

Promoting oral and dental healthcare among the elderly in a residential care home in Isfahan: a best practice implementation project

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ABSTRACT

Introduction: Oral health is an important aspect of general health, which affects the wellbeing and quality of life of older adults. Residents in aged care facilities often suffer from overall dental neglect and insufficient oral healthcare, leading to moderate-to-high levels of oral diseases. Furthermore, physical or mental health concerns may result in difficulties in maintaining good oral health.

Objectives: This implementation project aims to audit and improve the oral healthcare status of the elderly living in a residential care home in Isfahan, Iran using the JBI evidence summary.

Methods: The methods are preimplementation and postimplementation design using audit and feedback with a situational analysis to guide implementation planning. Seven evidence-based quality indicators were used to measure preintervention compliance with the best practice. Situational analysis was used to identify and target barriers through locally developed practice change strategies following which a repeat audit was conducted at 4 months. Four nursing staff, 11 caregivers, and 38 residents were interviewed for both the baseline and the follow-up audit.

Results: Compliance rates improved for all seven criteria except the use of a soft-bristled toothbrush (criterion 6). All eight categories of criterion 2 measuring assessment of oral health improved by at least 10%, with the largest improvements in saliva assessment and gingiva assessment. Criterion 1 (oral health training for caregivers) reached the greatest compliance rate (100%).

Conclusion: The implemented strategies included improving knowledge and changing the attitudes of the caregivers through organizing educational sessions. These strategies were developed to address process and structural barriers to best practice and were helpful for staff uptake of evidence.

Key words: aged care, dental care, evidence-based practice, oral health, residential facilities

JBI Evid Implement 2023; 21:25–35.

What is known about the topic?

- Residents living in aged care facilities often have poor oral hygiene and overall dental neglect.
- Limited knowledge and widespread psychological barriers when working on someone's mouth are the key reasons why aged care staff are reluctant to prioritize oral healthcare.

- Various physical and mental disabilities such as dementia may result in difficulties in maintaining good oral health.

What does this article add?

- Key barriers included a lack of standardized oral health assessment instrument and lack of formal care protocols for oral hygiene, leading to gaps in the quality of oral hygiene.
- Using JBI GRIP was instrumental in group-based problem-solving with clinical staff co-developing localized implementation strategies to address barriers.
- Group education with standardized care protocols has varied yet overall positive effects on compliance with best practice and facilitated a more proactive, consistent approach to oral hygiene among clinical staff.

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DOI: 10.1097/XEB.0000000000000353

Introduction

Oral health is an important part of general health, which affects well being and quality of life.¹ It is widely shown that oral health condition has various impacts on people's daily living, and influences many aspects as how they speak, chew, taste food, as well as their social well being.¹

Dental caries, when not treated, leads to the destruction of tooth structure, tooth loss, and eventually edentulism.² Edentulism impairs mastication, leading to deficient nutritional intake.² Furthermore, it leads to altered speech and changes in facial aesthetics, which negatively affect self-esteem and social communications.² Some authors have even proposed complete edentulism as a risk factor for mortality.^{3,4} There is also wide evidence supporting the association between oral diseases (especially periodontitis) and systemic diseases such as diabetes, cardiovascular diseases, and pulmonary infection.^{5–7}

Several variables have been associated with poor oral hygiene, among which, aging is one of the strongest risk factors.² Among adults over 65 years old, elevated prevalence of partially/complete edentulism and chronic oral diseases such as periodontal disease, dental caries, gingival recession, and oral mucosal lesions, as well as increased risk for oral cancer and temporomandibular joint disorders have been reported.^{8,9} As a side effect of medical drugs (especially antidepressants, antihypertensives, and antipsychotics), hyposalivation leading to xerostomia is more common in the elderly.¹⁰ Xerostomia significantly increases the risk of caries, mucosal lesions, periodontal diseases, and impaired taste.¹⁰

The institutionalized elderly population are even more vulnerable, with poor oral hygiene and overall dental neglect.¹¹ A recently conducted systematic review,¹¹ which included 25 studies on the oral health status and quality of life of the institutionalized elderly from 19 countries, reported high rates of oral and dental problems: moderate-to-severe periodontitis (approximately 30%), over 20 decayed, missing or filled teeth in each resident on average, mucosal lesion (over 10%), denture problems (up to 40%), calculus (over 50%), and denture plaque index (over 80%).

On the other hand, oral care for institutionalized elderly has not been encouraging. A study in Canada concluded that over half of the caregivers reported being rushed in their last shift providing oral care to residents, and 19% missed oral care.¹² In the USA, a study reported that less than 16% of the dependent residents had their teeth brushed, and none received oral assessment, dental flossing, or rinsing with mouthwash.¹³

Oral healthcare provision for institutionalized elderly is problematic for several reasons:

1. Aged care staff usually consider that feeding, toileting demands, and behavioral issues among residents often take more priority over oral healthcare.¹⁴ Studies have shown that psychological barriers exist when cleaning elders' mouth because of their personal values of oral health, or their perspectives that residents have to take oral care themselves.¹⁵ A study assessing the attitudes and perceptions among caregivers in nursing homes showed that the majority of caregivers (87%) considered oral care tasks unpleasant.¹⁶
2. Nursing home caregivers rarely receive proper training and often lack the knowledge to deliver appropriate oral care to residents.^{17,18} Caregivers, who provide 80% of the direct care in nursing homes, are often unregulated, nonprofessional workforce.¹⁹
3. Caregivers experience heavy workloads and encounter interruptions throughout their care delivery.²⁰ Long working hours and work stress increase the risk for burnout and job dissatisfaction,²¹ which can negatively impact their health and finally the quality of provided care.²²
4. Most of the residents need assistance for at least one activity and over half of them are dependent on caregivers for all daily activities, including oral care.²³ In addition to dependence, the oral care provision may get even more complicated for residents with behavioral and cognitive impairments.²⁴ Residents with dementia may need extra assistance maintaining oral health.¹⁵ On the other hand, some may lack cooperation or exhibit resistant behaviors opposing the efforts of the caregiver, which is considered a challenging barrier to providing proper oral care.¹⁵

Lack of support for regular oral hygiene habits might increase the risk of oral diseases among dependent residents. The best evidence regarding oral healthcare consists of brushing twice daily with a soft-bristled toothbrush and fluoridated toothpaste, and dental flossing once a day. In addition, for edentulous residents, it is recommended that they remove and soak the denture in water overnight and clean it with soap and water at least once daily.^{25–27} Furthermore, best practice recommendations suggest that aged care staff attend a training course on oral and dental healthcare of the elderly and evaluate residents' oral health status routinely.²⁷

Similar to the results of worldwide studies, local studies on the oral health status of the residents

in nursing homes in Iran demonstrate a poor situation.^{28–30} Therefore, we decided to conduct a best evidence implementation project in one of the residential care homes in Isfahan, Iran to get evidence into practice, as well as to identify and document useful strategies to improving oral care in residential homes, which can be utilized in other centers. This project used the JBI evidence summary to audit the level of compliance with the best practice recommendations and to improve the practice of caregivers regarding the oral healthcare of the elderly.

Aims and objectives

The overall aim of this project was to partner with residential aged care in the evaluation and improvement of oral hygiene for older adults by improving local compliance with JBI evidence-based quality indicators. The audit question of the project is ‘Is oral and dental healthcare among the elderly living in a residential care home in Isfahan compliant with the best evidence-based recommendations?’

Specific objectives of the current project are as follows:

1. To determine current compliance of caregivers with best practice recommendations for oral and dental hygiene care for the elderly living in a residential care home in Isfahan.
2. To identify barriers and strategies to improve compliance and develop strategies to address areas of noncompliance.
3. To evaluate changes in compliance with the evidence-based practice recommendations following the implementation of strategies to address identified barriers and enhance identified facilitators.

Methods

This implementation project was conducted in Niknam residential care home, Isfahan, Iran. This center is run by a manager, 4 nursing staff, and 11 caregivers providing direct care to the residents. *JBI Handbook for Evidence Implementation* was followed for performing the present project.³¹ The project was registered as a quality improvement activity and, therefore, did not require ethical approval. However, the project ensured confidentiality and anonymity. The JBI Implementation approach is grounded in the audit and feedback process along with a structured approach to the identification and management of barriers to compliance with recommended clinical practices. It consists of seven stages including: identification of practice area for change, engaging change agents, assessment of context and

readiness to change (i.e. situational analysis), review of practice (i.e. baseline audit) against evidence-based audit criteria, implementation of changes to practice, re-assessment of practice using a follow-up audit, and consideration of the sustainability of practice changes. These steps fit into three main phases of baseline audit, Getting Research into Practice (GRiP), and follow-up audit.³² This evidence implementation project used the JBI Practical Application of Clinical Evidence System (JBI PACES) and GRiP audit and feedback tool which cover the three-phase process.³²

Phase 1: Stakeholder engagement and baseline audit

This phase constitutes the first four stages of the JBI implementation approach.³¹ During a meeting, we reviewed the local reports about the visited residential care homes in Isfahan, Iran and considering the importance of oral health, frequent dental neglect and its consequences among the institutionalized older adults as well as the reports on the poor oral health status of institutionalized elderly in the nursing homes in Iran,^{28–30} this area was selected as the practice area for change (Stage 1; identification of practice area for change).

All the relevant stakeholders, including the project team members, the manager of the residential care home, the staff (nursing staff and caregivers), and the residents were engaged. The project team consisted of a project leader (A.V.), project supervisors and consultants (A.M. and A.T.), and project colleagues (P.I. and B.T.). The project leader was responsible for the promotion of the project, process control, and data analysis. All team members were engaged for scheduling and developing the strategies and helping to implement them to improve oral and dental hygiene care. Project supervisors and colleague, and the manager of the care home helped in identifying barriers and facilitators, and to bring the available resources to implement the strategies. The nursing staff were engaged in planning and reviewing the strategies and were responsible for supervising and assisting the caregivers in providing direct oral care to the residents. The caregivers were responsible for direct oral care, implementing the developed strategies, and providing education to independent residents. A dentistry student was responsible for interviewing the residents and the nurses of the residential care home and collecting data (Stage 2: engaging change agents).

A planning meeting was held to clarify the objectives of the project, review the project stages, and to inform the stakeholders about the best evidence recommendations, as well as to specify the individual responsibilities in the

project. Feedback of the stakeholders were gained regarding each item. Furthermore, we discussed and reached a consensus with the manager and staff of the residential care home about the feasibility of probable changes in the practice, their commitment to change, and the availability of resources to support implementation (Stage 3: context assessment).

The baseline audit was conducted based on the criteria obtained from the best evidence^{25–27} to determine the baseline compliance of the setting. Baseline audit was done from 25 September 2021 to 30 September 2021. Table 1 demonstrates the audit criteria, sample size, and the approach to the measurement of compliance with best-evidence practice. Four nursing staff, 11 caregivers, and 38 residents were considered as the sample size for the baseline audit (Stage 4: baseline audit).

Seven evidence-based audit criteria for the improvement of oral hygiene in adults were considered as follows.^{25–27}

1. Caregivers of the residents are advised to attend a training course on oral and dental healthcare.
2. Caregivers are advised to assess the residents' oral health status in eight categories: assessment of voice, lips, tongue, saliva, oral mucous membrane, gingiva (gums), teeth, and swallow reflex.
3. Residents with dentures are advised to remove and soak the denture in water overnight.
4. Residents with dentures are advised to brush the denture with soap and water daily.
5. In dentate residents, a toothbrush in conjunction with fluoridated toothpaste be used at least twice daily.
6. In dentate residents, a soft-bristled toothbrush be used.
7. In dentate residents, dental floss be used daily.

Phase 2: Design and implementation of Getting Research into Practice strategies to improve practice

The second phase, constituting of Stage 5, was conducted from 2 October 2021 to 22 December 2021. A meeting was held and according to the results of the baseline audit, the team members identified the gaps and barriers between current practice and the best evidence recommendations regarding oral and dental healthcare. Then, the project team discussed the potential strategies to overcome the identified barriers. Finally, an action plan was developed to achieve the improvement (Stage 5: implementation of changes to practice).

Phase 3: Follow-up audit after the implementation of the compliance improvement strategy

The follow-up audit was conducted from 25 up to 29 December 2021 (Stage 6; re-assessment of practice). The same audit criteria and methodology as in the baseline audit were used to measure the outcomes after the implementation of evidence-based practice. The follow-up audit was carried out in the same sample size as the baseline audit in 4 nursing staff, 11 caregivers, and 38 residents. The results were entered into JBI PACES online software to be analyzed and evaluate the efficiency of the implementation. For assessing the sustainability of the changes, we would consider a re-audit at 12 months from the follow-up audit (Stage 7: consideration of the sustainability of practice changes).

Data analysis

The results of the baseline and follow-up audits were analyzed utilizing the JBI PACES online software (version 0.0.11, 2022) designed by the JBI, Adelaide, South Australia, Australia.

Results

Phase 1: Baseline audit

For the audit criteria 1 and 2, a sample of 4 nurses and 11 caregivers were assessed. Data were collected from 25 up to 30 September 2021. The findings of the baseline audit (Fig. 1) showed that 4 (26.67%) caregivers had attended training sessions on oral and dental healthcare (criterion 1). Regarding criterion 2, none of the caregivers assessed the residents' oral health status in all of the eight categories. The mean compliance rate for categories within criterion 2 was 45%. Detailed rates of compliance for each category are depicted in Fig. 1 (bar number 2 to bar number 9). For assessment of criteria 3–7, 38 residents of Niknaman residential home were interviewed. Twenty-three (60.52%) residents were edentulous using complete dentures, and 11 (28.94%) were dentate, having some of their own teeth. Four (10.52%) residents were edentulous but did not have any denture. 43.48% of the edentulous residents used to remove their denture and soak it in water overnight (criterion 3). 26.09% of the residents declared to clean their dentures with soap and water using a toothbrush every day (criterion 4). Evaluation of the audit criteria 5–7 among the dentate residents demonstrated that 27.27% of the dentate residents used to brush their teeth twice a day with a fluoridated toothpaste, 18.18% of them used a soft-bristled toothbrush, none of them used a dental floss daily.

Table 1. Audit criteria, sample, and approach to the measurement of compliance with best practice

Audit criterion	Sample	Method used to measure percentage compliance with best practice
Caregivers of the residents have attended a training course on oral and dental healthcare.	Baseline audit: 4 nurses and 11 caregivers Follow-up audit: 4 nurses and 11 caregivers	Interview using a questionnaire. Caregivers were asked whether they had attended any training sessions so far. Answers were recorded as 'Yes' or 'No'.
Caregivers are advised to assess the residents' oral health status in eight categories including assessment of voice, lips, tongue, saliva, oral mucous membrane, gingiva (gums), teeth, and swallow reflex.	Baseline audit: 4 nurses and 11 caregivers Follow-up audit: 4 nurses and 11 caregivers	Interview using a questionnaire. Caregivers were asked which of the eight categories of oral health status they observe and evaluate. They were also asked about how they evaluate the categories they declared to assess. Each category was marked as 'Yes' if their answers were correct according to the guideline.
Residents with dentures, remove and soak the denture in water overnight.	Baseline audit: 38 residents Follow-up audit: 38 residents	Interview using a questionnaire. Residents were asked if they have dentures. If yes, then, they were asked where they keep dentures overnight. 'Not applicable' was recorded if they do not have dentures. 'Yes' was recorded if they declared to remove and soak the denture in water overnight. 'No' was recorded if they did not remove the denture or if they remove it but keep it dry overnight.
Residents with dentures, brush the denture with soap and water daily.	Baseline audit: 38 residents Follow-up audit: 38 residents	Interview using a questionnaire. Residents were asked whether, how, and when they clean their dentures. 'Not applicable' was recorded if they do not have dentures. 'Yes' was recorded if they claimed to clean the denture with soap and water using a toothbrush at least once a day. 'No' was recorded if they claimed not to clean their dentures, or if they claimed to clean their dentures just with water, or if they mentioned to clean their dentures in longer intervals, for example, once a week.
In dentate residents, a toothbrush in conjunction with fluoridated toothpaste is used at least twice daily.	Baseline audit: 38 residents Follow-up audit: 38 residents	Interview using questionnaire and direct observation. Residents were asked if they brush their teeth with a toothbrush and fluoridated toothpaste twice daily. In addition, they were asked to show the toothpaste they use to directly observe whether it was fluoridated. Answers were recorded as 'Yes', 'No', and 'Not applicable'. 'Not applicable' was recorded if they were edentulous or did not have any teeth.
In dentate residents, a soft-bristled toothbrush is used.	Baseline audit: 38 residents Follow-up audit: 38 residents	Direct observation. Residents were asked to show the toothbrush they use to directly observe if it was soft-bristled. Answers were recorded as 'Yes', 'No', and 'Not applicable'. 'Not applicable' was recorded if they were edentulous or did not have any teeth.
In dentate residents, dental floss is used daily.	Baseline audit: 38 residents Follow-up audit: 38 residents	Interview using questionnaire. Residents were asked if they use dental floss at least once a day. Answers were recorded as 'Yes', 'No', and 'Not applicable'. 'Not applicable' was recorded if they were edentulous or did not have any teeth.

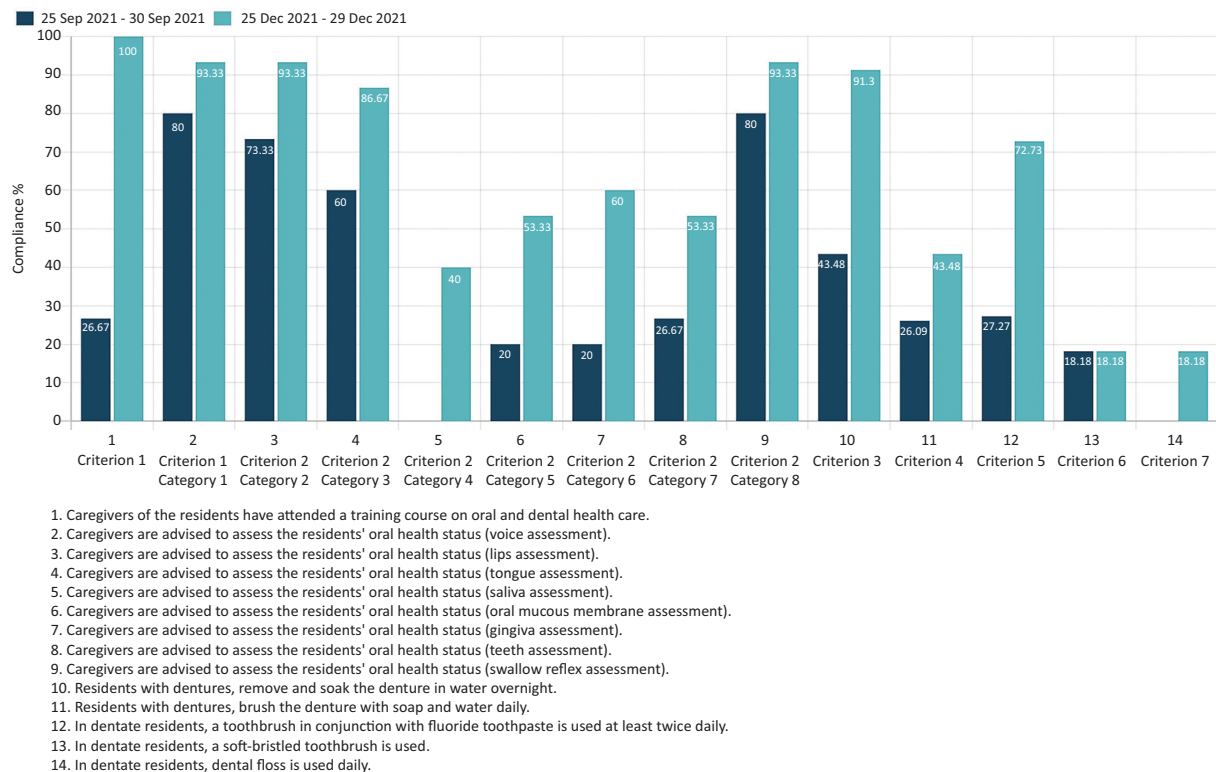


Figure 1. Baseline and follow-up audit compliance rates.

Phase 2: Strategies for Getting Research into Practice

Initially, a meeting was held and the stakeholders including the staff, the residential home manager, and the project team members were informed of the results of the baseline audit. Then a discussion was made, and the stakeholders provided their feedback on the baseline audit findings, the possible barriers resulting in low compliance to quality indicators, and existing strengths and facilitators, which can help implementing evidence into practice. After reaching a consensus on barriers and enablers, the stakeholders discussed the available resources and the potential strategies to overcome the identified barriers. The details of the GRIP matrix of this project are presented in Table 2.

The first barrier was that the caregivers underestimated the importance of oral health and considered that oral assessment of the residents was an unpleasant task. The second barrier was the staff's lack of knowledge on how to provide proper oral care. To address these two barriers, the team members reviewed the literature regarding oral healthcare provision for the elderly living in residential care homes, and initially prepared an educational pamphlet, which thoroughly

describes the recommended considerations and interventions both for edentulous and dentate residents. Then, the manager and the nurses of the residential care home reviewed and provided their feedback on the content of the material, and the finalized version of the material was developed. A PowerPoint slide was also designed to be used in the educational sessions. It contained images of abnormal oral status in each of the eight categories described in the checklist. We held three meetings with the nurses and the caregivers and fully discussed the importance of oral health and the adverse effects of poor oral health. In addition, we educated the staff on oral health consideration and interventions through the given pamphlet and presented PowerPoint slides during the meeting.

The third barrier was lack of a structured protocol for the nursing staff to screen oral health of the residents and to provide oral care to them. To overcome this problem, a flowchart for nursing management of oral hygiene as well as a checklist for oral health status screening of the residents were developed based on the available guideline.²⁷ The flowchart helps the caregivers to assess the oral cavity step by step, diagnose the presence of any abnormality, provide care of dentures

Table 2. Getting Research into Practice matrix

Barrier	Strategy	Resources	Outcomes
Wrong attitude of caregivers toward the provision of oral healthcare	Arrangement for staff training and education sessions in the provision of oral healthcare for the residents	Education sessions, PowerPoint slides, Education pamphlet	Nursing staff and caregivers were convinced about the importance of improving oral health in addition to general health for the residents.
Lack of knowledge on how to provide oral and dental healthcare for the residents	Arrangement for staff training and education sessions in the provision of oral healthcare for the residents	Education sessions, PowerPoint slides, Education pamphlets, available guideline in this regard	Nursing staff and caregivers learned how to screen the oral health status of the residents, and how oral healthcare interventions have to be performed according to each individual status.
Lack of a structured protocol for oral health screening of the residents	Development of a flowchart/algorithm for nursing management of oral health. Development of a structured checklist for oral health screening	Flowchart and checklist for nursing management of oral health	Nursing staff followed the items of the flowchart and checklist, which led to an improvement in the follow-up audit.
Heavy workload and limited time alongside poor general health of the residents have made the staff neglect the oral health compared with other healthcare aspects of the residents	Providing the nursing staff with a flowchart, which simplifies the oral status screening and healthcare provision so that it fits into their workflow	Flowchart and checklist for nursing management of oral health	Nursing staff followed the items of the flowchart and checklist, which led to an improvement in the follow-up audit.

for edentulous residents, and select appropriate cleaning tools and agents for dentate residents. The checklist guides the nursing staff to evaluate the oral health status of the residents in eight distinct categories [including the examination of voice, lips, tongue, saliva, oral mucous membrane, gingiva (gums), teeth, and swallow reflex] and describes any abnormalities, which can be present in each category. By utilizing the flowchart and the checklist, we planned to simplify the oral care task for the staff so that it fits to their heavy workflow (fourth barrier).

During the process of implementing the developed strategies, additional meetings were held online every 3 weeks to receive feedback of the staff (nurses and caregivers) and the team members about the progress of the project, and to discuss the possible problems they faced during performing the strategies.

Phase 3: Follow-up audit

For the follow-up audit, the same sample (4 nurses, 11 caregivers, and 38 residents) as for the baseline audit were interviewed. Data were collected from 25 up to 29 December 2021. Figure 1 demonstrates the compliance rates of the follow-up audit in comparison to the baseline audit. The mean compliance rate for assessing residents' oral health status (criterion 2) in the eight categories reached 71.66%, among which, assessment of voice, lips and swallow reflex achieved the highest rates (93.33%). Assessment of saliva and gingiva

underwent the greatest improvement in comparison with the baseline audit rate (40% improvement). Despite the greatest improvement, assessment of saliva had the lowest compliance rate (40%) among criterion 2 categories. All the nursing staff and caregivers reported that they had attended training sessions about oral healthcare provision (criterion 1), which was obvious as it was among the aims of the current project. 47.82% and 17.39% improvement were recorded for overnight removal of the denture (criterion 3) and daily cleaning of the denture (criterion 4), respectively. Regarding dentate residents, using a toothbrush twice a day with fluoridated toothpaste (criterion 5) improved 45.46%, reaching 72.73% compliance rate. Unfortunately, no improvement was made for criterion 6 (using a soft-bristled toothbrush). Daily dental flossing (criterion 7) alongside the usage of soft-bristled toothbrush (criterion 6) had the minimum compliance rates (18.18%) among all the criteria in the follow-up audit.

Discussion

The current best evidence implementation project aimed to improve the provision of oral and dental healthcare in a residential care home in Isfahan, Iran. The JBI PACES and GRiP frameworks were utilized to simplify putting the best evidence into practice. A sample size of 4 nursing staff, 11 caregivers, and 38 residents of Niknaman residential home were interviewed for both baseline and follow-up audits.

Baseline audit results indicated that compliance rates for most criteria were relatively poor, although four categories (voice, lips, tongue, and swallow reflex assessment) of criterion 2 (oral health assessment) had higher compliance. A similar study mentioned that the oral healthcare needs of the elderly living in aged care facilities are not well met because of healthcare providers' heavy workload, ignorance of the importance of oral healthcare and apathy, or lack of interest towards the application of oral healthcare principles.³³ Correspondingly in our project, wrong attitude, lack of knowledge, and heavy workload of the nursing staff, as well as lack of a structured protocol for oral health screening, were identified as barriers to achieving best practice recommendations.

The staff thought that caring for oral hygiene of the residents is not as important as their systemic diseases. Putting this attitude in addition to heavy workload and limited time of the staff, made them neglect the oral healthcare. An implementation project³⁴ on maintaining oral hydration in older adults in surgical wards reported that the nurses did not perform oral hydration because of poor understanding of the rationale behind it, time constraints, and high workload during nurses' shifts. By educating the nurses and the patients on the importance of adequate fluid intake, compliance rates were improved.³⁴ Generally, people are willing to be involved in practice change if they believe there is a good reason behind it.³¹ Therefore, as an initial step of implementation projects, all those involved in the process of change including staff should be given explanation about the importance and rationale of the subject.

As another barrier in our project, the nursing staff had limited knowledge regarding how to assess resident's oral health, what conditions are considered as abnormal, and what interventions should be done for each person based on their oral health status. Following educational sessions, which were aimed to both increase knowledge and change staff attitude, the compliance rate for criteria 1 (staff training) and 2 (assessment of resident's oral health status), which were directly related to the nursing staff, improved by 73.33 and 26.66%, respectively. Although all the categories of criterion 2 (assessment of resident's oral health status) improved in the follow-up audit, compliance rates of categories 5–8 (assessment of saliva, oral mucous membrane, gingiva, and teeth) are relatively low in comparison to other categories. Thus, more interventions are needed to improve these four categories.

Taking into account that the majority of the residents were dependent on maintenance of their oral hygiene, criteria 3–7 were indirectly related to the nursing staff.

That means the caregivers were responsible to assist or remind the residents for overnight denture removal (criterion 3), denture cleaning (criterion 4), daily toothbrushing (criterion 5), using a soft-bristled toothbrush (criterion 6), and daily flossing (criterion 7). Considering that, the current project focused on training caregivers (rather than the residents) to provide appropriate oral hygiene for the residents. In addition, direct instruction to the residents is not preferred because, due to their old age and probable mental disabilities like Alzheimer's disease, the efficacy of the training would decrease.

During the educational sessions, nursing staff and caregivers were trained how to screen oral health status of the residents using the 8-item checklist that was provided to them. In addition, abnormal clinical findings of the oral health were showed to them via the Power-Point slides, and they learned what considerations to take in these cases and if referral to a dentist is indicated. Furthermore, we instructed them to assist dependent residents to maintain their oral hygiene based on their dental status (edentulous or dentate).

Follow-up audit results showed an improvement for criteria 3–7 except for criterion 6 (using a soft-bristled toothbrush). Compliance for overnight removal and toothbrushing reached an acceptable rate, but still compliance rates for daily cleaning of the denture, using soft-bristled toothbrush, and dental flossing are poor. It is noteworthy to mention that changing health-related behaviors, including oral health, is a complex and multidimensional issue.³⁵ Studies have proposed different techniques and models with different barriers and facilitators for changing health behaviors.³⁵ Thus, reaching compliance rate of 100% for all audit criteria may require longer periods of time.

The findings of the current implementation report demonstrated that organizing sessions to educate the caregivers about nursing management of oral health can improve compliance in the follow-up audit. Similarly, a study reported that an integrated education program for primary healthcare providers can make a difference in the oral health status of the elderly.³⁶ Another study investigating the oral health status of attendees and residents of care homes came to the conclusion that oral health was generally poor, with pain and discomfort present in a high number of care home residents/attendees, and caregivers require training in oral health as it is a priority for this group.³⁷

Recent evidence implementations projects on other topics also have reported that organizing training workshops and providing educational materials result in improvement in compliance rates when the lack of knowledge is identified as a barrier.^{38–40}

In contrast to studies above, a study reported that despite arranging caregivers' training program, significant changes in oral health practice did not result. Barriers to practice of oral care by caregivers remained, and training, even with high knowledge gain, failed to reduce these barriers.⁴¹

Although the results of the studies regarding the effectiveness of education to improve the oral and dental health status of the elderly residing in care facilities are heterogeneous, still many studies support the training of nursing staff as an effective approach in this regard.^{36–40}

Another strategy applied during this project was developing structured protocols for oral care including a flowchart and a checklist. This strategy acts as a facilitator, which clarifies and simplifies the tasks for the caregivers to perform oral examination and provide a proper oral care based on each resident's dental status. Also, this strategy is useful in the way that all the staff in a healthcare center follow the same steps, which are predefined based on the best evidence recommendations. The results of other evidence implementation projects have shown the effectiveness of defining a structured protocol.^{42–44} A study on the care of patients with oral mucositis demonstrated that installing a laminated flyer about standard oral hygiene care protocol in the nursing station could improve oral mucositis management.⁴³

In summary, based on our experience with the present implementation project, we suggest that explaining the importance and rationale of the oral care, staff education, and developing structured protocols for oral screening and providing oral care can improve compliance with evidence recommendation.

Conclusion

This best practice implementation project utilized a clinical audit process to monitor oral and dental healthcare provision in a residential care home. The audit findings indicated an improvement in almost all criteria. The implemented strategy included improving knowledge and changing attitudes of the nursing staff and caregivers through organizing educational sessions regarding nursing management of oral health for the elderly. These strategies can facilitate the implementation of evidence into clinical practice. Further follow-up audits will be required to evaluate the sustainability of practice changes. Future projects are recommended to focus on wider aged care facilities to ensure that more aged care residents receive appropriate oral healthcare.

Acknowledgements

We would like to acknowledge Dr Saber Khazaei for his valuable guidance and support for conduction of this project. We would also like to acknowledge the Research Center for Evidence-Based Medicine, Iranian EBM Center for encouragement to follow best-evidence implementation projects.

Ethics approval and consent to participate: this project was registered as a quality improvement activity and, therefore, did not require ethical approval; however, ensured confidentiality and anonymity.

Availability of data and materials: the data that support the findings of this study and the materials used for GRiP (educational pamphlet, PowerPoint slides, and flowchart/checklist for nursing management of oral care) are available from the corresponding author upon request.

Funding: none.

Authors' contributions: study conception – A.V. and A.M.; Study design – A.V., P.I., and B.T.; interpretation of data for the work – A.V. and A.T.; manuscript drafting – A.V., P.I., and A.T.; manuscript revision – B.T. and A.M.; final approval: all authors.

Conflicts of interest

There are no conflicts of interest.

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