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Authors' Contribution

DK conceived and designed the study; analysed the results; wrote and revised the paper.

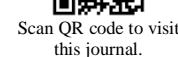
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INTRODUCTION

Dementia is a progressive neurodegenerative syndrome and a growing global health challenge. Current estimates place the number of affected individuals in the tens of millions worldwide, with substantial annual incidence. In the absence of a cure, non-pharmacological interventions are central to managing symptoms and maintaining quality of life for individuals and families. A comprehensive approach necessarily involves multiple, intersecting domains of support.

This review synthesizes evidence from a select corpus to explore three non-pharmacological pillars of dementia care: psychosocial support, nutritional integrity, and technological advancement. Psychosocial interventions help individuals and families navigate the emotional and psychological impact of a diagnosis, addressing depression and anxiety to support well-being. Nutritional management targets the common risks of malnutrition and weight loss stemming from altered appetite, taste, and swallowing, often via caregiver-implemented strategies. Artificial Intelligence (AI) and machine learning (ML) have emerged as tools with potential to enhance detection, monitoring, and research optimization by analysing complex data (e.g., speech/language, neuroimaging). While earlier versions of this manuscript referenced “food intolerances,” the available evidence in the corpus focuses more broadly on eating behaviours, appetite, and nutritional challenges; the analysis follows this evidence-based scope. Where appropriate throughout the text, recent citations are provided in author–year format (Sukhawathanakul, 2021).

METHODS

This narrative review undertook a thematic synthesis of a fixed, predefined corpus of documents. Inclusion required relevance to dementia, psychotherapy, nutrition, or AI, and sufficient bibliographic metadata to enable full

citation. Of ten documents screened, eight met inclusion; two were excluded due to missing authoring body or publication date. Key data were extracted (document type, population/context, interventions/technologies, and primary outcomes) and organized into three emergent domains: (1) psychotherapeutic interventions; (2) nutritional and eating behaviour challenges; and (3) AI applications in dementia detection and research. Justification for a fixed corpus: the goal was to provide a methodologically coherent synthesis of materials available to the authors at review inception, ensuring transparent traceability and citation fidelity. However, limiting the search to a fixed corpus reduces comprehensiveness and generalizability; findings should therefore be interpreted as a focused synthesis rather than an exhaustive systematic review.

Thematic Analysis of Interventions in Dementia Management

The role of psychotherapeutic interventions in supporting adjustment and well-being

Psychosocial interventions are non-pharmacological approaches to maintain mental health following a diagnosis. Across the corpus, the most consistently improved outcome is depressive symptomatology, with mixed effects on acceptance and quality of life. Cognitive Behavioural Therapy (CBT) targets maladaptive thoughts and behaviours and, when embedded in multi-component programmes (e.g., with exercise or support groups), has been associated with improvements in mood and self-esteem. Problem-focused approaches—such as Problem Adaptation Therapy (PATH)—combine compensatory strategies and environmental adaptations and have shown reductions in depressive symptoms and disability. Group and interpersonal therapies offer peer support and address relationship-driven distress; reported benefits include reduced anxiety and apathy and extended time to recurrence of depressive episodes with maintenance therapy.

Reminiscence and mindfulness-based therapies support acceptance and stress reduction, with reported gains in hope, life satisfaction, and spiritual well-being. Taken together, the cross-modal signal for reduction in depression suggests this may be a highly responsive target across therapeutic frameworks, potentially mediating broader adjustment and well-being.

Navigating nutritional and eating behaviour challenges

Nutritional well-being is frequently compromised by cognitive, sensory, and physical changes. Common issues include forgetting to eat, altered hunger recognition, decision-making difficulty, sweet-preference shifts, dysphagia, and reduced motor coordination. Evidence-based strategies emphasize: (i) environmental adjustments (calm mealtime settings, high-contrast tableware, simplified place settings); (ii) dietary modification and fortification (small frequent meals; energy/protein density via full-fat milk powder, butter, cream, cheese; aligning with changing taste preferences); (iii) promoting independence and safety (finger foods, adaptive cutlery, hydration support). The effectiveness of these strategies is caregiver-dependent, highlighting the need for caregiver education and emotional support to mitigate burden and sustain implementation.

The application of artificial intelligence in Dementia detection and research

AI is primarily deployed for early detection and research optimization rather than direct management. Natural Language Processing (NLP) of speech and language, stream-based processing, and classifier pipelines are explored to detect subtle linguistic markers of decline, with explainability dashboards proposed to enhance trust. A taxonomy spans supervised learning (e.g., SVMs, random forests), deep learning (CNNs for imaging, RNNs for sequences, multimodal fusion), and unsupervised/semi-supervised methods for

discovery when labels are scarce. Beyond diagnostics, AI can support experimental medicine via drug repurposing and trial enrichment. Persistent barriers include opacity of complex models (the “black box” problem), limited reproducibility, and generalizability from curated cohorts to real-world settings, raising equity concerns.

Discussion: Integration, implications, and limitations

Integration opportunities emerge across domains. AI-driven language analytics could provide objective, longitudinal measures of affective change to complement psychotherapeutic outcome assessment. Psychotherapy may indirectly improve nutrition by alleviating depression, apathy, and anxiety—common contributors to poor intake—suggesting synergistic care plans. Notably absent are applications connecting AI to nutritional management (e.g., intake monitoring, meal planning assistants), representing a concrete avenue for innovation.

Implementation barriers differ by domain: AI requires interpretable, reproducible, and externally validated models; psychosocial and nutritional care require access to trained professionals and sustained caregiver capacity, with associated financial and emotional costs.

Limitations: The review is restricted to a fixed, non-exhaustive corpus, which may introduce selection bias and limit generalizability. Heterogeneity in study designs and outcomes constrains comparative inference. The manuscript does not evaluate integrated multi-component interventions due to a lack of such studies in the corpus.

Evidence summary

The evidence summary table highlights several studies regarding the role of psychotherapy, nutrition, and artificial intelligence in Dementia care.

Table 1. Evidence summary table illustrating the role of psychotherapy, nutrition, and artificial intelligence in Dementia care.

Author (Year)	Study Type/Context	Sample/Setting	Key Findings (1–2 lines)	Notable Limitations
de Arriba-Pérez & García-Méndez (2024)	Preprint/Technical paper	AI model using patient conversation data	NLP pipeline for real-time, interpretable prediction of cognitive decline with explainability dashboard.	Preprint; technical focus over clinical validation.
Bucholc et al. (2023)	Review article	AI/ML applications in dementia research	Taxonomy of ML/DL methods for diagnosis, drug discovery, and trial optimization; highlights reproducibility and interpretability challenges.	Methods-focused; limited evaluation of clinical outcomes.
Guss et al. (2014)	Clinical guide	Psychosocial interventions guide (early dementia)	Catalogues CBT, CST, reminiscence, and related supports for cognitive, emotional, and social challenges.	Guide format; not a comparative efficacy review.
Sukhawathanakul et al. (2021)	Systematic review	24 studies of psychotherapeutic interventions	Consistent reductions in depressive symptoms; mixed effects on QoL, self-esteem, acceptance.	Heterogeneous study designs and samples.
Fostinelli et al. (2020)	Review article	Eating behaviour in ageing and dementia (AD, FTD)	Physiological and dementia-related drivers of food choice and intake; weight loss in AD; sweet cravings in FTD.	Narrative synthesis; no new empirical data.
UHCW (2025); NHS RDaSH guides (2020); NHS (2020); Alberta Health Services (2025)	Patient/carer guides	Nutrition dementia (practical guidance)	in Environmental, dietary, and safety strategies for eating and drinking difficulties; caregiver-focused implementation.	Practice guidance; lacks empirical effect sizes.

Future directions

AI: Prioritize interpretable (XAI) models with transparent rationales; validate across diverse clinical populations; explore transfer learning for robustness. Psychotherapy: Conduct longitudinal, component-level trials to identify optimal modalities, intensities, and delivery formats. Integration: Pilot and trial multi-component programmes—e.g., structured psychotherapy plus caregiver nutritional

support—with AI-based language analytics as an objective, non-invasive outcome measure.

CONCLUSION

Psychotherapy, nutritional support, and AI occupy complementary roles in dementia care. The evidence supports psychotherapy's impact on depression, caregiver-led nutritional

strategies for daily management challenges, and AI's promise for early detection and research efficiency. Real-world impact will likely come from integrating these domains, aligning human-centred care with trustworthy technological measures to improve outcomes for people living with dementia and their caregivers.

CONFLICT OF INTEREST

The author declares that this article content has no conflict of interest.

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