Review of "A tablet-based intervention for activating nursing home residents with dementia: results from a cluster-randomized controlled trial" by O'Sullivan et al.

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Key highlights:

- A multicomponent tablet-based non-pharmacological intervention (TBI) did not reduce apathy among nursing home residents with dementia. Changes in apathy scores between the TBI and control group (conventional activity session) was not statistically significant.
- A reduction of psychotropic medication was found for the TBI group compared to the control group, which demonstrates a potential benefit of this non-pharmacological intervention. Improvement in global quality of life following the intervention was revealed across both groups, which indicates possible effectiveness of both interventions.
- A high rate of staff turnover adversely impacted the quality of implementation in a nursing home setting, and its own intense intervention contents may account for non-significant group differences in apathy. Future research is warranted and should consider the burdens of the study on both staff and residents and its influence on attrition rate.

Dementia is one of the greatest health challenges globally with no cure is in sight currently. According to WHO (2021), around 55 million people live with dementia, and the number is expected to rise to 78 million in 2030, forecasting tremendous medical and care costs. To improve the quality of care for people with dementia (PWD), numerous trials are investigating treatments for different symptoms of dementia. However, despite being one of the most common neuropsychiatric symptoms in dementia apathy does not get enough focus. With often undesirable effects of medical treatment (O'Sullivan et al, 2022), research interest in non-pharmacological interventions for managing apathy has been growing. However, due to lack of a standardized approach, research results have been mixed and understanding of its effects remain unclear.

To fill in these gaps, O'Sullivan et al. (2022) used a cluster-randomized controlled approach to examine the effect of tablet-based intervention (TBI) in apathy (primary outcome) compared to conventional individual activity sessions (CAS). Meanwhile, effects on secondary outcomes including quality of life and neuropsychiatric symptoms were also investigated. Participants were randomly assigned to either TBI or CAS groups at the nursing home level to avoid contamination across groups. Ten nursing homes in Berlin Germany were recruited from June 2016 to May 2017. Based on eligibility criteria related to dementia diagnosis or cognitive impairment and power analysis, 162 participants were included in this study. Participants received regular TBI (n = 80) with stimulating activities developed to engage people with dementia or CAS (n = 82) for 8 weeks.

This prospective longitudinal study reported three major findings. First, there was no statistically significant differences in the level of apathy between the TBI intervention group and the CAS control group. Apathy Evaluation Scale – Informant version (AES- I) was used to assess apathy, and a linear mixed-effect model analysis showed that the average AES-I score was 48.27 (95% CI 45.32, 51.21*)* post-intervention in the TBI group which was similar to the CAS group at 48.51 (95% CI 45.61, 51.42). Thus, this finding did not support the authors' hypothesis that TBI could reduce apathy in PWD. However, given the fact that the level of apathy decreased slightly in both groups (mean decrease in AES-I of 0.61 points, 95% CI − 3.54, 2.33 for TBI and 0.36 points, 95% CI − 3.27, 2.55 for CAS) more effective interventions are needed. Considering several studies reported beneficial outcomes of occupational therapy, sports activities, and musical therapy in decreasing apathy, despite mixed results, it would be worthwhile incorporating these activities into information and communication technologies (ICT)-based intervention strategies. With more research and greater understanding more effective strategies for reducing apathy can be developed for the future.

The second finding is that a reduction of psychotropic medication was found for the TBI group compared to the CAS group. A generalized estimating equations model analysis showed that group differences in number of psychotropic medication prescriptions following in the intervention was statistically significant (mean in TBI 1.56, 95% CI 1.37, 1.76; mean in CAS 1.99, 95% CI 1.81, 2.17). This result points to the potential for non-pharmacological interventions in reducing the number of psychotropic drugs for nursing home residents with dementia. However, since the difference in NPI-NH scores used for assessing neuropsychiatric symptoms were not statistically significant, the reduction in psychotropic prescriptions cannot be interpreted as an improvement in neuropsychiatric symptoms. Future studies could investigate the impact of ICT-based interventions on psychotropic medication prescriptions further.

O'Sullivan et al. (2022) reported another major finding which indicated an improvement in quality of life for both groups post-intervention. In terms of ecological momentary assessments of quality of life, improvement was greater for the CAS group compared to the TBI group (β = .43; 95% CI .30, .56, $p<.001$). Since the results of non-pharmacological interventions often do not last after the cessation of the intervention, the results of this study are very meaningful for patients, family, and nursing home staff; clinicians could have a better understanding about what situational activities are more effective in improving quality of life for PWD.

The challenges unique to PWD and their families call for rigorous research on strategizing effective treatments and improving quality of life. Although O'Sullivan et al. did not detect significant changes in apathy across groups, the study still had important clinical and research implications. First, in terms of the intervention content, it is important for researchers to be mindful of the additional physical and mental burdens placed on PWD when designing future interventions. Given the fact that most participants (85%) failed to complete the originally scheduled 24 sessions, and 13 participants in the TBI group terminated the study because the TBI was too mentally challenging and stressful, researchers should carefully consider the biopsychosocial characteristics of this population. Second, this study was implemented in nursing homes with high staff turnover, which may partly explain why only 59% of interventions

requiring staff assistance were carried out. Future studies should account of different reasons for attrition and develop back-up plans in-advance.

In conclusion, this novel study delivered an intervention using a portable computer as the main device. With increasing prevalence of this technology, ICT-based interventions may have great potential in the future for PWD. In the meanwhile, researchers should be mindful of potential barriers of novel technology (e.g., unfamiliarity, mental burdens). Future studies may need to fully consider the challenges of implementing ICT-based interventions, so that these interventions can be further designed and tailored to improve quality of life among PWD.

References:

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