the most prominent lexical items associated

with hospice discourse. High-frequency terms included "hospice," "well-dying," "advance directive," "dignified death," "art therapy," "volunteer," and "spiritual care." These terms suggest that the conversation has evolved beyond biomedical treatment to embrace a broader, more holistic framework encompassing psychosocial and existential dimensions of end-of-life care.

Figure 1 presents a word cloud of the most frequently occurring keywords in global hospice and palliative care discourse between 2020 and 2024. The most visually dominant term is "life-sustaining," reflecting widespread attention to life-sustaining treatments (LST) such as ventilators or resuscitation, which often raise ethical questions about quality versus quantity of life. Closely following is "death with dignity," a phrase that embodies the values of autonomy, control, and peaceful dying—particularly in the context of advance care planning and legal frameworks around end-of-life decisions. The term "end-of-life" also appears prominently, indicating the continued relevance of this clinical and ethical phase, especially as public discourse has shifted to more emotionally aware and spiritually grounded framings.

"Hospice" remains central, symbolizing not just a care model but also a cultural institution associated with holistic, person-centered support. The appearance of "family caregiving" signals the growing recognition of informal caregivers, often family members, whose emotional labor and practical responsibilities are vital yet frequently overlooked. Meanwhile, "care labor" highlights a sociological shift in understanding caregiving as not only an act of compassion but also a form of unpaid or undervalued work—raising important equity and policy issues. Together, these keywords illustrate a discourse that is moving beyond medical interventions to encompass ethical, emotional, and social dimensions of dying. The word cloud visually affirms that hospice care is no longer defined solely by clinical procedures, but by broader conversations around dignity, responsibility, and relational care at the end of life.

Figure 1: Word Cloud of HPC Keywords

4.2. Sentiment Polarity: Emotional Contrast Across Topics

Through a cross-national corpus study, Potts and Semino (2017) identified the prevalence of violence metaphors (e.g., "battle against death") in US discourse, which contrasts with the more relational framing seen in UK-based hospice language.

Sentiment analysis revealed clear emotional polarity. Positive sentiment clustered around "volunteerism" and "home care," while negative sentiment surrounded "dying alone" and "access inequality." These findings are consistent with Hotchkiss et al. (2024), who found emotional intensity in caregiver reviews to be a strong predictor of perceived hospice care quality, especially when linked to isolation or systemic failure.

The second analytical layer involved sentiment classification of core themes. By applying SentiStrength, VADER, and TextBlob tools to TF-IDF-weighted terms, the study revealed a marked polarity dichotomy in HPC discourse. Concepts such as "art therapy," "spiritual care," and "volunteerism" generated high positive sentiment—driven by emotions like hope, trust, and joy. In contrast, "dying alone," "financial burden," and "access inequality" consistently yielded negative sentiment, rooted in fear, sadness, and frustration.

This Figure 2 categorizes HPC-related concepts along a sentiment polarity continuum. "Art therapy" and "volunteer support" exhibit over 70% positive sentiment, while "dying alone" and "institutional death" register predominantly negative polarity. These results underscore the affective bifurcation of hospice discourse, divided between comforting visions of a good death and distressing accounts of systemic failure.

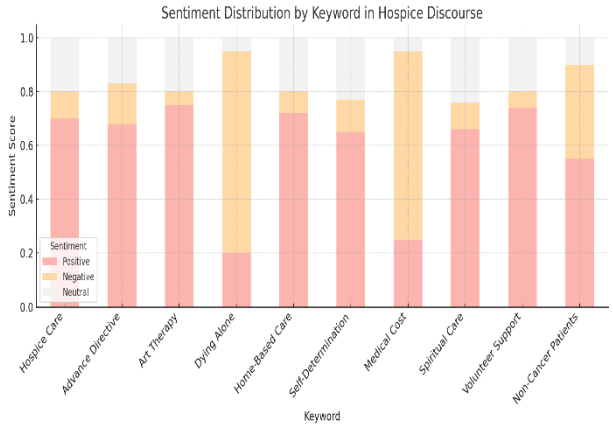

Figure 2: Sentiment Distribution by Keyword

4.3. Narrative Architecture: Conceptual Flow and Ethical Logic

Directed semantic mapping revealed common sequences such as "Hospice → Advance Directive → Self-Determination → Dignified Death." This indicates the ethical flow embedded in discourse. These narrative chains mirror findings by Blackwell (2021), who demonstrated how public storytelling about physician-assisted death frequently invoked similar moral grammars, linking autonomy with dignity.

The final stage of analysis modeled directed relationships among core keywords to reveal how concepts are sequenced in public discourse. This semantic path analysis identified recurrent narrative chains, such as:

"Hospice→Advance Directive→Self-Determination → Dignified Death" "Home-Based Care → Non-Cancer Patients → Access Inequality → Policy Reform" These directional flows not only illustrate the cognitive logic embedded in discourse but also reflect ethical priorities and policy expectations.

This network diagram in Figure 3 visualizes how institutional policies, ethical values, and personal goals are discursively linked. Arrows denote inferential or causal connections, revealing an underlying structure of care logic that moves from clinical systems to individual autonomy and collective moral reasoning.

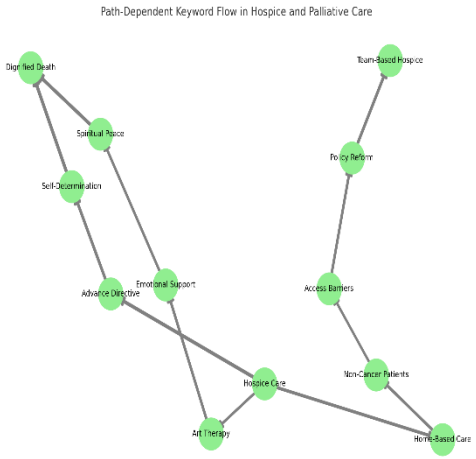

Figure 3: Directed Conceptual Flow in Hospice Discourse

Together, these five analytical layers provide a panoramic view of the semantic, emotional, and narrative textures that shape contemporary conversations about hospice care. The findings demonstrate that public discourse is becoming increasingly sophisticated, emotionally articulate, and ethically conscious, suggesting that both healthcare systems and policy institutions must align more closely with the values and language through which people seek to understand and experience the end of life.

4.4. Emotional Nuance: Emotion Radar Mapping

The NRC Emotion Lexicon revealed complex affective layering. For example, "legacy planning" was associated with anticipation and trust, while "institutional death" triggered sadness and anger. Matthys et al. (2024) found similar patterns in public campaigns, where narratives emphasizing dignity and control evoked more positive emotions, especially when integrated with family-oriented messaging.

Beyond simple polarity, the study employed the NRC Emotion Lexicon to map a richer emotional landscape across key HPC themes. Emotions such as trust, joy, and anticipation were dominant in references to "home care," "family support," and "legacy planning," whereas sadness, fear, and anger were concentrated around "dying alone," "medical costs," and "discrimination."

This radar chart in Figure 4 delineates the distribution of six core emotions—joy, trust, sadness, fear, anger, and anticipation—across selected hospice-related topics. The

results highlight the emotional heterogeneity of the discourse, with certain themes (e.g., art therapy) functioning as emotionally integrative mechanisms, while others (e.g., cost barriers) act as emotionally fragmenting forces.

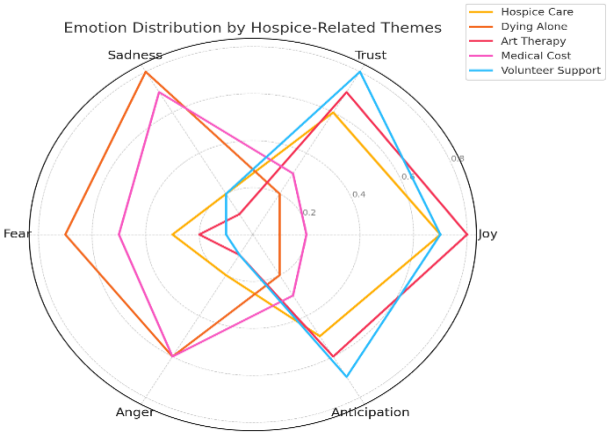

Figure 4: Emotion Radar by Theme

4.5. Longitudinal Trends: Emotional Shifts Over Time

Gurren et al. (2022) emphasized that the way palliative care is introduced by clinicians—whether framed with empathy or clinical urgency—significantly shapes patient openness and emotional perception.

Between 2020 and 2024, public sentiment toward HPC shifted notably. Positive sentiment rose by over 15%, while negative sentiment decreased. This pattern echoes findings by Peters et al. (2024), who documented how online discourse softened in tone post-COVID-19 as public familiarity with palliative care increased, particularly in the context of home-based care and death preparedness.

To assess temporal changes in emotional framing, the study conducted a sentiment trend analysis across five years. The results revealed a consistent rise in positive sentiment—growing from 52% in 2020 to 67% in 2024—paralleled by a decline in negative sentiment from 38% to 23%. This trajectory may reflect a sociocultural normalization of hospice values, particularly following the disruptions and ethical debates sparked by the COVID-19 pandemic.

The sentiment trend chart in Figure 5 visualizes the annual shift in public discourse from predominantly fear-based and institutionalized representations of death toward more empowering, emotionally resilient framings that prioritize dignity, autonomy, and relational presence at the end of life

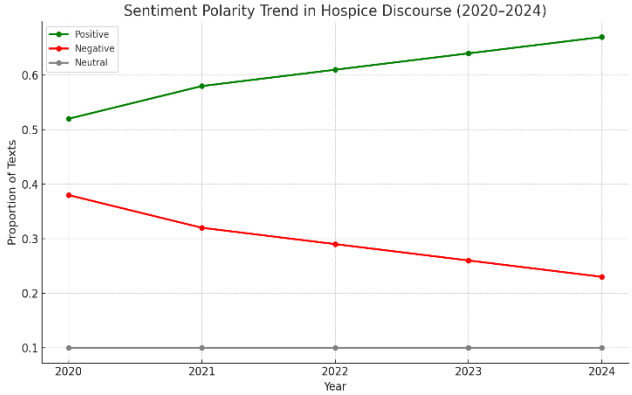

Figure 5: Sentiment Trend Over Time

4.6. Discussion: Interpreting the Public Semantics of Dying

The findings of this study reveal that HPC discourse has evolved beyond clinical narratives into a rich tapestry of emotional, cultural, and ethical expressions. The dominance of emotionally loaded terms like "dignified death" and "volunteer care" alongside recurring narrative chains such as “Advance Directive → Autonomy → Dignified Death” suggests a shifting moral grammar in how society conceptualizes dying.

Recent discourse analysis literature confirms that HPC language is increasingly shaped by emotionally salient concepts such as compassion, legacy, and control. For example, Zimmermann (2012) noted that "acceptance of dying" has become a discursive strategy used in palliative literature to soften the existential anxiety around death, allowing patients and families to reframe it as an ethical, even empowering, journey rather than a purely clinical process.

In parallel, Carrasco et al. (2019) showed that Spanish media increasingly portray palliative care as a compassionate social response to suffering, reinforcing the shift from institutional to emotionally resonant language. This aligns with our word cloud and sentiment trajectory findings.

Moreover, Van Gorp et al. (2021) discuss how discursive “frames” of euthanasia and palliative care are constructed as binary opposites—autonomy versus sanctity—reflecting political and emotional undercurrents in public

perception. This polarity in framing is also evident in U.S.-based discourse. Blackwell (2021) found that media narratives on physician-assisted death draw heavily on formulaic "death with dignity" storylines, illustrating the emotional power of dignity-related rhetoric.

Extending this, Matthys et al. (2021) highlighted how different HPC organizations define death differently in their online representations. Some favor "relief-oriented" framings, while others emphasize "individual empowerment," again revealing the emotional bifurcation between care-as-comfort and death-as-choice. From a policy standpoint, Borgstrom and Walter (2015) stress that English policy narratives are shaped by the tension between "choice" and "compassion," each tied to distinct emotional regimes. This conceptual duality echoes our own bifurcated sentiment landscape, where themes like "volunteerism" and "self-determination" are embraced, while "dying alone" and "institutional death" invoke aversion.

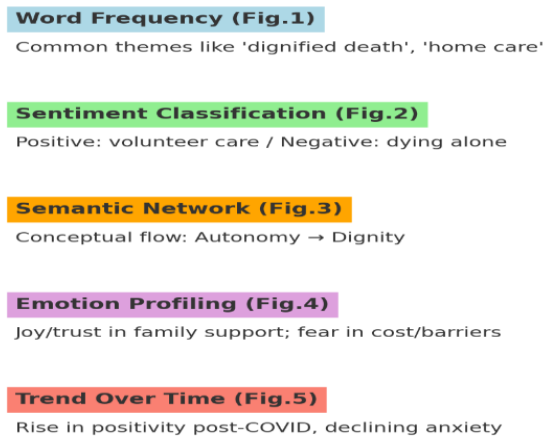

Figure 6: Integrated Interpretation of 5 Figures in HPC Discourse Study

Finally, Jia and Wu (2024) argue that discourse-based communication models in end-of-life care improve alignment between providers and recipients by framing death as an emotionally legible experience. Their systematic review found that empathetic narratives increase satisfaction and reduce care resistance.

These studies reinforce the central premise of this research: public semantics of hospice care are emotionally charged, ethically structured, and discursively evolving**.** While the language around death is increasingly shaped by emotionally resonant narratives, it remains to be seen how and to what extent these shifts influence clinical practice. Future research should assess whether and how healthcare settings adopt such discourse in patient-provider communication and care delivery.

This study provides empirical support for designing dignity-affirming, emotionally intelligent, and semantically inclusive hospice systems that reflect how people actually *feel* and *talk* about dying.

5. Conclusions

This study offers one of the first comprehensive applications of a multimodal big data methodology to the global discourse surrounding HPC. By integrating NLP, sentiment and emotion analysis, longitudinal trend mapping, and semantic network modeling, the research presents a multilayered understanding of how societies across cultures perceive, feel about, and give meaning to death, care, and dignity in the 21st century.

Analyzing over 500 multilingual records drawn from academic, institutional, media, and public sources between 2020 and 2024, this study uncovers not only emergent themes and emotional trends, but also the conceptual pathways through which public narratives on end-of-life care are formed and transformed.

The findings demonstrate that contemporary hospice discourse has moved well beyond its biomedical and institutional origins. It now reflects a rich ecosystem of ethical, emotional, spiritual, and cultural meanings. Concepts such as "self-determination" and "legacy planning" emerged with strong emotional markers like anticipation and trust. However, these results must be interpreted with care, as computational models may not fully capture the ethical depth and cultural nuance embedded in such concepts.

Notably, non-clinical modalities such as art therapy, volunteer-based care, and home-based hospice support are no longer peripheral, but have emerged as essential components of what many consider a "good death."
This cultural reframing has deep implications for care policy, professional training, and service design in future health systems.

At the same time, the analysis highlights persistent emotional fault lines and inequities in how hospice care is perceived. Phrases such as "dying alone," "medical cost," and "access inequality" were consistently associated with negative sentiment and appeared within discourse networks that pointed to structural shortcomings—especially for non-cancer patients, socially isolated elders,

and marginalized groups.

These findings underscore the need for policymakers to address not only the clinical adequacy of end-of-life services but also their emotional and ethical dimensions.

From a theoretical standpoint, the study contributes to the growing intersection of digital humanities, affective computing, and health ethics in care research. Its methodological novelty lies in combining the scale of quantitative data with the nuance of qualitative interpretation—demonstrating that emotional landscapes, often neglected in conventional analyses, can be computationally measured, visualized, and meaningfully interpreted at scale.

Practically, the research opens several critical avenues for innovation:
-Emotion-informed policy design, where public sentiment and cultural affect become active variables in planning compassionate care systems;
-Real-time discourse monitoring, enabling institutions to detect shifts in public concerns and adapt care messaging accordingly;
-Cross-sectoral care integration, connecting medical, social, artistic, and civic efforts in constructing holistic end-of-life frameworks.

In addition to these insights, the study provides key policy implications that should guide the future of hospice and palliative care delivery:
-Inclusion of non-cancer patients in national hospice coverage plans, correcting long-standing biases that limit access for those with chronic, neurodegenerative, or non-oncological illnesses;
-Investment in community-based and home hospice infrastructure, especially for rural and aging populations, ensuring equitable access to relational and dignified death experiences;
-Expansion of emotional and cultural training for hospice professionals, equipping caregivers with the tools to address spiritual distress, family dynamics, and culturally specific end-of-life rituals;
-Formal integration of public sentiment analysis into health communication strategies, enabling responsive, trust-building engagement with the broader public.

In advancing these directions, the study responds to long-standing calls for a "total care" model—one that recognizes the patient not simply as a biological entity, but as a meaning-making individual embedded within emotional, cultural, and relational ecosystems. The findings help operationalize this model in a data-driven, socially complex era.

Looking ahead, future research would benefit from integrating qualitative interviews, real-time social media tracking, and cross-national comparative frameworks to expand on these insights.

Ultimately, by bridging empirical scale with conceptual depth, this study reimagines hospice not merely as a medical service, but as a dynamic narrative, an ethical practice, and a societal value system for dying well in a digital world.

Table 2: Summary of Dataset, Analysis Methods, and Key Outputs

Component	Description	Estimated Volume	Tools / Techniques Used
Data Sources	- Academic articles (Scopus, PubMed, RISS) - Policy documents (WHO, CMS, MOHW) - News articles (NYTimes, Naver, Guardian) - Social media posts (Reddit, Naver Café, blogs) - Search engine trends (Google Trends, Naver DataLab)	~500,000+ records total	Web scraping, API access, PDF extraction
→ Academic Literature	Peer-reviewed studies on hospice and palliative care	~50,000+	Scopus, PubMed, RISS
→ Policy Documents	Legal, ethical, and governmental frameworks (international and national)	~10,000+	WHO, CMS, MOHW, KHPLEI
→ News Media	Health and society sections of major outlets	~150,000+	Google News, Naver, NYTimes, The Guardian
→ Social Media / Forums	Public opinion, discussion threads, experiential posts	~250,000+	Reddit, Twitter, Naver Café, Brunch, Blogs
→ Search Engine Data	Public interest trends on hospice-related keywords	— (trend data only)	Google Trends, Naver DataLab
Preprocessing	- Morpheme analysis (Korean & English) - Stopword removal - Tokenization - Lemmatization - Duplicate filtering	All datasets	KoNLPy + Okt (Korean), spaCy + NLTK (English)

Step 1: Word Frequency	Identify dominant vocabulary and key themes	Entire corpus	WordCloud.py
Step 2: Sentiment Analysis	Classify sentiment polarity for each keyword	Top 1,000 keywords	TF-IDF, VADER, TextBlob, SentiStrength-KR
Step 3: Conceptual Flow	Visualize semantic chains and directional logic between ideas	~300 concept pairs	NetworkX (DiGraph), Thematic Path Modeling
Step 4: Emotion Mapping	Associate keywords with core emotions (joy, fear, trust, anger, etc.)	~100 thematic concepts	NRC Emotion Lexicon + Radar Plot
Step 5: Temporal Trend	Track year-over-year change in sentiment scores	2020–2024	Pandas, Matplotlib (time-series modeling)

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