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Exercise and physiotherapy for nursing home residents with dementia: practices and preferences

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Chapter 8:

Summary and general discussion

Physiotherapy, primarily in the form of exercise therapy, is commonly employed in Western countries for the treatment of nursing home residents with dementia.[1,2] This practice is based on the evidence demonstrating that exercise has the potential to positively impact their well-being.[3–5] However, current physiotherapy practices in the nursing home population were found to vary largely, whereas factors underlying this practice variation are largely unexplored.[6,7] Moreover, there is limited understanding of the specific needs and preferences regarding its delivery among residents and their informal caregivers. With respect to the content and dosage of exercise interventions, the feasibility of a physiotherapist-supervised exercise intervention adhering to (inter)national exercise recommendations for this population is currently unknown. Given these gaps in knowledge, this thesis aims to address the following research questions:

Research question 1: What are the contents and effectiveness of physiotherapist-supervised exercise interventions for nursing home residents with dementia, and which contextual factors influence their application?

Research question 2: What are the perceptions, needs and preferences of nursing home residents, informal caregivers and health care professionals regarding physiotherapy and exercise for nursing home residents with dementia, including their mutual collaboration?

Research question 3: What is the feasibility of a physiotherapist-supervised exercise intervention for nursing home residents with dementia?

This chapter summarizes and discusses the main findings of this thesis and the methodological choices made. Implications and recommendations for future research, current practice and education are presented.

Main findings

Part 1: Effectiveness of physiotherapy and exercise for nursing home residents with dementia and their delivery in daily clinical practice

In the systematic review (**Chapter 2**), randomized controlled trials (RCTs) of exercise interventions for nursing home residents with dementia, supervised by physiotherapists, were identified through searches in six electronic medical databases. Of the 1,377 records retrieved, 6 RCTs reported in 11 publications, met the inclusion criteria and were included in the review. The exercise interventions varied largely with respect to type of exercises, frequency, intensity, and duration. Adherence to the interventions was generally low across studies. Due to further heterogeneity in study designs and outcome measures and

inconsistencies in the findings, the effectiveness of these interventions remains inconclusive.

Chapter 3 presents the findings of an online survey conducted to examine the structure and process of physiotherapy for nursing home residents with dementia in the Netherlands. A total of 109 physiotherapists, each representing a distinct nursing home, completed the survey. In terms of structure, variations were observed in the requirement of a physician's referral to initiate therapy and in the use of standardized protocols and guidelines. Greater consistency was noted in the composition of the multidisciplinary teams involved. Regarding the process of the delivery of physiotherapy, differences were present in the use of assessment tools and the involvement of informal caregivers. However, there was more agreement concerning the types of treatment modalities that were provided and the intended therapeutic outcomes. It was also found that physiotherapists were not only providing treatment to residents, but were also coaching other healthcare professionals and provided education and support to informal caregivers. Overall, it was concluded that, despite some consistent elements in multidisciplinary collaboration and treatment goals, there was considerable variation in the structure and process of physiotherapy delivery across nursing homes in the Netherlands

Part 2: Perceptions, needs and preferences of residents with dementia and their family caregivers regarding physiotherapy, and the feasibility of their involvement

Chapter 4 presents the findings of a qualitative interview study exploring the perceptions, needs and preferences of informal caregivers of nursing home residents with dementia regarding physiotherapy. Thirteen family caregivers were interviewed, and the data were analyzed thematically. Overall, caregivers reported limited familiarity with physiotherapy and expressed a desire for greater collaboration with physiotherapists. They emphasized the importance of individualized therapy, empathetic communication, and exercises that were both enjoyable and accessible for the residents. The conclusion of the study was that informal caregivers of nursing home residents with dementia expressed a need for clearer communication and greater involvement in physical therapy, emphasizing the importance of empathetic interaction, individualized and enjoyable care, and the potential value of shared decision-making within the interdisciplinary team, an approach that remains underexplored in this context.

In **Chapter 5**, the perspectives of nursing home residents with dementia regarding physiotherapy and exercise were investigated. Fifteen residents participated in semi-structured interviews, and the data were analyzed using thematic analysis. Participants generally viewed physiotherapy as a means of maintaining physical function and independence. While they considered supervision important, they were open to exercises

led by others, provided that safety and quality were ensured. Participants preferred that family caregivers be kept informed through reports provided by the physiotherapist; however, they felt that their relatives were too occupied with other responsibilities to assist them with the exercises. In summary, nursing home residents with mild to moderate dementia expressed clear preferences regarding physiotherapy, communication, and caregiver involvement, highlighting the potential for improved intervention adherence, as well as a shift toward a more supervisory role for physiotherapists.

Chapter 6 explored the barriers and facilitators to family involvement in physiotherapy and exercise among physiotherapists and management. For that purpose, interviews with 19 physiotherapists and 9 nursing home staff members were held. The study was conducted from a constructivist ontological perspective and data were analyzed using reflexive thematic analysis. Identified barriers included the perceived additional burden on family caregivers and an institutional culture that was sometimes perceived as unwelcoming. Facilitators included proactive promotion of engagement of informal caregivers by physiotherapists, clear and accessible information for families, prior positive experience of caregivers with healthcare or exercise, and the influence of family-centered cultural values. The study concluded that proactive role clarification, flexible approaches, and inclusive communication strategies by physiotherapists and aged care facilities could enhance caregiver collaboration and sustained engagement.

Part 3: The feasibility of a physiotherapist-supervised exercise intervention

Chapter 7 outlines an observational pilot study on the feasibility of a physiotherapist-supervised exercise intervention. The intervention encompassed four exercise sessions per week (two supervised, small-group sessions focusing on strength and balance exercises and two individual aerobic exergaming sessions using a seated bicycle trainer connected to software displaying a virtual cycling route) for a period of 10 weeks. Feasibility was evaluated based on the percentage of successfully recruited participants from those that were screened, the completeness of assessment instruments, participant adherence with the intervention, the occurrence of adverse events, the participants' appraisal of the intervention and the experiences of the supervisors. Of the 59 potentially eligible residents screened, 11 participated in the intervention, and all but one completing both types of treatment sessions over the intervention period. The average adherence rate with the sessions was high (median92 %), there were no serious and only a few mild adverse events, with transient fatigue being the most frequently reported. Ninety percent of the sessions were rated as pleasant or very pleasant and the exercise supervisors' experiences yielded valuable feedback regarding dementia-specific knowledge, individualized communication, and tailored approaches as facilitators, while sensory overstimulation or understimulation posed challenges. The assessment instruments proved feasible for use

in a larger-scale study. However, the recruitment process requires further optimization to enhance participant inclusion. The intervention was concluded to be feasible, with high adherence and positive feedback, although refinement of the recruitment and intervention delivery is recommended before conducting a larger effectiveness trial.

Reflection on findings and methodological considerations

Effectiveness of physiotherapy supervised exercise interventions and their outcomes

Chapter 2 demonstrated that there is currently a limited body of high-quality research specifically addressing exercise interventions delivered by physiotherapists to individuals with dementia. The existing literature showed substantial variation in intervention characteristics, limiting comparability. While there are indications of potential effectiveness, the evidence was insufficient to draw definitive conclusions.

The evidence for exercise in nursing home residents with dementia is not directly comparable to the extensive body of evidence on the benefits of exercise and physical activity in the general older adult population.[4,8] In this broader population, there is far more evidence available for improving outcomes such as cardiorespiratory fitness[9] or muscle strength.[10] Much of the evidence supporting the overall benefits of exercise and physical activity in the general older population is derived from large-scale epidemiological studies with long follow-up periods, focusing on the prevention or delay of progress of noncommunicable diseases such as obesity, sarcopenia, heart failure, hypertension, cancer, chronic kidney disease, pulmonary disease, osteoporosis, osteoarthritis, depression, dementia, or Parkinson's disease.[4,11,12] For instance, a study by Arem et al. (2015) had a median follow-up of 14.2 years.[13]

Concerning the evidence for specific exercise interventions in elderly people with dementia, a recent systematic review demonstrated beneficial effects of multicomponent exercise interventions in improving activities of daily living, depression, and balance in people with Alzheimer's Disease aged 60 and above.[14] Some of the interventions of the included studies in that review had a duration of 6-12 months, whereas it must be noted that the fewer than half of nursing home residents remain in long-term care for more than 1.5 years,[15] making long-term preventive interventions less feasible or impactful in this population. Most nursing home residents are considered to be in the palliative phase, defined as "the phase that begins when recovery is no longer possible, or when the end of life is approaching due to increasing vulnerability".[16] Consequently, the applicability of findings from community-dwelling older adults either or not with dementia to those elderly with dementia in nursing home settings is limited. In that latter context only

short-term physiotherapy interventions and treatment goals, with meaningful outcomes for that setting are relevant. This aligns with the findings presented in **Chapter 3,** where physiotherapists reported the outcomes their treatment was aimed at. In that survey study and in other literature reporting on physiotherapy outcomes for nursing home residents, treatment was typically aimed at physical performance,[2,6] independence in daily activities,[2] fall prevention,[2,6] mood enhancement,[2,6] pressure ulcer prevention,[1,6] pain management,[1,2,17] end-of-life care,[17] quality of life,[18] and continence care.[2,6] These outcomes are more realistically achievable with short-term, targeted objectives.

Adherence as a determinant of intervention effectiveness

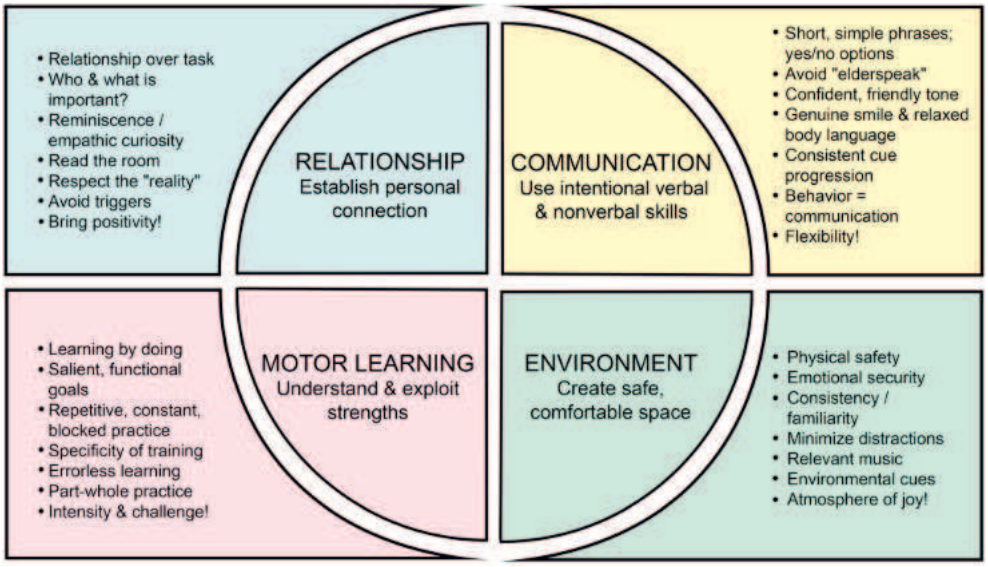
As shown in **Chapter 2** and documented by another review on exercise in dementia,[19] low adherence represents a major barrier to achieving intervention benefits. Adherence is commonly defined as "maintaining an exercise regimen for a prolonged period following the initial adoption phase".[20] A systematic review assessing exercise adherence in nursing home residents with dementia reported an average adherence of 65.4%.[21] Some high-quality randomized controlled trials (RCTs) have reported adherence rates of 73% [22] and 75%,[23] respectively. These studies used an exercise intervention consisting of three sessions per week and a duration of 45-60 minutes. With an average adherence of less than 75%, the participants may not reach the advised frequency of at least 3 times moderate to high intensity exercise per week as recommended in guidelines for older adults in nursing home care.[4,5] **Chapter 5** of this thesis explored residents' preferences regarding physiotherapy and exercise, providing useful insights to increase participation in and adherence with exercise interventions. Residents for example, emphasized the importance of communication and supervision skills of the supervisor of the intervention, while also indicating a preference for exercise sessions in designated areas of the nursing home and for functional exercises aimed at maintaining of increasing their physical performance and independence in daily activities.

The feasibility study described in **Chapter 7** incorporated these strategies, along with recommendations from two systematic reviews on supervisor preparation,[24,25] and achieved an overall adherence rate of 89% of the sessions. A notable difference in our study procedures was that the supervisor training emphasized communication techniques and dementia-specific knowledge, in contrast to the training approaches in previous RCTs,[22,23] which primarily focused on the characteristics of the exercises, such as exercise intensity or the use of weighted belts. This emphasis on communication supervisors' skills and knowledge on dementia, consistent with the preferences expressed by family caregivers in the qualitative study presented in **Chapter 4,** might be an important factor enhancing participant adherence. It is also central to the recently developed framework for physiotherapists working with people with dementia. [18] That framework (Figure 2)

serves as a foundation for defining and promoting best practices and comprises four key components:

1. Establishing a personal relationship
2. Using intentional verbal and nonverbal communication
3. Understanding and optimizing motor learning capacity
4. Creating a safe and meaningful environment

Figure 3: Model or framework by Ries (2022) of physiotherapy for people with dementia



This model, together with the findings of this thesis and other expert perspectives,[26,27] emphasizes the role of physiotherapists in establishing meaningful relationships with care recipients and utilizing effective communication strategies in the nursing home context.

Adverse events and their influence on exercise

While none of the clinical trials on exercise interventions in nursing home residents with dementia in **Chapter 2** provided detailed descriptions of potential side effects, concerns about possible adverse events may limit participation in exercise interventions. Two systematic reviews, on exercise interventions for people with dementia,[28] and specifically about inclusion of people with dementia in research,[29] reported exclusion of residents with dementia due to safety concerns. A randomized controlled trial described a low recruitment rate, related to family representatives' fear of harm.[30] In the feasibility study reported in **Chapter 7**, no such reluctance was observed, as all approached family repre-

sentatives and residents provided consent. Nevertheless, the reporting of adverse events in the literature is in general insufficient for a robust risk evaluation.[19,28,31] In the feasibility study all nine adverse events potentially linked to the intervention concerned fatigue. While fatigue can be a limiting factor for older adults,[32] in this case it raises the question of whether it should be classified as an adverse event or rather as a normal physiological response to physical exertion.[33] Previous research indicates that nursing home residents with dementia may value challenging exercise; this is exemplified by the subtitle "*While it's tough, it's useful*" of a qualitative study exploring exercise experiences in this population.[34] In the feasibility study, no additional interviews were conducted to determine whether the reported fatigue was perceived as an acceptable, or even pleasant, consequence of exercise, or as a limiting and potentially harmful effect.

Exercise dosage

In the feasibility study (**Chapter 7**), compliance with exercise intensity, defined as "whether participants exercised at the prescribed intensity",[21] was not formally assessed. This represents a methodological limitation, as exercise intensity, in combination with session frequency, reflects the dosage and is a strong determinant of beneficial outcomes.[35] Although supervisors used physical performance test data to target moderate-to-high intensity exercise, no systematic monitoring of compliance with the intended dosage was undertaken. In other studies explicitly designed to achieve high-intensity exercise, such compliance has indeed been assessed.[22,23] However, compliance was typically estimated by supervisors, similar as the study procedures of the feasibility study, and not by an instrument to measure perceived exertion such as the Borg scale[36] or an objective instrument such as heart rate monitoring .

Collaboration of physiotherapists with informal caregivers and healthcare professionals

Collaborating with Informal Caregivers

While the foundational scope of physiotherapy and its emphasis on exercise is well established, [37,38] the study in **Chapter 3** found that physiotherapists in the Netherlands contribute not only through structured exercise programs but also by coaching other healthcare professionals and by providing education and support to informal caregivers. Collaboration with informal caregivers is an essential, and very much appreciated (**Chapter 4**) component of physiotherapy in dementia care. Family involvement in physiotherapy can have notable advantages. It can provide valuable background information about the residents' history,[17] e.g with respect to participation in sports and physical activity. Family members could also support exercises when the physiotherapist is not present, provided that these are safe without an expert present. In a broader context, family-supported exercise programs in transitional care from hospital to home have been effective, showing

an increase daily step counts.[39] However, the nursing home setting might also be a more challenging context for collaboration in comparison with community of transitional care settings. Informal caregivers are frequently exhausted by the lead-up to nursing home placement of their loved one.[40,41] Following a resident's admission to a nursing home or long-term care facility, there often appears to be a shift in the locus of responsibility for care. Literature on nursing home care has noted that staff members may perceive themselves as the primary caregivers, while family members are sometimes regarded as intrusive or disruptive.[42–44] This dynamic was also reflected in the findings of **Chapter 3**, where 95% of physiotherapists reported providing advice to other healthcare professionals, yet only 57% reported providing advice to family caregivers.

Collaboration among health care professionals

Examples of topics where physiotherapists are coaching other healthcare professionals are the appropriate use of mobility aids or the prevention of falls. This contribution has been identified as a physiotherapy service with benefits for both the individual resident and the broader care system.[7,26] The importance of multidisciplinary collaboration is formally acknowledged in the competency guidelines for physiotherapists working with people with dementia.[27] Nevertheless, these guidelines predominantly emphasize aspects that have a direct or immediate impact on the resident. Broader systemic benefits, such as enhanced interdisciplinary communication or other indirect improvements of the quality of care, are less frequently addressed. Indeed, a 2019 systematic review on physiotherapy in nursing homes identified only two studies that clearly described the specific interventions delivered by physiotherapists in this setting, both of which focused solely on resident-centered goals: pain management and pressure ulcer prevention.[1]

Qualitative interview study design

In **Chapters 4, 5 and 6** qualitative methods were employed with interviews with informal caregivers, residents and professionals (physiotherapists and managers), respectively. It was decided to interview the various stakeholder groups separately. Specifically, the decision to conduct the interview studies **(Chapter 4 and 5)** with informal caregivers residents independently of one another was based on several considerations: the risk that participants with dementia might be overshadowed by their informal caregivers,[45] the possibility that participants with dementia might feel unable to express themselves freely in the presence of their caregiver,[46] and the methodological differences in approaching the two participant groups. From a methodological standpoint it was further decided not to interview residents with dementia during a period when COVID-19 restrictions were still frequently being tightened. Conducting interviews digitally, while wearing face masks, or under visiting limitations was deemed unfeasible. In **Chapter 6**, interviews with physiotherapists and managers were held about the barriers and facilitators for family involvement. The decision to interview professionals separately, rather than in combination

with informal caregivers or residents, was motivated by both practical and methodological considerations. First, professionals were expected to share perspectives related to organizational processes, professional responsibilities, and interprofessional collaboration, which could differ substantially from the lived experiences of informal caregivers and residents. Conducting these interviews separately allowed participants to speak freely about sensitive topics such as institutional constraints, workload, or disagreements with families, without the risk of social desirability bias or conflict in a mixed group.[47] Although focus groups with all stakeholders together might have yielded rich interactive data, this design was considered less appropriate in the context of the research objectives and ethical considerations regarding power dynamics and confidentiality.[48]

With respect to the interviewers, the interviews with the caregivers were conducted by students, while in the other two studies they were conducted by physiotherapists. We recognized that the physiotherapy background of the interviewer in **Chapter 6** had a considerable influence on the interpretation of the data. For that reason, in contrast to the generic thematic analysis founded in realist ontology approach employed in the studies described in **Chapters 4 and 5**, we deliberately chose to apply a reflexive thematic analysis for the study in **Chapter 6**, in which the researcher's perspective and background are acknowledged as playing an active role in the analytic process, and potential biases arising from the researchers background are more thoroughly evaluated.[49]

Generalizability of the study results

All data presented in **Chapters 3 through 6** were collected in the Netherlands. With regard to the participants in **Chapters 4 and 6**, the average age and proportion of female participants are comparable to those reported in a previous international study involving physiotherapists and experts working in nursing homes,[27] as well as in an interview study involving residents with dementia participating in an exercise intervention from Sweden.[34] Although the results are thus likely to be generalizable to nursing homes in other settings, the specific long-term care landscape in The Netherlands may differ substantially from that of many other countries. Dutch long-term care is characterized by a relatively large amount of formal care provision and relatively high healthcare expenditures. Moreover, the availability of nursing home care reimbursed through public health insurance is relatively unique to the Dutch context,[50] and The Netherlands has been acknowledged as a pioneer in long-term care provision.[51] As such, some of the findings from our studies may not be directly generalizable to countries with different long-term care systems.

Recommendations

Recommendations for research

A recent scoping review reported that only 0.6% of physiotherapy research published over the past decade has focused on individuals with dementia.[52] Given that more than 5% of the global population is affected by dementia,[53] and considering its status as a leading cause of disability and dependency globally, the limited volume of physiotherapy research in this area seems disproportionate and highlights a gap in the literature. A first recommendation for future research is to conduct clinical trials on physiotherapist-supervised interventions that align with physical activity recommendations as outlined in expert guidelines.[4,5,8] The pilot study described in **Chapter 7** serves as a first step towards such an approach. To improve replicability and facilitate cross-study comparison, future research should include a clear and detailed description of the setting, including organizational context, staffing structure, and care routines. In addition, a comprehensive characterization of the study population is essential, in order to better understand who benefits most from specific interventions. Consensus on the minimum set of core characteristics of the population that should be recorded with every clinical trial is needed in that respect. To ensure that interventions can be accurately replicated and evaluated, the use of the TIDieR (Template for Intervention Description and Replication)[54] framework is recommended, which provides a standardized format for reporting the essential components of complex interventions. These components include the content, delivery mode, frequency, intensity, tailoring, and fidelity of the intervention. Additionally, a standardized set of appropriate outcome measures for exercise and physical rehabilitation studies involving nursing residents with dementia is needed. Apart from outcomes reflecting effectiveness, such as mobility, performance in activities of daily living, or quality of life. Such a set should also include measures of safety, in particular possible adverse events. In addition, standardization of implementation-related outcomes (e.g., feasibility, fidelity, acceptability, adverse events) The latter type of measures is very relevant to speed up the process of the translation of research findings to daily practice. From that perspective, the consideration of a hybrid implementation-effectiveness study design[55] should be considered in the conceptional phase of each clinical trial.

Another recommendation is to explore further how physiotherapists contribute not only to the direct care of residents with dementia, but can also support the broader care network around them, including family caregivers and other professionals. As highlighted in this thesis, physiotherapists also play an important role in educating caregivers, coaching staff, and supporting interdisciplinary collaboration. Given the growing recognition of the value of integrative and network-based approaches in dementia care, future research should further investigate and define these broader roles of physiotherapists within the care system.

Ethical considerations

In research practice, individuals with dementia are still frequently excluded from study participation in exercise trials.[2,56,57] Conducting research involving individuals with dementia is subject to rigorous ethical scrutiny, a practice that is undoubtedly rooted in the intention to protect this vulnerable population.[58] Despite these challenges, it is essential to emphasize the importance of conducting research in populations where the potential benefit is greatest.[18] This implies that studies should not necessarily be conducted first in populations without cognitive impairment, but rather where the clinical relevance and impact are most significant. Moreover, the interview study with residents included in this thesis makes it clear that their perspectives, and not only those of informal caregivers and health professionals can and should be considered with the design of the future interventions and their evaluation. In fact, active involvement of patient and public in research is more and more advocated and the reporting of their contribution should be in line with current reporting guidelines.[59]

Recommendations for current practice

As described throughout this thesis and supported by international physical activity guidelines,[4,5,8] the physiotherapist is considered the expert in movement and mobility within the context of elderly care, including care provided in nursing homes and for residents with dementia. With the fairly recent introduction of movement specialists (*bewegingsagogen*) in long-term care and the upcoming presence of other professions such as personal trainers or exercise physiologists, the number of professionals focusing on movement, physical activity and exercise is increasing. Nevertheless, physiotherapists possess specific competencies to treat individuals with various illnesses and complex disabilities. Those specialized in geriatrics also have particular expertise in working with people with dementia, their families, and the care systems around them. Based on the findings of this thesis, we recommend that these competencies of the physiotherapist will be more explicitly propagated and utilized, including the consideration of a leading role of the physiotherapist in policy development related to physical activity on the organizational level. Such a role includes establishing structured collaborations of physical therapists with formal care professionals and informal caregivers and residents. In doing so, physiotherapists can apply their expertise to advise a wider range of individuals, thereby indirectly extending the reach of movement-related guidance to more residents.

Recommendations for education

A recent study showed that 59% of Bachelor's and Master's-level physiotherapy curricula in Ireland, the UK and New-Zealand dedicate no more than three hours in total to the topic of dementia care.[60] Dementia is major causes of disability and dependency among older people in primary care and nursing home care, and thus constitute a significant proportion of elderly patients in demand of physiotherapy.[61] Despite this significant

clinical demand, many physiotherapists report feeling inadequately prepared by their basic education to work effectively with this population,[60,62] which may contribute to the development of negative attitudes towards treating people with dementia.[63] This lack of preparedness may partially explain why residents with dementia receive less physiotherapy than their cognitively intact counterparts in nursing homes.[64,65] Similar concerns have been raised internationally, with multiple studies from Canada, [66] Ireland,[17] and Oceania[26,62] highlighting that current physiotherapy education insufficiently equips students to deliver competent and confident care to individuals with dementia.[18]

This raises concerns regarding whether people with dementia, both those living in the community and those residing in nursing homes, receive adequate physiotherapy. In the Netherlands, geriatric physiotherapists are the designated specialists with additional training in dementia-related disorders and their management.[67] There are approximately 1,600 registered geriatric physiotherapists in the Netherlands, all of whom have completed accredited postgraduate education.[68,69] Membership of the national professional society, however, is not mandatory, and there is no comprehensive overview of the sectors in which these physiotherapists are employed, nor of how individuals in need can readily identify and access their services. With approximately one geriatric physiotherapist available for every 1,000 older adults, the Netherlands ranks among the top 10 European countries in terms of workforce availability.[70] Internationally, considerable variation exists in educational programs, workforce capacity, and service provision for geriatric physiotherapy, which complicates direct comparisons both between and within countries.[70] Given the anticipated rise in demand for geriatric physiotherapy, strategic promotion and further development of this specialty are warranted.[71]

Overall conclusion

In summary, the findings presented in this thesis indicate considerable variation in the delivery of physiotherapy, in particular exercise interventions, to nursing home residents with dementia. The studies in this thesis made it clear that for the future delivery and evaluation of such interventions, both the individual resident and the broader system of formal and informal caregivers should be involved. More research into the effectiveness and safety of such interventions, that should be appropriately dosed and employ all strategies known to enhance participation and adherence, is urgently needed. For the comparability and interpretation of the results of future studies, adherence with the relevant reporting guidelines is essential. Given the scarcity of studies in this area as a whole, funding bodies and relevant policy makers should prioritize research in this field. Eventually, the insights from this thesis may contribute to the development of effective,

evidence-based and person-centered physiotherapy practices for nursing home residents with dementia.

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