

# Impact of oral health management on mental health and psychological disease: a scoping review

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## Abstract

**Objective:** The relationship between oral and mental health has been controversial. Few studies have assessed the direct effects of oral health management on mental health and psychological disease. Using evidence from the last 5 years, this scoping review aimed to map and discuss recent progress in understanding this relationship.

**Methods:** Electronic literature searches were performed using PubMed, Web of Science, the Cochrane Library, and the Cumulative Index to Nursing and Allied Health Literature databases. An additional manual search was performed using Google Scholar databases. Studies were selected using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 flow diagram.

**Results:** An eligibility review process identified three randomized controlled trials for inclusion in this review. The oral health interventions and participants' target age, mental health status, and psychological diseases varied across these studies. The only study that reported an improvement included psychosocial support integrated with educational components of oral health as the intervention. The remaining two studies detected no significant impact of oral health interventions on mental health and psychological disease.

**Conclusions:** Evidence of the impact of oral health management on mental health and psychological disease is insufficient in studies published between 2017 and 2021.

## Keywords

Oral health, mental health, psychological disease, randomized controlled trial, scoping review, intervention

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## Introduction

Oral health is preserved by maintaining the hygiene of all oral structures, not just the teeth.<sup>1,2</sup> Dentists should engage in the oral healthcare of patients and contribute to oral health promotion in their communities. Voluntary oral health care by community residents based on appropriate dental promotion is also important.<sup>1,2</sup> Previous studies in this area have reported that even older adults have a large number of retained teeth, suggesting that dental professionals should be appropriately involved in the long-term oral health of their community residents.<sup>3</sup> Another study in this field reported that oral health was not affected by the coronavirus disease 2019 (COVID-19) pandemic—a phenomenon that may result from suitable education on the self-management of oral health.<sup>4</sup>

In recent years, the relationship between mental health and systemic symptoms has garnered attention.<sup>5–7</sup> Moreover, detailed associations between factors such as oral microbiota, oral health, and systemic diseases including pneumonia, diabetes, and cardiovascular diseases have been reported.<sup>8–11</sup> Therefore, maintaining mental and oral health is important in the prevention and management of systemic diseases. Furthermore, poor mental health and psychological disease are associated with poor oral health and reducing pain in the teeth and oral mucosa with dental treatment may be important for mental health management.<sup>5</sup> In addition, dental anxiety and phobias are among the most common psychological problems encountered in dentistry and are sometimes associated with a history of trauma during dental services.<sup>12,13</sup> These conditions negatively impact psychological, physical, and public health.<sup>12,13</sup> Dentists should be actively involved in maintaining good oral health and managing oral problems in patients with dental anxiety and phobias.<sup>12,13</sup>

In 2016, Khokhar et al. reported a lack of clinical evidence that oral health advice provided clinically meaningful outcomes to patients with serious mental illnesses.<sup>14</sup> In contrast, in 2016, Kisely observed the bidirectional association between oral and mental health—namely, the importance of oral health management for mental health and of mental health management for oral health.<sup>5</sup> A recent study further discussed the relationship between oral and mental health.<sup>15</sup> The authors hypothesized that the relationship between oral and mental health has been controversial and that few studies have assessed the direct effects of oral health management on mental health and psychological disease. Additionally, the authors suggested the absence of sufficient research to allow a systematic review to elucidate these relationships. Moreover, no comprehensive and high-quality review has addressed the progress in this field. In this context, the authors deemed it appropriate to conduct a scoping review. The COVID-19 pandemic may have a prolonged effect on mental health worldwide.<sup>16</sup> Therefore, a review of the impact of oral health management on mental health and psychological disease can prove valuable.

This scoping review aimed to map and discuss recent progress in understanding the impact of oral health management—including all interventions involving oral health—on mental health and psychological disease based on evidence from the last five years.

## Methods

### *Design and search strategy*

This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for scoping reviews and adopted the Joanna Briggs Institute methodology framework<sup>17–22</sup> (Additional file 1). This study was registered in the Open Science

Framework (<https://osf.io/f59da/>) on February 15, 2022. Electronic literature searches were performed using PubMed, Web of Science, and the Cumulative Index to Nursing and Allied Health Literature with Full Text databases, and an additional manual search was performed using Google Scholar on February 15, 2022 (Table 1).

### *Inclusion and exclusion criteria*

Inclusion criteria were established according to the Participant–Concept–Context design suggested by the Joanna Briggs Institute guidelines: P, patients with mental health problems and/or psychological diseases; C, interventions for the management of oral health; and C, the impact of oral health management on mental health and psychological disease.<sup>17–22</sup> Because the authors determined that sufficient discussion of this research area had been reported until 2016, randomized controlled trials (RCTs) published between 2017 and 2021 were included in the review to map and discuss recent findings.<sup>5,14</sup>

The exclusion criteria were: (1) reviews; (2) conference papers or proceedings, letters, and commentaries; (3) unavailable

full text; and (4) studies in languages other than English.

### *Study selection and data extraction*

Two independent reviewers, S.M. and H. Y., selected studies based on the PRISMA 2020 flow diagram.<sup>22,23</sup> Disagreements between reviewers were resolved through discussion. If additional information was required, reviewers contacted the corresponding authors of the studies included. Critical quality appraisal of the studies included was performed using the Mixed Methods Appraisal Tool Version 2018.<sup>22,24</sup>

The following elements were extracted for this review: study design; the number, age, and sex of participants; participants' mental health issues and psychological diseases; oral health interventions; and the impact of oral health management on mental health and psychological disease.

Because this was a scoping review, ethics approval was not required for this study.

## **Results**

### *Study selection and eligibility assessment*

Using electronic literature searches, 10 studies were extracted from PubMed,

**Table 1.** Electronic literature search strategy.

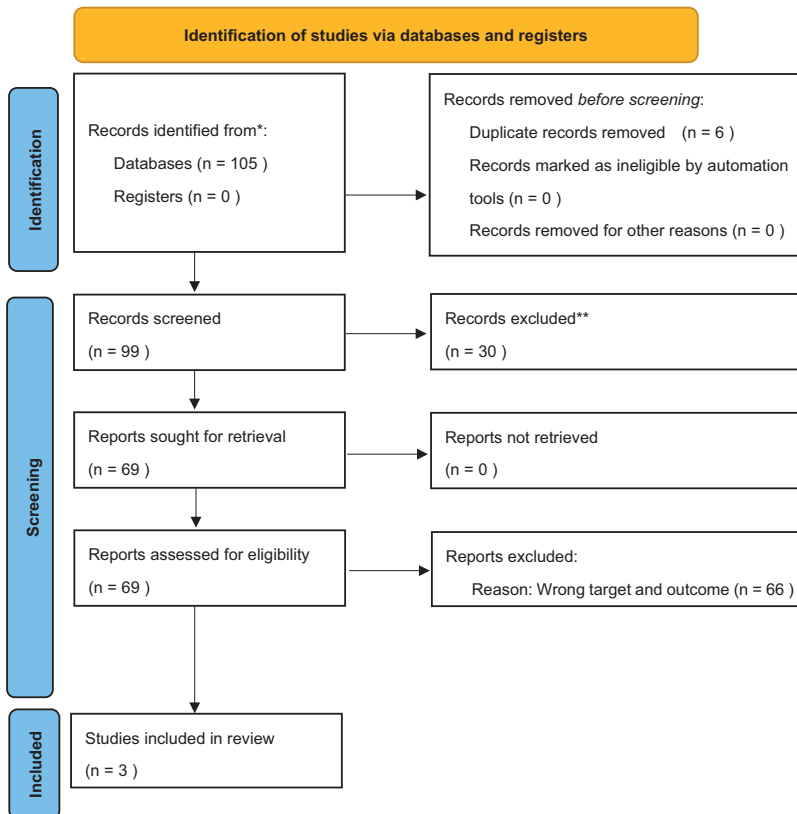
Database	Search strategy	Number of texts
PubMed	Search: ((oral health[Mesh Terms]) AND ((mental health[Mesh Terms]) OR (mental illness[Mesh Terms]) OR (psychological disease[Mesh Terms]))) Filters: Randomized Controlled Trial, from 2017–2021	10
Web of Science	((TS=(((oral health) AND ((mental health) OR (mental illness) OR (psychological disease))) AND (randomized clinical trial))) AND DOP=(2017-01/2021-12))	88
CINAHL with Full Text	oral health AND (mental health OR mental illness OR psychological disease) AND randomized controlled trial AND DT 2017–2021	7

CINAHL = Cumulative Index to Nursing and Allied Health Literature.

88 studies were extracted from Web of Science, and seven studies were extracted from the Cumulative Index to Nursing and Allied Health Literature with Full Text database (Figure 1). No additional studies were found with a manual search using Google Scholar. Six duplicate studies were removed and 30 studies were removed because of document type (e.g., reviews and letters). The titles and abstracts of 69 studies were assessed and 66 studies were excluded. The authors included three studies following an assessment of the eligibility and critical quality of the full text of these studies<sup>25-27</sup> (Table 2, Figure 1).

### Analysis of studies included

The three studies in this review consisted of two RCTs and one quasi-RCT. All studies included a total of approximately 100 participants in the intervention and control groups.<sup>25-27</sup> The studies were estimated to have a low risk of bias using the Mixed Methods Appraisal Tool Version 2018.<sup>22,24</sup> However, oral health interventions and the target age, mental health status, and psychological diseases of participants varied.<sup>25-27</sup> The only study that reported an improvement was one in which psychosocial support integrated with educational components of oral health was provided



**Figure 1.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 flow diagram. See online supplemental material.

**Table 2.** Details of studies included in this scoping review.

Authors	Study design	Number, age, and sex of the participants	Mental health problems and psychological diseases	Oral health interventions	Impact on mental health and psychological disease
Jablonski et al. (2018) <sup>25</sup>	RCT	n = 100 (Women = 76), 81.6 ± 9.9 years	Dementia with care-resistant behavior	Managing oral hygiene using throat reduction	No impact
Asimakopoulou et al. (2019) <sup>26</sup>	RCT	n = 97 (Women = 54), 60.6 ± 11.2 years	None	Simple behavioral intervention (risk communication intervention, Goal-Setting, Planning, and Self-Monitoring)	No impact
Hamid et al. (2021) <sup>27</sup>	quasi-RCT	n = 118 (Women = 75), 11.0 ± 1.4 years	Posttraumatic stress disorder	Psychosocial support integrated with oral health educational components	Positive improvement

RCT = randomized controlled trial.

as the intervention.<sup>27</sup> The remaining two studies detected no significant impact of oral health interventions on mental health and psychological disease.<sup>25,26</sup>

### Discussion

Two RCTs and one quasi-RCT each involving approximately 100 participants were selected based on the PRISMA 2020 flow diagram and included in this review. However, the studies included participants of different ages, sexes, and mental health statuses and the oral health interventions differed.<sup>25–27</sup> The three studies could not conclude that oral health had a direct impact on mental health.<sup>25–27</sup> Based on research published between 2017 and 2021, the authors concluded that no significant recent evidence supports the impact of oral health management on mental health and psychological disease. A study of Polish older adults published in 2022 had difficulty establishing the direct impact of oral health management on mental health and psychological disease.<sup>15</sup> We anticipate that high-quality RCTs in this area will provide stronger evidence in the future.

The COVID-19 pandemic has had a significant impact on the mental health of individuals of various ages.<sup>16</sup> Therefore, clarifying the relationship between oral hygiene and mental health is important both during and after the COVID-19 pandemic. A recent systematic review concluded that dental education is a promising oral health management intervention for individuals with mental health problems.<sup>28</sup> However, the involvement of oral hygiene interventions in mental health has not been adequately discussed. Therefore, this scoping review was performed to map and discuss recent evidence of the impact of oral health management on mental health and psychological disease.

Introduced by Freud in his 1910 essay “A Special Type of Choice of Object Made by men”,<sup>29–31</sup> the concept of “rescue fantasy”—which refers to men’s desire to save “fallen women”—was originally an idea in the domain of psychology.<sup>29–31</sup> When applied to non-psychological fields such as dentistry, this concept could affect safety management in clinical practice where human factors are involved.<sup>32</sup> Kisely discussed the bidirectional association between oral and mental health in 2016; notably, however, recent evidence does not support the direct mutual impact of oral and mental health.<sup>5</sup>

The possibility that the execution of clinical studies including RCTs was hindered by the COVID-19 pandemic during the literature search period is a limitation of this study.

## Conclusions

Insufficient evidence exists of the impact of oral health management on mental health and psychological disease in studies published between 2017 and 2021. We anticipate that high-quality RCTs in this field in patients of various ages will provide stronger evidence in the future.


## Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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