

# Comparing quality of life in smell and taste disorders with other chronic conditions – a narrative review

Carl Philpott<sup>1</sup>

<sup>1</sup>Affiliation not available

February 19, 2026

## Comparing quality of life in smell and taste disorders with other chronic conditions – a narrative review

### ABSTRACT

#### Objectives

Smell and taste disorders (SATDs) are increasingly prevalent but remain underrecognized, significantly affecting patients' physical, social, and psychological well-being. We recently published a large cohort study reporting Olfactory Disorder Questionnaire (ODQ), EQ-5D-5L (EuroQol Five-Dimension Five-Level) and EQ-5D-5L Visual Analogue Scale (VAS) scores for patients with SATDs. These results highlight the considerable impact of SATDs on quality of life and mental health. This review seeks to evaluate the disease burden of SATDs by comparing their impact on quality of life and mental health with other chronic conditions, using established metrics such as EQ-5D-5L and BDI from the existing literature.

#### Methods

A literature review was conducted from January 1, 2010, to August 10, 2024, to identify systematic reviews reporting EQ-5D-5L or BDI values in chronic conditions.

#### Results

Our findings show that EQ-5D-5L and BDI scores for patients with SATDs are comparable to those reported for other chronic conditions, including diabetes, stroke, cardiovascular, respiratory and ENT disorders.

#### Conclusion

These results highlight the significant burden olfactory dysfunction imposes on individuals. However, unlike other chronic conditions with established treatment protocols, effective therapies for SATDs remain limited, emphasizing a critical gap in both research and care. Increased awareness and further research are essential to develop effective treatments and improve outcomes for this often-overlooked population.

**KEYWORDS:** Olfaction Disorders, Chronic disease, Quality of life, Patient Reported Outcome Measures

#### KEY POINTS

- Smell and taste disorders (SATDs) are increasingly prevalent but remain underrecognized
- They have a significant impact on patients' quality of life across physical, social and psychological dimensions
- Effective therapeutic options for SATDs are limited
- Our findings show that quality of life/depression scores for patients with SATDs are comparable to those reported for other chronic conditions

- Further research is essential to develop effective treatments and improve outcomes for patients with SATDs.

## INTRODUCTION

### Background

Smell and taste disorders (SATDs) are increasingly common yet often underrecognized. A comprehensive meta-analysis <sup>(1)</sup> of 25 studies reported an overall prevalence of olfactory dysfunction (OD) at 22.2%. Olfactory dysfunction can be categorised into quantitative changes, affecting odour intensity, and qualitative changes, altering odour perception or causing perception in the absence of a stimulus. Quantitative disorders include anosmia and hyposmia, while qualitative disorders include parosmia and phantosmia. Generally, qualitative changes are accompanied by quantitative alterations, with isolated qualitative disturbances being relatively rare. Qualitative olfactory disturbances, in particular, may exert a distinct impact on quality of life compared to quantitative loss alone, as distorted or unpleasant odour perceptions can be especially distressing and challenging to measure and manage clinically. While smell and taste are distinct senses with separate receptor organs, they are intimately entwined. The primary causes of SATDs include sinonasal conditions, post-infectious olfactory dysfunction (PIOD), post-traumatic olfactory dysfunction, neurological diseases, congenital factors, idiopathic origins, as well as toxic and iatrogenic factors <sup>(2)</sup>.

SATDs pose a significant challenge, profoundly affecting an individual's quality of life. Affected individuals often face substantial physical, social, psychological, and emotional difficulties<sup>(3,4)</sup>. Olfactory dysfunction poses serious safety risks by impairing the ability to detect hazardous odours such as smoke, gas, or spoiled food. Given the close connection between taste and smell, disruptions in olfactory function can diminish food enjoyment, appetite, and overall nutritional health. Furthermore, olfactory dysfunction may hinder an individual's ability to detect personal body odours or environmental smells, potentially affecting personal hygiene and contributing to social insecurities. Chemosensory disorders are also linked to higher rates of depression, anxiety, social isolation, and relationship challenges. Notably, anosmia has been identified as an independent risk factor for reduced longevity, even after controlling for neurocognitive and cardiovascular factors <sup>(5)</sup>.

Despite these challenges, patients with SATDs encounter significant barriers to accessing healthcare. These include inadequate recognition of the impact of smell loss, limited understanding of management strategies, difficulty accessing specialist consultations and frustration due to the scarcity of effective treatment options<sup>(6)</sup>. In contrast to other chronic conditions that benefit from well-established management protocols, effective therapeutic options for SATDs remain notably limited. This underscores a critical gap in both research and treatment, highlighting the urgent need for advancements to improve patient outcomes.

### Objectives

Building on the identified gaps in research and treatment, we previously published data from a large cohort of 445 patients with SATDs<sup>(7)</sup>. This analysis revealed mean Olfactory Disorder Questionnaire (ODQ) scores of 111.82 out of 190 (standard deviation 30.47, range 39 to 177), mean EQ-5D-5L (EuroQol Five-Dimension Five-Level) scores of 0.79 (SD 0.20, range -0.14 to 1), mean EQ-5D-5L Visual Analogue Scale (VAS) scores of 73.36 (SD 19.56, range 4 to 100) and mean Beck Depression Inventory (BDI) scores of 13.38 (SD 9.36, range 1 to 48).

Our hypothesis is that SATDs impose a burden on quality of life and mental health comparable to that of other chronic illnesses. This narrative review aims to contextualise this disease burden using established quality-of-life and mental health measures, including EQ-5D-5L and BDI scores, drawn from the existing literature.

### METHODS

A narrative literature review was undertaken to contextualise the disease burden of SATDs by comparison with other chronic conditions. Published systematic reviews were identified through searches of PubMed,

Scopus, and the Cochrane Library, covering the period from January 1, 2010, to August 10, 2024. Reviews reporting health-related quality of life or mental health outcomes measured using EQ-5D-5L or BDI values in common chronic conditions were examined. This study followed the STROBE guidelines for reporting observational research.

Chronic conditions were defined a priori and included diabetes, cardiovascular, respiratory, neurological, and ear, nose, and throat (ENT) disorders, selected to represent common chronic diseases with established impacts on quality of life and mental health. Within SATDs, both quantitative and qualitative olfactory disorders were included. Comparative analyses were based on published EQ-5D-5L and BDI outcomes to ensure consistency across conditions.

The EQ-5D-5L is one of the most widely used standardised instruments for measuring health-related quality of life (HRQoL) and calculating quality-adjusted life years (QALYs) in economic evaluation studies. It assesses health across five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression and has five levels of severity for each dimension, ranging from no problems to extreme problems. Respondents indicate their health state by selecting the most appropriate level for each dimension. This is converted to a utility index (UI) which ranges from less than 0 (where 0 is the value of a health state equivalent to dead; negative values representing values as worse than dead) to 1 (the value of full health). In addition to the descriptive system, the EQ-5D-5L includes a visual analogue scale (VAS) where respondents rate their overall health on a scale from 0 (worst imaginable health) to 100 (best imaginable health)<sup>(8)</sup>. Hence, an improvement in HRQoL is associated with an increase in UI and EQ-VAS.

The Beck Depression Inventory (BDI) is a widely used self-report inventory designed to measure the severity of depression symptoms in adolescents and adults. It consists of 21 items assessing various emotional, cognitive, behavioural, and physical symptoms of depression. Respondents select the statement that best describes their feelings, with each response assigned a score from 0 to 3. Total scores range from 0 to 63, with higher scores indicating more severe depression<sup>(9)</sup>.

## RESULTS

Systematic reviews reporting health-related quality of life or mental health outcomes measured using the EQ-5D-5L or BDI were identified across a range of chronic conditions. Six systematic reviews reported EQ-5D-5L outcomes, with data available for diabetes, stroke, asthma, and heart failure. BDI outcomes were reported in only three systematic reviews, primarily focusing on diabetes and selected ear, nose, and throat (ENT) conditions. Across conditions, outcomes were variably stratified by disease severity, clinical subgroup, or complication status, contributing to heterogeneity in reported values. Comparative EQ-5D-5L and BDI values for smell and taste disorders and other chronic conditions are presented in Tables 3 and 4 to support contextual interpretation.

### EQ-5D-5L

EQ-5D-5L outcomes were reported for diabetes, stroke, asthma, and heart failure; key findings are summarised in Table 1.

#### Diabetes

Afshari, Ameri, Baharinya et al.<sup>(10)</sup> conducted a systematic review of 46 studies published between 2009 and 2020, evaluating the psychometric properties of the EQ-5D-5L in patients with type 2 diabetes mellitus (T2DM). EQ-5D-5L mean scores (SD) ranged from 0.314 (0.4) for patients undergoing haemodialysis to 0.971 (0.082) for those without retinopathy. EQ-VAS scores ranged from 50.85 for patients undergoing haemodialysis to 85 for those without nephropathy. The overall utility value in the UK was 0.72 (95% Confidence Intervals: 0.64–0.79). Redenz et al.<sup>(11)</sup> synthesized health state utility values for T2DM and related complications and reported a pooled EQ-5D-5L mean score of 0.815 (95% CI: 0.808–0.823).

#### Stroke

Joundi et al.<sup>(12)</sup> performed a comprehensive systematic review of health-related quality of life after stroke using indirect utility measures taken at least three months post-stroke. Their analysis, which included data from 10 studies, found a pooled EQ-5D-5L utility value of 0.68 (95% CI: 0.61–0.76).

## Asthma

Afshari, Ameri, Daroudi et al.<sup>(13)</sup> conducted a systematic review to evaluate the psychometric properties of the EQ-5D-5L in asthma patients, analysing data from studies published between 2009 and 2020. Their review included 17 studies. EQ-5D-5L scores ranged from 0.45 to 0.93, depending on asthma severity. EQ-VAS scores ranged from 35.67 to 83.80. Mean scores for well-controlled asthma were significantly higher (0.88, 95% CI: 0.81–0.96) compared to poorly controlled asthma (0.72, 95% CI: 0.67–0.77).

Similarly, Oh et al.<sup>(14)</sup> summarized utility values for asthma based on severity and control levels in a review covering studies up to 2020. Their review included 52 studies. Seven studies employed the EQ-5D-5L and the pooled utility value for asthma was 0.84 (95% CI: 0.83–0.86). The analysis revealed that utility values decreased with worsening asthma control and increased severity.

## Heart Failure

Di Tanna et al.<sup>(15)</sup> conducted a systematic literature review to identify and summarize heart failure utility values. They identified 35 studies on chronic heart failure (HF); however, only 2 used the EQ-5D-5L. Zhu et al. reported a mean utility value of 0.73 for a broad population of patients with chronic heart failure. Squire et al.<sup>(16)</sup> reported a mean utility value of 0.60 (SD 0.25) for patients with HF with New York Heart Association [NYHA] class II–IV who had been diagnosed for at least 12 months. We identified several systematic reviews reporting heart failure utility values that did not specify the version of EQ-5D used; these were therefore excluded from this study.

## Beck Depression Inventory

BDI outcomes were reported primarily for diabetes, cardiovascular, and ENT conditions; key findings are summarised in Table 2.

## Diabetes

Narita et al.<sup>(17)</sup> conducted a meta-analysis to evaluate the effectiveness of physical activity in treating diabetes-related depression. Four studies utilizing the BDI were included, with a mean BDI value at baseline of 12.55.

## Cardiovascular conditions

Khan et al.<sup>(18)</sup> conducted a systematic review of articles published after 2000, examining the prevalence of depression in patients post-acute coronary syndrome (ACS). The review used a BDI score of  $\geq 10$  to indicate mild-to-moderate depression, reporting a prevalence range of 20% to 37%, with a weighted average prevalence of 31.1% (95% CI: 29.2–33.3). Dong et al.<sup>(19)</sup> performed a meta-analysis aiming to estimate the global prevalence of depression among ACS patients. They reported a prevalence of 33.7% (95% CI: 0.32–0.35), based on six studies. However, they did not specify the BDI score used to define depression in these studies. Neither of these two systematic reviews reported a mean BDI score for ACS patients

## ENT Conditions

Patel et al.<sup>(20)</sup> conducted a systematic review to identify studies assessing depression in Meniere’s disease up to 2019. Their review included 15 studies, of which only 2 utilized the Beck Depression Inventory. The weighted average BDI score reported was 8.5 (SD 7.9).

Yeo et al.<sup>(21)</sup> conducted a systematic review examining the association between benign paroxysmal positional vertigo (BPPV) and depression/anxiety. Of the 23 articles included, 3 utilized the BDI. The mean BDI score reported in these studies was 6.35 (95% CI: 1.39–11.31).

## DISCUSSION

## Key Results and Interpretation

Our findings indicate that smell and taste disorders are associated with quality-of-life and mental health impacts that are comparable in magnitude to those reported for several common chronic conditions. These results align with previous literature and underscore the substantial burden imposed by SATDs.

We have previously published data from a large cohort of patients with SATDs <sup>(7)</sup>, showing mean ODQ scores of 111.82, mean EQ-5D-5L scores of 0.79, mean EQ-5D-5L VAS scores of 73.36 and mean BDI scores of 13.38. In terms of depression classification in our cohort of patients, 45.4% had normal mood (BDI score 1-10), 22.3% had mild mood disturbance (score 11-16), 12.8% had borderline clinical depression (score 17-20), 13.9% had moderate depression (score 21-30), 4.3% had severe depression (31-40) and 1.4% had extreme depression (score > 40). We identified a strong correlation between total ODQ score, BDI score and EQ-5D-5L score. A clear gradient in total ODQ score for each BDI classification was also noted; those with mild depression had the lowest mean ODQ score and those with moderate-to-severe depression had the highest. These results align with other published studies, further underscoring the significant impact of SATDs on patients' quality of life and mental health.

Said et al.<sup>(22)</sup> investigated health state utility values (HUVs) for individuals with persistent COVID-19-related OD. Their study of 286 subjects reported mean HUVs (SD) of 0.81 (0.14) on the EQ-5D-5L and 0.73 (0.21) on the EQ-VAS, concluding that individuals with persistent OD reported lower HRQoL scores compared to age-matched population norm. Luong et al.<sup>(23)</sup> surveyed 111 patients with either COVID-19 or chronic rhinosinusitis/rhinitis (CRS/R) and reported EQ-5D-5L scores of 0.84 (SD 0.13) for COVID-related OD and 0.84 (SD 0.08) for CRS/R-related OD, along with EQ-VAS scores of 0.74 (SD 0.19) and 0.67 (SD 0.18), respectively.

A systematic review has demonstrated that patients with depression exhibit reduced olfactory performance compared to healthy controls and conversely, patients with olfactory dysfunction, have symptoms of depression that worsen with severity of smell loss<sup>(24)</sup>. Among those with olfactory dysfunction, BDI scores were significantly different by severity: normosmics had a weighted mean of 5.21 (SD 4.73), hyposmics had 10.93 (SD 9.25), and anosmics had 14.15 (SD 5.39), supporting a severity-dependent relationship between sensory loss and mental health.

## Limitations

Patient-Reported Outcome Measures (PROMs), such as the EQ-5D-5L and BDI, rely on self-report, and may be influenced by individual perception and cultural variations in symptom interpretation, potentially affecting data reliability <sup>(25)</sup>. In addition, generic instruments may not fully capture SATD-specific domains such as food enjoyment, sensory distress, safety concerns, and social interaction, for which disease-specific measures may offer greater sensitivity. Nevertheless, generic measures remain valuable for cross-disease contextual comparison and health-economic evaluation.

Differences between quantitative and qualitative smell and taste disorders also warrant consideration. Quantitative disorders are characterised by reduced or absent sensory input, whereas qualitative disorders involve distorted or aberrant sensory perception. These phenotypes may have different implications for quality of life; however, most studies did not stratify outcomes by symptom type, highlighting an important gap in the current literature. Generic instruments may therefore incompletely capture the impact of these symptom subtypes.

The studies reviewed exhibited substantial heterogeneity, including differences in study populations, disease severity, outcome instruments, valuation tariffs, and reporting practices. While formal comparative analyses were considered, this heterogeneity precluded robust inferential comparison, and a contextual narrative approach was therefore adopted. Furthermore, relatively few systematic reviews—particularly those reporting BDI outcomes—were available, and inconsistent reporting of BDI cut-off values to define depression severity further limited cross-study comparison.

## Generalisability

Despite these limitations, our findings highlight the substantial impact of smell and taste disorders on an individual's quality of life. Since our analysis is based on a synthesis of systematic reviews that aggregate data from diverse studies, we are confident in the generalizability of our results. By incorporating data from various patient populations and methodological approaches, our findings provide robust evidence that is across a wide range of demographic groups with similar health conditions.

## CONCLUSION

In conclusion, our findings reveal that the impact of smell and taste disorders on quality of life is comparable to that of other chronic conditions. The significant effects on health-related quality of life, as evidenced by EQ-5D and BDI scores, underscore the substantial burden that olfactory dysfunction places on individuals. Increased awareness and further research are essential to develop effective management strategies for SATDs, ultimately improving the outcomes and well-being of this often-overlooked patient population.

## REFERENCES

1. Desiato VM, Levy DA, Byun YJ, Nguyen SA, Soler ZM, Schlosser RJ. The Prevalence of Olfactory Dysfunction in the General Population: A Systematic Review and Meta-analysis. *Am J Rhinol Allergy*. 2021;35(2):195–205.
2. Philpott C, Dixon J, Boak D. Qualitative Olfactory Disorders: Patient Experiences and Self-Management. *Allergy Rhinol (Providence)*. 2021; 12:21526567211004251.
3. Erskine SE, Philpott CM. An unmet need: Patients with smell and taste disorders. *Clin Otolaryngol*. 2020;45(2):197–203.
4. Zou LQ, Hummel T, Otte MS, et al. Association between olfactory function and quality of life in patients with olfactory disorders: a multicenter study in over 760 participants. *Rhinology*. 2021;59(2):164–72.
5. Ekström I, Sjölund S, Nordin S, et al. Smell Loss Predicts Mortality Risk Regardless of Dementia Conversion. *J Am Geriatr Soc*. 2017;65(6):1238–43.
6. Ball S, Boak D, Dixon J, Carrie S, Philpott CM. Barriers to effective health care for patients who have smell or taste disorders. *Clin Otolaryngol*. 2021;46(6):1213–22.
7. Garden EM, Kumaresan K, Clark A, Philpott CM. Olfactory Disorders Questionnaire: Scaling severity of quality-of-life impact. *Clin Otolaryngol*. 2023;48(2):206–12.
8. EuroQol Research Foundation. EQ-5D-5L User Guide, 2019. Available from: <https://euroqol.org/publications/user-guides>.
9. Beck AT. An Inventory for Measuring Depression. *Arch Gen Psychiatry*. 1961;4(6):561.
10. Afshari S, Ameri H, Baharinya S, Arab-Zozani M, Mojahedian MM. Assessment of the properties of the EQ-5D-5L in patients with type 2 diabetes mellitus: a systematic review and meta-analysis. *Expert Rev Pharmacoecon Outcomes Res*. 2022;22(2):351–64.
11. Redenz G, Ibaceta MC, Aceituno D, Balmaceda C, Espinoza MA. Health State Utility Values of Type 2 Diabetes Mellitus and Related Complications: A Systematic Review and Meta-Analysis. *Value Heal Reg Issues*. 2023;34:14–22.
12. Joundi RA, Adekanye J, Leung AA, et al. Health State Utility Values in People With Stroke: A Systematic Review and Meta-Analysis. *J Am Heart Assoc*. 2022;11(13).
13. Afshari S, Ameri H, Daroudi RA, Shiravani M, Karami H, Akbari Sari A. Health related quality of life in adults with asthma: a systematic review to identify the values of EQ-5D-5L instrument. *J Asthma*. 2022;59(6):1203–12.
14. Oh B-C, Lee J-E, Nam JH, Hong J-Y, Kwon S-H, Lee E-K. Health-related quality of life in adult patients with asthma according to asthma control and severity: A systematic review and meta-analysis. *Front Pharmacol*. 2022; 13:908837.
15. Di Tanna GL, Urbich M, Wirtz HS, et al. Health State Utilities of Patients with Heart Failure: A Systematic Literature Review. *Pharmacoeconomics*. 2021;39(2):211–29.
16. Squire I, Glover J, Corp J, Haroun R, Kuzan D, Gielen V. Impact of HF on HRQoL in patients and their caregivers in England: results from the ASSESS study. *Br J Cardiol*. 2017; 24:30–4.

17. Narita Z, Inagawa T, Stickley A, Sugawara N. Physical activity for diabetes-related depression: A systematic review and meta-analysis. *J Psychiatr Res.* 2019;113:100–7.
18. Khan Z, Musa K, Abumedian M, Ibekwe M. Prevalence of Depression in Patients With Post-Acute Coronary Syndrome and the Role of Cardiac Rehabilitation in Reducing the Risk of Depression: A Systematic Review. *Cureus.* 2021;13(12):e20851
19. Dong Z, Yang Q, Chen H. Estimating the prevalence of depression in people with acute coronary syndromes: A systematic review and meta-analysis. *Medicine (Baltimore).* 2024;103(17):e37906.
20. Patel JJ, Levy DA, Nguyen SA, Rizk HG, Meyer TA. Depression in Meniere’s disease: a systematic review and meta-analysis. *J Laryngol Otol.* 2020;134(4):293–301.
21. Yeo BSY, Toh EMS, Lim NE, et al. Association of Benign Paroxysmal Positional Vertigo with Depression and Anxiety—A Systematic Review and Meta-Analysis. *Laryngoscope.* 2024;134(2):526–34.
22. Said M, Luong T, Jang SS, Davis ME, DeConde AS, Yan CH. Clinical factors associated with lower health scores in COVID-19-related persistent olfactory dysfunction. *Int Forum Allergy Rhinol.* 2022;12(10):1242–53.
23. Luong T, Jang SS, Said M, DeConde AS, Yan CH. Impact of COVID -19 versus chronic rhinosinusitis/rhinitis associated olfactory dysfunction on health utility and quality of life. *Laryngoscope Investig Otolaryngol.* 2022;7(5):1299–307.
24. Kohli P, Soler ZM, Nguyen SA, Muus JS, Schlosser RJ. The Association Between Olfaction and Depression: A Systematic Review. *Chem Senses.* 2016;41(6):479–86.
25. Rudmik L, Hopkins C, Peters A, Smith TL, Schlosser RJ, Soler ZM. Patient-reported outcome measures for adult chronic rhinosinusitis: A systematic review and quality assessment. *J Allergy Clin Immunol.* 2015;136(6):1532-1540.e2.