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REVIEW PAPER

Oral Health, Literacy and Quality of Life in the Elderly – Systematic Literature Review

Saúde Oral, Literacia e Qualidade de Vida em Idosos - Revisão Sistemática da Literatura

Salud Oral, alfabetización y calidad de vida en personas mayores - Revisión Sistemática de la Literatura

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Abstract

Context: Given the increasing longevity of human beings, the impact of oral health becomes more urgent, negatively affecting quality of life.
Objective: To explore the impact of oral health and literacy on the quality of life of the elderly.
Methodology: A search on different search engines using combinations of the descriptors "Oral Health", "Quality of Life" and "Education" in Portuguese and English, identified studies between 2000 and 2012. The principles proposed by the Cochrane Handbook were followed and the critical analysis conducted by two researchers.
Presentation of results: Eleven primary studies were analysed, which show that poor literacy and tooth loss are associated with poor quality of life.
Conclusions: Literacy and edentulism have a negative impact on oral health. Low levels of education and tooth loss are related to poor quality of life. In order to promote the quality of life of the elderly, both literacy and oral health should be included in nursing education, research and practice.

Keywords: oral health; education; quality of life.

Resumo

Contexto: O impacto da saúde oral torna-se cada vez mais premente face à maior longevidade do ser humano, influenciando negativamente a qualidade de vida.
Objetivo: Explorar o impacto da saúde oral e da literacia na qualidade de vida dos idosos.
Metodologia: Pesquisou-se em vários motores de busca, através de diferentes combinações dos descritores "Saúde Bucal", "Qualidade de Vida" e "Educação" e dos idiomas de português e inglês, identificando-se estudos de 2000-2012. Foram seguidos os princípios propostos pelo *Cochrane Handbook* e a análise crítica realizada por dois investigadores.
Apresentação dos resultados: O corpus do estudo foi composto por 11 estudos primários e demostra que a baixa literacia e a perda de dentes estão relacionadas com uma baixa qualidade de vida.
Conclusão: A literacia e o edentulismo influenciam negativamente a saúde oral, sendo que menor escolaridade e perda de dentes determinam pior qualidade de vida. A literacia e o estado de saúde oral deverão ser considerados na praxis clínica, educacional e investigativa de enfermagem de modo a promover a qualidade de vida dos idosos.

Palavras-chave: saúde bucal; educação; qualidade de vida.

Resumen

Contexto: El impacto de la salud oral se vuelve cada vez más urgente debido al aumento de la longevidad del ser humano, influyendo negativamente en la calidad de vida.
Objetivo: Explorar el impacto de la salud oral y de la alfabetización en la calidad de vida de los ancianos.
Metodología: Buscamos en varios motores de búsqueda a través de diferentes combinaciones de descriptores: "Salud Bucal", "Calidad de Vida" y "Educación" y de los idiomas portugués e inglés, identificando estudios desde el año 2000 hasta el presente. Seguimos los principios propuestos por el Manual Cochrane y el análisis crítico se llevó a cabo por dos investigadores.
Presentación de los resultados: El corpus del estudio consistió en 11 estudios primarios y demuestra que la baja alfabetización y la pérdida de dientes se relacionan con una menor calidad de vida.
Conclusión: La alfabetización y el edentulismo influyen negativamente la salud oral y las personas con menor alfabetización y mayor pérdida de dientes tienen una peor calidad de vida. La alfabetización y el estado de salud oral de los ancianos debe ser considerada en la práctica clínica, educativa y investigación de enfermería con el fin de promover la calidad de vida de los ancianos.

Palabras clave: salud bucal; educación; calidad de vida.

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Introduction

Oral health is defined as the state of being free from mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth loss, and other diseases and disorders that affect the oral cavity. It is a key component in quality of life, affecting people's mental, physical and psychological well-being. Therefore, oral health may influence social skills, as it interferes with word pronunciation, social life and feeding (WHO cited by Pinto, 2009).

When oral health is compromised, the elderly change their behaviour. Studies reinforce that oral health and literacy have an impact on the quality of life of the elderly (Cohen-Carneiro, Souza-Santos, & Rebelo, 2011; Dahl, Wang, Holst, & Ohrn, 2011; Haikal, Paula, Martins Moreira, & Ferreira, 2011; Martins, Barreto, & Pordeus, 2009; Martins et al., 2011; Okunseri, Hodges, & Born, 2008; Silva et al., 2011; Zainab Ismail, Norbanee, & Ismail, 2008; Zini & Sgan-Cohen, 2008).

In health, literacy is defined as "The degree to which people are able to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Seldon et al., cited by Loureiro, et al., 2012, p. 158). In turn, quality of life is an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (DGS cited by Pacheco, 2011). It is a broad ranging domain which may be complexly affected by the person›s physical health, psychological state, level of independence, social relationships, and their relationship with the salient features of the environment (Silva, Meneses, & Silveira, cited by Pinto, 2009).

Nowadays, the assessment of elderly oral health, particularly of the most vulnerable in terms of literacy and socioeconomic conditions, is both scientifically and socially relevant in view of the need to develop programmes which promote an effective oral health and quality of life (Okunseri et al., 2008; Cohen-Carneiro et al., 2011).

Within this theoretical background, this systematic literature review takes the form of a meta-synthesis whose methodology brings together and systematises relevant scientific evidence on the impact of oral health and literacy on the quality of life of the elderly. Thus, to answer the research question "What is the impact of oral health and literacy on the quality of life of the elderly?" we set the following objective: To explore the impact of oral health and literacy on the quality of life of the elderly.

Systematic review method

The corpus of the study was gathered based on the principles defined by the *Cochrane Handbook* (Higgins & Green, 2009).

First, a search was conducted in the database of the Library of the Health School of Viseu and the Repositories of the University Fernando Pessoa and University of Porto to find the most common terms used in this area and define the keywords. Then, we confirmed if the draft keywords were MeSH descriptors on www.ncbi.nlm.nih.gov/mesh. A positive response was obtained for *Oral Health*, *Quality of Life* and *Education*.

The studies were located and selected between March and April 2012 through electronic search in various databases and search engines: Google Scholar; SciELO Scientific Electronic Library Online; The Joanna Briggs Institute; CINAHL Plus with Full Text, MedicLatina, Academic Search Complete, MEDLINE with Full Text, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Nursing and Allied Health Collection: Comprehensive (via EBSCO), - Elsevier Science Direct (via b-on - Online Knowledge Library).

In this process, the following search strategy was adopted: #1 MeSH Descriptor Oral Health (explode all trees); #2 MeSH Descriptor Quality of Life (explode all trees); #3 MeSH Descriptor Education (explode all trees); #4 (#1 OR #2 AND # 3) (title).

The initial sample comprised 10534 studies. The following exclusion criteria were applied to the search: Published in Portuguese or English; Full-text; Date of publication (2000 - 2012).

After these criteria were applied, the number of studies dropped to 1576. Subsequently, titles and abstracts were analysed based on stricter selection criteria (Table 1) in order to reduce and refine the corpus of the study.

TABLE 1 – Inclusion and exclusion criteria for selecting studies

Selection Criteria	Inclusion Criteria	Exclusion Criteria
Participants	≥65 years old (according to the WHO definition (WHO, 2009 cited by Pacheco, 2011)	<65 years old
Interventions/ phenomenon of interest	Studies assessing the impact of oral health and literacy on quality of life	Phenomena of interest other than those in the inclusion criteria
Outcomes	Perception of oral health; Level of literacy; Perception of quality of life	Studies that do not analyse inclusion variables.
Design	Primary studies	Studies with designs other than those in the inclusion criteria.

By this process 1541 studies were excluded as either they did not relate to the topic under study, did not meet the inclusion criteria or were repeated. In total, the corpus was then reduced to 23 primary studies.

Methodological assessment was then performed, and since the selected studies were descriptive, the adapted version of Crombie cited by Steele, Bialocerkowski, and Grimmer, (2003) was used.

This instrument includes 16 items, with a score ranging from 1, when the item is present, to 0, when the item is not present or is unclear. The maximum score, indicating high quality, is 16, and the lowest score is 0. The methodological quality of each study is considered low when scoring between zero 0 and 5 points, moderate between 6 and 11 points, and high between 12 and 16 points (Crombie cited by Steele et al., 2003).

Regarding the hierarchy of evidence, the scheme described by Sackett, Straus, Richardson, Rosenberg and Haynes (2000) was used to determine the level of evidence of the selected studies (Table 2).

TABLE 2 – Hierarchy of evidence

Levels of evidence	Tipe of study
Level 1	Meta-analyses of randomized controlled trials
Level 2a	Randomized controlled trials (RCT)
Level 2b	Non-randomized, non-controlled or non-blinded clinical trials
Level 3	Observational Studies
Lavel 4	Clinical trials with pre- or post-test
Level 5	Descriptive Studies
Level 6	Insignificant evidence

Source: Sackett el al., (2000)

Finally, we have also summarized the dimensions of each study, as well as its objective, key results and proposed interventions within a *framework of evidence*.

It should also be noted that the assessment of the studies' methodological quality, data extraction (using the JBI-MAStARI data extraction tool) and data synthesis were performed by two researchers. If consensus was not achieved, a third researcher was included (tie-breaking criterion).

Presentation of results

Of all the studies identified using the different searches and methodology referred in the previous chapter, only eleven were selected for the sample. The process of study selection is shown in Figure 1.

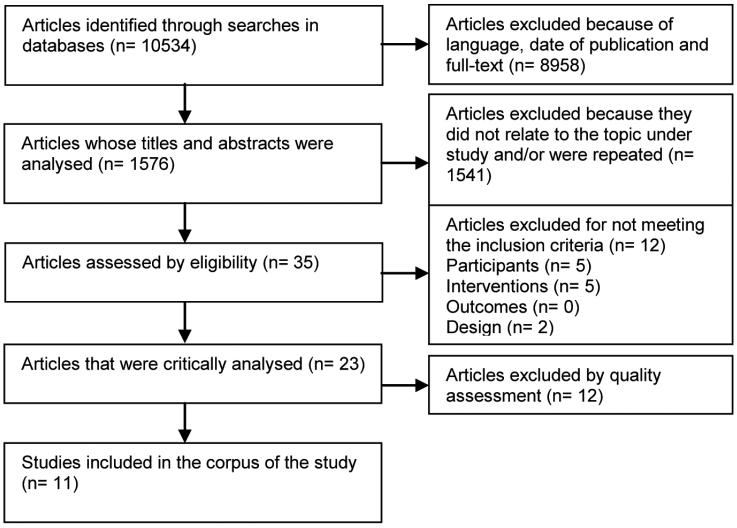

FIGURE 1 – Study selection process

A descriptive summary of the most relevant aspects of the studies included is presented below.

Haikal et al. (2011) analysed the association between self-perception and impact of quality of life and oral conditions in the elderly. To this end, clinical examinations and semi-structured interviews were performed. They concluded that most of the elderly had a positive perception of their oral health, although they suffered from a poor dental status and a negative impact of oral health on quality of life.

Souza, Barbosa, Oliveira, Espíndola and Gonçalves (2010) assessed the influence of oral health on the everyday life of institutionalized and non-institutionalized elderly in the city of Recife. This study aimed to understand whether oral health was equally relevant in both groups. The Geriatric Oral Health Assessment Index (GOHAI) was applied to assess perceptions of oral health. Results suggested that the perception of oral health of *more than half* of the elderly in this study was low. There was a significant difference between the groups, and the lowest scores were found in the group of non-institutionalized elderly.

Dahl et al. (2011) investigated whether self-rated dental health and satisfaction with dental health were related to quality of life. Results suggested that dental health affects quality of life, since the elderly with few teeth reported lower quality of life. There was a relationship between self-evaluations of dental health and quality of life.

In turn, Tsakos, Demakakos, Breeze and Watt (2011) analysed the associations between socioeconomic position and oral health outcomes in older adults in England. They concluded that there were inverse graded associations between the socioeconomic position and the state of oral health, with more edentate participants in a lower socioeconomic position. Lower socioeconomic positions were also associated with participants who used less dental health services. With respect to oral impacts, they affected more dentate than edentate participants.

The study of Zainab et al. (2008), with 506 participants, aimed to determine the prevalence of denture wearing among elderly and to compare the oral health-related quality of life between elderly with dentures and those without dentures. Therefore, interviews were conducted using a version of the Oral Health Impact Profile (OHIP), which allowed concluding that the prevalence of dental wearing was 46.2%, and that denture wearers and non-denture wearers did not differ in terms of age, socio-economic status, living status and general health ($p < 0.001$). According to this study, there were more female denture wearers (76%) than males. Most denture wearing and non-denture wearing elderly had *no formal education* (69.2% and 63.6%).

The study of Zini and Sgan-Cohen (2008) measured the effect of oral health on quality of life in elderly people in Jerusalem and compared homebound and non-homebound people. They concluded that homebound elderly people reported greater difficulties than non-homebound people in communication, eating, relaxation, and life satisfaction as related to oral health.

Silva et al. (2011) assessed oral health using the Oral Health Assessment Index (GOHAI) and found that 17.2% of the studied older people had more than 20 teeth. They also observed a better self-perceived oral health in the elderly who used dentures and in those who reported having a functional dentition. Tooth loss and oral mucosa abnormalities were negatively related to nutrition, social impact and physical appearance, thus interfering with quality of life.

As for the study of Martins et al. (2009), the authors analysed the factors associated with the negative perception of oral health, and they concluded that, despite the precarious dental conditions of elderly Brazilians, a positive self-assessment of oral health was predominant. The health-related subjective conditions associated with a negative self-assessment of oral health were as follows: report of gum or tooth pain over the past six months; self-rating of physical appearance and chewing as fair, bad or very bad.

Okunseri et al. (2008) conducted a descriptive study on a sample of 53 people aged 18 to 65+ years so as to assess self-reported oral health perceptions and associated factors in an adult Somali population living in the USA. A questionnaire to collect data on sociodemographics and on oral and general health was applied. An oral health examination was also performed. Results suggested that a substantial proportion of adults rated their oral health as poor and that the population would benefit from improved access to oral health care if they had more culturally appropriate oral health education. Therefore, the implementation of primary prevention measures when adopting health education programmes has become essential.

Martins et al. (2011) analysed a sample of 498 older adults to determine whether self-perceived oral health was associated with sociodemographic variables. Sociodemographic information, a health history, and health perceptions were assessed using a structured questionnaire. Results indicated that self-perception was associated with sociodemographic levels and that participants living in rural areas were less likely to report positive oral health self-perceptions.

Table 3 summarizes the characteristics and dimensions of the abovementioned studies in order to facilitate their understanding and comparison.

TABLE 3 – Primary studies on the relationship between oral health, literacy and quality of life in the elderly

Authors/ Date / Country	Title	Type of Study / Number of Participants	Study aim	Main Results	Study classification
Haikal et al., 2011 (Brazil)	Self-perception of oral health and impact on quality of life among the elderly: a quantitative-qualitative approach	Descriptive correlational study / 45 participants.	To understand the relationship between oral health self-perception, impact of oral health on quality of life and oral clinical status among the elderly.	- Most elderly people evaluated their oral health positively, although they presented poor oral clinical status and suffered a great impact on quality of life due to oral health conditions.	Methodological quality assessed with a score of 87.5% - high quality
Souza et al., 2010 (Brazil)	Impact of oral health in the daily life of institutionalized and non-institutionalized elder in the city of Recife (PE, Brazil)	Descriptive study / 154 participants.	To assess the influence of oral health in the daily routine of both institutionalized and non-institutionalized elders living in the city of Recife-PE To verify the relevance level of oral health in both groups.	- The perception of oral health was lower for more than half of the examined elderly population, even though there was a meaningful difference between the two groups, with lower levels for the non-institutionalized group; - The result of the perception of oral health was compatible with the high number of decayed and lost teeth.	Methodological quality of 12 points - high quality
Dahl et al. 2011 (Norway)	Oral health-related quality of life among adults 68-77 years old in Nord-Trøndelag, Norway	Descriptive-correlational study / 151 participants	To study the relationship between oral health assessment and quality of life in older people.	- Oral health affects the quality of life of the elderly. Individuals with few teeth reported lower quality of life; - The study showed a relationship between self-evaluations of dental health and quality of life.	Methodological quality of 14 points - high quality

Tsakos et al., 2011 (England)	Social Gradients in Oral Health in Older Adults: Findings From the English Longitudinal Survey of Aging	Descriptive-correlational study / 6634 participants.	To examine associations between the socioeconomic position (SEP) and oral health outcomes in a national sample of older adults in England.	- There was an inverse graded association between SEP and edentulousness, with proportionately more edentate participants in lower SEPs; - There was an association between lower SEP and worse self-rated oral health impacts; - There are more oral impacts among dentate elderly than among edentate elderly.	Methodological quality of 15 points - high quality.
Zini and Sgan-Cohen 2008 (Jerusalem)	The Effect of Oral Health on Quality of Life in an Underprivileged Homebound and Non-Homebound Elderly Population in Jerusalem	Descriptive study/ 344 participants.	- To measure the effect of oral health on quality of life in elderly people in Jerusalem. - To compare homebound and non-homebound people.	- Homebound elderly people reported greater difficulties than non-homebound people in communication, eating, relaxation, and life satisfaction related to oral health.	Methodological quality of 14 points - high quality.
Zainab et al., 2008 (Malaysia)	The prevalence of denture wearing and the impact on the oral health related quality of life among elderly in Kota Bharu, Kelantan	Descriptive study 506 participants.	- To determine the prevalence of denture wearing among elderly. - To compare the oral health related quality of life (OHRQoL) between elderly people with dentures and those without dentures.	- The prevalence of denture wearing was 46.2%; - There was no statistically significant difference between denture wearers and non-denture wearers in terms of age, socio-economic status, living status and general health; - There were more female denture wearers (76%) than males.	Methodological quality of 16 points - high quality.
Silva,et al., 2011 (Brazil)	Self-perceived oral health and associated factors among the elderly in Campinas, Southeastern Brazil, 2008-2009	Descriptive study / 876 participants.	To describe self-perceived oral health among elderly people and assess their oral health.	- The proportion of the individuals with more than 20 teeth was 17.2%; - The use of dental prostheses is associated with a higher quality of life; - Elderly who use dentures and who reported having a functional dentition have a better self-perceived oral health.	Methodological quality of 13 points - high quality.
Martins, Barreto, and Pordeus 2009 (Brazil)	Objective and subjective factors related to self-rated oral health among the elderly	Descriptive study / 128921 participants.	To investigate factors associated with negative self-rated oral health.	- Despite their precarious oral conditions, most participants gave their oral health a positive rating; - Health-related subjective conditions associated with negative self-assessments of oral health in the elderly were: gum or tooth pain over the past six months; self-rating of appearance and chewing as fair, bad or very bad.	Methodological quality of 14 points - high quality.
Martins et al. 2011 (United States of America)	Resilience and self-perceived oral health: the hierarchical approach	Descriptive-correlational study / 496 participants.	To determine whether positive self-perceived oral health is associated with sociodemographic health variables.	- There is a relationship between self-perception and demographic levels. - Participants living in rural areas were less likely to report positive self-perceived oral health.	Methodological quality of 12 points - high quality.
Okunseri, Hodges, and Born 2008 (United States of America)	Self-reported oral health perceptions of Somali adults in Minnesota: a pilot study	Descriptive study / 53 participants.	To assess self-reported oral health perceptions and associated factors in an adult Somali population living in the USA.	- Oral health education programs for the elderly are needed.	Methodological quality of 16 points - high quality.

As regards the assessment of the methodological quality of the studies included, this literature review was based on high-quality studies and took into account the hierarchy of evidence developed by Sackett et al. (2000). Given that most studies are descriptive, our level of evidence is level 5.

Discussion

In recent decades, and despite the attention paid by health professionals to the promotion of oral health, responses for the elderly population have been inadequate or non-existent. It is, therefore, essential to understand their concepts, values and levels of satisfaction regarding oral health so as to adapt interventions to how they experience them (Souza et al., 2010; Haikal et al., 2011).

Thus, we have carried out this systematic literature review to explore the impact of oral health and literacy on the quality of life of the elderly so that we can make sustained recommendations to be implemented using the results obtained.

According to the best available evidence, the impact of oral health on the quality of life of the elderly is evident and particularly worrying. According to the study of Nutall et al., cited by Zainab et al. (2008), it affects about half of the older adults who reported oral health problems affecting their quality of life.

The existing relationship between oral health and quality of life in the elderly is particularly evident in institutionalized elderly people who are single, disabled or frail, receiving care by caregivers from outside the family, and in those with lower levels of education (Zini & Sgan-Cohen, 2008).

The perception of oral health status is an important indicator of the health of older people, as it is directly related to quality of life. However, the elderly usually self-rate their oral health as positive, even when undergoing unfavourable clinical status, in part, due to an attitude of culturally pervasive resignation (Atchison & Dolan as cited in Haikal et al., 2011; Okunseri et al., 2008; Silva et al., 2011).

Hence, when assessing quality of life, the elderly compare their expectations and experiences, perceiving as normal and even acceptable for a more advanced age to have poor oral health. This highlights the differences between the older person's clinical conditions and self-perception (Locker & Gibson as cited in Dahl et al., 2011; Matos & Lima-Costa as cited in Haikal et al., 2011).

However, this positive self-perception has profound negative effects on elderly health because changes in the oral cavity may hamper feeding and speech. Compromised oral health contributes to the onset of eating disorders and poor nutrition. It can also make the elderly more vulnerable to infections and to the loss of social relationships, decreasing their confidence and pleasure in living (Silva et al., 2011; Souza et al., 2010).

Thus, and despite precarious oral health conditions, such as tooth loss, the fact that the elderly do not perceive the functional limitation of these conditions is decisive. The elderly are aware that they have poor oral health; however, they do not feel uncomfortable with it. It is therefore likely that the number of elderly people who report suffering an impact on their quality of life due to oral health is higher than what is actually reported (Haikal et al., 2011).

We have also observed that elderly literacy is particularly relevant to the topic under analysis. Cohen-Carneiro et al. (2011) found that the social conditions which are more clearly associated with the perception of negative impacts of oral health on quality of life were observed in women with low education and low income, immigrants or belonging to ethnic minority groups. Thus, these authors concluded that elderly people with a lower socioeconomic level presented higher rates of edentulism and poorer oral health perception.

Dahl et al. (2011) also reported that the elderly with higher literacy levels had more natural teeth and better quality of life. On the other hand, the elderly with fewer teeth had poorer quality of life and were less satisfied with their quality of life.

Tooth loss is related to ageing, and, as was highlighted by Jung and Shin (2008), the loss of one or more teeth can affect quality of life.

We verified that the best oral health self-ratings in the elderly were associated with the presence of functional dentition and the use of total upper and lower dentures, revealing a significant difference between the perception of oral health in denture wearers and non-denture wearers. The use of dentures positively influences the quality of life of elderly people, whereas tooth loss has a negative impact on quality of life (Silva et al., 2011; Tsakos et al., 2011; Zainab et al., 2008).

Zini and Sgan-Cohen (2008) pointed to a more positive perception of quality of life among the elderly with higher levels of education, who also presented more natural teeth and were more aware of the need to conduct oral examinations, thus suggesting that better economic conditions favour oral health (Jung & Shin, 2008).

Therefore, and based on the results of the studies included in our review, we can say that oral health has a positive impact on the quality of life of elderly people, and that elderly literacy is particularly relevant for this causal relationship. In this sense, lower educational levels and tooth loss determine a worse quality of life (Cohen-Carneiro et al., 2011; Dahl et al., 2011; Haikal et al., 2011; Martins et al., 2009; Martins et al., 2011; Okunseri et al., 2008; Silva et al., 2011; Zainab et al., 2008; Zini & Sgan-Cohen, 2008).

We thus recommend the conduction of primary studies with designs other than the ones analysed, with a higher evidence level, as well as the use of larger samples in future reviews in order to explore the contributions of nurses to the improvement of the issue under analysis.

Conclusion

As a contribution to the existing knowledge, we recognise the existence of secure and substantial evidence that oral health and literacy influence quality of life in elderly people. For this reason, there is an urgent need to reinforce clinical interventions in this area.

According to the results from our review, oral health status proved to be a positive determinant of the quality of life of elderly people, and that literacy is particularly relevant for this causal relationship. Hence, lower educational levels and tooth loss determine a worse quality of life.

The existing studies also recommend oral health assessments, nutritional counselling and the provision of information on oral hygiene, as well as half-yearly/yearly oral exams.

It is, therefore, essential to consider the elderly as a target population for primary prevention interventions and to include literacy and oral health status as foci of Nursing clinical, educational and research practice in order to promote the quality of life of the elderly.

More thorough research is still required to clarify the strength of the relationship between the variables analysed in this literature review. Thus, we recommend that further studies quantify the strength of the variables *oral health* and *literacy* on the quality of life of the elderly population. Therefore, a necessary research question in the future is: How strong is the cause-effect relationship? Given the lack of studies in this field, we consider that they should be carried out to build indicators of the impact of oral health and literacy on the quality of life of the elderly.

Study limitations and implications for the Nursing practice

This systematic literature review had some limitations. At first, we observed a lack of studies related to the topic under analysis, and that most of them were descriptive or descriptive-correlational studies. In what concerns the role of Nursing in this area, we observed an even *more substantial* reduction.

As for the implications for the Nursing practice, nurses must implement health education programmes and awareness sessions specifically designed for the elderly population. They must also monitor the oral health status and self-perceptions of the elderly, particularly of the most vulnerable ones, in order to implement inclusive policies to promote elderly health and quality of life.

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