ARTICOLO

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Keywords:
presbyosmia, prevention, olfactory assessments, olfactory therapy

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Contributions:
the author(s) made a substantial intellectual contribution, read and approved the final version of the manuscript, and agreed to be accountable for all aspects of the work.
Conflict of interest:
the author(s) declare no potential conflict of interest.
Ethics approval and consent to participate:
not applicable.
Patient consent for publication:
not applicable.
Funding:
none.
Availability of data and materials:
data and materials are available from the corresponding author upon request.

Received: 23 July 2025
Accepted: 17 September 2025

PRESBYOSMIA: A PUBLIC HEALTH PROBLEM

ABSTRACT

In the population, about 20% of individuals currently suffer from olfactory dysfunctions, part of which (about 5%) who have a total loss of smell.
These problems can result from several factors such as illness, age, gender, lifestyle and socio-professional activities. For example, presbyosmia (*physiological loss of olfactory acuity*) is commonly encountered in healthy seniors.
However, a smell disorder is not always identified compared to alterations in other sensory systems, such as sight or hearing, partly due to a lack of standardization of evaluation practices and an insufficient public health policy in this area.

In addition, olfactory assessments provide useful information on the health status of individuals.
Indeed, dysomia can not only appear during preclinical stages of diseases (Alzheimer's, Parkinson's, multiple sclerosis, schizophrenia, etc.), but also increase the risk of domestic accidents and aggravate certain pathological processes such as high blood pressure or obesity.

However, olfactory therapy has already shown its effectiveness in certain situations (ENT infections) both to recover olfactory acuity after viral infection and also to improve the well-being and nutritional status of hospitalized patients (chemotherapy care) or for residents in retirement homes.

RIASSUNTO

Nella popolazione, circa il 20% degli individui soffre attualmente di disfunzioni olfattive, una parte delle quali (circa il 5%) presenta una perdita totale dell'olfatto. Questi problemi possono derivare da diversi fattori come malattie, età, sesso, stile di vita e attività socio-professionali. Ad esempio, la presbiosmia (*perdita fisiologica dell'acutezza olfattiva*) è comunemente riscontrata negli anziani sani. Tuttavia, un disturbo dell'olfatto non viene sempre identificato rispetto ad alterazioni in altri sistemi sensoriali, come la vista o l'udito, in parte a causa della mancanza di standardizzazione delle pratiche di valutazione e di un'insufficiente politica di sanità pubblica in questo ambito. Inoltre, le valutazioni olfattive forniscono informazioni utili sullo stato di salute degli individui. Infatti, la disomia può non solo manifestarsi durante le fasi precliniche di malattie (Alzheimer, Parkinson, sclerosi multipla, schizofrenia, ecc.), ma anche aumentare il rischio di incidenti domestici e aggravare alcuni processi patologici come l'ipertensione o l'obesità. Tuttavia, la terapia olfattiva ha già dimostrato la sua efficacia in determinate situazioni (infezioni ORL) sia per recuperare l'acutezza olfattiva dopo un'infezione virale, sia per migliorare il benessere e lo stato nutrizionale dei pazienti ospedalizzati (cure chemioterapiche) o degli ospiti delle case di riposo.

This article was published on December 30, 2025, at IJPDTM.IT
doi.org/10.30459/2025-37

INTRODUCTION

Dysosmia is an alteration in olfactory function or smell disorder (SD). When everything is going well, we speak of normosmia (normal olfactory function). On the other hand, in the event of dysfunction of the sense of smell, two types of SD are possible. There are quantitative and/or qualitative dysfunctions, which can occur together or independently, depending on the often complex and multifactorial origins.

Estimates are that approximately 5% of the population currently has no sense of smell. Depending on definitions, decreased olfactory function (hyposmia) may affect an additional 15%. The prevalence of quantitative SD is higher than that of qualitative SD. Olfactory dysfunction is very common in the elderly (more than half of people aged 65 to 80) and impact about 75 % of people over 80, but it can start as early as 60 [(1)] (**figure 1**).

Among the many mechanisms involved, there is a decrease in the number and quality of olfactory receptors, an alteration of nasal engorgement or cumulative damage to the olfactory epithelium due to repeated viral attacks.
In addition, there is a predominance of age-related dysosmia (presbyosmia) in men compared to women (14,6% of men va. 8,6 % of women at age 60, 48,5% of women compared to 29,2% of women at age 78) [(2)].
The criteria for assessing olfactory acuity allow for the differentiation pathological dysosmias from presbyosmia. In fact, in the latter, the olfactory sensitivity (detection thresholds) would be affected more significantly and drastically than discrimination and the identification of odours [(3)].

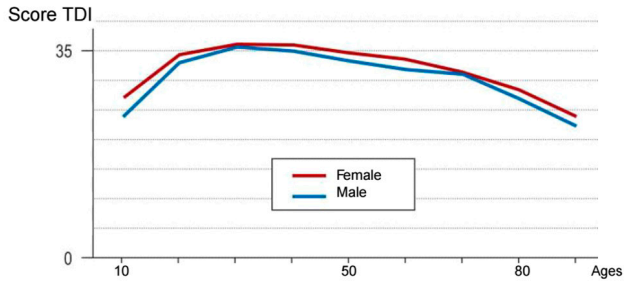

Figure 1
Modification of olfactory function according to age and sex - TDI, Summed results, olfactory threshold + discrimination test + identification test - Modified from [(5)] [(6)]

Smell assessments

Hyposmia, and anosmia are part of quantitative SD [(4)]. However, presbyosmia generally evolves into hyp- or anosmia. Moreover, qualitative SD are most often associated with other pathologies.
For example, parosmia (abnormal perception of odors) may often appear after an infection, and phantosmias (olfactory hallucinations) can be typically found after head trauma. Among the many origins of quantitative and qualitative SD, there are sinunasal infections (typically with nasal polyposis), craniofacial trauma, endocrine diseases (e.g., Kallmann syndrome, primary amenorrhea, diabetes, obesity, kidney failure).

In some cancers or after chemotherapy treatment, a decrease in olfactory acuity is accompanied by a loss of palatability of food. Exposure to potential toxins, neurological (e.g., Alzheimer's disease, Parkinson's disease) and psychiatric conditions (e.g., schizophrenia, depression, bipolar disease), certain medications, and surgical operations can also be accompanied by dysosmias. Sometimes, no cause is found, in which case we speak of idiopathic SD, or individuals can no longer identify smells although they can perceive them very well: this is olfactory agnosia, which can occur after a stroke.

Numerous tests are used to evaluate quantitative SD [(5)]. The Sniffin' Sticks Test (Burghart, Holm, Germany) (48 samples) developed and validated since 1997, is among the most widely used in the world, from three criteria represented by the TDI Score: detection threshold, discrimination and identification [(6)].
To evaluate the qualitative SD, especially to clarify the relationships with cognitive disorders, we had created another questionnaire (PN© Test) consisting of an alternative choice of responses based on food and non-food aromas (research authorization from CNIL in 2018 after a favorable opinion from CEREES[1] , now CESREES[2]) [(7)].

[1] *Committee of Expertise for research, studies, and evaluations in the field of health in France.*
[2] *Ethical and Scientific Committee for research, studies, and evaluations in the field of health in France.*

This article was published on December 30, 2025, at IJPDTM.IT
doi.org/10.30459/2025-37

Italian Journal of Prevention, Diagnostic and Therapeutic Medicine
Ital. J. Prev. Diagn. Ther. Med. | Vol.8 N°4 2025.

We also added two scales (emotional valence, affective tolerance), two indicators (familiarity and cognitive fatigue), a typology of olfactory errors that includes links to multisensory perceptions[3] based on phenomenological analyses (autobiographical narratives) and lexical analyses (form of discourse and syntax) [(8)].

Significant health and social consequences

A 2004 study revealed that 37% of people with anosmia were more likely to suffer a household accident compared to people with normosmia, whose risk was estimated at 19%.
The statistics mainly involve cooking activities (45%, spoiled food), gas leaks (23%), and fires (7%).
Anosmia also has implications for mental health (depression, social life) [(9)].
Moreover, certain depressive episodes are accompanied by a change in olfactory acuity, and conversely, deficits in odor perception can contribute to depression (in 30% of cases)[(10)].
Indeed, even if a portion of dysosmic individuals presents depressive symptoms, conversely, the prevalence of dysosmias among depressed individuals is not ruled out. SD can also indirectly promote overweight, obesity, high blood pressure, and long-term diabetes, due to an increased consumption of salt, sauces, and fats to restore the taste or texture of food, exacerbated by tobacco or alcohol use or poor lifestyle habits (insomnia, sedentary behavior).

Another American study from the University of Chicago (National Social Life, Health and Aging Project), published in 2014, demonstrates a significant correlation between smell disorders (SD) and an increased risk of mortality.
These scientists describe it as a predictive indicator of brain aging since deaths occur in 39% of individuals with major SD, while the mortality risk is lower, around 19%, in cases of hyposmia and 10% for normosmic individuals. They add that the alteration of olfactory acuity would be a mortality warning signal within 5 years, similar to heart and lung failures, diabetes, or cancer [(11)].

Howerver, the earlier olfactory therapy is started, the better the chances of success and recovery of olfactory acuity. Indeed, numerous international studies have demonstrated the usefulness of olfactory training (between 4 and 12 months) to maintain cognitive functions, improve well-being, social cohesion, but especially to recover the sense of smell in patients with dysosmia of infectious, post-traumatic, and idiopathic origin.

CONCLUSION

The medical and scientific communities are convinced that early olfactory assessments should be implemented across the population, in companies, hospitals, and nursing homes to reduce the prevalence of dysosmia.
Furthermore, the French Society of ENT and Facial and Neck Surgery specified in 2021 that "in the absence of associated comorbidities, early initiation of olfactory reeducation even allows for late recovery of the sense of smell in most patients with post-viral anosmia. [...] Olfactory reeducation is currently the most effective and safest treatment for this indication" [(12)].
Moreover, the goals and the protocol for olfactory therapy must be perfectly understood by people with dysosmia since most olfactory exercises are carried out at home. However today, the assessment of a smell disorder is not systematic in the general population, especially for presbyosmia, compared to other sensory systems such as vision (presbyopia) or hearing (presbycusis).

This is partly due to a lack of standardization in assessment practices and a very insufficient public health policy in the field of smell.
However, this could significantly improve through initial and continued training of students and healthcare professionals as well as targeted awareness among patient associations. Indeed, it is proven that only 25% of people affected by SD are aware of their deficiency.

[3] *EPIGOVA® in French (Exteroception, Proprioception, Interoception, Goût, Odorat, Vision, Audition) or EPITSV in English (Exteroception, Proprioception, Interoception, Taste, Smell, Vision)*

This article was published on December 30, 2025, at IJPDTM.IT
doi.org/10.30459/2025-37

Finally, olfactory therapy is effective, not very expensive, especially since it can be carried out at home or during working hours. On one hand, smell assessments provide doctors with useful information for their diagnoses. On the other hand, olfactory therapy allows for recovery after a loss of smell, limits the consequences of a dysosmia that might go unnoticed, and helps maintain olfactory function for as long as possible to ensure good overall health.

References

1. *Dan X, Wechter N, Gray S, et al. Olfactory dysfunction in aging and neurodegenerative diseases. Research journals on aging. September 2021; 70:101416. DOI: 10.1016/j.arr.2021.101416. PMID: 34325072; PMCID: PMC8373788.*
2. *Seubert J, Laukka EJ, Rizzuto D, Hummel T, Fratiglioni L, Backman L, Larsson M, 2017. Prevalence and correlates of olfactory dysfunction in older adults: a population-based study. J Gerontol A Biol Sci Med Sci 72, 1072–1079.*
3. *Hummel T, Kobal G, Gudziol H, Mackay-Sim A. Normative data for Sniffin' Sticks, including odor identification, odor discrimination, and olfactory threshold tests: an update based on a group of over 3,000 subjects. Eur Arch Otorhinolaryngol. mars 2007 ; 264(3):237-43. DOI: 10.1007/S00405-006-0173-0. EPUB 23 septembre 2006. PMID : 17021776.*
4. *P. Bonfils, D. Malinvaud, H. Bozec, Ph. Halimi, Olfactory disorders, Annals of Otolaryngology and Head and Neck Surgery, Volume 121, Issue 2, 2004, Pages 67-74, ISSN 0003-438X, https://doi.org/10.1016/S0003-438X(04)95492-8.*
5. *Hummel Thomas, Liu DT, Müller CA, Stuck BA, Welge-Lüssen A, Hähner A. Olfactory dysfunction: etiology, diagnosis and treatment. Dtsch Arztebl Int. 13 mars 2023; 120(9):146-154. DOI: 10.3238/arztebl.m2022.0411. PMID : 36647581 ; PMCID : PMC10198165.*
6. *Oleszkiewicz A, Schriever VA, Croy I, Hähner A, Hummel T. Updated Sniffin' Sticks normative data based on an extended sample of 9139 subjects. Eur Arch Otorhinolaryngol. 2019 Mar;276(3):719-728. doi: 10.1007/s00405-018-5248-1. Epub 2018 Dec 15. PMID: 30554358; PMCID: PMC6411676.*
7. *Michel, F-B., Pinelli, N. J-B., Alzheimer's disease: a new test and a treatment, Psychiatrie, Sciences humaines, Neurosciences, vol. 15, no. 4, 2017, pp. 39-49. http://www.cairn.info/revue-psn-2017-4-page-39.htm.*
8. *Pinelli JB Nicolas, The sense of smell and its mysteries, Tome I: olfactory therapy according to the Epigova method, Eds Ermengaud, 2024, 402 p., ISBN 9782955944516.*
9. *Croy I, Nordin S, Hummel T. Olfactory disorders and quality of life--an updated review. Chem Senses. 2014 Mar;39(3):185-94. doi: 10.1093/chemse/bjt072. Epub 2014 Jan 15. PMID: 24429163.*
10. *Bensafi M, Rouby C. Brain and sense of smell. How to (re)educate your nose. Les Ulis, France: EDP Sciences; 2020, 136 p.*
11. *Pinto JM, Wroblewski KE, Kern DW, Schumm LP, McClintock MK (2014) Olfactory Dysfunction Predicts 5-Year Mortality in Older Adults. PLOS ONE 9(10): e107541. https://doi.org/10.1371/journal.pone.0107541.*
12. *Teissier Natacha, Truy Eric, RCP Diagnostic and therapeutic approach to viral infections in ENT, Recommendation for clinical practice, SFORL, 2021, p187. https://www.sforl.org/wp-content/uploads/2021/09/Reco-SFORL-Diagnostic-et-ttt-des-infections-virales-en-ORL-15092021_compressed.pdf.*

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