# Palliative Care and AI in Nursing Homes

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1. What palliative systems or strategies incorporating AI have been designed for, used in, or studied in nursing home settings?  
  
2. What kinds of AI are used within palliative systems in nursing home settings?  
  
3. Do relevant projects include health professionals in system or strategy design, deployment, or testing?

## Planning

This paper attempts to synthesise research surrounding palliative care interventions using Artificial Intelligence in nursing homes.

### PICOC

* **Population:** nursing home
* **Intervention:** Artificial Intelligence
* **Comparison:** paper-based methods
* **Outcome:** palliative care
* **Context:** healthcare tools

### Research Questions

1. What palliative interventions have been designed for nursing homes involving artificial intelligence?
2. What types of AI are used within these interventions?
3. Are end-users involved in intervention design, development, and testing?

### Keywords and Synonyms

|  |  |
| --- | --- |
| Keyword | Synonyms |
| artificial intelligence | AI, expert system, intelligent retrieval, knowledge engineering, machine learning, ml, natural language processing, neural network, nlp, nn |
| nursing home | aged care facility, assisted living facility, care home, convalescent home, convalescent hospital, old folks home, old peoples home, residential care home, rest home, retirement facility, retirement home, skilled nursing facility |
| palliative care | EoLC, comfort care, end-of-life care, occupational therapy, palliation, palliative medicine, palliative therapy, palliative treatment, supportive care |
| paper-based methods | clinical judgement, manual data |

### Search String

("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND ("artificial intelligence" OR "AI" OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR "nlp" OR "nn") AND ("paper-based methods" OR "clinical judgement" OR "manual data") AND ("palliative care" OR "EoLC" OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR "palliation" OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")

### Sources

* ACM Digital Library (http://portal.acm.org)
* Hand-Picked
* IEEE Digital Library (http://ieeexplore.ieee.org)
* ISI Web of Science (http://www.isiknowledge.com)
* Science@Direct (http://www.sciencedirect.com)
* Scopus (http://www.scopus.com)
* Springer Link (http://link.springer.com)

### Selection Criteria

**Inclusion Criteria:**

* 2018 - 2024
* Q1 or Q2 journals and A or B conferences
* articles from conferences, journals, magazines
* articles in English
* articles relevant to one or more research questions
* open-source or university-provided

**Exclusion Criteria:**

* Prior to 2018
* Q3 or Q4 journals and C conferences and unranked material
* articles not in English
* articles not relevant to any of the research questions
* inaccessible or purchase required
* reports policy literature working papers newsletters government documents speeches IEEE Early Access articles Articles from books non-peer reviewed materials conference abstracts literature reviews

### Quality Assessment Checklist

**Questions:**

* Is the study relevant to my research?
* Is the research methodology clearly outlined?
* Are the study results clearly described in the paper?
* Is there a clear discussion of the limitations of the study?

**Answers:**

* Yes (1.0)
* Partially (0.0)
* No (-1.0)

### Data Extraction Form

* Article Name
* Authors
* Year
* Country
* Type of Publication
* Hardware
* Software
* End-Users
* Outcomes
* Type of Resident
* Application Area
* Type of ML Algorithm
* Algorithm Details
* Input
* Output
* Patient Involvement
* Patient Involvement Details
* Health Professional Involvement
* Health Professional Involvement Details

## Conducting

### Digital Libraries Search Strings

**ACM Digital Library:**

("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND ("artificial intelligence" OR "AI" OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR "nlp" OR "nn") AND ("palliative care" OR "EoLC" OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR "palliation" OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")

**IEEE Digital Library:**

("Full Text & Metadata": "nursing home" OR "Full Text & Metadata": "aged care facility" OR "Full Text & Metadata": "assisted living facility" OR "Full Text & Metadata": "care home" OR Search\_All\_Text: "convalescent home" OR "Full Text & Metadata": "convalescent hospital" OR "Full Text & Metadata": "old folks home" OR "Full Text & Metadata": "old peoples home" OR Search\_All\_Text: "residential care home" OR "Full Text & Metadata": "rest home" OR Search\_All\_Text: "retirement facility" OR "Full Text & Metadata": "retirement home" OR "Full Text & Metadata": "skilled nursing facility" AND Search\_All\_Text: "artificial intelligence" OR "Full Text & Metadata": "expert system" OR Search\_All\_Text: "intelligent retrieval" OR "Full Text & Metadata": "knowledge engineering" OR "Full Text & Metadata": "machine learning" OR "Full Text & Metadata": "natural language processing" OR "Full Text & Metadata": "neural network" AND Search\_All\_Text: "comfort care" OR "Full Text & Metadata": "end-of-life care" OR "Full Text & Metadata": "occupational therapy" OR "Full Text & Metadata": "palliat\*" OR "Full Text & Metadata": "supportive care")

**ISI Web of Science:**

AB=(("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND (artificial intelligence OR AI OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR nlp OR nn) AND (palliative care OR edlc OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR palliation OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")) OR TS=(("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND (artificial intelligence OR AI OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR nlp OR nn) AND (palliative care OR edlc OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR palliation OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")) OR TI=(("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND (artificial intelligence OR AI OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR nlp OR nn) AND (palliative care OR edlc OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR palliation OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care"))

**Science@Direct:**

("nursing home" OR "aged care facility" OR "care home") AND ("artificial intelligence" OR "machine learning" OR "natural language processing") AND ("palliative care" OR "end-of-life care"))

**Scopus:**

("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND ("artificial intelligence" OR "AI" OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR "nlp" OR "nn") AND ("palliative care" OR "EoLC" OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR "palliation" OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")

**Springer Link:**

("nursing home" OR "aged care facility" OR "assisted living facility" OR "care home" OR "convalescent home" OR "convalescent hospital" OR "old folks home" OR "old peoples home" OR "residential care home" OR "rest home" OR "retirement facility" OR "retirement home" OR "skilled nursing facility") AND ("artificial intelligence" OR "AI" OR "expert system" OR "intelligent retrieval" OR "knowledge engineering" OR "machine learning" OR "ml" OR "natural language processing" OR "neural network" OR "nlp" OR "nn") AND ("paper-based methods" OR "clinical judgement" OR "manual data") AND ("palliative care" OR "EoLC" OR "comfort care" OR "end-of-life care" OR "occupational therapy" OR "palliation" OR "palliative medicine" OR "palliative therapy" OR "palliative treatment" OR "supportive care")

### Imported Studies

* **ACM Digital Library:** 33
* **Hand-Picked:** 5
* **IEEE Digital Library:** 1953
* **ISI Web of Science:** 3
* **Science@Direct:** 111
* **Scopus:** 1159
* **Springer Link:** 626