Perceptions on Oral Care Needs, Barriers, and Practices Among Managers and Staff in Long-Term Care Settings for Older People in Flanders, Belgium: A Cross-sectional Survey

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Abstract

Background and Objectives: This study aimed to explore oral health perception and oral care needs, barriers, and current practices as perceived by managers and staff in long-term care organizations for older people in Flanders.

Research Design and Methods: This is a cross-sectional study where 2 questionnaires were developed, one for managers and one for caregivers, and were validated in Flemish long-term care organizations. Descriptive analyses and multivariable generalized linear models evaluated the main outcomes and their associations with determinants such as the size of the organization, the presence of an oral health policy, collaboration with a dentist, among others.

Results: A total of 145 managers and 197 caregivers completed the questionnaire. More than 50% of caregivers and managers perceived their residents’ oral health as mediocre to good. Collaboration with a dentist ($B = 0.84$) and oral health care involvement ($B = 0.08$) within the organization showed a strong association with a positive perception of oral health. Lack of time (57%) and care resistance (70%) were the most important barriers perceived by caregivers. Guidelines concerning oral care were not available or were unknown to 52% of the caregivers. Having an oral health policy within the organization was strongly associated with the correct use of guidelines for daily care of natural teeth ($B = 1.25$) and of dental prosthesis ($B = 1.15$).

Discussion and Implications: The results emphasize that collaborating with a dentist and the presence of an oral health policy in care organizations are important for a positive perception of the oral health of the residents and for the adoption of guidelines by caregivers and managers. In addition, training on handling care refusal should be included in the overall training. These results are crucial input for the development of a methodology for implementing a structured oral care policy in long-term care facilities.
**Translational Significance:** The analysis of oral health care perceived needs, barriers, and current practices is the first step of an intervention mapping structure that ultimately aims to improve oral health in long-term care settings. It is essential to identify caregivers’ barriers and needs regarding oral health and oral care in order to develop an effective and innovative intervention, in this case, the installation of an oral health policy in care organizations, that overcomes the observed barriers and meets the indicated needs. These results are crucial input for the development of a methodology for implementing a structured oral care policy in long-term care facilities.

**Keywords:** Barriers, Caregiving—formal, Needs-assessment, Nursing homes, Oral health

**Background and Objectives**

The population of adults older than 80 years of age increases (1). Improvements in oral care delivery and awareness of the importance of oral hygiene lead to an increase in older people retaining their natural teeth (2). Functional or cognitive decline challenges daily oral care, which may lead to oral infection and additional preventable oral health problems (3–6). Research reveals that 50%–75% of the older population have at least one active oral health problem (3–6). Oral hygiene and periodontal conditions are worse compared with the general population (8–10). However, older adults’ awareness of their unfavorable oral health status is limited despite the importance of oral health for their general health and well-being (11). Good oral hygiene does have a preventive effect not only on oral pathology, but also on general health problems, such as aspiration pneumonia (12, 13), cardiovascular risks (14), diabetes control (15), and fall incidents (16). Besides the physical effects, good oral health is also important for overall quality of life (17,18).

Several determinants are important to consider with respect to the oral health of this population. Socioeconomic status, gender, age, general health problems, cognitive impairment, and biological oral health factors are determinants that influence oral health (19). These determinants are not (or not easy) changeable. Other determinants are more susceptible to change, such as individual (eg, life style), environmental (eg, care setting), and interpersonal determinants (eg, caregivers’ attitude). All these determinants are important to consider because they can bring about barriers or enablers to oral health care. Several barriers can exist at the level of each of these determinants. Barriers can be situated at 4 different levels (20,21). Organizational barriers can be present, such as time pressure, the lack of an oral health policy, and nonavailability of materials and products (22,23). Barriers found at caregiver level are, for example, unpleasantness of the task and lack of knowledge and skills of the caregiver (24–26). Examples of barriers at the level of the older person are refusal or resistance to care, lack of support by the family, and level of care dependency (24–26). And finally, barriers concerning oral health situations themselves, for example, bad condition of oral health and underestimation of the seriousness of the oral health problems as such cause a barrier for the caregiver.

To improve oral health in care-dependent older adults, the goal is to develop interventions that empower care organizations and caregivers toward better oral care. Development of such interventions should be done systematically, for example, using an intervention mapping structure (27). This article considers the first step of intervention mapping, being a needs analysis of caregivers in care homes concerning oral health. This article has 4 aims. The first aim is to explore how oral health of the residents is perceived by the managers and caregivers. The second aim is to investigate the oral care needs experienced by the caregivers. The third aim is to detect the barriers that are experienced by the caregivers when performing oral care. The fourth and final aim is to ascertain current oral care practices as perceived by the caregivers within the organizations.

Knowledge about the needs of the organization and caregivers is essential to determine the focus of the intervention. Furthermore, a clear view on needs and barriers can increase awareness of policy makers about the importance and problematic condition of oral health in care-dependent older persons. In addition, the identified barriers and the proposed solutions can be used as a base to compose much-needed oral health indicators for quality control in care organizations. Additionally, we wanted to explore following hypotheses. First, organizations collaborating with a dentist and organizations with an established oral health policy have a better perception of oral health or experience other needs and barriers compared to organizations without. Second, personal (experience, profile, and contact with oral health in job description) and organizational (size, management system, region) characteristics are associated with the caregivers’ perception of oral health, perceived needs, barriers, and use of current practices.

This study, therefore, assessed managers’ and caregivers’ perceptions of oral health care, their perceived needs, and barriers toward oral care and current oral care practices in long-term care settings. The goal is to gather relevant information for the development of a methodology for implementing a structured oral care policy in long-term care facilities.
Research Design and Methods

This cross-sectional survey was designed as an overall inventory study. The survey was commissioned by the Flemish government and carried out as 2 online questionnaires between January and February 2018.

Participants

The target population consisted of the managing board and professional caregivers responsible for the daily care in long-term care settings for older individuals. Participants who did not consent were deleted from the analyses as no information on them could be shared. The objective was to include as many organizations working with frail older persons in Flanders as possible. Separate hyperlinks to complete each questionnaire (Q1 for managers and Q2 for caregivers) were sent by email to 913 residential and home care organizations. All relevant data of these organizations were online available from the Flemish government. To allow analysis of caregivers answering pattern on an organizational level, we strived for a minimum of at least 10 caregivers per organization. Therefore, the email asked the manager to send the caregiver questionnaire to at least 10 caregivers.

Instrument

An existing questionnaire, used to assess barriers in care homes in 2010, served as a basis to develop the new questionnaires (6). In a first round, 4 coworkers of the scientific staff of the Flemish Institute for Oral Health (3 dentists and 1 psychologist) selected questions considered relevant. New questions were added based on a literature search (22,28,29). Next, the questionnaire was sent to an expert panel, consisting of 6 dentists with expertise in gerodontology and oral health promotion, 1 health care policy expert, and 1 marketing professional, for individual feedback and content validation. Their input resulted in the development of 2 questionnaires. To evaluate face and content validity, the questionnaires were sent to caregivers and managers of 2 care organizations. Thirty-seven caregivers filled out the online questionnaires using Google Forms and were asked to assess the clarity and relevance of each question. Based on their comments, improvements were made to eliminate ambiguity of some questions and to optimize answer options. The question “is daily oral care part of your job description” was added. In a final round, the 2 versions of the questionnaires were revised and approved by the same expert panel using individual feedback by email.

The final version of the questionnaire for managers was divided into 3 sections and consisted of 19 closed multiple choice questions and Likert scales. The first section questioned personal characteristics. A second section explored the perception of the managers concerning the oral health of the residents and the perceived need for oral health education and skills training. The final section consisted of questions about the organization, such as management system (nonprofit organization, private organization, Public Centres for Social Welfare [OCMW]), capacity of the organization, and the presence of an oral health care policy in the organization, variables that could be associated with their perceptions of the oral health, needs, barriers, and current practices. The final version of the questionnaire for the caregivers was also divided in 3 sections. Sections 1 and 2 collected the same information as the questionnaire for the management. Additionally, the caregivers’ profile in the organization, years of experience, and their role in daily oral care were inventoried. The third part questioned their perceived barriers and perception of current practices.

Procedure

The online survey was carried out using Google Forms. The managing board received an email with information about the purpose of the survey and hyperlinks to both questionnaires. They were asked to fill in the management questionnaire and to forward the hyperlink for the caregiver questionnaire to the caregivers within their organization. If the caregivers did not have access to a computer, the managing board could ask for a PDF version of the questionnaire and return the filled-in documents to the researchers by post. As a first step participants were informed about the study purpose, confidentiality handling, anonymity, and the principal of voluntary participation. The protocol was approved by the ethics committee of the Ghent University Hospital (No. B670201733146). Two weeks after the first email, a reminder was sent to the same contacts.

Analysis

Closed questions were analyzed with IBM SPSS statistics V24.0. Descriptive analyses were used to summarize the data on frequency, means, and variability. Both questionnaires were linked using the postal code and the name of the organization. The organizational characteristics of the caregivers were linked and entered in the caregiver database based on the name of the organization and postal code. To explore the association of personal and organizational characteristics on perceived needs, barriers, and practices, multivariable generalized linear models with ordinal and linear regression analyses were used.

Results

Participant Characteristics

Table 1 shows the characteristics of the participating management staff and caregivers. The manager questionnaire was filled out by 145 managers out of 918 contacted organizations (response rate: 15%). Most of them were professional managers (77.2%), about 5% were head nurses, and
| Variable                        | Option                        | Caregivers (N = 197) | Managers (N = 145) |
|--------------------------------|-------------------------------|----------------------|-------------------|
|                                |                               | N    | %   | N    | %   |
| **Personal characteristics**   |                               |      |     |      |     |
| Employment                     | Self-employed                 | 3    | 1.5 |      |     |
|                                | Employed in an organization   | 194  | 98.5| 6    | 4.1 |
| Type                           | Home care                     | 14   | 7.1 | 137  | 94.5|
|                                | Residential care              | 182  | 92.4|      |     |
|                                | Informal caregiver/other      | 1    | 0.5 | 2    | 1.4 |
| Gender                         | Male                          | 21   | 10.7| 50   | 34.5|
|                                | Female                        | 176  | 89.3| 93   | 64.1|
|                                | X                             | 0    | 0   | 2    | 1.4 |
| Age (years)                    | <30                           | 46   | 23.4| 10   | 6.9 |
|                                | 31–40                         | 61   | 31.0| 27   | 18.6|
|                                | 41–50                         | 38   | 19.3| 41   | 28.3|
|                                | 51–60                         | 50   | 25.4| 65   | 44.8|
|                                | 61+                           | 2    | 1.0 | 2    | 1.4 |
| Experience                     | Less than 1 years             | 5    | 2.5 | 8    | 5.5 |
|                                | 1–5 years                     | 47   | 23.9| 31   | 21.4|
|                                | 6–15 years                    | 61   | 31.0| 43   | 29.7|
|                                | 16–25 years                   | 38   | 19.3| 31   | 21.4|
|                                | More than 25 years            | 46   | 23.4| 32   | 22.1|
| Educational degree             | Secondary school (high school)| 41   | 20.8| 2    | 1.4 |
|                                | Higher education (extended    | 144  | 73.1| 92   | 63.4|
|                                | education in addition to      |      |     |      |     |
|                                | secondary school)             |      |     |      |     |
|                                | University degree             | 12   | 6.1 | 51   | 35.2|
| Role in providing daily oral care | Almost none                  | 42   | 21.3|      |     |
|                                | Moderate                      | 40   | 20.3|      |     |
|                                | A lot                         | 115  | 58.4|      |     |
| Profile                        | Manager                       | 112  | 77.2|      |     |
|                                | Head of nursing               | 22   | 11.2| 7    | 4.8 |
|                                | Medical responsible           | 8    | 5.5 |      |     |
|                                | Oral health responsible       | 4    | 2.8 |      |     |
|                                | Nurse                         | 88   | 44.7|      |     |
|                                | Nurse aid                     | 49   | 24.9|      |     |
|                                | Occupational therapist        | 20   | 10.2|      |     |
|                                | Speech therapist              | 5    | 2.5 |      |     |
|                                | Social worker                 | 3    | 1.5 |      |     |
|                                | Physiotherapist               | 2    | 1.0 |      |     |
|                                | General practitioner          | 1    | 0.5 |      |     |
|                                | Other                         | 7    | 3.5 | 14   | 9.7 |
| **Organizational characteristics (N = 174)** |                       |      |     |      |     |
| Region                         | Brussels                      | 0    | 0   | 3    | 2.1 |
|                                | West Flanders                 | 63   | 32  | 43   | 29.7|
|                                | East Flanders                 | 41   | 20.8| 37   | 25.5|
|                                | Antwerp                       | 31   | 15.2| 27   | 18.6|
|                                | Flemish Brabant               | 23   | 11.7| 21   | 14.5|
|                                | Limburg                       | 39   | 19.8| 14   | 9.7 |
| Management system              | Nonprofit                     | 0    | 0   | 73   | 50.3|
|                                | OCMW (Public Centres for      | 85   | 48.9| 49   | 33.8|
|                                | Social Welfare)               |      |     |      |     |
|                                | Private                       | 84   | 48.3| 20   | 13.8|
|                                | Missing                       | 5    | 1.8 | 3    | 2.1 |
5.5% were medical staff responsible for quality of care. Most of the participating managers worked in a residential care organization (94.5%) and have received a higher education (63.4%) or had a university degree (35.2%). The mean age of this group was 47 years old (SD = 9.5; range 20–64) and most of them were female (64.1%).

The web-based caregiver survey was completed by 180 caregivers and 17 completed the paper version (Table 1). Of the 197 caregivers, 174 (88%) could be linked to 59 different organizations (41%). Of 118 different organizations represented in the sample, 63 could not be linked to caregivers of the same organization. The number of caregivers per organization who participated ranged from 0 to 11 caregivers. All questionnaires were included when consent was obtained to the informed and ethical questions, even if they were not fully completed (online all questions were mandatory). The mean age of the caregivers was 41 years (SD = 11.18; range 19–61). Most caregivers were nurses (44.7%), nursing aids (24.9%), head nurses (11.2%), or occupational therapists (10.2%). Most caregivers were female (89.3%), worked in residential care (92.4%), and received higher education (79.2%).

More than half of the participants were working in the province of West Flanders, one of the 5 provinces of Flanders. About 30% of the participating nursing homes are also from this province, which shows an overrepresentation for this region, as residential care is uniformly distributed in Belgium, mostly according to the number of inhabitants of the region. In fact, the province of West Flanders has about 20% of the total of residential care homes in Flanders. As half of the participating care organizations were nonprofit (50.3%), this gives a good representation of the care organizations participating in the study when compared with the real situation, as about 53% of nursing homes in Flanders are private but have a nonprofit system. The 34% of nursing homes of the type OCMW, organized by the Public Centers for Social Welfare, correspond to about 25% of the reality in the Flemish region. The OCMW nursing homes are also nonprofit, but have no private system. Similar to the number of care residents in Flemish nursing homes, the participant organizations had a diverse number of residents. The majority of the participating organizations (61%) had a medium size (from 50 to 150 residents), corresponding to the majority of the residential care sector in Flanders, where about 70% of the nursing homes have a medium size. In the study, large organizations (above 150 residents) were about 32% and small size care organizations (below 50 residents) were about 7%. The presence of an oral health policy was reported by 53% of the managers and 59% affirmed that their organization collaborated with a dentist. Participation in an oral care project was reported by 29% of the managers, and 15% participated in a specific oral health program, called the Gerodent project, which combines the installation of a preventive oral health policy in the organization with mobile oral care delivery on site.

### Table 1. Continued

| Variable                        | Option                  | Caregivers (N = 197) | Managers (N = 145) |
|---------------------------------|-------------------------|----------------------|--------------------|
| Size                            | Less than 50 older persons | 6 3.4                | 10 6.9             |
|                                 | 50–100 older persons    | 58 33.3              | 52 35.9            |
|                                 | 101–150 older persons   | 16 9.2               | 37 25.5            |
|                                 | More than 150 older persons | 94 54.0            | 46 31.7            |
| Oral health project*            | Yes                     | 56 32.2              | 42 29.0            |
|                                 | No                      | 118 67.8             | 103 71.0           |
| Gerodent project†               | Yes                     | 21 12.1              | 22 15.2            |
|                                 | No                      | 153 87.9             | 121 83.4           |
| Collaboration with dentist      | Yes                     | 116 66.7             | 86 59.3            |
|                                 | No                      | 58 33.3              | 58 40              |
| Oral health policy              | Yes                     | 112 64.4             | 77 53.1            |
|                                 | No                      | 62 35.6              | 67 46.2            |

Notes:
* Oral health project: any type of project aiming to improve oral health of older people.
† Gerodent: Oral care project in East and West Flanders, which consists of a mobile dentist cabinet visiting nursing homes and providing oral care to the residents, as well as training and guidelines for oral health policy.

**Perceived oral health and oral care delivery**

The oral health of the clients of the organizations was perceived as good or very good by 40%, as mediocre by 43% and as poor by about 10% of the managers (Figure 1). (Supplementary Table 1). Caregivers reported the oral health of their residents to be good or very good in 31%, mediocre in 53%, or poor in 11% of the cases. The difference between managers’ and caregivers’ perceived oral...
health of their clients was significant (Pearson $\chi^2 = 11.26$, $p = .047$).

More than 50% of the caregivers reported the provision of oral care to care-dependent residents to be difficult, and 48% found it difficult to motivate semi-dependent residents for the performance of daily oral care. The expectations concerning the performance of oral care by caregivers were considered to be clear for 78% of the managers. A clear point of contact within the organization where caregivers can go to with their questions concerning oral care was reported by 67% of the managers and 90% was convinced that the questions of caregivers concerning oral care could be answered within the organization. For the caregivers themselves, it was even more clear what is expected of them concerning oral health care performance (97%). They also considered that questions concerning oral health could be answered within the organization (83%). It was slightly less clear for caregivers to know who acted as contact point for oral health care-related questions within their organization (65%). Caregivers and managers agreed regarding the questions whether there is a clear contact point and whether they can ask oral health-related questions within the organization. However, managers think that what is expected of the caregivers concerning oral care is less clear to them compared with what the caregivers themselves think (Pearson $\chi^2 = 29.49; p < .001$; Table 2).

Generalized linear models showed that caregivers’ perception of the oral health status of their residents was significantly positively associated with the collaboration of the organization with a dentist ($B = 0.84$; Table 3). Caregivers working in organizations that collaborated with a dentist showed more positive perceptions toward oral health. In addition, caregivers indicating that daily oral care performance was part of their duty, perceived oral health significantly better than those who had no role in daily oral care ($B = 0.78$).

**Perceived Oral Care Needs**

More than 70% of the managers were interested in offering a training concerning oral health, more specifically concerning the cleaning of dental prostheses and dealing with patients with resistant care behavior. Two thirds (66%) of the caregivers were interested in following a training (Supplementary Table 2). More specifically, the topics regarding care refusal and halitosis were preferred subjects for, respectively, 89% and 82% of the caregivers (Figure 2). (Supplementary Table 2). Overall, more than 59% of the caregivers replied that there were some needs regarding oral health and almost 17% argued that there were a lot of needs and shortcomings in oral care. Managers did not perceive significantly more needs compared to caregivers (Pearson $\chi^2 = 2.36; p = .669$).

**Perceived Oral Care Barriers**

Concerning barriers experienced in the performance of oral care, lack of time was mentioned by 57% of the caregivers as an important barrier (Table 4). This was followed by a shortage of staff (45%). Around 38% agreed that lack of skills and knowledge were important barriers, and around 30% reported factors concerning the older person, such as presence of halitosis, deprived oral health, and poor visibility of the oral cavity as a barrier. While performing daily oral care, caregivers were often confronted with older persons who are physically limited in opening their mouth or who refuse oral care. One in 5 caregivers stated that they experienced these difficulties most of the time when performing oral care. Of the 85% of caregivers confronted with physical resistance, almost 26% answered that it concerned only involuntarily physical resistance (eg, patients

![Figure 1. Oral health as perceived by the organization managers and caregivers (in %).](https://academic.oup.com/innovateage/article/6/5/igac046/6654771)

| Table 2. Statistical Tests of the Differences Between Answers From Participating Caregivers and Managers |
|-------------------------------------------------|---------------|----------------|---|---|
| Responses                                      | Caregivers, % | Managers, %    | Pearson $\chi^2$ Significance |
| Clear expectation of oral health-related tasks (yes) | 97.00         | 78.47          | 29.49 | .000*** |
| Possibility to ask oral health-related questions within the organization (yes) | 85.28         | 90.28          | 3.80  | .150   |
| Clear oral health contact point in organization (yes) | 65.97         | 68.06          | 3.36  | .187   |
| Perception of residents’ oral health (good or very good) | 30.96         | 40.28          | 11.26 | .047*  |
| Perception of unmet needs/deficiencies in oral health | 76.20         | 80.00          | 2.36  | .669   |

Notes:

* $p < .05$; ** $p < .001$. 

Downloaded from https://academic.oup.com/innovateage/article/6/5/igac046/6654771 by Gent University user on 19 September 2022
Table 3. Multivariable Generalized Linear Model for Caregivers’ Perceptions, Perceived Barriers, and Availability of Oral Care Guidelines

| Determinants                   | Oral Health Perception |                                      | Perceived Personal Barriers |                                      | Perceived Environmental Barriers |                                      |
|--------------------------------|------------------------|--------------------------------------|-----------------------------|--------------------------------------|----------------------------------|--------------------------------------|
|                                | 95% CI                 | 95% CI                               | 95% CI                      | 95% CI                               | 95% CI                          | 95% CI                               |
| Experience                     |                        |                                      |                             |                                      |                                  |                                      |
| More than 5 years              | 0.14                   | −0.64                                | 0.91                        | 0.729                                | 0.41                            | −0.726                               | 1.547                                | .479                                 | 0.19                            | −0.92                               | 1.31                                | .727                                 |
| Less than 5 years              |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
| Function                       |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
| Other                          | −0.46                  | −1.35                                | 0.44                        | .320                                 | −0.01                            | −1.261                              | 1.247                                | .991                                 | −1.16                            | −2.41                               | 0.08                                | .068                                 |
| Nurse                          | −0.49                  | −1.26                                | 0.28                        | .215                                 | 0.16                             | −0.941                              | 1.251                                | .782                                 | 0.38                             | −0.70                               | 1.47                                | .488                                 |
| Oral health responsibility     | 0.78                   | 0.09                                 | 1.47                        | .027**                               | −1.97                            | −2.942                              | −1.003                               | .000***                              | −1.36                            | −2.33                               | −0.39                               | .006**                               |
| Dentist                        | 0.84                   | 0.16                                 | 1.52                        | .015*                                | −0.003                           | −0.049                              | 0.042                                | .885                                 | 0.38                             | −0.05                               | 0.05                                | .985                                 |
| Age                            | −0.01                  | −0.04                                | 0.020                       | .491                                 | −0.003                           | −0.049                              | 0.042                                | .885                                 | 0                                | −0.05                               | 0.05                                | .985                                 |
| Size                           |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
| More than 100 beds             | −0.21                  | −0.86                                | 0.44                        | .529                                 | −0.35                            | −1.29                               | 0.39                                 | .463                                 |                                  |                                      |                                      |                                      |
| Less than 100 beds             |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
| Management                     |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
| Private                        | −0.66                  | −2.67                                | 1.36                        | .523                                 | −2.04                            | −4.79                               | 0.69                                 | .144                                 |                                  |                                      |                                      |                                      |
| Public center                  | −0.32                  | −0.97                                | 0.34                        | .341                                 | 0.98                             | 0.04                                | 1.92                                 | .040*                                |                                  |                                      |                                      |                                      |
| Nonprofit                      |                        |                                      |                             |                                      |                                  |                                      |                                      |                                      |                                  |                                      |                                      |                                      |
### Table 3. Continued

| Determinants                      | Guidelines Dental Prosthesis | Guidelines Natural Teeth |
|----------------------------------|------------------------------|--------------------------|
|                                  | 95% CI B  LL  UL  p          | 95% CI B  LL  UL  p      |
| Experience                       |                              |                          |
| More than 5 years                | 0.41 −0.15  0.961 .148      | −0.24 −0.79  0.31 .396  |
| Less than 5 years                |                              |                          |
| Function                         |                              |                          |
| Other                            | 1.22  0.61  1.837 .000***    | 0.52 −0.09  1.12 .092   |
| Nurse                            |                              |                          |
| Nurse aid                        | 1.15  0.53  1.770 .000***    | 1.23  0.62  1.87 .000*** |
| Oral health responsibility       |                              |                          |
| Yes                              | 0.44 −0.15  1.036 .146      | 0.17 −0.43  0.76 .582   |
| No                               |                              |                          |
| Age                              |                              |                          |
| Dentist                          | −2.24 −4.63  0.147 .066     | −1.59 −3.89  0.71 .176  |
| Yes                              |                              |                          |
| Policy                           |                              |                          |
| Yes                              | 0.18 −0.41  0.776 .552      | −0.31 −0.91  0.29 .306  |
| No                               |                              |                          |
| Management                       |                              |                          |
| Private                          |                            |                          |
| Less than 100 beds               |                              |                          |
| Public center                    |                            |                          |
| Nonprofit                        |                            |                          |

Notes: CI = confidence interval; LL = lower limit; UL = upper limit.

***p < .001; **p < .01; *p < .05.
with dementia, Parkinson, etc.) and 18% voluntarily physical resistance. Confrontation with both types of resistance is reported by 40% of the caregivers. Caregivers felt most uncomfortable when the older person showed physical (70%) or verbal resistance (63%). They also felt uncomfortable when an older person had a deprived oral health (e.g., patients with a high treatment backlog; 52%) or halitosis (44%). Interdental cleaning was perceived as the most uncomfortable oral hygiene act to perform (43%). On the contrary, cleaning dental prostheses was perceived as the most comfortable task (70%), followed by performing oral hygiene in older persons who do not resist (64%) and motivating care-independent older persons to perform oral hygiene (61%).

In the regression model, results show that caregivers where oral care is part of their daily duties reported significantly less environmental ($B = -1.36$) and less personal barriers ($B = -1.97$) than caregivers where oral care was not part of their daily duties. Caregivers in social profit organizations reported less environmental barriers than those in community care organizations (OCMW; $B = 0.98$; Table 3).

**Current Oral Health Care Practices**

When caregivers were confronted with physical resistance, several response strategies were used (Supplementary Table 3). About 79% of the caregivers stated that in most cases they tried talking to the older person, followed by using diversion (67%) and the use of humor (57%). When confronted with physical resistance, 37% of the caregivers answered that they use mouth rinse instead of providing standard oral hygiene care and 48% of the caregivers refrained from providing oral care in the majority of cases. According to the caregivers, no guidelines for cleaning natural teeth (31%) or a dental prosthesis (21%) were available in the care organization and about 21% and 16% of the caregivers, respectively, were unaware of such guidelines. According to 7% of the caregivers, guidelines for cleaning natural teeth were supported and followed in the entire organization according. About 20% of the caregivers said that the guidelines were mostly followed and 17% said they used their own way (Figure 3). In contrast, 14% of the caregivers reported that the guidelines concerning cleaning dental prostheses were followed by the whole organization, whereas 32% said that they were mostly followed and only 11% used their own method. Approximately 4% of the caregivers indicated that protocols were tailored to the individual. Almost 1 in 4 caregivers answered that interdental cleaning was not part of their job description. In addition, about 7% of the caregivers stated that tooth brushing and cleaning of a prosthesis was not included in their job description (Supplementary Figure 1).

The use of guidelines for taking care of natural teeth was strongly associated with the presence of an oral health policy. Caregivers working in care organizations with an oral health policy reported significantly more standardized use of daily oral care guidelines for natural teeth ($B = 1.25, \ p < .001$) and for dental prostheses ($B = 1.15, \ p < .001$). The use of guidelines for the daily oral care of dental prostheses was significantly more frequent when the organization was collaborating with a dentist ($B = 1.22, \ p < .001$).

Between the organizations enrolled in the Gerodent project and those not enrolled, no significant differences were found regarding cooperation with a dentist and having a clear expectation of what oral care tasks are, although a significant difference was found for the presence of an oral health policy in the organization ($p = .019$) and having a contact point for questions regarding oral health ($p = .004$). Concerning barriers experienced in the performance of oral care, for the items lack of time, shortage of staff and lack of material, no significant differences were found between the responses of caregivers working in organizations participating in Gerodent or not. In addition, both groups agreed that lack of skills and knowledge were important barriers, with no significant difference across groups. Regarding the residents’ factors, such as presence of halitosis, deprived oral health, and poor visibility of the oral cavity, no differences were found in the perceived barriers. In both groups, caregivers felt equally uncomfortable when the older person showed physical or verbal resistance.
Discussion

The aim of this study was to detect managers’ and caregivers’ perceptions of oral health, and their perceived needs, barriers, and current practices when delivering oral care in long-term care settings for older persons. These results are crucial input for the development of a methodology for implementing a structured oral care policy in long-term care facilities.

The first aim was to assess the perception of the overall oral health by managers and professional caregivers. Managers perceived oral health of residents more positively than the caregivers. When the organization is collaborating with a dentist and when caregivers indicate that oral care is part of their daily duties, a more positive perception of oral health was observed. This confirms our hypothesis that collaboration with a dentist is important for the oral health perception. One could argue if this positive perception of oral health is desirable, when research indicates major oral health problems and high oral care needs in frail older people (30). Hennequin et al. observed that caregivers overestimate residents’ oral health (31). This implies that oral health problems are missed out and that managing
boards and caregivers have a too optimistic picture of their residents’ oral health. Further research should elucidate the relation between the objective oral health status and the oral health perception of caregivers and management.

The second aim was to detect the needs caregivers and managers experience concerning oral care. The most important finding was the need for training concerning the performance of oral health when the resident refused care. This was also confirmed by the finding that caregivers were most uncomfortable performing oral care when the resident was physically or verbally resisting. De Visschere et al. also found that residents expressing gratitude had a positive effect on nurses’ compliance in contrast with unwilling residents (32). One in 5 thought residents of their organizations had a lot of oral care needs and more than half perceived several oral care needs within the residents. This can further enhance the threshold for daily oral care since deprived oral health functioned as a barrier for more than half of the caregivers (32).

Third, this research explored the oral care barriers experienced by caregivers. The most important barrier reported by the caregivers was lack of time. A study by De Visschere et al. explored this barrier and found more than half of the participants saying it was not so much a lack of time that was acting as most important barrier but the lack of priority given to oral care or time management during daily care of the residents (32). As confirmed by the needs expressed by the caregivers they also experience resistance to care as an important barrier; most were uncomfortable with performing oral care when residents showed resistance (physical and verbally). When confronted with residents resisting to oral care, most of the caregivers tried to talk or used humor which can be described as a good way of dealing with resistance. Nevertheless, almost half of the caregivers still use occasionally negative strategies such as stopping to perform oral care or using a mouthwash instead. Caregivers reported less barriers when they had a significant role in performing daily oral care for older individuals. This implies that not only knowledge about oral care is required, but also acquiring skills needed to perform daily oral care in difficult circumstances (25). This need for more training is also confirmed by the fact that the majority of the caregivers is interested in an on-site oral health training.

The evaluation of the current oral health practices applied by the managers and caregivers revealed that 40% of the organizations did not have an oral health policy and very few organizations made use of adequate guidelines for the oral care of natural teeth. This stresses the need for guidelines concerning preventive oral care in Flanders. It is crucial to include this information in the education of caregivers, to facilitate the implementation, distribution and use of these guidelines. In contrast with all other oral care tasks, interdental cleaning is not considered as part of the job description. This means that it is important to focus on interdental cleaning as a standard part of daily oral care. Even in the general population in Flanders, only 20% reported to use a wooden toothpick and 15% dental floss (9). The finding that the presence of an oral health policy and the use of guidelines for daily oral care are linked stresses the importance of implementing an oral health care policy in long-term care settings and making standardized oral health policies available.

In this study, despite the low response rate, the participating organizations can be considered representative for the Flemish residential care sector. The low response to participation confirms the limited attention paid to oral care in health care. In addition, the comparison between the responses of caregivers and managers in organizations participating or not in the Gerodent project showed that the barriers they perceive in the oral health care for older people are very similar.

Implications

The analysis of the oral health care perceived needs, barriers, and current practices is the first step of an intervention mapping structure that ultimately aims to improve oral health in long-term care settings. It is essential to identify caregivers’ barriers and needs toward oral health and oral care in order to develop an effective intervention. In this case, the installation of an oral health policy in care organizations, that overcomes the observed barriers and meets the indicated needs. The results show that contact with oral health professionals is crucial for tackling the observed barriers and implementing an oral health care policy.
care is important for the perception of the caregivers. The more oral health is part of their daily tasks, the better the caregivers perceive oral health and the fewer barriers they experience. Furthermore, education and on-site training on how to perform qualitative daily oral care is needed to promote the use of optimal response strategies when there is care resistance. Lack of guidelines on how to perform oral care in frail older persons underlines the need for more oral care topics to be included in the education of health care students as well as on-site training. Installation of an oral health policy and the collaboration with a dentist encourages basic use of guidelines and protocols in long-term care settings. These outcomes are useful guidelines for the development of a structured oral health policy implementation strategy.

Supplementary Material
Supplementary data are available at Innovation in Aging online.

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Conflict of Interest
None declared.

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Ethics Approval
The protocol was approved by the ethics committee of the Ghent University Hospital (no. B67020173314).

Informed Consent
Informed consent was obtained from all individual participants included in the study.

Data Availability
All data are available upon request.

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