Impact of functional rehabilitation and occupational therapy on functional and cognitive status of older people in nursing homes – results of the ICARE4OLD project

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Introduction

Functional rehabilitation (FHR) and occupational therapy (OT) are the therapies important to improve the nursing home (NH) residents' physical and cognitive functioning.

Functional rehabilitation including walking program consists of various interventions performed by a licensed nurse to assist or promote the person's ability to attain maximum functional potential. For example, a walking program includes activities used to improve or maintain the person's self performance in walking with or without assistive devices.

Occupational therapy includes services provided or directly supervised by a certified occupational therapist.

Aim of the study

The aim of study was to estimate the effects of FHR and OT on cognitive function and functional status of the NH residents.

Methods

We analyzed data collected between 2005 and 2023 from routine assessments of patients in NHs using interRAI instruments version 9.0 and the Minimum Data Set 2.0. These tools include 200 to 400 standardized variables covering clinical, functional, medical, and psychosocial domains. The analysis included over 5 million assessments from the Netherlands, Belgium, and Canada.

Functional status was measured with the Activity of Daily Living Short Form (ADLSF, range: 0-16) and cognitive functioning with the Cognitive Performance Scale (CPS, range: 0-6). To evaluate the impact of FHR and OT on outcomes, we applied machine learning techniques and used propensity score matching to pair treated residents with controls. We calculated the average treatment effect (ATE), which is the averaged outcome change between the treatment and control groups. Additionally, we estimated an Individual Treatment Effect (ITE) for each resident.

Results

Impact of functional rehabilitation on functional status

From the analysis, we excluded residents who had: gastrointestinal (GI) or genitourinary (GU) bleeding (n=297), peripheral edema (n=2994), unstable conditions (n=5098), CPS equal six (n=321) and aspiration (n=912). In addition, our models have been standardised by: age (M=83 ±SD 6.9), CPS (M=2.0 ±SD 1.7), BMI (M=25.9 ±SD 5.1), Agressive Behaviour Scale (M=0.6 ±SD 1.4) and end-stage disease (n=22). Finally, we obtained a group of 8834 residents, of whom 1.9% (n=166) received an FHR.

Analyses conducted on data from the Netherlands and Belgium showed that FHR has a positive impact on the functional status of NH residents (Figure 1).

The average treatment effect was -0.32 [95% CI from -0.58 to -0.05]. A predicted effect lower than 0 indicates less decline, no decline, or greater improvement in ADL among residents who received FHR compared to those without FHR.

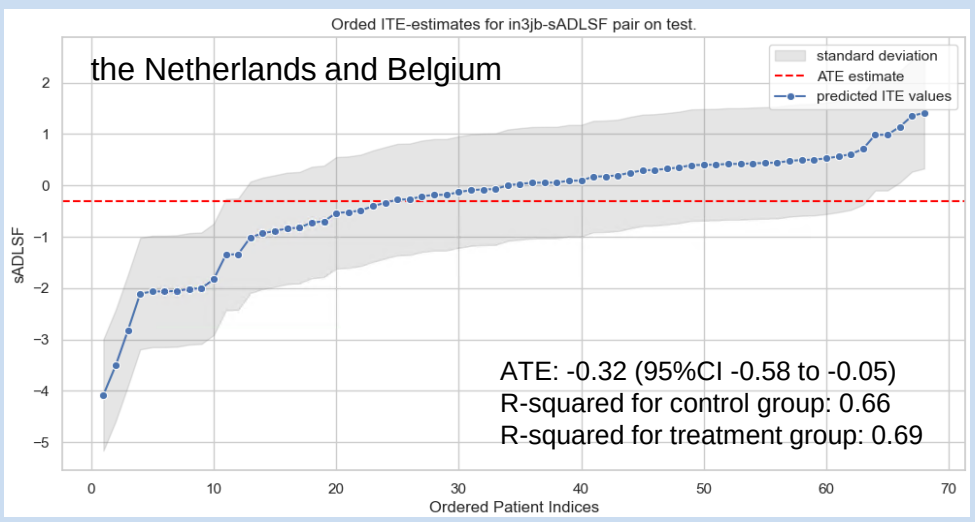

Figure 1. Impact of Functional Rehabilitation* on Functional Status Over a 6-Month Period (n=332)
*at least 45 minutes FHR per week

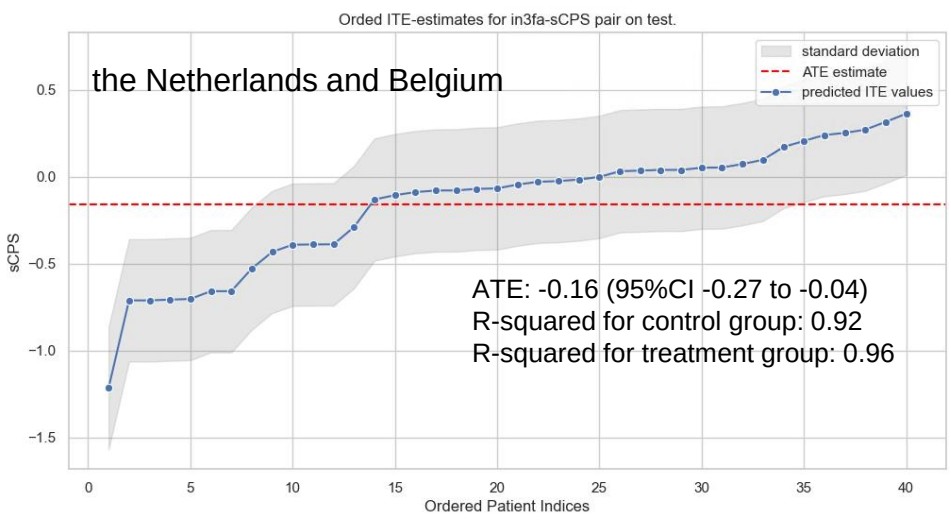

Figure 2. Impact of Occupational Therapy * on Cognitive Status Over a 6-Month Period (n=200)
*at least 4 days per week (minutes OT per week >= 15 minutes)

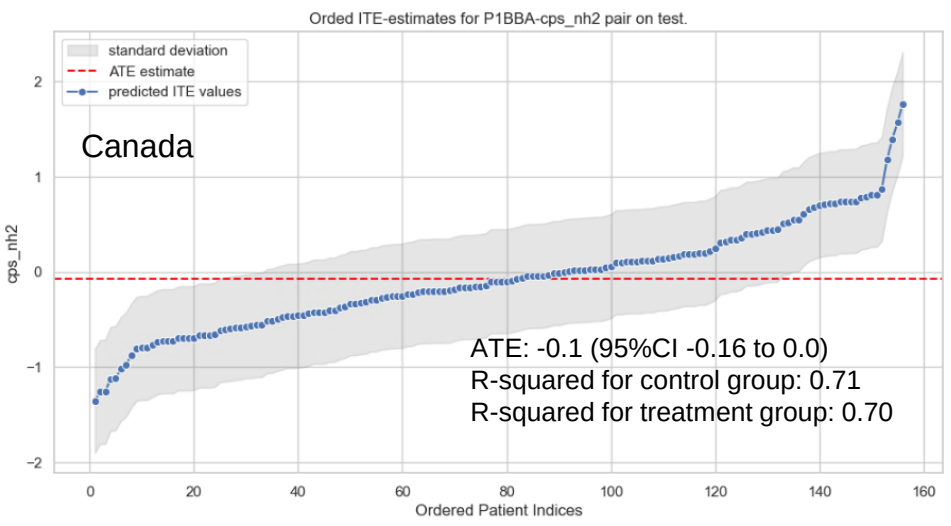

Figure 3. Impact of Occupational Therapy * on Cognitive Status Over a 6-Month Period (n=776)
*at least 4 days per week (minutes OT per week >= 15 minutes)

Impact of occupational therapy (OT) on cognitive status

The criterion for inclusion of residents in the analyses was meeting at least one of the following condition: Parkinson's disease (n=619), stroke (CVA) (n=2429), schizophrenia (n=105), bipolar disease (n=74), anxiety (n=1066), social withdrawal (n=2288) and reduced social interactions (n=3297).

From the analysis, we excluded residents who had: chest pain (n=472), aspiration (n=681), fever (n=121), GI or GU bleeding (n=172) pneumonia (n=166), abnormal thought proces (n=2297) and hallucinations (n=989). We also included the following factors as confounders in the models: age (M=82 ±SD 6.3), any bone fracture (n=135), presenting conflict with other care recipients (n=1060) or with staff (n=1059), causing staff frustration (n=661), end-stage disease (n=55) and palliative care (n=56). Finally, we obtained a group of 6354 residents, of whom 1.6% (n=100) received an OT.

Analysis showed a positive effect of OT on cognitive functioning (ATE: -0.16, 95%CI from -0.27 to -0.04). The goodness of fit of the model to the data was very high (Figure 2). These results were confirmed on data from Canada (ATE: -0.1, 95%CI from -0.16 to 0.0) (Figure 3).

Conclusions

Our analysis might support professionals providing care to older residents in nursing homes in making decisions on prescribing functional rehabilitation or occupational therapy. The use of these therapies varies between countries and therefore their impact on residents' functioning may differ. Hence, their effect should be adjusted to the country context.

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