

Effectiveness of Fluoride Varnish in Caries Prevention among Older Adults in Care Homes



Nic Iomhair A¹, Kelly N¹, McKenna G^{1,2}, Watson S²

1. Belfast Health and Social Care Trust 2. Centre for Public Health, Queen's University Belfast



Introduction

- Older adults residing in care homes experience significant inequalities in oral health, in comparison to their age-equivalent community-dwelling counterparts.¹⁻³
- The annual dental caries increment among older people in care homes is more than double that of those in the community, while in those suffering from dementia, it is more than twice the rate again.⁴
- Evidence on the effectiveness of oral health interventions for care home residents has been identified as a priority research area by the National Institute for Health and Care Excellence.¹
- While a small number of previous studies have suggested a potential role for fluoride varnish application in the prevention and arrest of carious lesions among older adults in care homes, further research is required to consolidate these findings.

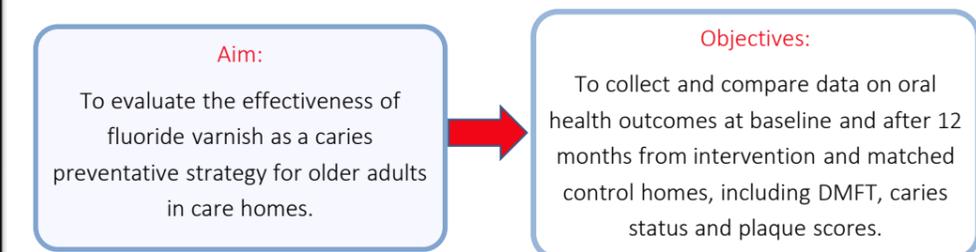
Background

- During 2016-2017, the Community Dental Service within the Western Health and Social Care Trust (WHST) in Northern Ireland were allocated funding by the Department of Health to pilot an Oral Health Prevention Programme for dentate adults in care homes. (Figure 1)
- The purpose of this scheme was to improve the overall oral health of residential and nursing home residents through the delivery of an extended preventative programme.
- Nine nursing and residential homes within the geographical area covered by the WHST were invited to participate.
- To enable comparison of oral health outcomes between those receiving the intervention and those receiving standard care, the nine nursing and residential homes involved were matched with nine control homes in the WHST.

Oral Health Prevention Programme	
Annual Oral Health assessment	
Fluoride varnish application for eligible residents biannually	
Oral hygiene instruction for residents	
Training of care home staff on oral hygiene and dietary practices, as well as screening of oral tissues for abnormalities	
Development of a resource folder with oral health care plans, advice sheets and training materials	

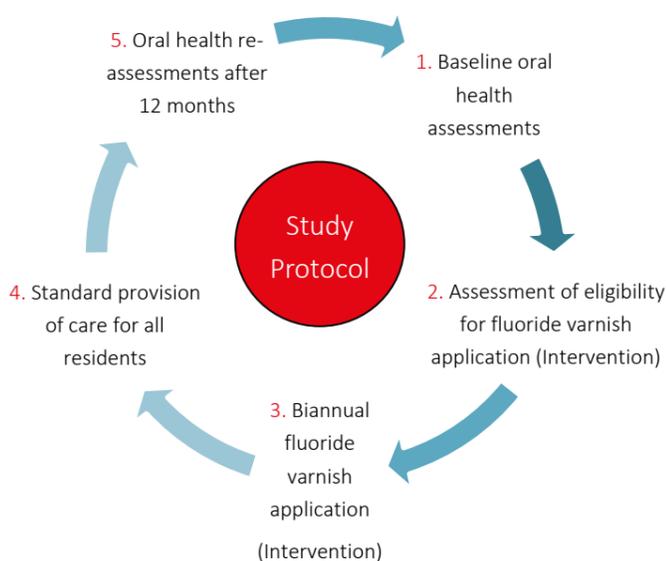
Figure 1: Components of the Oral Health Prevention Programme for dentate adults in care homes

Methodology



Study Sample

- 407 older adults randomised to control (n= 217) or intervention groups (n=190).
- 71% (n=291) female with a mean age of 84.1 yrs.
- 43% (n=175) lost to follow-up at 12-months.
- No significant differences detected between intervention and control groups in terms of age, gender and baseline oral health measurements.



Statistical Analysis

Data	Statistical Test
Continuous variables	Independent samples t-test
Categorical variables	Chi-square
Within group changes in oral health outcomes	Paired samples t-test
Between group changes in oral health outcomes	Analysis of Covariance (ANCOVA)

- Models adjusted for baseline measurement and DMFT.
- Analyses undertaken using complete case and last observation carried forward (LOCF) (to deal with missing data) approaches.

Results

Intervention

- As per **Table 1**, at 12-month follow-up, there was a significant reduction in the mean number of carious teeth but a significant increase in mean DMFT score.
- Although the mean plaque score within the intervention group did decrease from baseline, this change was not significant.

Control

- Significant increases in the mean number of carious teeth, mean plaque score and mean DMFT score were noted at 12-month follow-up within the control group.

Comparison

- Mean differences in plaque score reduction and the number of carious teeth between the groups (favouring the intervention group) were **-1.69** (95% CI: -2.86, -0.53) and **-0.98** (95% CI: -1.19, -0.78) respectively.
- No between group differences identified in DMFT scores.
- High plaque scores consistently noted among both groups with 67.1% of all participants at initial assessment and 76.8% of participants at reassessment awarded a plaque score of 100.
- Similar results observed using LOCF approach for dealing with missing data.

Table 1: Oral health outcomes between intervention and control groups

Oral health outcome	Study group	Baseline Mean (SD)	Mean change from baseline (95%CI) ^a	Mean difference between groups (95% CI) ^b	P value
Complete case analysis					
No. of carious teeth	Intervention (n=101)	4.65 (1.27)	-0.85 (-1.12, -0.58)***	-0.98 (-1.19, -0.78) ^c	<0.001
	Control (n=131)	4.48 (1.37)	0.21 (0.05, 0.37)*		
Plaque Score	Intervention (n=101)	88.97 (13.97)	-0.06 (-1.13, 1.01)	-1.69 (-2.86, -0.53) ^c	0.004
	Control (n=131)	91.17 (10.78)	1.16 (0.28, 2.04)*		
DMFT Score	Intervention (n=101)	21.49 (3.62)	0.10 (0.03, 0.17)**	-0.05 (-0.16, 0.07)	0.420
	Control (n=131)	21.87 (3.04)	0.13 (0.04, 0.22)**		
LOCF analysis					
No. of carious teeth	Intervention (n=190)	-	-0.45 (-0.61, -0.30)***	-0.52 (-0.67, -0.37)	<0.001
	Control (n=217)	-	0.12 (0.03, 0.22)*		
Plaque Score	Intervention (n=190)	-	-0.03 (-0.60, 0.53)	-1.02 (-1.73, -0.31)	0.005
	Control (n=217)	-	0.70 (0.17, 0.12)*		
DMFT Score	Intervention (n=190)	-	0.05 (0.01, 0.09)**	-0.03 (-0.10, 0.03)	0.310
	Control (n=217)	-	0.08 (0.03, 0.13)**		

Discussion

- Findings suggest a potential role for fluoride varnish as a caries preventative strategy for older adults in care homes.
- Limitations include small sample size, high rates of attrition and incomplete data collection.
- Poor oral hygiene was evident in both groups at initial and subsequent oral health assessments, despite oral hygiene training for care home staff within the intervention group.
- Consideration should be given to factors that may prohibit the implementation of recommended hygiene practices, including time and staffing constraints within care homes.
- The application of fluoride varnish has previously demonstrated effectiveness in controlling coronal and root caries among elderly in long-term care facilities, although it was less efficient in those with poor oral hygiene.⁵
- An even greater caries preventative effect could be achieved through the application of fluoride varnish, if effective oral hygiene practices are also implemented.

Conclusions

- Study supports the findings of the limited previously published research demonstrating the effectiveness of fluoride varnish application in the prevention and arrest of carious lesions among older adults in care homes.
- Need for improved oral hygiene practices among care home residents has also been identified
- Further research on a more extensive scale is needed to strengthen the body of evidence advocating the use of fluoride varnish in the prevention of caries among older adults in care homes.
- Additional investigation into the most effective strategies to improve the oral hygiene of care home residents is also required.

References

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