A literature review of oral health awareness among caregivers in aged care facilities

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I declare that the work presented in this dissertation, is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text and reference pages.

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Abstract

The population of older people is growing at an exponential rate, and the number of elderly entering aged care facilities is also increasing. The health challenges of advancing age increase the dependency of this population group on others for care needs. There is an undeniable correlation between oral health and overall well-being, and a state of adverse oral health considerably diminishes the quality of life. Oral health in elder persons, particularly those living in nursing homes, is extensively compromised and increased dependence for oral care assistance exacerbates their poor oral status. Caregivers are the primary oral care providers for the institutionalised elderly, which necessitates an understanding of their awareness and attitudes towards oral health. The aim of this study was to review the published literature pertaining to the analysis of the knowledge, awareness and attitudes of caregivers working in residential homes regarding oral health. The objectives of this study were to explore the literature on the knowledge, awareness and attitudes of caregivers employed in residential homes towards oral health and identify the key barriers in the provision of oral care to the elderly residents. An integrative literature review was conducted which revealed four major themes: caregiver barriers, elderly barriers, organisational barriers and systemic enablers as well as seven sub-themes. The review highlighted the importance of understanding oral health from a caregiver's perspective and identifying the multi-level barriers that prevent effective oral care delivery, change of which presents substantial oral health gains for the elderly. Moreover, it was identified that generating awareness through oral health education is not sufficient in inducing positive oral health attitudes in caregivers and an integrated multidisciplinary approach coupled with better organisational support is needed in order to achieve exemplary oral health goals for the institutionalised elderly. The review concludes with recommendations for practice in nursing homes and examples of qualitative questions which could further future research.

Keywords: Oral health, caregivers, aged care facilities, knowledge, awareness, attitudes, barriers, enablers.

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Chapter 1

Background

1.1 Introduction

Oral health and elderly people have been two important aspects of my life, the former as part of my professional background and the latter, as something that evokes a personal connection. This personal connection probably emerges from me being not so fortunate enough to have grown up with grandparents. This realization only struck me when I started working in residential care homes and developed a deeper interaction with elderly people. While assisting the elderly residents in their daily activities, the dental professional in me refused to overlook the evident neglect in oral care, which was the driving force behind undertaking this research. Although there has been significant research in this field over the years, most of the existing literature has primarily focused on the elderly population and their awareness and perceptions towards oral health. However, since a vast proportion of the elderly reside in aged care homes and depend on caregivers for assistance in their daily oral care, it was important to approach this area of concern through a different lens. For this purpose, an integrative literature review was carried out to revisit and explore the existing knowledge regarding the perceptions, knowledge and attitudes of caregivers regarding oral health since they are the key determinants of the oral health of elderly people living in aged care homes. This chapter introduces the oral health of the elderly and the role that caregivers have as primary oral care providers, providing operational definitions and outlining the research question and objectives.

1.2 Operational definitions

Some terms have been repeatedly used for the purpose of this research, the meanings of which are clarified for better comprehension.

Older adults or elderly or aged - Adults over the age of 65 years which is a widely accepted and used term for referring to those defined as old persons (Brown, 2010).

Residential homes - Organizations that provide long term live-in care for older people, assists them in their daily living activities and support their independent living (Australian Institute of Health and Welfare, 2010). Other terms such as aged care facilities, nursing homes and rest homes have also been used synonymously with residential homes in the private sector over the years.

Oral health – A multi-dimensional discipline of health that enables a range of functions like speech, mastication, swallowing, smiling along with communication of emotions through facial expressions with high self-esteem, devoid of any pain or discomfort of the craniofacial system (Lee et al., 2016).

Xerostomia – A subjective feeling of dryness of mouth, sometimes not associated with a reduced salivary flow (Hopcraft & Tan, 2010).

Periodontal disease – A disorder affecting the surrounding tissues that support the teeth, and can be either acquired or have a genetic predisposition (Philstrom et al., 2005).

Dysphagia – Any impairment in swallowing due to anatomical or physiological defects in the mouth, pharynx, larynx and oesophagus (Crary et al., 2012).

Edentulous – An irreversible state of dentition characterised by complete tooth loss (Emami et al., 2013).

1.3 Background

1.3.1 Population demography

The transitions in the global demographic scenario suggest that the elderly population, which was about 542 million in 1995, will make up approximately 1.2 billion of the world population by the year 2025 (Letchumanan et al., 2020). Based on the 2013 census, the population of older adults in NZ, particularly those aged above 65 years is expected to more than double and reach 1,285,800 by the year 2038, while the proportion of people in the age group of above 85 years is projected to reach 378,800, almost double the population in 2013 (Statistics NZ, 2015). In New Zealand (NZ), older people constitute about 12% of the general population, 5% of whom are residing in aged care facilities (Smith, 2010). This boom in the elderly population is expected to lead to a concomitant rise in life expectancy rates which are being maintained at a steady rate on a global level by the ever-progressing advancements in the medical and technological fields (The University of Auckland, 2013).

1.3.2 Oral health and its implications for the elderly

With advancing age, an individual's capacity for self-care is noticeably compromised due to a subsequent cognitive decline accompanied by deterioration of physical and mental health (Portella et al., 2015). Old age is associated with a higher risk for chronic and degenerative diseases, increased medication use and age-related physiological changes culminating in deprivation of their mobility and independence (Delgado et al., 2016). With advancing age, the cognitive and functional capabilities of an individual become impaired and this is aggravated by a range of co-morbidities that they experience. This further increases their dependence on others for their basic oral care needs. The elderly adults residing in aged care facilities are at a higher risk of presenting with poor oral health which may further exacerbate the already existing chronic conditions (Chalmers & Pearson, 2005).

It is a known fact that ageing has considerable impacts on systemic health and well-being which increases the vulnerability of elder people to chronic illnesses such as cardiovascular disease, diabetes, cancer as well as dental conditions like periodontal diseases (Rodrigues Junior et al., 2012). Although good oral health is fundamental for the maintenance of the overall health and well-being of an individual, it has mostly been regarded as an area independent from general health, which explains the neglect that this area of health faces (Chalmers & Pearson, 2005). Poor oral health in the elderly is mostly characterized by

untreated dental decay, severe periodontal disease, increased tooth loss and xerostomia. In addition to these issues, being edentulous has adverse consequences on their systemic health due to dietary changes where foods rich in fibre are replaced by soft diets of lower nutritional value, as well as increased weight loss (Rodrigues Junior et al., 2012).

Something as simple as the ability to chew food has major impacts on an individual's nutritional intake and diet quality, and poor diet impairs their cognitive and functional capabilities. Needless to say, this has greater adverse consequences on older people who are already experiencing an age-related cognitive decline (Porter et al., 2015). A compromised masticatory function forces individuals to prefer a predominantly soft diet, which is considerably lower in nutritional value, resulting in dietary deficiencies (Zhang et al., 2019). In addition to this, non-communicable diseases like cardiovascular conditions, diabetes and pneumonia show a definite correlation to poor oral health. Cardiovascular diseases are associated with periodontal disease, for example, there is evidence linking poor oral health with a threefold increase in the incidence of stroke or coronary heart disease (Miegel & Wachtel, 2009). Apart from this, poor oral hygiene promotes proliferation and colonization of pathogenic bacteria in the oropharynx, adversely affecting the swallowing and cough reflexes of the individual, and this can potentially result in life-threatening aspiration pneumonia in dependent elderly residents (Miegel & Wachtel, 2009).

All these factors substantiate the significance of good oral health in the social, physical and emotional well-being of an individual, and its positive influence on the quality of life (Chalmers & Pearson, 2005).

There has been documented evidence demonstrating a consistent association of older people with adverse oral health due to their increased vulnerability to oral diseases and a major challenge lies in the effective management of these dental conditions in this target population (Wardh et al., 2002). The oral health scenario in New Zealand has posed as a significant health concern for some time due to a noticeable increase in chronic dental diseases among New Zealanders. Although the oral health strategy devised by the Ministry of Health in NZ has categorized the aged population under the high needs group, it is concerning that effort aimed at formulating appropriate policies to address the oral health issues of this target population, have been minimal (CBG Health Research, 2015). This can be considered as non-adherence to the directives of the World Health Organisation (WHO) who expect national policy development and setting oral health goals for the elderly population. This lack of oral health policy has subsequently disadvantaged the oral health of the older New Zealanders (Smith,

2010). In addition to the lack of policy, previous studies have reported limited documented evidence related to the oral health experiences, awareness, behaviours and perceptions of the nursing staff working in aged care homes in NZ (McKelvey et al., 2003).

1.3.3 Oral care in residential homes

The health of older people, particularly those residing in nursing homes, is compromised due to presence of co-morbidities along with functional and cognitive disabilities, predisposing them to a multitude of oral health-related risk factors (Chalmers & Pearson, 2005). Research shows that the oral health of older adults in nursing homes is frequently characterized by a higher incidence of dental caries, gingival and periodontal diseases, oral candidiasis and masticatory problems with associated pain and discomfort (Hoben et al., 2017). Moreover, these residents are usually prescribed several medications, many of which lead to xerostomia, a condition known to reduce salivary flow. This further exposes them to oral health issues like tooth decay, compromised mastication as well as digestive disorders, thereby affecting their self-esteem and quality of life (Jones et al., 2019). Although appropriate clinical management of dental diseases is required, priority should also be directed towards maintaining oral hygiene on a regular basis (Hoben et al., 2017).

Furthermore, the number of older persons retaining their natural teeth has significantly increased, even though most of the retained dentition is either grossly decayed or having large restorations. The maintenance of natural teeth demands a higher level of oral care in comparison to dentures (De Visschere et al., 2015).

Another concerning factor surrounding the oral health of elder people living in aged care facilities, is the negligence directed towards proper delivery of oral hygiene, despite the oral care guidelines formulated by the organizations (Weening-Verbree et al., 2013). Since most of the elderly residents are functionally or cognitively compromised, simple daily tasks like oral hygiene can become challenging (De Visschere et al., 2015). This results in an increased dependence of the elderly people on caregivers for assistance in their daily activities (Tran et al., 2019).

This dependence on the caregiving staff for oral care needs calls for a better understanding of the awareness of caregivers regarding oral health and their attitudes towards its importance in overall well-being.

What further intensifies the burden of oral disease is an evident lack of awareness regarding the significance of oral health among family members, health professionals, caregivers as well as the elderly people (Smith, 2010).

Moreover, oral health is frequently excluded in the personal hygiene and general health guidelines of most aged care facilities, apart from the global negligence that this health discipline is subjected to in health policies for the elderly (Weening-Verbree et al., 2013).

Research conducted in an American nursing home revealed that individuals with functional and cognitive deficit have a 1.5 times higher likelihood of adverse oral health when compared to their more independent counterparts (Tran et al., 2019). This explains the need for prioritization of oral care in residential care facilities. However, the numerous barriers that mitigate against routine oral care delivery have shown to cause neglect in performing oral care.

In NZ, results of the 2012 Oral Health Survey indicate a better state of oral health among the elderly people living in their own homes, in comparison to those residing in nursing homes (CBG Health Research, 2015). One reason for the poor oral health of the elderly in these aged care homes could be attributed to the negative responsive behaviours of most of the elderly residents towards the assistance provided to them during oral care. In addition to this, it is found that majority of these residents refrain from communicating their dental concerns to the staff unless it causes them any pain or distress (De Visschere et al., 2015). Findings of a study reveal that there was a noticeable lack of adherence to satisfactory standards of oral care practice among the aged care staff in residential homes (Stein et al., 2012). International research has attributed this to a poor understanding among the caregivers about the oral care requirements of these aged residents. Moreover, a general lack of awareness regarding the significance of oral health among the caregiving staff, as well as time constraints due to their workload are other factors that govern the access of elderly residents to acceptable levels of oral care on a regular basis (Tynan et al., 2018). There have been studies which have suggested that caregivers delivered a compromised quality of oral care due to the lack of adequate skill or training in oral hygiene practices (Weening-Verbree et al., 2013). Considering the challenging environment that caregivers work in, time constraints have been constantly cited as a reason which necessitates the prioritization of their tasks. This places oral care at a rather

undeserved position of least priority, as more focus is directed towards general health concerns when compared to oral health (Tran et al., 2019).

It is interesting to note that most of the caregivers were unaware of the correlation between the oral and systemic health of the aged residents (Weening-Verbree et al., 2013). In addition to this, it was observed that most of the organizations did not set out standard oral health guidelines for the staff to adhere to, and there was a lack of adequate support or guidance from dental professionals regarding the oral care needs of the elderly people residing in these facilities (De Visschere et al., 2015). Since most of the retained natural teeth of the residents are usually grossly damaged with unhealthy and swollen gums, many caregivers state that the fear of triggering gingival bleeding during tooth brushing is another reason for deferring routine oral hygiene practices (De Visschere et al., 2015). It is widely recognised that caregivers play a key role in determining the oral health of the elderly residents due to their close association with the daily life activities of these aged people (McKelvey et al., 2003). Studies have proven that delivering oral care instructions, and educating the caregiving staff regarding the implications of poor oral health on general health have generated a positive attitude in caregivers towards oral health (Manchery et al., 2020). Unfortunately, caregivers are compelled to take ownership of the oral health adversities of the elderly under their care, while the underlying driving factors of neglect remain unaddressed (Thorne et al., 2001).

In aged care facilities, caregivers are the key determinants of the delivery of appropriate care to the elderly residents. Since oral health is correlated to general health and quality of life, analysing the perceptions and awareness of caregivers regarding oral health is imperative in achieving good dental status in older adults (Tran et al., 2019). Moreover, this enables a better identification of the factors that hinder the effective provision of oral care to the elderly, which is fundamental in the elimination of the barriers and the active inclusion and promotion of facilitators in enhancing the oral health status for elderly residents in aged care homes.

1.4 Purpose of this research

The purpose of this study is to review existing literature in order to understand and analyse the knowledge, awareness and attitudes of the caregiving staff of aged care homes regarding oral health and its importance in general health and well-being.

1.4.1 Research question

Since the caregiving staff have direct involvement in the oral care of the older residents, their role in determining the oral health of this target group is certainly impactful. Therefore, the research question is:

- What is the knowledge, awareness and attitudes of the caregiving staff working in aged care facilities towards oral health?

1.4.2 Aims and objectives

The aim of this study was to review the literature that analyses the knowledge, awareness and attitude of caregivers working in residential homes regarding oral health.

The objectives of this study are to:

- Identify the literature on the knowledge, awareness and attitudes of caregivers employed in residential homes towards oral health
- Identify the key barriers in the provision of oral care to the elderly residents

1.5 Research method

The research method used for this study is an integrative literature review, which provides a comprehensive understanding of the phenomenon of interest by including a range of methodologies (Whittemore & Knafl, 2005). To be more precise, an integrative review is referred to as “research of research” (Whittemore, 2005, p. 58). An analysis of literature through this process will guide the formulation of recommendations on how caregiver attitudes and oral health of the elderly can be improved.

1.6 Dissertation structure

Chapter One has set the scene about the oral health status of the elderly residing in aged care facilities and the knowledge and attitudes of caregivers towards oral health. It has also identified the integral role that caregivers have in the oral health status of the elderly. In addition to this, some barriers that encourage oral health neglect have also been briefly outlined. The research purpose, aims and objectives are mentioned and the research method of an integrative literature review is introduced.

Chapter Two describes the methodological design used to amass and review the literature.

Chapter Three consists of the literature search results obtained following the application of the methodological design. A summary of all the retrieved literature is provided, with a description of the thematic analysis process that guided data analysis.

Chapter Four elaborates on the integrative research process and interprets findings from the literature based on the themes and sub-themes that emerged during this process.

Chapter Five discusses the research findings, the outcome of which is used to make recommendations that will strengthen elderly oral health. This chapter finally concludes with a section on study limitations and recommendations for future research.

1.7 Summary

To summarise, this chapter has introduced the research area for this Dissertation. The research method used is an integrative literature review with the objectives of exploring the oral health awareness and knowledge of caregivers, and identifying the barriers to oral care provision.

Chapter 2

Methodology

2.1 Introduction

In order to achieve a comprehensive understanding of the key components that influence the oral health awareness, knowledge and attitudes of caregivers working in aged care facilities, an integrative literature review was performed. Perceptions and attitudes are predominantly subjective in nature, making it difficult to quantify them. However, approaching this research area by examining literature of heterogeneous methodologies, enables a profound understanding of the phenomena through both policy and practice.

The following is a detailed account of the research design, research methodology and data evaluation in the integrative literature review process. Strategies to establish trustworthiness will be discussed along with ethical approval.

2.2 Research design and methodology

A preliminary literature search identified heterogeneity in the methodology of the studies (the studies differed in terms of samples, study design or data; Munn et al., 2014), which reaffirmed that an integrative literature review was the most appropriate method of approaching the research question.

Narrative reviews are heavily reliant on a selective body of literature as well as the skill and knowledge of the author to create a review of a predominantly subjective nature. While this method can be utilized to introduce a topic, it evidently lacks a methodology that can be replicated or an analysis of the findings (Aromataris & Pearson, 2014).

On the other hand, systematic reviews incorporate a more rigorous and standardized methodology which is readily reproducible, resulting in the synthesis of results that lack the risk of bias and subjectivity (Aromataris & Pearson, 2014). However, although systematic reviews can be undertaken for both qualitative and quantitative methodologies, it allows the researcher to investigate only one research design per review (Aromataris & Pearson, 2014).

This approach was therefore not considered, given the inclination for diversity in methodological perspectives to investigate the research question.

Integrative literature reviews provide a broad scope for the researcher to summarize and synthesize previous theoretical and empirical literature by permitting the inclusion of both qualitative and quantitative methodologies, thus providing a comprehensive understanding of a topic or issue of concern (Torraco, 2005). This approach is fundamental in visualizing the research area in a comprehensive way, taking into consideration the numerous methods by which the perspectives and knowledge of caregivers regarding oral health can be analysed. As such, an integrative literature review was considered the most appropriate method to examine this phenomenon of concern.

In an integrative literature review, an explicitly described process is fundamental in ensuring transparency to the reader with regard to the search strategy, search results and data evaluation. Moreover, any ensuing reviews that would consider expanding on this area of research can undertake this process without the risk of duplication (Jackson, 1980). Adopting a five-stage approach to integrative review which includes problem identification, literature search, data evaluation, data analysis and presentation, is essential to enhance accuracy and rigour (Whittemore & Knafl, 2005).

2.3 Refining the research question and criteria

2.3.1 Aim

The aim of this study was to review the literature that analyses the knowledge, awareness and attitudes of caregivers working in residential homes regarding oral health.

2.3.2 Objectives

The objectives of this study were to:

- Identify the literature on the knowledge, awareness and attitudes of caregivers employed in residential homes towards oral health
- Identify the key barriers in the provision of oral care to the elderly residents

2.3.3 Search criteria

The mnemonic PICO (population, intervention, comparator, and outcome) model described by Richardson, Wilson, Nishikawa & Hayward (1995) has been used to develop the key search terms in relation to the research question as shown in Table 1. Mnemonics aid in providing structure and clarity to the review method, and PICO mnemonics mostly guide qualitative reviews (Santos et al., 2007) that explore subjective feelings such as perceptions of caregivers in this case.

Table 2.1 Search criteria by the PICO model.

Population	Intervention	Comparator	Outcome
Elderly	Oral Health	Caregiver	Awareness
Old	Oral Care	Nursing assistant	Attitudes
Frail	Aged Care Facilities Nursing Home	Healthcare assistant	Education

2.4 Literature review search strategy

An overarching literature search is a vital component of an integrative literature review in order to achieve rigour and minimize any biased searches (Whittemore & Knafl, 2005). It is expected that a meticulous search strategy should be able to produce similar results on replication. Setting detailed parameters for the search strategy may yield relevant articles, but the probability of missing out quality literature is very high. By contrast, a wider search strategy reveals a large number of articles, however, the irrelevance of a major portion of this literature may mandate their exclusion from the review (Porritt et al., 2014).

Achieving transparency and reproducibility in the search process takes precedence over the quantity of literature identified. Therefore, a systematic approach was undertaken for this study to identify relevant research articles published in the last twenty years, relating to the knowledge and awareness of caregivers working in aged care facilities regarding oral health.

The methodology was adopted in alignment with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines by Moher et al. (2009) which are guided by a four-step approach:

- Identification – Potentially relevant articles are identified through the search strategy. The databases and search terms used for the process along with the date and number of articles are also listed.

- Screening – The abstracts are screened to assess the relevance of the articles to the research topic so that full-text articles can be located and duplicates removed.

- Eligibility – The full-text articles are assessed against the inclusion and exclusion criteria, where the number of excluded articles are noted while citing reasons for exclusion.

- Included articles – Full-text articles meeting the inclusion criteria are listed and grouped based on methodology.

A completed version of the PRISMA flow diagram can be found in Appendix B.

2.4.1 Identification

The literature search included electronic scholarly databases such as CINAHL Complete, SCOPUS, PROQUEST and Cochrane Library (Central) for identification of potential studies. The search terms were formulated in accordance with the PICO categories. A combination of keywords were used which included elderly, old, frail, adults, “oral health”, “oral care”, ‘rest home”, “nursing home”, “aged care facilities”, caregivers, “nursing assistant”, “healthcare assistant”, education, behaviour, attitudes and perceptions. These keywords were then combined with an “OR” and then “AND” was included between the PICO categories to create a final search query. Appropriate limiters were applied suited for the different databases. Later, all the search results which included screened titles and abstracts of references were exported to Endnote X9 (Clarivate Analytics, Philadelphia), and the pdf files of all the full-text articles were downloaded and attached to each reference. The primary interest of this study was to explore studies specific to caregiver perceptions and knowledge of oral health. However, a large number of articles that included caregivers in the study sample, along with other allied health providers were also identified. It was decided to include these articles as well since the perceptions of the caregivers in these studies added value to the review.

2.4.2 Inclusion criteria

- Research articles related to knowledge, awareness and attitudes of caregivers regarding oral health in an institutional care setting for the elderly.
- Peer-reviewed articles published from the year 2000 onwards
- Articles published in the English language

2.4.3 Exclusion criteria

- Studies that solely focused on the awareness and perceptions of the elderly people towards oral health
- Studies that involved the perceptions of dental professionals and other allied health providers towards oral health and interventions proposed by them
- Studies concerning the knowledge and perceptions of caregivers regarding the oral health of the elderly in a palliative or hospital setting
- Articles related to the outcome of oral health educational interventions without a caregiver component
- Articles published in languages other than English
- Non-empirical work (editorials, theoretical discussions)

Exclusion of studies published prior to the year 2000 was chosen to manage the potential volume of literature considering the involvement of a single researcher as well as the size of the project. Moreover, the studies published after 2000 were still representative of the oral health awareness of caregivers with respect to the elderly people, the population of which had demonstrated considerable expansion and higher oral health needs during this period.

2.4.4 Search results and screening

The original search yielded 4,690 articles through databases out of which 343 duplicates were removed to identify 4,347 articles.

The titles and abstracts were screened, following which 4,231 articles were excluded and 116 studies remained. These articles were independently screened and full-text versions of the studies which met the criteria for the review were read and checked against the inclusion and exclusion criteria. Ninety-one studies did not meet the inclusion criteria and were excluded. The excluded articles involved studies based on the perceptions of informal caregivers/family members, perceptions of nurses and managers of an elderly institution, articles based on caregiver perceptions but in a hospital setting, and studies published in languages other than English. In addition to this, articles which were not published in peer-reviewed journals were also excluded. Finally, this process identified 20 research articles which reflected contemporary evidence and relevance specific to attitudes, knowledge and perceptions of caregivers in relation to oral health, were included in the review.

Numerous research and descriptive articles linked to the keyword combinations of oral health, elderly, caregivers and awareness, were found within the databases. For a robust literature review process, adequacy of sample size can be achieved by adopting the principle of data saturation. Data saturation was achieved in this study when further data sampling failed to uncover any new concepts or theories, and the same articles, authors and citations kept recurring.

2.4.5 Characteristics of the articles

The predominant research method observed in most articles was quantitative with interventions, where the knowledge, awareness and attitudes of the caregivers towards oral health were examined. Although some studies included a range of participants which involved caregivers, elderly residents, family members, nurses and managers, the subject of concern in all the studies was the perspectives of the caregivers towards oral health. The final search included one literature review, four studies with a mixed-methods design and four qualitative studies which employed varied methodological approaches to analyse the knowledge, attitudes and perceptions of caregivers regarding the topic of concern. The remaining articles were 11 quantitative studies out of which three of them were randomized controlled trials which contained valuable information specific to educational interventions that influenced the

attitudes of the caregivers towards oral health, and hence were deemed relevant to the research. Since gathering an understanding of the knowledge of caregivers was the priority of this research, such studies, which were targeted at improving the oral health knowledge of caregivers in aged care facilities were included as the measurable outcomes of these studies informed the review on the awareness of caregivers regarding oral health prior to and following educational training programmes.

2.5 Data evaluation and quality appraisal

Evaluation of the quality of data in integrative review methods can be a complex process due to the diversity of the primary sources (Whittemore & Knafl, 2005). Since there is no universal model for the quality assessment of literature reviews, the diverse sampling frame decides the quality of an integrative literature review (Whittemore & Knafl, 2005). The quality of the studies included significantly adds to the strength of the conclusions in a literature review, necessitating the selection of an appropriate quality assessment tool to add value to the review itself. Incorporating a meticulous approach in data evaluation is essential to establish trustworthiness. In order to critically appraise the included studies, the Critical Appraisal Skills Programme Appraisal Tool (CASP) was used to avoid any sort of bias (CASP, 2013). Moreover, this tool can be employed for both qualitative and quantitative research. The lack of a gold standard approach for data evaluation necessitates the adoption of a consistent process, and the CASP tool facilitates consistency by undertaking a systematic application of the ten questions to each research article, keeping in consideration the principles of rigour, credibility and relevance that define research.

Rigour – has an exhaustive and thorough approach been used in the research method for the study?

Credibility – are the findings comprehensible and well structured

Relevance – what is the extent of usefulness of these findings to your research topic?

(Adapted from Greenhalgh & Taylor, 1997).

These principles are fundamental in establishing trustworthiness, and helps determine the extent to which a reader may regard the findings reliable or trustworthy (Greenhalgh & Taylor, 1997). These factors are particularly of significance in the health context, where health professionals will be hesitant to apply any research findings that lack an element of trustworthiness, to their own area of research or practice.

2.6 Reflexivity

Reflexivity refers to a continued critical reflection of any inherent biases or preconceived ideas that the researcher develops during the research process (Holloway & Wheeler, 2010). The author acknowledges her own experience as a dental professional who has temporarily transitioned into a health provider role in a residential care home setting. Considering this, it was necessary to apply the self-evaluation principle of reflexivity to overcome any researcher bias that may have developed during the course of this study.

2.7 Ethical Approval

Since this research project was limited to peer-reviewed and other published literature, ethical approval was not necessary. However, seeking institutional approval is mandated to support the research through a scrutiny of the processes, thereby establishing protection and trustworthiness (DePoy & Gitlin, 2015). Approval was obtained from the Eastern Institute of Technology (EIT) Research Ethics and Approval Committee (REAC), reference number PG20/02.

2.8 Summary

This study is guided by an integrative literature review methodology. The research methods discussed here outline the range of approaches which were involved in exploring literature that was relevant to the research topic. Articles were included for the final study after analysing them according to the inclusion and exclusion criteria. Trustworthiness, reflexivity and ethical considerations were also discussed. A summary of the literature search results will be detailed in the next chapter along with a description of the thematic process of data analysis.

Chapter 3

Literature search results

3.1 Introduction

This chapter elaborates on the findings that were gathered during the different processes of literature search, data evaluation, quality appraisal, data extraction and analysis, as detailed in the previous chapter. This integrative literature review was conducted through the compilation of a body of literature that featured 20 research articles, by setting parameters to define the research question. The process of data analysis was based on the method of thematic analysis as outlined by Braun and Clarke (2006), which provided a framework to build ideas and concepts, leading to the formulation of findings in order to fulfil the aim of assessing the knowledge, awareness and attitudes towards oral health from a caregiver perspective.

3.2 Data extraction and synthesis

All data from the 20 articles relevant to the literature review were transcribed into a spreadsheet which listed elements such as author details, year of publication, research aim, country and setting of the study, sample size, sampling method, research design, findings and limitations of each article. This spreadsheet has been summarized and is presented in Table 3.1

3.3 Literature search findings

3.3.1 Characteristics of the included studies

The eligible publications had a geographically diverse representation where some of them originated from United Kingdom (n = 3), Brazil (n = 3), Canada (n = 3), Australia (n = 2), United States (n = 2), India (n = 2), while others were conducted in Chile, Singapore, Spain, Belgium and Malaysia (n = 1 respectively). Moreover, the selected studies also demonstrate methodological heterogeneity wherein the extracted publications are comprised of 11 quantitative, 4 qualitative, 4 mixed design studies and one literature review. The research design of the 11 quantitative studies which were included in this review used either a self-

designed questionnaire or previously developed questionnaires such as the ones based on the theory of planned behaviour (TPB) (used by Goh et al., 2016) and nursing Dental Coping Beliefs Scale (nDCBS) which was used by Garrido Urrutia et al. (2011) for data collection. In addition to this, there were three randomized controlled trials which measured the effectiveness of educational interventions on oral health behaviours and outcomes. There were four qualitative studies which incorporated varied methodologies ranging from semi-structured interviews (n = 2), nominal group technique (n = 1), or face-to-face interviews along with an observational design (n = 1). In addition to this, 4 studies were characterized by a mixed design approach which featured surveys, interventions, focus group interviews, the inclusion of Visual Analog Scales (VAS), as well as dental audits.

The reported sample sizes of these included publications ranged from 322 to 6 with the smallest sample sizes belonging to the study that involved focus groups. The samples of caregivers studied were predominantly females, employed in an institutional care setting such as a residential aged care facility, nursing home, long-term institutions or an aged care home. A systematic representation of the characteristics of all the included studies can be found in Table 3.1

Table 3.1 Summary of extracted articles.

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
1.	Chicote (2019)	Canada	To determine whether theoretical education or clinical skill development is more effective in achieving good standards of oral care delivery	n/a	Literature review	Barriers such as excessive workload, lack of oral health training, poor organizational support, combative behaviours of elderly and poor competence in oral care Recommendations for integrating clinical skills training with theoretical study and inclusion of oral health assessment tools	No demonstrable evidence of the long-term effects of the interventional strategies on the attitudes of the care staff and the oral health outcomes of the elderly
2.	Cornejo-Ovalle et al. (2013)	Spain	To evaluate the frequency of oral care practices of caregivers in aged care homes	196 caregivers 31 long-term facilities Random sampling	Cross-sectional study Questionnaire	High self-perceived need for oral health Gaps between awareness and implementation Lack of organizational support Self-reported adherence to oral health guidelines Adequacy of dental care resources	Self-reporting generates bias Functional capacity of the elderly not assessed leading to bias

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
3.	Dharamsi et al. (2009)	Canada	To evaluate the effectiveness of Geriatric Dentistry Program (GDP) educational initiative on the oral health knowledge and behaviours of caregivers and to enlist the barriers and enablers controlling oral care provision and policies using PRECEDE-PROCEED model of health promotion and analyse the caregivers perceived needs for oral health	90 caregivers for survey 18 caregivers and other health professionals for interviews 1 aged care facility Purposive sampling	Mixed methods design Surveys, semi-structured open-ended interviews and dental product audits Triangulation of results	Barriers identified were time constraints, care-resistive behaviour of elderly, lack of caregiver awareness regarding oral health, psychological factors and gaps between knowledge and practice. No significant differences in knowledge and attitudes between participants and non-participants of GDP Study recommends inclusion of a practical approach to educational training and reinforcing it at regular intervals Need for better organizational support	Surveys may lead to self-reporting bias No direct quantifiable oral health outcomes of the elderly were measured to study the effectiveness of GDP

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
4.	Frenkel and Newcombe (2001)	UK	To investigate the impact of educational intervention for caregivers on oral health of elderly	322 caregivers 378 residents 22 nursing homes	Cluster randomized controlled trial Block size 4 randomization Oral examination of residents at baseline, one month and six months after intervention	Poor baseline oral hygiene practices Barriers reported were deficits in oral hygiene resources, psychological factors Significant improvement in oral health knowledge and practices evident in specific areas (denture hygiene) Minimal improvement in intra-oral hygiene	Exclusion of residents with severe cognitive impairment can skew results Provision of dental care supplies likely to influence results as much as intervention Caregiver participation rate was only 66%
5.	Garrido Urrutia et al. (2011)	Chile	To draw comparisons in oral care practices and perceptions between formal and informal caregivers	21 formal caregivers 1 aged care facility 18 informal caregivers 1 primary health domiciliary programme Purposive sampling	Cross-sectional study Structured nursing Dental Coping Beliefs Scale (nDCBS) questionnaire	Educational training more evident in formal caregivers Oral care knowledge did not always translate into practice Considered incapable of exercising control over oral health outcomes Excessive workload led to time constraints Unsure of own potential contribution to oral health outcome of elderly	Small sample affects generalization of population Social desirability bias

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
6.	Goh et al. (2016)	Singapore	To investigate the perceptions of caregivers towards oral care and to study the motivational factors that influenced their attitudes/ behaviour	96 caregivers 5 nursing homes (public) Purposive sampling	Cross-sectional study with survey questionnaire based on the theory of planned behaviour (TPB)	Barriers included lack of formal education or any previous oral health training Caregivers had positive attitudes towards oral health but lacked self-confidence in delivery Excessive workload No difference in self-confidence between trained and untrained caregivers	Not generalizable due to exclusion of private nursing homes and low response rate Response bias
7.	Hilton et al. (2016)	Australia	To explore the perceptions and experiences of nurses and caregivers in implementing best-practice oral health guidelines and determine the barriers and facilitators that influence its effective implementation.	35 care providers (nurses, caregivers, managers) Convenience sampling 6 caregivers 1 nursing home Convenience sampling	Mixed Design Online survey questionnaire Focus group interviews	Gaps between knowledge and practice, inadequate oral hygiene supplies, health conditions of elderly were the barriers identified. Conflicting findings regarding time constraints as a barrier Recommends oral health education to caregivers, residents and families, organizational support and observational studies of current practices	Self-reporting bias associated with surveys Social desirability and response bias in focus groups Limited generalizability

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
8.	Jablonski et al. (2009)	USA	To assess the knowledge, attitudes and oral health behaviour of nursing assistants, with the aim of designing an educational program for nursing assistants	106 nursing assistants, convenience sampling 2 nursing homes Purposive sampling	Mixed design Survey questionnaire incorporating a visual analogue scale for few questions(VAS) Open-ended written questions	Reported barriers were non-compliant attitude of residents, psychological factors, lack of oral hygiene resources, incompetency in handling difficult behaviours and gaps between knowledge and implementation.	Self-reporting bias Use of VASs may produce skewed results
9.	Junges et al. (2012)	Brazil	To explore the perceptions and attitudes of caregivers towards oral health and oral care practices in an aged care home	Convenience sampling 27 permanent caregivers 1 nursing home	Cross-sectional study Researcher-administered questionnaire	Facilitators had prior oral health training and availability of oral care resources Barriers included resident non-compliance and time constraints. Low priority towards oral care	Lacks generalizability due to small sample size Hawthorne effect could have impacted findings

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
10.	Khanagar et al. (2014)	India	To assess the impact of an intervention on oral health knowledge and attitudes of caregivers	78 caregivers 7 nursing homes	Randomized intervention trial Oral health training at baseline and reinforcement after 3 months Pre and post-intervention questionnaires at baseline and at 6 months	Poor oral health knowledge at baseline Marked improvement in oral health knowledge after education Recommends incorporating oral health in curriculum and reinforcement of training on a regular basis	Self-reporting bias No measurable oral health outcomes of residents after intervention
11.	Khanagar et al. (2015)	India	To assess the oral health knowledge of caregivers, oral care status of elderly residents, to provide oral health education and to evaluate the effectiveness of this intervention on the oral health outcome of the residents	322 residents 78 caregivers 7 rest homes Random sampling	Quantitative Randomized Control Trial Oral examination of residents at baseline and six months Questionnaire for caregivers at baseline and at six months Oral health training for caregivers at baseline and after three months Blinding of dental examiner	Significant improvement of oral health knowledge post-intervention Improvement in caregiver and elderly attitudes towards oral health and practices	Did not include residents with dementia or cognitive impairments

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
12.	Kohli et al. (2017)	USA	To analyse the attitudes and knowledge of caregivers towards oral care for aged people in long term care and to provide adequate training for administrators	8 long-term care facilities 70 caregivers Probability proportional to size sampling 10 long-term care facilities 265 caregivers	Mixed design Cross-sectional study with surveys After one year Interventional study with pre- and post-intervention surveys	Barriers included prioritization of other health needs over oral health, care-resistive behaviours and non-compliance of elderly. Post-intervention, gain in oral health knowledge and competence.	Response bias due to self-reporting element of surveys Both studies were done on different sets of samples Effectiveness of intervention not measured
13.	Letchumanan et al. (2020)	Malaysia	To assess the perceptions of the caregivers towards dental services provided to elderly in nursing homes in Malaysia To analyse the challenges encountered by them while delivering oral care	36 caregivers Purposive sampling 3 nursing homes Random sampling	Qualitative study using nominal group technique (NGT)	Barriers such as negative attitudes of elder people mainly care-resistive behaviours, lack of awareness of oral health and mistrust towards caregivers. Caregivers underestimate importance of oral care	Omission of caregiver work experience related questions could impact study findings Participation relied on availability

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
14.	Matear and Barbaro (2006)	Canada	To analyse the perceptions of the caregiving staff which determine the challenges and facilitators in provision of oral care to the elderly in nursing homes and arrive at strategies to minimize the barriers through educational interventions where appropriate	100 residents 40 caregivers Convenience sampling Number of residential homes not specified	Qualitative Structured interviews through questionnaires with caregivers	Caregivers prioritized emergency and preventive care over more complex oral care procedures Lacked adequate oral health training Identified importance of dental services in aged care settings	Low response rate (40%) contributed to bias Not generalizable
15.	Preston et al. (2006)	UK	To draw comparisons between the oral health knowledge and beliefs of nursing staff in hospitals and aged care homes	75 caregivers in nursing homes 100 healthcare providers from hospitals Voluntary sampling	Quantitative Semi-structured questionnaire	Caregivers fared better in oral care motivation Comparatively impressive attitude and practices among caregivers Study recommends more oral health training	Self-reporting bias

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
16.	Reis et al. (2011)	Brazil	To analyse the perceptions of caregivers about oral health and the factors influencing their role in oral care provision in aged care facilities	10 caregivers 1 residential home Convenience sampling	Qualitative Face-to-face in-depth interviews and observational study	Lack of oral health awareness, and resident non-compliance presented as barriers Positive attitude and satisfaction towards caregiver role Study calls for the need for organizational support	Volunteer participation introduces bias Small sample size lacks generalization
17.	Simons et al. (2000)	UK	To investigate the oral health knowledge of caregivers and to evaluate the effectiveness of an interventional study on the oral health knowledge of caregivers and on the oral health outcome of elderly	39 caregivers (only 7 residential homes agreed to caregiver training) 213 residents 18 residential homes Random sampling	Cross-sectional study For caregivers: Oral health training Questionnaires at baseline and 1 week after training For residents: Oral examination, dental support at baseline Follow-up after one week and one year Structured questionnaire interview at baseline and after one week	Poor baseline oral health knowledge Lack of prior training High staff turnover Noticeable improvement in knowledge after intervention but did not translate into practice Minimal change in behaviour despite training Need for comprehensive oral health strategies to promote behavioural changes and skill enhancement	High staff turnover may influence results Response bias Assessing oral health improvements after one week is unrealistic

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
18.	Unfer et al. (2011)	Brazil	To analyse the perceptions of caregivers about oral health of the elderly under their care and to understand the oral care routines, barriers for oral care provision as well as the competence of caregivers	Convenience sampling 120 caregivers 7 long-stay institutions	Qualitative Semi-structured interview	Formal qualifications of caregivers did not differently impact quality of care Considered the need for dental professionals or extra staff for oral care delivery Adequate availability of oral hygiene products Barriers cited were time constraints, inadequate staff, incompetence due to lack of training, less prioritization of oral health and psychological barriers	Response bias as few interviews were conducted in a public space
19.	Vanobbergen and De Visschere (2005)	Belgium	To identify the extent of dental service utilization and the factors influencing any variations in these parameters	225 health providers (nurses and caregivers) 16 nursing homes Stratified random sampling	Quantitative Researcher-administered questionnaire	Barriers reported were knowledge gaps, time constraints, lack of oral health protocols and organizational support. Recommendations for oral health training as well as directive and supportive involvement of organization	Recall and response bias due to overestimated and inaccurate responses to survey

Study	Author	Country	Aim	Sample	Method	Major findings	Limitations
20.	Webb et al. (2013)	Australia	To explore the perceptions of caregivers regarding oral care delivery in residential homes as well as to analyse the challenges faced by them in provision of oral care.	211 caregivers 406 nursing homes Random sampling	Quantitative Questionnaire self-reported	Barriers were resident non-compliance, poor knowledge about oral care products Considered oral care procedures to be time-consuming and tiresome Failed to recognize the need to incorporate dental professionals in residential homes Attributed importance of oral health to diet and self-esteem	Low questionnaire response introduces bias Questionnaire element leads to self-reporting bias

3.4 Data synthesis

Data synthesis refers to the compilation of all the findings that were presented during data extraction into a comprehensive and coherent manner (Munn et al., 2014). The methodological heterogeneity of the included literature warrants the use of a narrative summary approach, as a meta-analysis of literature of this nature is not deemed appropriate. Narrative summary is an interpretive expression of extracted data and this method is adopted when the included studies are highly heterogeneous in nature (the studies differ in terms of samples, study design or data; Munn et al., 2014). Although the methodological aspects of all the studies included in this review vary markedly, each one of them identified similar outcomes, which aided the synthesis of the data using thematic analysis where common themes or patterns were identified.

3.4.1 Thematic analysis

Thematic analysis is a method of data analysis that can be adopted for identifying, analysing and reporting the various themes that emerge from the extracted data. Due to its high suitability to heterogeneous approaches, thematic analysis permits the identification of similarities and differences, thus enabling a deeper interpretation of the primary aspects of the research question across varying styles of literature (Braun & Clarke, 2006). However, this form of analysis is accompanied by a risk of researcher bias, where intentional or unintentional identification of particular themes across the literature is possible. Therefore, in order to minimize bias, the thematic analysis framework of Braun and Clarke (2006) as shown in Table 3.2 was used.

Table 3.2 Phases of thematic analysis

	Phases	Description of process
1.	Familiarizing yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2.	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code
3.	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4.	Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5.	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6.	Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back to the analysis of the research question and literature, producing a scholarly report of the analysis.

(Braun & Clarke, 2006, p.35)

3.4.2 Thematic analysis process

This study incorporated the six phases of the thematic analysis framework of Braun and Clarke (2006). Following the critical appraisal of the quality of the accumulated literature, the findings could be collated into a logical and meaningful narrative sequence.

Phase 1: Familiarization with the data

This was achieved by rigorously reading and re-reading the full-text articles and highlighting the key aspects of the caregivers' perspectives in relation to oral health. During this stage, no attempts were made to collate the pieces of information until a complete and thorough reading of the articles was achieved. This enabled individual reflection upon all information within each study to minimize the possibility of transfer of information from one article to another, which could have generated bias. However, since the data analysis process was conducted single-handedly by one researcher, the task of minimizing such a bias was challenging.

Phase 2: Generation of initial codes

The major concepts or points highlighted in the previous phase were transferred onto a spreadsheet with the inclusion of codes, references and headings which were used by the authors of the included articles to provide context to the findings. This resulted in a total of 167 items for data synthesis.

Phase 3: Searching for themes

This phase comprised of grouping together of the findings within the spreadsheet based on the generated codes. This resulted in the formation of themes, where similar results or characteristics were grouped together. Although some findings aligned with multiple themes, their final grouping was decided after careful consideration of their suitability under the most apt theme. Four major themes emerged from this process.

Phase 4: Review of the categories

This step involved the verification of the four major themes, the subsequent sub-themes and the actual results with the research articles to reaffirm their alignment with the concepts of the original articles. This did result in the interchange and reorganization of some findings between themes to establish congruency with the original articles.

Phase 5: Defining and naming the themes

The four major themes which emerged from this data analysis process were then refined to explicitly distinguish between the themes, such that each theme was uniquely identified and expressed. These themes are identified in Table 4.1.

Phase 6: Producing the report

In this phase, appropriate examples that represent each theme have been selected from the research articles.

3.5 Summary

In this chapter, the results of the literature search have been summarised with a brief detailing of the main characteristics of each study such as the methodology, sampling, key findings and limitations. The process of data analysis using the thematic approach was also described using the thematic analysis framework. The next chapter will explore the interpretation of the data analysis based on the emergence of themes.

Chapter 4

Findings

4.1 Introduction

This chapter describes the integrative research process which explores the relationships and themes in the literature that inter-connects the knowledge, awareness and attitudes of caregivers regarding oral health with the oral health outcomes of the elderly residing in residential homes. The interpretation of the data analysis will be described based on the four themes and seven sub-themes that were identified during this process.

4.2 Findings

Following the data analysis of the 20 included articles, four themes were identified that provided a framework to outline the integral aspects of oral health awareness among caregivers. The major themes and sub-themes have been outlined in Table 4.1.
While analysing the literature identified on oral health knowledge and attitudes of caregivers, a consistently recurring concept that emerged from the literature was of the various barriers that were encountered with respect to caregiver's development of their knowledge and behaviours regarding this area of health, and how these barriers affected the knowledge translation into effective practice at their workplace. Most of the barriers identified in the literature were assimilated within the three dominant themes and five sub-themes. The themes outlined the barriers through the caregiver, elderly and organizational components, with the sub-themes defining attributes specific to each component. Conversely, the need for addressing the barriers that caregivers were faced with in relation to oral care delivery and maintenance of the oral health of the elderly in aged care facilities was also identified in the literature and acknowledged in the fourth major theme namely system-level enablers with two sub-themes comprising of oral health promotion interventions and multidisciplinary collaboration.

Table 4.1 Themes and subthemes from the literature

Theme	Sub-theme
Caregiver Barriers	Oral health knowledge
	Attitudes towards oral health
Elderly Barriers	Behaviours & Awareness
Organisational Barriers	Policy and Practice
	Oral health resources
System-level Enablers	Oral health promotion interventions
	Multidisciplinary collaboration

4.2.1 Caregiver Barriers

The fundamental role that caregivers play in the oral health provision of elder people in aged care facilities is undeniable. However, what is more essential, is being adequately knowledgeable and developing positive attitudes regarding this area of health, so that it reflects in their practice on a daily basis. The theme of caregiver barriers was assimilated from the synthesis of two sub-themes namely oral health knowledge and attitudes towards oral health.

4.2.1.a Oral health knowledge

The literature identified in this review showed that the oral health knowledge of caregivers is unarguably a major determinant of the oral health of the elderly residing in aged care facilities (Vanobbergen and De Visschere, 2005). It is interesting to note that while according to some studies, caregivers had a reasonably good knowledge about oral hygiene practices (Hilton et al., 2016; Unfer et al., 2011), other studies found that there were major knowledge gaps regarding this area of health among a large proportion of caregivers, with oral care practices learned mainly on the job (Simons et al., 2000; Letchumanan et al., 2020). In addition to this, while comparing the oral health knowledge of formal and informal caregivers, it was revealed

that the number of formal caregivers having received oral health training far exceeded the informal caregivers (Garrido Urrutia et al., 2011). However, this knowledge gain did not translate into practice, which was evident from the low frequency of oral care practice implemented (Garrido Urrutia et al., 2011). Nevertheless, it is challenging to draw comparisons of their knowledge with other studies due to the lack of a standardized tool that measures oral health knowledge.

Nonetheless, the degree of knowledge and awareness among caregivers varied within different areas of oral health and hygiene (Jablonski et al., 2009). This was evidenced by the predominantly positive nature of the responses to questions concerning the frequency of routine oral care as well as the correlation between oral and systemic health, which demonstrated that the oral health knowledge of caregivers in these areas was adequate (Jablonski et al., 2009). However, Khanagar et al., (2015) in their study, had observed a limited understanding of the importance of oral health, denture hygiene, intra-oral hygiene and dental check-ups among caregivers who had no previous oral health training. To add to this, another study found that oral health was largely associated with treatment, oral care and prostheses, while the dietary and self-motivation aspects were frequently overlooked (Reis et al., 2011). Many caregivers failed to recognize the importance of dental check-ups for edentulous residents as they associated dental screening solely to dental decay and periodontal problems, hence overlooking the importance of soft tissues in the maintenance of oral health (Preston et al., 2006). Moreover, a sufficient understanding about certain aspects like oral care provision in residents with dysphagia was less, and this greatly impacted the confidence levels of caregivers (Dharamsi et al., 2009).

To add to this, the knowledge of caregivers regarding various oral hygiene products was also minimal (Webb et al., 2013). This was evidenced by studies which revealed knowledge inadequacy regarding the use of denture cleansing tablets as well as the inappropriate use of dental care products, resulting in an increased risk of denture plaque accumulation and subsequent bacterial colonization, culminating in the poor oral health of the elderly (Dharamsi et al., 2009; Jablonski et al., 2009).

A noticeably consistent observation of most studies was the contradictions between knowledge and implementation, despite the great value that most caregivers attributed to oral health and hygiene (Hilton et al., 2016; Unfer et al., 2011; Dharamsi et al., 2009; Jablonski et al., 2009; Reis et al., 2011). This is evidenced by the non-adherence of the nursing staff to the recommended oral and denture hygiene guidelines of the organizations (Hilton et al., 2016).

An increased frequency of oral care practices have been associated with some sort of formal training, in most cases, even though the majority of the caregivers positively reported on the routine delivery of oral care, this theory failed to reflect on the oral health status of the elderly (Garrido Urrutia et al., 2011). It is assumed that this inconsistency in findings could have probably been a result of self-reporting bias developed from a social desirability phenomenon, which is frequently associated with research designs involving questionnaires. The reliability of these findings could be further verified through observational studies of the routine oral care practices in these facilities.

Finally, while investigating the causal factors of this knowledge-practice gap, one study revealed that this deficiency in practice could possibly arise from the excessive workload that formal caregivers are faced with (Garrido Urrutia et al., 2011). Whilst establishing causation is important, the small sample size of this study limits the validity of the findings.

4.2.1.b Attitudes towards oral health

It is expected that a caregiver's attitude and perceived need for their own oral health can heavily influence their oral care behaviours towards the elderly people (Unfer et al., 2011; Chicote, 2019). Caregivers generally acknowledged the significance of oral health, yet there was a clear disconnect between their perceptions of oral care and its implementation at their workplace (Simons et al., 2000). According to Letchumanan et al. (2020), most of the caregivers had a fair understanding of their role in the oral health of the elderly residents, however, they were faced with certain barriers that prevented them from undertaking their role efficiently. Nonetheless, many caregivers believed that addressing the barriers to oral care implementation was beyond their control or responsibility (Unfer et al., 2011; Goh et al., 2016). This is in contrast to the findings of another study where the caregivers were mostly unaware of their potential contribution to the oral health of the elderly. In fact, they were convinced that their oral health beliefs or knowledge had no control over any improvement in the oral health of the residents under their care (Garrido Urrutia et al., 2011).

Although caregivers acknowledged the correlation of optimal and quality oral care practices to a satisfactory state of overall health and well-being of the elderly, most of them regarded tooth loss as an inevitable consequence of the ageing process (Goh et al., 2016; Reis et al., 2011; Jablonski et al., 2009). Attitudes to oral health were heavily influenced by psychological barriers associated with having to work in another person's mouth which most of the

caregivers considered as an intrusion of privacy, while such psychological issues did not intervene when dealing with incontinence (Unfer et al., 2011). Another psychological barrier was observed in a study by Dharamsi et al. (2009), where some of the caregivers considered intra-oral care provision highly repulsive. In support of this issue, a second study revealed that despite educational interventions, the poor oral status of the elderly was highly indicative of the impact of psychological barriers that prevented caregivers from carrying out intra-oral hygiene (Frenkel et al., 2001). In addition to this, an evident lack of affinity for the job often adversely affected the quality of care they delivered to the elderly, where in most cases, the caregivers stayed on the job due to compulsion, as a consequence of which job satisfaction was severely lacking (Cornejo-Ovalle et al., 2013).

Some nursing assistants reported being discouraged by feelings of self-doubt regarding their skills and competence in effectively providing oral care to fulfil the oral health needs of the aged residents (Goh et al., 2016; Chicote, 2019). Regardless of their oral health training status, most caregivers associated their reluctance to oral care delivery with the fear of causing pain or harm to the residents (Jablonski et al., 2009; Goh et al., 2016). In residents with conditions like dysphagia where the risk of aspiration is high, the caregivers preferred to refrain from delivering oral care as a better alternative in order to avoid these risks altogether (Hilton et al., 2016). In addition to this, the degree of dependency of the residents was another predominant factor determining the oral health attitudes of care providers, where they chose to discontinue oral care in challenging circumstances (Goh et al., 2016). This proves the disturbing reality that residents with a high degree of dependency or poor state of health are probably the most disadvantaged in terms of oral care (Hilton et al., 2016).

Although the caregivers mostly demonstrated enthusiasm in reporting adequate oral hygiene practices on a routine basis, these were rarely evident in practice (Chicote, 2019). This is further substantiated from the dental audits and interviews of a study which revealed a significant gap between attitudes and implementation (Dharamsi et al., 2009). In contrast, another study revealed satisfactory oral hygiene practices with increased frequencies of care of the dentition, dentures as well as oral mucosa (Junges et al., 2012). However, these results lack generalizability due to a small sample size, and hence are not entirely reliable.

Even though most caregiving staff maintained positive attitudes towards oral care, in practice general health needs took precedence over oral health, resulting in incomplete and incompetent oral care for the elderly (Unfer et al., 2011). Regarding perceptions about their own oral health, caregivers identified the frequency of dental visits as an important parameter

for measuring oral health outcomes. This was a primary reason why they perceived dental professionals to be the major determinants of oral health for the elderly (Unfer et al., 2011). Although caregivers recognized the need for emergency and preventive dental care with prioritization of restorative, surgical and prosthetic interventions, more complex treatments like implants were considered insignificant and unnecessary (Matear & Barbaro, 2006).

In addition to this, caregiver perceptions regarding the importance of natural dentition or dentures in the appearance and self-esteem of the residents were mostly positive, however, few of them wanted the residents or their family members to be accountable for the residents' oral health (Webb et al., 2013).

In spite of a perceived comfort related to their own oral health and routine oral care, nursing assistants recognized the necessity of oral health education to enhance their knowledge, particularly in certain areas concerning oral diseases and their systemic involvement (Kohli et al., 2017). Caregivers also stressed the need for mandating oral health training and reinforcing it on a periodic basis, and expected it to significantly improve their competence while administering oral care to residents with challenging conditions like dementia or dysphagia (Hilton et al., 2016). Despite this recognition, it has been asserted that emphasis should be given in developing profound behavioural changes in caregivers in order to evoke positive oral health outcomes for the elderly, as educational interventions alone cannot achieve this (Simons et al., 2000).

4.2.2 Elderly Barriers

This theme focuses on the perspectives of the caregivers in relation to the elderly residents under their care. It recognizes the barriers that originate from the elderly with regard to oral health behaviours and awareness of the elderly, towards oral care assistance.

4.2.2.a Behaviours and awareness

According to the caregivers' responses in the literature, meeting the oral care needs of institutionalised elderly was often challenging due to an element of mistrust in the attitudes of the residents, when approaching them for oral care provision (Letchumanan et al., 2020; Junges et al., 2012). Multiple studies maintained that a more favourable behaviour from the residents would encourage better oral care provision (Goh et al., 2016; Webb et al., 2013; Junges et al., 2012). In most situations, the inability of the elderly to communicate their oral

health problems to the caregivers was identified as an important deterrent in oral care provision (Webb et al., 2013). In addition to this, advancing age was accompanied by cognitive decline and dementia, which resulted in non-compliant and resistive behaviours towards oral care which further discouraged caregivers from pursuing oral hygiene for these residents (Chicote, 2019). The disapproval and non-cooperation of residents towards assistance in oral care was a consistently stated reason in many studies for poor oral care delivery (Junges et al., 2012; Jablonski et al., 2009; Dharamsi et al., 2009).

This can be corroborated by a caregiver's response in the study by Hilton et al. (2016, p.199),

> *"Usually, it is a struggle to get them to open their mouth, let alone clean everything adequately. They also bite down on, or try to eat brushes or swabs, refuse point blankly, or swallow toothpaste. Will not let staff remove their dentures."*

Furthermore, caregivers considered themselves highly incompetent in managing care-resistive behaviours of the elderly during oral care delivery (Chicote, 2019; Letchumanan et al., 2020).

Letchumanan et al. (2020) stated that the development of oral health education programmes for the residents in aged care homes is essential to generate a positive attitude among them towards oral health. Moreover, the trust of the elderly towards their care providers with regard to their oral health can be acquired by enhancing the oral health knowledge and skills of these care providers.

A poor attitude towards oral health among elderly residents was another major challenge that caregivers commonly encountered. Their appreciation for oral health and need for dental treatment only emerged in the event of pain, chewing discomforts or aesthetic concerns (Letchumanan et al., 2020). One of the reasons for this negative attitude of the elderly towards oral health was found to be associated with their lack of awareness regarding this area of concern. This knowledge deficit paved the way for unsatisfactory oral health outcomes in the elderly due to their own uninformed oral care practices (Letchumanan et al., 2020).

4.2.3 Organisational barriers

This theme focuses on the organisational system responsible for the directive and supportive decisions that guide the oral health of elderly residents. It comprises of two sub-themes namely policy and practice and oral health resources.

4.2.3.a Policy and Practice

Poor self-confidence and incompetency of caregivers in oral care provision was mostly attributed to a lack of organizational support and adequate oral health training (Chicote, 2019). A major proportion of caregivers in two studies considered their understanding of oral health to be adequate, although only a few of them had participated in an educational training program (Dharamsi et al., 2009; Goh et al., 2016). On the contrary, two other studies argued that the majority of the caregivers had received some training in oral health under their organizations (Cornejo-Ovalle et al., 2013; Junges et al., 2012). Although the provision of educational training helps the caregiving staff in attaining confidence in oral care, certain institutional barriers like time constraints and understaffing needs to be overcome in order to benefit from the knowledge gain (Unfer et al., 2011). Time constraints for caregivers were mainly associated with the number of residents under their care (Junges et al., 2012; Goh et al., 2016), since the oral health behaviours of trained caregivers with fewer elderly under their responsibility, were noticeably positive (Goh et al., 2016). According to Chicote (2019, p.179),

> *"Oftentimes, care aides have high workloads, creating a situation where prioritization of tasks is necessary. This complicates oral care, as oral diseases are prioritized less often when compared to systemic health concerns".*

Contrary to the findings of these studies, Jablonski et al. (2009) stated that inadequate staffing or time constraints were never an issue or concern for care providers. In addition to this, Frenkel et al. (2001) argued that lack of time for oral care provision cannot be regarded as a genuine barrier for oral care provision as routine dental care for a resident does not require more than 2 or 3 minutes, which according to the authors is quite achievable among other routine tasks.

Interestingly, in one study which used a mixed design methodology, there were contradictory findings regarding time constraints, where survey respondents claimed that lack of time was an important barrier to oral care delivery, while focus group participants drawn from the same participant pool disagreed (Hilton et al., 2016). This suggests results on this topic could be representative of the way in which data was collected.

Institutions with higher occupancies, those accommodating residents with greater dependencies as well as those with a larger proportion of extremely aged residents, demonstrated a pattern of compromised levels of oral care (Vanobbergen and De Visschere, 2005). The care of residents with a high degree of dependency necessitates the employment of

more personnel, and this need remains unmet mostly due to financial constraints in the concerned institutions (Vanobbergen & De Visschere, 2005). In this context, the quality of oral care provided to extremely aged residents was considerably compromised due to an organisational trend of prioritising other areas of health over oral health. This could have resulted from the assumption that the dentition status of really old people is mostly edentulous, and this does not mandate oral hygiene (Vanobbergen & De Visschere, 2005). Further literature supports this, by identifying that oral care plans which were integrated into the general care plans of the residents as part of an educational training package, completely free of cost, remained unfulfilled which was suggestive of the lack of organisational support (Simons et al., 2000).

Oral health protocols of aged care organisations are based on recommendations for routine elimination of dental plaque from the surfaces of teeth or dentures, regular use of mouth rinses and maintaining the hygiene of the oral mucosal tissues by proper hygiene practices (Junges et al., 2012). One study showed that there was an evident lack of oral health documentation or structured oral health guidelines in most institutions for the caregivers to adhere to (Vanobbergen & De Visschere, 2005). In spite of this, caregivers reported an active and routine engagement in oral care provision for the elderly residents (Vanobbergen & De Visschere, 2005). However, these findings could have arisen out of self-reporting bias associated with questionnaire-based studies.

On the other hand, the study by Cornejo-Ovalle et al. (2013) highlighted the presence of appropriate oral health guidelines in the organisation, guiding the caregivers to deliver appropriate care. Despite the presence of adequate oral health guidelines, a major factor that could compromise the quality of oral care was the excessive workload in these organisations, where many caregiving staff are working more than one shift. Such issues are under the control of the administration and can be only addressed with better organisational support (Cornejo-Ovalle et al., 2013). One study in the review been recommended workforce expansion through the inclusion of dental aides in oral care as well as the incorporation of clinical skills training in order to address the underlying causes of excessive workload and understaffing (Goh et al., 2016).

In one study, it was observed that deficits in knowledge, as well as time constraints, resulted in a lack of adherence to the oral health protocols, which in turn led to inappropriate oral care practices that could cause injury or harm to the caregivers (Dharamsi et al., 2009).

Another study in the review recommends a greater organisational involvement in developing oral health protocols and incorporating training programs to assist caregivers in adhering to these protocols (Vanobbergen & De Visschere, 2005). More recently Hilton et al., (2016) identified that the formulation of well-structured oral health guidelines with an emphasis on oral health training for the staff and quality oral care provision is a fundamental requirement of every institution. In addition to this, Junges et al. (2012) suggested the inclusion of chlorhexidine mouthwash in oral health protocols due to its beneficial role in the prevention of oral diseases. To maximize the effectiveness of these oral health guidelines, it is imperative that organizations develop a systematic auditing tool to sufficiently guide the translation of these policies into effective practice (Hilton et al., 2016).

4.2.3.b Oral health resources

The lack of adequate dental resources necessary for the provision of appropriate oral care presented as a major concern for caregivers in the literature identified in this review. This is in violation to the oral health protocols that recommend the timely and adequate provision of supplemental oral care aids in addition to the basic oral hygiene products like toothpaste and toothbrush (Hilton et al., 2016). Consequently, caregivers attributed the compromised quality of oral care of elderly residents to this resource deficit (Frenkel et al., 2001). Similarly, the study by Jablonski et al. (2009) also identified that the inadequacy of oral care resources could probably have some influence over the lack of implementation of oral care. However, the reliability of the findings in this particular study are questionable as the use of a Visual Analogue Scale is not suitable to measure the frequency of oral care in an environment where dental supplies are already limited.

Another study argued that from the caregiver's perspective, the availability of dental resources in their institutions for oral hygiene practices was never an issue, thus allowing them to align their oral care practices with the organization's oral health guidelines (Junges et al., 2012). However, these findings have the likelihood to be influenced by Hawthorne effect, wherein the participants of the study demonstrate a modified behaviour or response due to their

awareness of being & monitored (McCambridge et al., 2014) thereby affecting the reliability of the results.

In addition to this inconsistent evidence on oral health resource provision, the transfer of responsibility for the funding of oral hygiene resources to the family members, greatly disadvantages the residents, particularly if the family lacks awareness regarding the adversities of poor oral health to their elderly relatives in aged care homes (Hilton et al., 2016). This calls for a careful re-examination of the financial decisions that underpin an organization's access to basic oral care equipment (Hilton et al., 2016).

4.2.4 System-level Enablers

System-level enablers have an influential role in determining the quality and continuity of oral care practices in facilities where the oral health of the elderly is a challenging concern (Goh et al., 2016). Enablers at the system-level incorporate an interplay of approaches that can strengthen the oral health framework of the institution. Examples from the literature included oral health promotion through education which could influence practice, and the incorporation of multidisciplinary collaboration, which could influence policy. These enablers came to the forefront during the synthesis of these findings.

4.2.4.a Oral health promotion interventions

The studies in this review showed that incorporating educational training for nursing assistants in aged care facilities, will enable the integration of oral care into the routine activities of the institution, with regular knowledge reinforcement delivered through in-service training (Kohli et al., 2017). Regardless of the high proportion of formally trained caregivers, organizations must emphasize on constantly updating their oral health knowledge through effective initiatives (Cornejo-Ovalle et al., 2013). Moreover, a third study observed that caregivers recognized the need for further educational training in specific areas of oral health namely impact of medications on oral health, management of elderly with cognitive decline and identification of oral diseases including oral cancer (Webb et al., 2013). The knowledge deficit regarding certain oral care aspects and dental product information accentuates the need for educational training of caregivers in these areas as well (Webb et al., 2013).

An assessment of the oral health status of the elderly revealed evidence of poor oral practice among untrained caregivers and these oral health needs of the elderly were resolved by appropriate dental management as part of the study (Simons et al., 2000). Following an educational intervention, caregivers felt equipped enough to identify the adverse oral health that the elderly experienced, and develop competencies to address the numerous oral health needs of the residents under their care (Kohli et al., 2017; Frenkel et al., 2001). Indeed, the inclusion of an educational intervention evoked a realization among caregivers regarding the significant role that they had in the oral health of the elderly (Frenkel et al., 2001). Another interventional study observed similar findings, where prior to education, the oral health knowledge of the caregivers was minimal but the knowledge gaps were considerably reduced post-intervention. These results are suggestive of the positive impact of oral health educational programmes (Khanagar et al., 2014). Previous educational interventions have shown to enhance oral health knowledge (Simons et al., 2000), however, the longstanding outcomes of these interventional programmes on the oral health status of the elderly as well as its impact on behavioural change have not been sufficiently explored (Simons et al., 2001; Chicote, 2019).

A popularly implemented method of educational intervention was the theory-based one by means of presentations, which usually covered routine oral hygiene practices (Chicote, 2019). A study in Malaysia incorporated oral health talks along with distribution of educational resources such as pamphlets and posters, aimed at creating oral health awareness among the elderly residing in aged care homes (Letchumanan et al., 2020). The study stated that the inclusion of audio-visual aids regarding oral health and oral hygiene, to educate the elderly in nursing homes with regard to their negative oral health attitudes and trust issues with the caregivers, also helped enhance the oral health knowledge of both the elderly and caregivers (Letchumanan et al., 2020). However, in clinical trials, this method lacked depth in terms of information and did not prove beneficial to the care staff (Chicote, 2019).

Along with the knowledge gain of the care providers, enhancing their practical skills should also be a priority (Goh et al., 2016). The integral part that theoretical education plays in laying the foundation for oral health knowledge, has been widely acknowledged. However, limiting interventions to a solely theoretical approach would result in knowledge gaps. This mandates the incorporation of the clinical skills training element to enhance the confidence of caregivers in an efficient and independent delivery of oral care (Chicote, 2019). This is supported by another study which calls for a need in incorporating theoretical and practical elements in

educational interventions along with the provision of a more conducive and supportive organizational environment (Reis et al., 2011).

Following an educational intervention targeted at caregivers, there was a considerable gain in knowledge regarding various aspects of oral care and oral health, which reflected the effectiveness of training programs on oral health attitudes (Khanagar et al., 2014). Consequently, this knowledge gain was seen to translate into efficient oral hygiene practices of the elderly residents due to greater oral care motivation, which was a resultant effect of educating their caregivers (Khanagar et al., 2015). Nevertheless, further research is needed to evaluate the effectiveness of such initiatives (Letchumanan et al., 2020).

One study revealed that prior to their intervention, the poor oral status of the elderly clearly depicted the low levels of oral care that they received. Consequently, the intervention brought about significant improvement in the oral health of the elderly, which was probably accentuated by the supplementation of oral hygiene supplies as part of the intervention. However, beneficial changes were limited to denture hygiene whereas persistent dental plaque levels were unattended to possibly due to psychological barriers of caregivers towards intra-oral care (Frenkel et al., 2001).

On the other hand, outcomes of a study that incorporated an educational programme revealed that caregivers considered themselves unskilled to integrate preventive care services in their routine oral care regimen to the elderly in their facilities. Despite acquiring confidence through oral health training, most of them recognized the need for reinforcing and updating their knowledge and skills in geriatric oral health on a regular basis (Kohli et al., 2017). This need for ongoing training was supported by a study which periodically evaluated the oral health outcomes of the elderly one week and one year after providing oral health training for the caregivers. Although expecting positive outcomes one week after the intervention was unrealistic, there were no noticeable improvements in the oral care practices of caregivers or the oral status of the elderly even after one year (Simons et al., 2000).

Caregivers in the literature stressed the need for mandating oral health training of all the staff, coupled with the incorporation of strategic techniques to effectively manage care-resistive behaviours during routine oral care (Hilton et al., 2016). In an intervention for management of elderly combative behaviours, caregivers developed sufficient competence to manage challenging behaviours, thereby overcoming their reluctance in oral care delivery for such

residents. However, the implementation of this approach is limited by the lack of adequate dental professionals for the provision of oral health training to the caregivers (Chicote, 2019).

One study in the review devised an educational intervention based on the Need-Driven Dementia-Compromised Behaviour Model and implicit memory theory to address the challenging behaviours associated with dementia or cognitive decline. This programme was expected to enable the caregivers to identify these combative behaviours as reflective of the resident's fear or discomfort and modify their approach towards the resident in an attempt to overcome these responses (Jablonski et al., 2009).

The literature appears to advocate for active engagement of the caregiving staff in oral health training and reinforcing their knowledge at regular intervals, with the inclusion of practical training to manage residents with uncooperative or challenging behaviours is fundamental in guiding oral health decisions for the elderly. This can be further enhanced by encouraging staff participation in decision-making roles to address barriers in oral care provision (Dharamsi et al., 2009). However, high staff turnover could be a factor impacting the effectiveness of the training programs, as most of the trained staff were no longer in the institution one year after the intervention (Simons et al., 2000). Irrespectively, the lack of co-operation of managers and caregivers in attending multiple sessions of training prior to an educational initiative, is a reflection of the low prioritization that oral health receives both at the individual and organizational levels (Simons et al., 2000).

Oral health assessment tools have been developed with the purpose of assisting caregivers in examining and maintaining a good oral status of the elderly. Although these tools aid in evaluating the effectiveness of oral care provision by determining the dental and denture plaque levels, their positive impacts on oral health outcomes and quality of life often remain unreported (Chicote, 2019). It has been recommended that training caregivers to identify specific characteristics of oral diseases, which would enable them to appropriately assess the oral health requirements of the resident and expand their oral health knowledge and skills in disease identification (Chicote, 2019). Moreover, it is fundamental to impart high standards of training to the nursing personnel to increase the reliability of the results of an oral health assessment on the elderly (Matear & Barbaro, 2006).

4.2.4.b Multidisciplinary collaboration

In order to address the challenges associated with oral care delivery, caregivers recommended the active involvement of dental professionals in providing dental consultations at the aged care facilities, along with oral health education for both the staff and the elderly (Letchumanan et al., 2020). It has been recommended that establishing an interdisciplinary collaboration through the integration of dental professionals in aged care facilities, will encourage oral health-related knowledge gain and skill upgrade among the health workers. Active engagement of dental professionals in the discussions of care provision in these institutions will also facilitate the exchange of ideas between different health disciplines and aid in the formulation of oral health care plans personalized to the needs of the elderly, while integrating their numerous systemic health concerns into these plans (Chicote, 2019). Moreover, one notable finding from a recent study was the caregivers considered it practical to incorporate dental clinics within these facilities, in order to improve oral health access for the elderly with motor and functional impairments (Letchumanan et al., 2020).

Due to a consistent neglect of oral health in the nursing curricula, the health professionals in aged care facilities lack the knowledge or expertise to carry out oral care practices effectively. Therefore, attainment of good oral health of the elderly in aged care facilities calls for collaborations on a multidisciplinary level to counteract the existing organizational neglect that oral health faces. This can be established by encouraging the participation of professionals from varied health disciplines in initiatives targeted at the prevention and promotion of oral health (Unfer et al., 2011). However, this strategy may be met with resistance as another study found that not many caregivers were supportive of the inclusion of dental professionals in aged care homes (Webb et al., 2013).

Regardless of oral policies recommending professional oral care to this vulnerable population on a weekly basis, its implementation is clearly lacking. The provision of professional dental care may assist the caregivers in overcoming the barriers that they frequently encounter during routine oral care (Hilton et al., 2016). However, situations where funding of professional care is heavily reliant on family members, their unfavourable attitudes may expose the residents to a greater risk of adverse oral health (Hilton et al., 2016).

4.3 Summary

Following a process of rigorous and exhaustive search, appraisal and analysis of the literature, four major themes namely caregiver barriers, elderly barriers, organisational barriers and system-level enablers had emerged as key components that determine the caregiver perspectives pertaining to oral health and the elderly in aged care facilities. Within the realm of the barrier focus, five sub-themes which encompass the caregiver, the elderly and the organisational components were identified. The caregiver barriers are characterised by knowledge and attitudes towards oral health, while the elderly component deals with the behaviours and awareness factors that determine oral care. The third component focuses on the policy and practice aspects as well as oral health resources that underpin the oral care practices in aged care institutions. The fourth theme which is the system-level enablers focuses on oral health promotion interventions and multidisciplinary collaboration as guiding principles for addressing the barriers of oral care provision through a caregiver's lens. The next chapter will include a discussion and interpretation of these findings correlating them to the research objectives. Recommendations and implications for practice, in addition to recommendations for future research, will also be provided.

Chapter 5

Discussion

5.1 Introduction

This final chapter discusses the significance of the major synthesized findings, and reflects on their relevance in analysing the relationship between the knowledge, awareness and attitudes of caregivers regarding oral health and the dental health outcomes of the elderly in aged care facilities. Implications and recommendations for practice and future research are discussed and limitations of the study are identified.

5.2 Discussion of findings

Considering the central role that caregivers have in the oral care provision to the institutionalised elderly, analysing their knowledge and attitudes of caregivers to oral care provision for the elderly resulted in the identification of barriers that influence their oral care behaviours and the integral role that system-level enablers play in modifying those behaviours into oral health benefits for the elderly.

Oral care delivery to the elderly can be quite challenging and is often accompanied by numerous barriers that the caregivers encounter on a regular basis. The review of literature revealed a multitude of barriers perceived by caregivers with regard to their understanding and prioritization of oral health, as well as its impact on the translation of that understanding into practice in their work settings. These barriers related to broad themes of caregiver, elderly and organisational components which were significant deciding factors for the oral health knowledge, awareness and attitudes of the caregivers, with major implications for the oral health of aged people living in long-term care institutions. These barriers recognised the need for enablers in oral care provision at the system-level through oral health promotion interventions and multidisciplinary collaboration to attain optimal oral health gains for the aged people residing in these facilities.

5.2.1 Caregiver barriers

It is widely acknowledged that caregivers have a significant role in determining the oral health of elderly residents under their care. Most importantly, it is the oral health knowledge and attitudes of these caregivers that dictate the oral health of the old residents who are reliant on them for assistance in their daily oral care needs (McKelvey et al., 2003).

5.2.1.a Oral health knowledge

Throughout the literature reviewed, the oral health knowledge of the caregivers has been consistently associated with the oral health status of the dependent aged people in aged care homes. Being well-informed regarding the potential risks and benefits that accompany oral health is fundamental in accomplishing satisfactory levels of dental health for the elderly. Therefore, an assessment of the knowledge levels of caregivers in relation to oral health is of prime importance. However, the degree of knowledge that caregivers possessed varied considerably across studies (Hilton et al., 2016; Unfer et al., 2011; Simons et al., 2000; Letchumanan et al., 2020). This could be attributed to the sampling variations and the range of methodologies that the concerned studies used.

Apart from the wide knowledge gaps, there were inconsistencies in the knowledge acquired by caregivers with relation to specific realms of oral health. While caregivers perceived knowledge adequacy in most areas, knowledge in areas corresponding to intra-oral care, dental attendance, self-motivational oral care, dental care products and nutritional relevance of oral health was fragmented. In fact, it appears that dental attendance for edentulous residents was regarded as a matter of least priority from a caregiver's perspective as the importance of oral mucosa in the maintenance of oral health was rarely understood.

Oral care in older individuals with debilitating health conditions mandates sufficient knowledge and competence, due to their increased vulnerability to other health complications. This is particularly relevant in the care of the elderly suffering from dementia or dysphagia, where caregivers seemed to lack confidence in imparting oral care assistance. In elderly with dysphagia, lack of oral care promotes the proliferation of pathogenic micro-organisms in the respiratory tract, increasing their susceptibility to aspiration pneumonia (Seedat & Penn, 2016). The adversities of oral health seemed to multiply with the increasing severity of dementia. This is suggestive of the incompetence of caregivers in providing oral care assistance for the elderly with dementia (Philip et al., 2011). Feelings of poor self-

confidence and incompetence among caregivers with regard to oral health does appear to generate reluctance in oral care delivery. This is probably the reason why when faced with challenging residents, caregivers seemed to defer oral care leaving the highly dependent and debilitated elderly in a compromised state of oral health. Therefore, the importance of educating caregivers in managing older persons with challenging health conditions cannot be stressed enough.

Contradictions with regard to oral health awareness and practice was a consistent finding of most studies where theoretical knowledge often failed to translate into improved oral care behaviours. This would explain the deplorable state of oral health among older people residing in aged care homes, which is often reported as a public health concern that has attracted global attention. While studies claim that this knowledge-practice gap seems to have emerged from the demanding nature of the caregiving job, the findings from this review are less conclusive due to the variance seen in sample study sizes.

5.2.1.b Attitudes towards oral health

It is understood that the attitudes and perceptions of caregivers towards oral health are fundamental in guiding their oral care behaviours at work. Few studies were divided over the perceptions of caregivers in relation to their accountability for the oral health outcomes of the elderly under their care (Letchumanan et al., 2020; Garrido Urrutia et al., 2011). Evidence was shown of those caregivers who recognised their contribution to the oral health of the elderly, however, refused to take responsibility for addressing the barriers that accompanied oral care provision.

Despite demonstrating a good understanding of the correlation between oral health and general well-being, the caregivers in some studies possessed a nonchalant attitude towards tooth loss which was dismissed as something that is bound to happen with advancing age. Furthermore, caregivers' psychological factors often interrupted the oral care behaviours for the elderly as mouth care, particularly intra-oral hygiene was regarded as an intrusive and repulsive task. In fact, it appears that these psychological barriers seemed to persist even after attending educational programmes.

Low levels of job satisfaction reportedly affected the caregivers' attitudes towards oral care for the elderly, however, the interrelation between this factor and suboptimal oral care behaviours found mention in only one study (Cornejo-Ovalle et al.,2013).

The literature showed that caregivers identified a self-perceived need for oral health and equated high dental attendance to good oral health outcomes, thus placing dental professionals as the key determinants of oral health for the older residents. In addition to this, few caregivers considered the older residents or their family members as primary influences for the residents' oral health. Expecting family members to assist in oral care may help resolve the excessive workload that caregivers are faced with (Yoon & Steele, 2012), but this reflects an attitude of transfer of responsibility in the caregiver, which is concerning.

Regardless of the attitudes that caregivers possessed in relation to oral health, they stressed on the need for knowledge enhancement, specifically in areas involving interactions between dental and systemic health. Moreover, a periodic reinforcement of oral health knowledge was considered pivotal in gaining competence to manage older people with challenging conditions. However, efforts should also be directed towards addressing the deep-seated psychological barriers for oral care provision and evoking behavioural changes, in order to improve favourable oral health outcomes for the institutionalised elderly. This can be achieved by focusing on incorporating the caregiver's own oral health beliefs and practices into dental education, while emphasising on the correlation between their personal oral hygiene and general well-being. This is expected to generate behavioural changes in caregivers who might feel better motivated by situations that reflect personal experience (Yoon & Steele, 2012).

5.2.2 Elderly barriers

A state of good oral health can be easily achieved by simply ensuring proper oral hygiene practices on a daily basis. However, what seems like a minor routine task can be quite challenging in aged care facilities. This can be attributed to the poor general health of the elderly residents, most of whom have physical and cognitive disabilities, visual impairments as well as poor manual dexterity (Stein et al., 2012). This study identified elderly awareness of oral health and their responsive behaviours as challenges perceived by caregivers while providing oral care assistance.

5.2.2.a Behaviours and awareness

The responsive behaviours of the elderly residents were perceived by caregivers as a major hindrance in oral care provision. These behaviours mostly comprised of mistrust, lack of communication, and non-compliance to offered care. Care-resistive behaviours were mostly associated with dementia, stroke and other neurological disorders, and considerably impacted the quality of oral care that these residents received (Miegel & Wachtel, 2009). Moreover, a lack of competency among nursing assistants in behavioural management further exacerbated the poor oral health outcomes in this already vulnerable population.

In addition to this, the barriers of time restrictions that caregivers frequently experience during their routine oral care tasks are further compounded while managing difficult behaviours (Göstemeyer et al., 2019).

In order to address care-resistive behaviours, incorporating behavioural management programmes in educational interventions for caregivers will considerably increase their competency and skills in managing difficult behaviours during oral care (Miegel & Wachtel, 2009). Implementing communication strategies and psychosocial interventions in routine care activities can help alleviate non-compliance, however, the effectiveness of tailoring these approaches to oral care needs further investigation (Hoben et al., 2016).

The poor awareness of elderly regarding their oral health reflects in their unfavourable attitudes towards dental assistance. Communicating dental concerns to caregivers and seeking dental management were mostly driven by pain, discomfort or aesthetic concerns. Caregivers perceived this lack of awareness among the elderly as a primary cause for their poor oral health decisions and outcomes. Although only one study reported the awareness element as a contributory factor to poor oral health for the elderly from the caregivers' perspective, its relevance with respect to the research objectives cannot be overlooked. This review supports previous studies which show that educational approaches specifically targeted at aged people can help them develop a favourable attitude towards oral health and increase care responsiveness (Miegel & Wachtel, 2009).

5.2.3 Organisational barriers

Despite the need for addressing the barriers involving the caregiver and resident components, numerous concerns at the organisational level further limits the capacity for improved oral care provision. Although the significance of oral health is widely appreciated at the institutional level, provision of oral care is hindered by an interplay of factors such as inadequacy of dental support staff, deficits in oral health resources, staffing concerns, limited collaborative opportunities and differing goals (Hearn & Slack-Smith, 2015).

5.2.3.a Policy and Practice

Oral health training as part of an organisational priority is a major step in enhancing the knowledge and competencies of the caregiving staff. Expecting caregivers to recognise the significance of oral health without providing an effective educational support is unfair (Miegel & Wachtel, 2009). Caregivers perceived a lack of organisational support as institutions, particularly those accommodating highly dependent residents with a complexity of care needs, focused on setting general health priorities while overlooking oral health in the process.

The studies which were reviewed revealed inconsistencies in the educational training received by caregivers from their organisations. Regardless of the provision of oral health training, caregivers felt overburdened due to factors like time restrictions and insufficient personnel to carry out their routine tasks. To add to this, a high staff turnover disrupted the continuity of oral care.

However, the mention of time constraints as a barrier to oral care provision garnered divided opinions between studies. This could probably be due to the differing organisational frameworks across studies, as time was a commonly cited barrier in long-term care institutions with high resident to staff ratios. However, the studies that did not support the inclusion of time constraints and staffing issues as a barrier, did not report staffing ratios and staff turnover which is a major omission that fails to put their arguments into context. Consequently, failure to adhere to the oral care policies of the organisations in these studies mostly culminated in unsafe practices that presented the caregiver as the barrier and not the system.

All these findings highlight the need for extensive organisational involvement in policy development targeted at setting realistic oral health goals, formulating well-structured oral health protocols, encouraging caregiver engagement in the development of oral care plans,

enabling workforce expansion through inter-professional collaboration as well as incorporating a theoretical and practical approach of knowledge enhancement (Miegel & Wachtel, 2009). In addition to this, it is ideally recommended to devise oral care plans through an interactive process involving caregivers and dental professionals (Bailey et al., 2005).

To be effective, translation of these policies into practice is absolutely essential. Adherence to oral health guidelines has a remarkably favourable effect on the improvement and maintenance of oral health in the elderly. Inclusion of these guidelines in the personalised care plans of the residents, and frequently updating them can aid the caregivers in efficient oral care provision (Bailey et al., 2005). Literature beyond this review shows that organisational frameworks that do not involve caregivers in the development of oral health guidelines, fail to see the implementation of oral care in alignment with those guidelines (Hearn & Slack-Smith, 2015). Furthermore, for organisations to ensure adherence of caregivers to the oral health guidelines, development of a systematic auditing tool has also been recently recommended. The barrier to improvement in practice here appears to be policy thus establishing a software outlining standardised oral assessment guidelines might be beneficial in guiding the documentation of dental audits with the care practices in aged care facilities (Jiang & MacEntee, 2013).

5.2.3.b Oral health resources

Inadequacy of oral health resources does appear to promote inappropriate and insufficient oral care provision. While oral health guidelines mandate a consistent and regular allocation of oral hygiene products to meet the oral care needs of residents, these needs seem to remain unmet. Transferring funding responsibilities of dental supplies to family members of the elderly residents, showed an increased likelihood of resulting in ill-informed decisions for the oral health of the elderly, particularly if the oral health knowledge of the family members is sub-optimal. These findings provide an insight into the role of the organisation in making judicious financial decisions that dictate the quality of oral care received by the residents.

5.2.4 System-level Enablers

The challenges to oral care provision in aged care facilities mandates a greater involvement at the system-level to bring about pronounced changes in the oral health outcomes of the aged

people in nursing homes. Considering the fundamental role of oral health in the overall well-being and quality of life of an individual, the promotion of this area of health recognises the need for incorporating an educational as well as an integrative multidisciplinary approach to generate maximum knowledge gains and improved oral care attitudes of caregivers.

5.2.4.a Oral health promotion interventions

The literature reviewed demonstrates inconsistencies in the findings relating to the impact of caregiver-targeted educational interventions on the oral health outcomes of the elderly. This could probably be associated with a myriad of factors such as differences in the quality of the educational programmes, staff turnover or the extent of organisational support. Moreover, studies that demonstrate successful outcomes for their interventional programmes often excluded demented and cognitively impaired residents (Khanagar et al., 2015; Simons et al., 2000; Frenkel &Newcombe, 2001), thereby omitting the evaluation of oral health outcomes in a dependent population who have the highest oral health needs. Educational training tailored to address specific knowledge gaps of the staff is expected to considerably enhance their competence and skills. Furthermore, incorporating a clinical skills training programme in addition to the regularly adopted theoretical approach encourages the possibility of knowledge gain with skill enhancement. Increased organisational support is necessary for mandating knowledge reinforcement on a periodic basis. However, the evidence is lacking regarding the long-term effectiveness of these interventions on oral health outcomes and behavioural change.

Most often, an overburdened work schedule prevents nursing assistants from attending training sessions. In addition to this, the low priority placed on oral health is evident from the unsupportive attitude of managers that considerably affected caregiver training opportunities.

Educational interventions alone do not influence the quality of oral care provision, however, it is fundamental in providing the caregivers with a comprehensive understanding of the interdependence between oral health and overall well-being (Miegel & Wachtel, 2009). Providing education has shown minimal impact in instilling behavioural changes towards oral care in caregivers. Therefore, the interactive relationships that exist between oral health knowledge, attitudes and behaviour needs to be explored to gain a deeper insight into the underlying issues (Wardh et al., 2003). Evidence from previous research has demonstrated that strategies which have incorporated theoretical and practical training, while facilitating

oral care behaviour through the provision of dental resources or continuous professional support, has seen major success in oral health gains for the elderly (Weening-Verbree et al., 2013). Interventions which incorporate caregivers, residents and families would also increase the opportunities for improving the oral health of the elderly.

5.2.4.b Multidisciplinary collaboration

An integrated approach to oral health care necessitates marked transformations in the organisational framework, where the focus of oral health shifts from a solely interventional approach to a multidisciplinary collaboration across health disciplines (Hearn & Slack-Smith, 2015). Caregivers perceived the need for integrating dental practitioners in aged care facilities for providing dental services to the elderly along with involving them in oral health promotion roles. This addition has the potential to overcome barriers and create an environment which prioritises preventive dental care over emergency interventions. Those at most risk of a reduction in oral health are elderly who exhibit care resistive behaviours, however it has been shown that a collaborative approach incorporating different health disciplines (psychologists, dentists, physicians and nursing professionals) is required to encourage oral care in uncooperative residents (Zuluaga et al., 2011).

It is imperative to design tailor-made oral care plans for residents and this can be better achieved through shared experiences and interactive decision-making between caregivers and dental professionals. Introduction of ambulatory dental services in these institutions is one way to facilitate oral health access for functionally compromised elderly. Organisational support is needed to facilitate the weekly provision of professional dental services to the elderly to align with the requirements of oral health policies. In addition to this, the inclusion of oral care aides in aged care facilities can be beneficial in the distribution of duties, thereby addressing the barrier of time constraints that caregivers are constantly faced with. This would considerably reduce caregiver burden to oral care delivery and result in improved oral health outcomes for the elderly.

5.3 Implications and recommendations for practice

This literature review highlights the lack of knowledge translation into implementation among caregivers regarding oral care in their work settings. Identification of these knowledge-practice gaps in this study should lead to better and effective problem-solving approaches. Although educational initiatives can trigger improvement in attitudes, this does not guarantee behavioural changes. However, adopting a theory-based approach of performance feedback and goal setting by care providers, is considered to promote practice change (Hoben et al., 2017). Differing priorities and inadequate support at the organisational level have widened the gaps between oral health knowledge and practice. Efforts should be targeted at both the individual and organisational levels, to effect change. In order to bridge any existing gaps and ensure the success of new strategies within these facilities, creating a conducive organisational culture is of prime importance (Thorne et al., 2001). Addressing work and workforce-related issues should be regarded as major organisational priorities (Smith, 2020). In the evaluation of organisational success, the oral health outcomes of the residents as a performance indicator is frequently overlooked. It is understood that educational programmes and oral care protocols achieve maximum success when organisations take accountability for the poor oral care management of their residents (Niesten et al., 2013).

Interventions engaging an integrative theoretical and skill-based practical approach to oral health education, along with organisational collaboration on a multidisciplinary level were useful findings from this study, which can be used to guide appropriate and effective oral care delivery and maximise oral health outcomes in the elderly. An example of such an approach is the Healthy Mouth, Healthy Ageing oral health training initiative developed by the NZ Dental Association with the financial backing of the Ministry of Health. This programme is supported by dental professionals and extends beyond the provision of regular oral hygiene instructions with an all-inclusive approach encompassing behaviour management strategies, guidance in formulating personalised oral care plans, along with enhancement of oral health-related knowledge (NZ Dental Association, n.d.). To improve the success of programmes like these organisational barriers must be reduced to enable better caregiver access to these initiatives. Furthermore, continued oral health promotion and organisational support are essential for multidisciplinary relationship building.

It is expected that adequate knowledge, self-awareness and a positive attitude concerning a particular issue leads to better implementation in daily life, and this study has enabled an exploration of the inter-relation between knowledge, attitudes and implementation.

Furthermore, this review has highlighted the non-alignment of oral care practices to oral health protocols. Formulating oral care protocols based on evidence-based guidelines will encourage better caregiver adherence thus benefiting the oral health of elderly and incorporating dental professionals and caregivers in policy design will enhance adherence. Addressing all types of dentition status by including the best-practice guidelines for denture hygiene outlined by Felton et al. (2011), basic oral hygiene techniques for dentate and edentulous residents, as well as incorporating behaviour management strategies for care-resistive elderly will help achieve this. One such threat-reduction strategy is the MOUTh intervention that facilitates a reciprocal interaction between the caregiver and resident while developing a more person-centred approach to oral care (Jablonski-Jaudon et al., 2016). Incorporating such strategies in oral care protocols will help address the barriers related to resident non-compliance that deter oral care delivery, resulting in satisfactory oral health outcomes for this particularly disadvantaged population group.

Development of oral health assessment tools could facilitate caregiving staff to make appropriate oral care decisions for the elderly residents. For example, in the United States, a mandatory oral assessment known as the Minimum Data Set, is carried out for residents during admission into the facility. There is a scarcity of validated and reliable oral assessment tools made available for caregiver use in nursing homes, nevertheless, there are clinically proven tools in geriatric dentistry such as the Revised Oral Assessment Guide (ROAG) which could be used for assessing the oral health of the elderly (Sonde et al., 2011). For this purpose, training caregivers in oral disease identification can help enhance their knowledge and skill proficiencies, however effective oral health assessment mandates exceptional standards of training for best outcomes and adopting such strategies without resource may further exacerbate current gaps between policy and practice.

The current scenario in NZ excludes oral health from the Ministry of Health's Age-Related Residential Care (ARRC) agreement between the district health boards and aged care facilities, leaving oral health care responsibilities of the residents under the discretion of the facilities and families (The University of Auckland, 2013). This review presents evidence that oral health should be addressed as a priority in the ARRC contract so that institutionalised elderly can enjoy a satisfactory oral health status.

The realisation among caregivers, elderly, family members and organisations that oral disease is avoidable, should help in redirecting emphasis on the preventive aspects of oral health (Reznick & Matear, 2002). Further research is needed to develop standardised oral assessment tools and oral training programmes and evaluate the outcomes of behaviour management strategies as well as preventive geriatric care strategies.

5.4 Limitations of this review

This literature review is dominated by quantitative studies with varying methodological designs ranging from survey questionnaires to randomised controlled trials. Although a rigorous and extensive search strategy was devised to retrieve the relevant literature, studies examining the impact of their interventions on caregiver attitudes were predominantly placed in the literature search. These methodological approaches fail to capture the perspective and knowledge elements of a study in its entirety, something that a qualitative methodology facilitates. In spite of this, it is argued that the results of this integrative literature review are relevant to the research objectives.

Another limitation of this review is the publication bias that accompanies literature searches involving electronic databases (Whittemore, 2005). Research studies that produce significant outcomes have an increased likelihood of being published, thus generating publication bias. Thus, studies that failed to result in expected outcomes usually remained unpublished, paving way for potential inconsistencies in reported outcomes.

Finally, the involvement of a single researcher increases the possibility of researcher bias. The selection of studies, identification of themes and interpretation of results could have been guided by professional knowledge in oral health and current role in aged care facilities. To avoid this bias, rigorous steps were undertaken to ensure an objective interpretation and presentation of data. This was achieved by framing a well-structured and objective PICO model and clearly outlining the inclusion and exclusion criteria to establish a transparent search strategy followed by a thorough review of the themes and findings in consultation with the supervisor and consensus was reached through discussion.

5.5 Recommendations for future research

One of the key objectives of the research was to analyse the knowledge, awareness and attitudes of caregivers regarding oral health. Future research opportunities could expand on a predominantly qualitative methodological approach to explore the ideas presented in this review. This review consisted of a majority of quantitative studies, which normally generate quantifiable responses. Moreover, the questionnaire nature of the quantitative research design invites a high probability of self-reporting bias. Presenting important aspects like knowledge and attitudes on the basis of measurable outcomes lacks depth and limits analysis.

In order to gather a meaningful understanding of perspectives, a qualitative approach is preferred as it equates to a subjective elaboration of lived experiences, emotions and feelings, along with interpretative justifications of the participant's behaviours (Rahman, 2016). A qualitative approach would also provide an insight into more specific reasoning behind particular attitudes and behaviours that are generally attributed to frequently discussed concerns. To acquire such an in-depth understanding of the research topic, a semi-structured face-to-face interview would be an ideal study design as focus group discussions add the risk of response bias. This methodology would require the inclusion of caregiver-specific interview questions concerning oral health focusing on relevant areas that address the research topic. A sample of the interview questions have been included below to guide future qualitative research:

5.5.1 Interview questions

1. Demographic information:
    - Age
    - Years of experience in caregiving.

2. Participants' own oral health
    - What can you tell me about your own oral health practices?
3. General oral health awareness
    - How do you think oral health can be maintained?
    - What do you think are the consequences of poor oral health?
    - How important do you think oral health is for the overall health and well-being of an individual?
4. Daily oral care for residents
    - Could you briefly describe the current oral care practices that you are carrying out for the residents within the aged care facility?
    - What are the barriers/challenges that you face while delivering oral care for the residents?
    - What strategies do you implement in managing care-resistive behaviours of the elderly during oral care provision?

5. Oral health training and organisational support
    - What, if any, educational programs on the oral health of aged care residents have you participated in?
    - How would it benefit you if your organisation provided you with ongoing training?
    - What is your opinion of implementing a multidisciplinary approach by incorporating dental professionals for oral health promotion, oral care provision, disease management and decision-making roles for the oral health of elderly in aged care facilities?

5.6 Conclusion

The detrimental effect that adverse oral health has on the general health and quality of life of an individual is widely acknowledged. The literature has revealed that oral health is a frequently overlooked dimension of health. This is of particular relevance to the elderly population who are already experiencing age-related challenges, which have considerably limited their capacity for self-care, thus increasing their dependency on others for their routine oral care needs. This dependency has significant impacts on the oral health of the elderly residing in aged care homes. The role of oral health in maintaining the overall well-being of an individual cannot be stressed enough and it is interesting to observe that many caregivers lack this awareness. The maintenance of good oral hygiene stems from the perceived importance of oral health. Since caregivers have an integral part in maintaining the oral health of the elderly residents, it is absolutely imperative that they possess the necessary knowledge and a positive attitude towards oral health to deliver effective and good quality oral care. It can be asserted that the differences in perceptions and attitudes of caregivers towards dental health can potentially benefit or disadvantage the elderly people with regard to their oral health. The caregivers need to have a good understanding of the potential benefits of good oral health as well as the risks that poor oral hygiene poses to an individual's systemic health and well-being for which an analysis of their awareness, knowledge and attitudes was necessary.

This integrative literature review has achieved the research objectives of first, exploring the knowledge, awareness, and attitudes of caregivers employed in residential homes towards oral health; and second, of identifying the key barriers in the provision of oral care to the elderly which have paved the way for recommendations aimed at improving the oral health outcomes of the aged population. The findings of the literature review identified caregiver barriers, elderly barriers, organisational barriers and system-level enablers as the key deciding factors of oral health awareness and attitudes of caregivers.

The first finding described the perceived barriers to oral care provision through the caregiver component. The predominantly emerging factors were knowledge deficits, knowledge-practice gaps and psychological inhibitions of caregivers that posed as hindrances to effective oral care delivery. The second finding presented the barriers associated with the elderly as perceived by the caregivers. It comprised of non-compliant behaviours as well as inadequate oral health awareness of the aged people as the primary concerns. The third finding detailed on the organisational barriers that were evident through the inconsistencies in policy and practice as well as the deficits in oral health resources. These were identified as important factors guiding

the oral health behaviours of caregivers. Finally, the fourth finding elaborated on the various system-level enablers that were considered to evoke positive attitudes in caregivers towards oral health by addressing the frequently encountered barriers to oral care delivery. The focus of this finding was centred on evaluating the long-standing effectiveness of educational programmes on caregiver practices and establishing interconnections between health disciplines to facilitate good oral health for the elderly. This led to the recognition that developing positive attitudes in caregivers towards oral health necessitates a multifaceted approach and education alone does not suffice. To establish knowledge assimilation and its rightful implementation, it is fundamental to formulate and execute a strategic approach that encompasses all the intervening and influential determinants of oral care provision.

It is evident from this literature review that caregiver perceptions and oral health of the elderly are individually complex areas in their own right while maintaining a congruent relationship at the same time. This relationship needs to undergo rigorous analysis to establish positive oral health outcomes for elderly people. By identifying the key barriers of oral care provision, this review has paved the way for strategizing educational and behavioural interventions in conjunction with multidisciplinary collaborations that address the needs of the caregiver, elderly and the organisational components in relation to oral health. Achieving a balance between these determinants, in turn, will have a cumulative and favourable effect on the elderly, who rightfully deserves to be the beneficiaries of good oral health.

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Appendix A

EIT Research and Ethics Approval

EASTERN INSTITUTE OF TECHNOLOGY
TE AHO A MĀUI

Our Ref: **Ref PG20/02**

27th March, 2020

Dear Linimol,

Thank you for your application for your research project ***"A literature review of oral health awareness among staff in aged care facilities in New Zealand"*** **– our Ref PG 20/02**, received by the Research Ethics and Approvals Committee.

I am pleased to inform you that your research application has been approved.

As you continue with your research, please refer to the EIT Code of Research Ethics. As a reminder, if your proposal changes in any significant way, you must inform the Committee. Please quote the above reference number on all correspondence to the Committee. Please send all correspondence to REACapprovals@eit.ac.nz.

The Committee wishes you well for the project.

Yours sincerely

Catherine Hines
Secretary - Research Ethics & Approvals Committee

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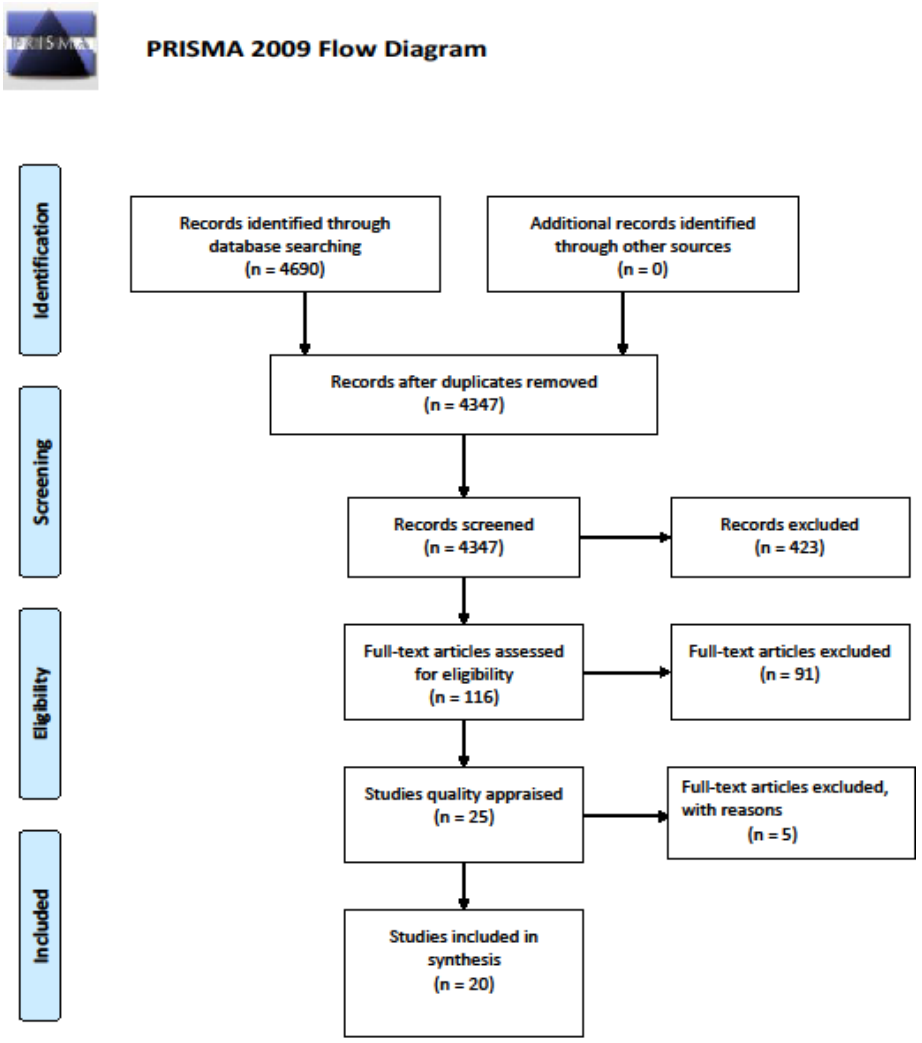
Appendix B

PRISMA Flow Diagram



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For more information, visit www.prisma-statement.org.