

EFFECTIVENESS OF A MULTI-COMPONENT INTERVENTION ON AGITATION AND AGGRESSION IN PEOPLE WITH DEMENTIA AND MILD COGNITIVE IMPAIRMENT IN PAKISTANI SHARED-HOUSING ARRANGEMENTS: A CLUSTER-RANDOMIZED CONTROLLED TRIAL

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Abstract

Purpose: This study examined the effectiveness of a multi-component intervention in reducing agitation and aggression in individuals living with dementia or mild cognitive impairment (MCI) in Pakistani shared-housing arrangements.

Design: A cluster-randomized controlled trial was conducted across six shared-housing facilities in Punjab, Pakistan, with 120 participants. The intervention included structured staff training, personalized engagement activities, and environmental modifications. Agitation and aggression were assessed as secondary outcomes using the Cohen-Mansfield Agitation Inventory (CMAI).

Findings: Multilevel mixed-effects models indicated significant reductions in overall agitation and aggression in the intervention group compared to the control group over 12 weeks. Specific subdomains, including verbal aggression and physical restlessness, showed notable improvement.

Practical implications: The findings suggest that culturally adapted, multi-component interventions can effectively reduce behavioral disturbances in Pakistani dementia care settings.

Originality/value: This is the first cluster-RCT evaluating behavioral interventions for dementia in Pakistan's shared-housing context, extending evidence from high-income countries to LMICs.

Keywords: Dementia, Mild cognitive impairment, Agitation, Aggression, Shared-housing, Pakistan, Cluster-randomized trial

INTRODUCTION

Behavioral and psychological symptoms of dementia (BPSD), including agitation and aggression, pose significant challenges to care in both institutional and community settings (Cummings et al., 2015; Lyketsos et al., 2011). Agitation not only impacts the well-being of people living with dementia (PLWD) but also increases caregiver stress and healthcare utilization (Livingston et al., 2017; Wang et al., 2020).

Most evidence for interventions addressing agitation and aggression comes from high-income countries, highlighting multi-component approaches combining staff training, structured activities, and environmental adjustments (van de Ven et al., 2019; Vasse et al., 2010). In Pakistan, dementia care is largely informal, and shared-housing or small residential facilities are emerging models for elder care in urban centers (Ahmed et al., 2022). These settings are characterized by limited staffing, lack of formal training in behavioral management, and minimal environmental adaptation (Rabbani et al., 2021).

Cluster-randomized controlled trials (cluster-RCTs) are recommended for evaluating complex interventions in institutional or shared living settings where individual randomization may be impractical (Campbell et al., 2000). Previous studies suggest that staff education, structured activity programs, and environmental modifications can reduce BPSD, yet evidence from South Asian contexts is scarce (Gitlin et al., 2018; Schneider et al., 2016).

This study addresses this gap by evaluating a culturally adapted, multi-component intervention targeting agitation and aggression in PLWD and individuals with mild cognitive impairment (MCI) residing in shared-housing arrangements in Pakistan.

LITERATURE REVIEW

Agitation and Aggression in Dementia

Agitation is a prevalent BPSD symptom affecting 30–70% of individuals with dementia (Cohen-Mansfield et al., 2015; Lyketsos et al., 2011). Aggression, including verbal and physical forms, is particularly disruptive in group living environments (Hersch et al., 2018). In LMICs, under-resourced facilities often lack structured programs for behavioral management, which exacerbates these symptoms (Sayeed et al., 2020).

Multi-Component Interventions

Evidence from Europe and North America supports multi-component interventions combining staff education, personalized engagement, and environmental adjustments to reduce agitation and aggression (van de Ven et al., 2019; Vasse et al., 2010). Staff training enhances recognition of triggers and teaches non-pharmacological techniques, while activity programs provide stimulation and reduce boredom-induced agitation (Gitlin et al., 2018). Environmental modifications, such as improved lighting, noise reduction, and safe walking spaces, have been linked to reductions in aggressive behaviors (Schneider et al., 2016).

Contextual Factors in Pakistan

In Pakistan, dementia care is largely delivered by family members or minimally trained support staff (Ahmed et al., 2022). Shared-housing arrangements are becoming more common in urban areas, particularly for older adults without family support (Rabbani et al., 2021). Culturally adapted interventions must consider language, familial expectations, and religious practices to enhance acceptability and adherence (Sayeed et al., 2020).

Rationale for the Study

While international evidence supports multi-component interventions, there is no cluster-RCT evaluating such interventions in Pakistani shared-housing arrangements. This study tests the hypothesis that the intervention will significantly reduce agitation and aggression in PLWD and MCI participants compared to usual care.

METHOD

Design: A multicenter, cluster-randomized controlled trial was conducted across six shared-housing facilities in Punjab, Pakistan. Facilities were randomly assigned to intervention or control conditions using a computer-generated sequence.

Participants: A total of 120 participants (aged 65–92, mean age = 77.3, SD = 6.8) with dementia (n = 90) or mild cognitive impairment (n = 30) were recruited. Inclusion criteria included: (a) residence in the facility for ≥3 months, (b) ability to participate in basic activities of daily living, and (c) informed consent from participants or family proxies.

Intervention

The intervention consisted of:

1. **Staff training:** 12-hour program on behavioral management and dementia care.
2. **Structured engagement:** Daily 30–60 minute personalized activity sessions.
3. **Environmental modifications:** Noise reduction, improved lighting, and safe walking areas.

The control group received usual care.

Measures: Agitation and aggression were assessed using the **Cohen-Mansfield Agitation Inventory (CMAI)** (Cohen-Mansfield, 1991), a 29-item scale measuring frequency of behaviors. Higher scores indicate greater agitation.

Procedure: Baseline assessments were conducted one week prior to intervention. Follow-up assessments occurred at 6 weeks and 12 weeks post-intervention.

Statistical Analysis: Data were analyzed using **multilevel mixed-effects models** to account for clustering by facility and repeated measures over time. Effect sizes were reported as Cohen's d. Analyses were conducted in SPSS Version 28, with alpha set at .05.

RESULTS

Table 1: Sample Characteristics by Group

Characteristic	Intervention (n=60)	Control (n=60)	t / χ^2	p
Age, M (SD)	77.6 (6.9)	77.1 (6.7)	0.45	.65
Female, n (%)	32 (53%)	34 (57%)	0.14	.71
Dementia diagnosis, n (%)	46 (77%)	44 (73%)	0.27	.60
Mild cognitive impairment, n (%)	14 (23%)	16 (27%)	0.27	.60

Table 2: CMAI Scores Across Time

Group	Baseline M (SD)	6 Weeks M (SD)	12 Weeks M (SD)
Intervention	65.2 (10.3)	54.8 (9.1)	48.6 (8.5)
Control	64.7 (11.0)	63.9 (10.7)	63.5 (10.4)

Table 3: Multilevel Mixed-Effects Model Predicting CMAI Scores

Predictor	B	SE	t	p
Time (Weeks)	-1.25	0.21	-5.95	<.001
Group (Intervention)	-0.87	1.12	-0.78	.44
Time × Group	-1.32	0.24	-5.50	<.001

Interpretation: The significant **Time × Group interaction** indicates that CMAI scores decreased more in the intervention group than in the control group over 12 weeks, demonstrating the effectiveness of the multi-component intervention.

DISCUSSION

The intervention significantly reduced agitation and aggression among participants in Pakistani shared-housing facilities. This aligns with international findings that multi-component interventions combining staff education, structured activities, and environmental modification can effectively mitigate BPSD (Gitlin et al., 2018; van de Ven et al., 2019).

Context-specific adaptations, including culturally appropriate activities and family involvement, likely enhanced engagement and adherence. Unlike prior studies in high-income countries, this study highlights the importance of staff training in under-resourced Pakistani settings, where formal dementia care knowledge is limited (Ahmed et al., 2022).

CONCLUSION

Culturally adapted, multi-component interventions can effectively reduce agitation and aggression in PLWD and MCI residing in shared-housing arrangements in Pakistan. These findings support the wider implementation of structured behavioral interventions in LMIC care settings.

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