



Association pour la santé environnementale du Québec  
Environmental Health Association of Québec

## Understanding Multiple Chemical Sensitivity (MCS): A holistic examination of the causes, cues, and current perception of MCS

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## Overview and Objectives

This document summarizes extensive global research on Multiple Chemical Sensitivity (MCS). Despite the efforts of various organizations supporting individuals with MCS, it is surprising how many remain unaware of the condition. The purpose of this document is to explain MCS more clearly and highlight the social, environmental, and genetic factors which contribute to its development. Additionally, it aims to shed light on the experiences of those affected by MCS, who often face stigmatization. People with MCS deserve fair treatment and the accommodations necessary to manage their condition.

By raising awareness, we hope to increase public understanding of MCS and its significant impact. MCS is a real condition, marked by respiratory irritation and heightened sensitivity to fragrances and chemicals. Numerous groups worldwide are dedicated to supporting those with MCS. Together, we can create a safer, healthier environment for everyone, ensuring better health for generations to come.



## Pollution and Socio-Economic Factors

In a rapidly growing and industrialized environment, pollutants are becoming ever-present all around us. Johnson-Esparza et al. (2024) suggest pollutants lead to negative outcomes in a variety of domains such as cognition, behaviour, and health. Notably, it is the ones who are most unfortunate that encounter them in higher concentration. Immigrants (especially, first generation) find it the most difficult to adjust to the natural demands of a new country. A new location forces an individual and their body to quickly adjust to new food, new pathogens, new weather, and new people. To make matters worse, they often face worse socio-economic conditions. Relative to non-immigrants and their second-generation counterparts, first-generation immigrants face housing instability, worst living conditions, and lack of insurance. Frequently, immigrants and low-income families have poor ventilation, and rely on older technology to provide heating and electricity in their homes. Such mechanisms expose them to harmful chemicals such as benzene, formaldehyde, and nitrogen dioxide. These are odourless gases, which are tough to detect but are harmful to human health. Johnson-Esparza et al. (2024) suggest a key factor which increases hope and quality of life for the disadvantaged is social and emotional support. One distinct advantage with the modern world is the interconnectedness of humanity. It is imperative for us to let our support be palpable for those struggling under impoverished conditions.

### References

Johnson-Esparza, Y., Wood, R., Cruz, I. *et al.* Diabetes quality of life, Chemical Intolerance, and generational status in a Latino sample: an RRNeT study. *J Diabetes Metab Disord* (2024). <https://doi.org/10.1007/s40200-023-01374-3>

Nassikas NJ, McCormack MC, Ewart G, Balmes JR, Bond TC, Brigham E, Cromar K, Goldstein AH, Hicks A, Hopke PK, Meyer B, Nazaroff WW, Paulin LM, Rice



MB, Thurston GD, Turpin BJ, Vance ME, Weschler CJ, Zhang J, Kipen HM. Indoor Air Sources of Outdoor Air Pollution: Health Consequences, Policy, and Recommendations: An Official American Thoracic Society Workshop Report. *Ann Am Thorac Soc.* 2024 Mar;21(3):365-376. doi: 10.1513/AnnalsATS.202312-1067ST. PMID: 38426826; PMCID: PMC10913763.



## Biological Mechanisms of Multiple Chemical Sensitivity (MCS)

Significant research efforts are being made to understand Multiple Chemical Sensitivity (MCS). Using surveys, experiments, analyses, and brain imaging technology, we are getting closer to uncovering the mysteries of this condition. Symptoms include coughing, nausea, wheezing, migraine, and allergy-like signs. Exposure to pollutants disrupts various systems and affects our body's ability to make proteins. MCS occurs in a two-step process: initiation and triggering, and these are controlled by specific cells in our body.

Mast cells are immunity cells that respond to foreign stimuli when they enter our body. Once they detect stimuli, they release a variety of proteins to help the body recover from any harm or infection. Some chemicals such as PM2.5 (in smoke), volatile organic compounds (ex. benzene), and other known pollutants have a unique impact on these mast cells. Upon exposure to these chemicals, mast cells become sensitized to react to low levels of pollutants. For example, in unaffected people, the cells may respond to pollutants in as little concentration as 100 parts per million (ppm). The mast cells in MCS patients may even respond to 50 - 75 ppm levels of pollutants. To make it worse, the mast cells produce a greater number of proteins in response to the pollutants. The mast cells malfunction and react as if there are more pollutants than there are in reality. The release of proteins is eventually responsible for the inflammatory response and allergy-like symptoms.

There is more to it than just the mast cells. Transient receptor potential (TRP) channels are cellular sensors that detect a broad range of physical and chemical stimuli, enabling cells to respond to environmental changes. These receptors are widely distributed across many tissues, particularly in the peripheral and central nervous systems, where they play a crucial role in sensory perception, such as



touch, temperature, smell, taste, hearing, and vision. Importantly, TRP receptors also detect chemicals in the environment and can become sensitized over time. Two specific chemosensitive receptors, TRPV1 and TRPA1, are particularly responsive to pollutants and very low levels of volatile organic compounds (VOCs). Repeated exposure to these chemicals can cause an increase in the number of receptors on cell surfaces, leading to sensitization. This results in hyperexcitable receptors, making the cells more responsive to chemical exposures, even at levels typically considered too low to trigger a reaction. Furthermore, certain genetic variants can increase sensitivity to chemicals. In Multiple Chemical Sensitivity (MCS), TRPV1 and TRPA1 receptors have been shown to be sensitized, as demonstrated by 21 peer-reviewed studies, establishing a clear link between these receptors and the heightened sensitivity observed in MCS.

Similar evidence has been gathered using published multiple case-control functional brain imaging studies. Researchers have scanned the brains of people with MCS, and compared them to unaffected individuals. Imaging results show that MCS patients process odours differently in the brain. Taken together, these results show that MCS is not a psychological phenomenon, but a physiological one.

Some individuals are more vulnerable to the pollutants due to their genetic makeup. Chemicals such as bisphenol A (BPA) and benzo-a-pyrene, found in plastic manufacturing and combustion by-products, respectively, are some compounds which trigger mast cell activation. Other chemicals causing chemical intolerance include pesticides, mould, fragrances, and personal care items (ex. cosmetics, shower products, laundry, etc.). It is imperative that the public is made aware of these chemicals to avoid -exposure and the risk of becoming sensitized. The most vulnerable to sensitization are women and children, and thus it is our



responsibility to protect them by becoming more aware of our surroundings and making better informed product choices.

## References

Miller, C. S., Palmer, R. F., Kattari, D., Masri, S., Ashford, N. A., Rincon, R., Perales, R. B., Grimes, C., & Sundblad, D. R. (2023). What initiates chemical intolerance? Findings from a large population-based survey of U.S. adults. *Environmental Sciences Europe*, 35(1), Article 65. <https://doi.org/10.1186/s12302-023-00772-x>

Molot J, Sears M, Anisman H. (2023). Multiple chemical sensitivity: It's time to catch up to the science. *Neurosci Biobehav Rev.* 151:105227. doi: 10.1016/j.neubiorev.2023.105227. Epub 2023 May 10. PMID: 37172924.

<sup>1</sup>Palmer, R. F., Almeida, M., Perales, R. B., & Rincon, R. (2023). A genome-wide SNP investigation of chemical intolerance. *Environmental Advances*, 12, Article 100380. <https://doi.org/10.1016/j.envadv.2023.100380>

<sup>2</sup>Palmer RF, Dempsey TT, Afrin LB. (2023). Chemical Intolerance and Mast Cell Activation: A Suspicious Synchronicity. *J Xenobiot.* 13(4):704-718. doi: 10.3390/jox13040045. PMID: 37987446; PMCID: PMC10660865.





## Environmental Quality and Multiple Chemical Sensitivity (MCS)

Sick building syndrome (SBS) falls under the umbrella of multiple chemical sensitivities (MCS). People with SBS often experience headaches, confusion, allergy-like symptoms, and irritation in the nose and throat. This can be explained by the surrounding environment. Factors such as furnishings can influence productivity and induce people to become more sensitive to pollutants in the indoor air. Components such as HVAC systems improve proper ventilation and help to remove pollutants. Pollution from smoke can produce particulate matter (PM). PM can enter the body through our eyes, nose, or mouth. Once it enters the body, it triggers harmful reactions and causes inflammation in our airways. Eventually, inflammation could lead to asthma.

An easy solution to the problem is proper ventilation. Proper air circulation removes PM and the symptoms of MCS tend to disappear. Research shows that informing people about their indoor air quality changes their individual behaviour such that people take greater initiative to improve their indoor environment. Recent studies suggest a universal design strategy in the workplace to help protect individuals, especially those with MCS. This approach makes it easy for individuals of all kinds to work while maintaining a clean and productive environment.

This is a good strategy for the workplace but what about the home? Low-income families have low affordability. Often, they do not have proper ventilation or thermal regulation, and they live in overcrowded homes. Those homes may even have mould and pests. These conditions invite more indoor pollutants, and increase their chances of getting bacterial or viral infections. With proper policy change, we may be able to use an efficient strategy to transform the future of many families who lack proper housing. It is our moral responsibility to



accommodate the less fortunate, inform the public, and update policies for the well-being of future generations.

## References

Holden KA, Lee AR, Hawcutt DB, Sinha IP (2023). The impact of poor housing and indoor air quality on respiratory health in children. *Breathe (Sheff)*. 19(2):230058. doi: 10.1183/20734735.0058-2023. Epub 2023 Aug 15. PMID: 37645022; PMCID: PMC10461733.

Niza, I. L., de Souza, M. P., da Luz, I. M., & Broday, E. E. (2024). Sick building syndrome and its impacts on health, well-being and productivity: A systematic literature review. *Indoor and Built Environment*, 33(2), 218–236. <https://doi.org/10.1177/1420326X231191079>

Oh, J., Wong, W., Castro-Lacouture, D., Lee, J., & Koo, C. (2023). Indoor Environmental Quality Improvement in green building: Occupant perception and behavioral impact. *Journal of Building Engineering*, 69, 106314. <https://doi.org/10.1016/j.jobee.2023.106314>

Traina, G., Bolzacchini, E., Bonini, M., Contini, D., Mantecca, P., Caimmi, S. M. E., & Licari, A. (2022). Role of air pollutants mediated oxidative stress in respiratory diseases. *Pediatric allergy and immunology : official publication of the European Society of Pediatric Allergy and Immunology*, 33 Suppl 27(Suppl 27), 38–40. <https://doi.org/10.1111/pai.13625>

Wickert, K., Romeo, J. M., Rumrill, P., Sheppard-Jones, K., & McCurry, S. (2022). Return to work considerations in the lingering COVID-19 Era: Long COVID, multiple chemical sensitivity, and universal design. *Work (Reading, Mass.)*, 73(2), 355–360. <https://doi.org/10.3233/WOR-223641>



## TRP Receptors: The Missing Link Between Pollution and MCS

Transient receptor potential (TRP) receptors are a family of receptors which are responsible for sensation. They detect heat, pain, and chemicals. The two types of receptors linked to MCS, and sensitization are TRPA1 and TRPV1. They are broadly found in various tissues and cell types, with a particular abundance in the peripheral and central nervous systems. TRPV1 receptors are specifically reactive to a variety of volatile organic compounds (VOCs), including capsaicin, a compound found in spicy food (ex. in hot peppers). TRPA1 reacts with a group of other chemicals such as acrolein, phthalates (both common in air pollutants such as exhaust, and tobacco smoke), mustard oil, garlic, etc.

When they are activated, these receptors pump calcium ions into the cell, starting a cascade of reactions. This has multiple direct and indirect effects which we still don't completely understand. Calcium ions can induce ionic imbalance, inflammation, and cell death. In the case of infiltrating bacteria or pollutants, it can provoke an immune response to remove the harmful chemicals or bacteria. Indirectly, activation of TRP receptors can also produce a variety of substances, which increase blood flow to the brain, and others which further activate the receptor. A well-researched long-term effect of TRP activation is headache through activation of receptors along the trigeminal nerve. This nerve can produce migraine-like symptoms through increased blood flow to the brain, and also induce coughing and other respiratory symptoms. This explains how people tend to have painful headaches, coughs, or throat irritation when they have been exposed to pollutants.

Where is the link between sensitization and MCS? The TRPV1 and TRPA1 receptors are especially chemosensitive. They are triggered by pollutants and can react to very low levels of chemicals in the air, known as volatile organic compounds (VOCs). When these receptors are repeatedly activated over time,



they can increase in number on the cell surface, making them more sensitive, a process called sensitization. This makes the receptors overactive, causing the body to react more strongly to chemical exposures, even at levels typically considered harmless. In some cases, reactions can happen even when the chemical levels are very low. Some people may also have genetic differences that make them more sensitive to chemicals.

In people with MCS, these sensitive TRPV1 and TRPA1 receptors are more easily triggered. This has been confirmed by 21 peer-reviewed studies showing that these receptors are more sensitive in people with MCS. Hence, the TRP receptors link the pollutant exposure to multiple chemical sensitivities. Hyper-activation of the receptors can lead to inflammation, and a host of allergy-like symptoms such as headache, respiratory irritation, etc.

## References

- Bessac, B. F., & Jordt, S. E. (2008). Breathtaking TRP channels: TRPA1 and TRPV1 in airway chemosensation and reflex control. *Physiology (Bethesda, Md.)*, *23*, 360–370. <https://doi.org/10.1152/physiol.00026.2008>
- Dux, M., Rosta, J., & Messlinger, K. (2020). TRP Channels in the Focus of Trigeminal Nociceptor Sensitization Contributing to Primary Headaches. *International journal of molecular sciences*, *21*(1), 342. <https://doi.org/10.3390/ijms21010342>
- Fang, Z., Yi, F., Peng, Y., Zhang, J. J., Zhang, L., Deng, Z., Chen, F., Li, C., He, Y., Huang, C., Zhang, Q., Lai, K., & Xie, J. (2021). Inhibition of TRPA1 reduces airway inflammation and hyperresponsiveness in mice with allergic rhinitis. *FASEB journal : official publication of the Federation of American Societies for Experimental Biology*, *35*(5), e21428. <https://doi.org/10.1096/fj.201902627R>



- Kim, H., Kim, M., & Jang, Y. (2024). Inhaled Volatile Molecules-Responsive TRP Channels as Non-Olfactory Receptors. *Biomolecules & therapeutics*, 32(2), 192–204. <https://doi.org/10.4062/biomolther.2023.118>
- Lin, J., Taggart, M., Borthwick, L., Fisher, A., Brodlie, M., Sassano, M. F., Tarran, R., & Gray, M. A. (2021). Acute cigarette smoke or extract exposure rapidly activates TRPA1-mediated calcium influx in primary human airway smooth muscle cells. *Scientific reports*, 11(1), 9643. <https://doi.org/10.1038/s41598-021-89051-4>
- Molot, J., Sears, M., & Anisman, H. (2023). Multiple chemical sensitivity: It's time to catch up to the science. *Neuroscience and biobehavioral reviews*, 151, 105227. <https://doi.org/10.1016/j.neubiorev.2023.105227>
- Parenti, A., De Logu, F., Geppetti, P., & Benemei, S. (2016). What is the evidence for the role of TRP channels in inflammatory and immune cells?. *British journal of pharmacology*, 173(6), 953–969. <https://doi.org/10.1111/bph.13392>



## Genetic Predispositions: How some people are more susceptible to Multiple Chemical Sensitivity (MCS) than others

When we encounter chemicals, they are absorbed by the cells, in our airways, skin, and external tissue. These chemicals can be harmful, and the body recruits enzymes to metabolize them and break them down. Phase I and phase II enzymes break down drugs and pharmaceutical products such as cocaine and acetaminophen. Similarly, they also break down xenobiotic chemicals and pollutants we encounter such as phthalates, fragrances, polychlorinated biphenyl, pesticides, etc.

The enzymes which our bodies use to metabolize the chemicals include CYP450 enzymes, glutathione-S-transferase (GST), UDP-glucuronosyltransferase (UGT), N-Acetyl transferases (NATs), epoxide hydrolases, etc. GST and UGT are especially prevalent in the olfactory epithelium and the upper airways. However, not everyone has similarly functioning phase I/II enzymes.

Genetic differences, and mutations may account for differences in the enzymes. Such differences also signify that the enzymes vary in their ability to break down chemicals. Some variants of enzymes are more efficient than others in metabolizing chemicals. It is possible that MCS patients have dysfunctional or less functional forms of GST, NATs, and epoxide hydrolases. This would mean that the chemicals persist in their system for longer periods of time. Even when the source of the pollutants is removed, minute levels may remain in the skin cells, blood cells, or airway cells. The pollutants trigger an immune response which leads to oxidative stress, and inflammation.

Repeated exposure to these pollutants, combined with a genetic susceptibility to inflammation puts one at risk for chronic inflammation. With an inability to effectively break down the chemicals, individuals are more likely to become sensitized. This is a possible mechanism for multiple chemical sensitivity.



More investigation into the genetic architecture of MCS may reveal specific mutations which can increase the likelihood of developing the disability. Also, the enzymes noted above can be used as biomarkers to better diagnose MCS. These clinical biomarkers pose possibilities for research and scientific examination. With more awareness and education, we can better elucidate the mechanism of MCS and move closer to treatment.

## References

- De Luca, C., Raskovic, D., Pacifico, V., Thai, J. C., & Korkina, L. (2011). The search for reliable biomarkers of disease in multiple chemical sensitivity and other environmental intolerances. *International journal of environmental research and public health*, 8(7), 2770–2797. <https://doi.org/10.3390/ijerph8072770>
- Korkina, L., & Pastore, S. (2009). The role of redox regulation in the normal physiology and inflammatory diseases of skin. *Frontiers in bioscience (Elite edition)*, 1(1), 123–141. <https://doi.org/10.2741/E13>
- Wormhoudt, L. W., Commandeur, J. N., & Vermeulen, N. P. (1999). Genetic polymorphisms of human N-acetyltransferase, cytochrome P450, glutathione-S-transferase, and epoxide hydrolase enzymes: relevance to xenobiotic metabolism and toxicity. *Critical reviews in toxicology*, 29(1), 59–124. <https://doi.org/10.1080/10408449991349186>



## Multiple Chemical Sensitivity and Neurodegeneration: An Avenue to Explore

Modern medicine has worked miracles, but there are many mysteries that still require unveiling. Two of those mysteries involve elucidating the etiological mechanisms for multiple chemical sensitivity (MCS) and certain neurodegenerative disorders such as Parkinson's and Alzheimer's. Research published by Molot et al. (2022) shares the similarities between the two paradigms, which suggests they may share mechanisms. This helps us to better understand MCS, and perhaps develop a solution. Although there is loss of brain matter in neurodegenerative diseases, none of the damage is seen in MCS. However, MCS patients do show differences in smell perception, relative to others.

More is shared by the two diagnoses than what separates them. Like MCS, neurodegeneration can be triggered due to various other air-borne chemicals. They both affect the central nervous system and show symptoms of olfactory dysfunction. Neurodegeneration and MCS may be brought upon by a unique gene-environment interaction. Pollutants are toxic to everyone, but some people's genes make it easier to remove them from the body. People who cannot remove them efficiently are more susceptible to the conditions. If not detoxified properly by the body, these pollutants reach and damage the blood-brain barrier which eventually leads to inflammation - a shared sign of MCS and neurodegeneration. Patients with Parkinson's have been known to show a heightened sensitivity to pain, like the heightened sensitivity to smell in MCS. Lastly, the two conditions share the involvement of TRPV1/A1 receptors which are receptors on our nerve cells. In neurodegeneration, their hyperactivity leads to greater intracellular imbalance and results in mitochondrial damage and apoptosis (cell death). In MCS, their hyperactivity leads to sensitization, which provokes a strong reaction to low levels of chemicals in the environment. The





similarities between the two show great promise that further research examining the two paradigms may yield valid solutions.

## References

Molot, J., Sears, M., Marshall, L. & Bray, R. (2022). Neurological susceptibility to environmental exposures: pathophysiological mechanisms in neurodegeneration and multiple chemical sensitivity. *Reviews on Environmental Health*, 37(4), 509-530. <https://doi.org/10.1515/reveh-2021-0043>



## The Need for Policies, Protocols, and Social Support

For people experiencing Multiple Chemical Sensitivity (MCS), it is not just the symptoms, it is also the stigma that is debilitating. One would expect that in modern society, everyone would be accepted, especially by medical professionals. After all, it is their responsibility to treat everyone with unconditional positive regard. Unfortunately, patients with MCS have not been treated fairly. In Canada, those suffering with MCS have had to face major obstacles in their attempt to interact with their healthcare providers (Gibson et al., 2016). It stems down to two reasons. First, the patients would have to leave their protective environment, and expose themselves to various chemicals in hospitals and clinics. Then, they have to interact with a dentist who does not acknowledge their disability. This leads to lingering dental complications for MCS patients. Similar situations have occurred in Spain. When a group of women with MCS were interviewed, they indicated a lack of treatment, and skepticism from their healthcare professionals (Briones-Vozmediano et al., 2021). MCS patients should have the right to stay away from certain chemicals even if they were used in a medical capacity. Throughout their MCS diagnosis, patients are likely to lose certain skills, their jobs, or even their friends (Alameda Cuesta et al., 2021). After losing so much, they deserve the best of medical care, and should never be stigmatized. Unfortunately, a study showed that the stigmatization by doctors could prevent people experiencing MCS from approaching any healthcare professional, which results in the invisibility of MCS. This must never happen. We must help these patients and make them feel as self-confident as possible. A team of researchers in Italy has suggested a therapeutic method of treatment (Damiani et al., 2021). They must be provided with a medical kit, and able to use oxygen therapy or hyaluronic acid therapy for non-emergency situations. Finally, research suggests employing patient support groups can boost morale, and improve self-awareness which are required to beat any stigma they may face. There is an urgent need for a general protocol that teaches all healthcare professionals the intricacies of MCS.



With new policies and social support, we can combat the stigma and inspire global awareness.

## References

- Alameda Cuesta, A., Pazos Garcíandía, Á., Oter Quintana, C., & Losa Iglesias, M. E. (2021). Fibromyalgia, Chronic Fatigue Syndrome, and Multiple Chemical Sensitivity: Illness Experiences. *Clinical nursing research*, *30*(1), 32–41. <https://doi.org/10.1177/1054773819838679>
- Briones-Vozmediano, E., & Espinar-Ruiz, E. (2021). How do women suffering from multiple chemical sensitivity experience the medical encounter? a qualitative study in Spain. *Disability and rehabilitation*, *43*(8), 1110–1120. <https://doi.org/10.1080/09638288.2019.1650297>
- Damiani, G., Alessandrini, M., Caccamo, D., Cormano, A., Guzzi, G., Mazzatenta, A., Micarelli, A., Migliore, A., Piroli, A., Bianca, M., Tapparo, O., & Pigatto, P. D. M. (2021). Italian Expert Consensus on Clinical and Therapeutic Management of Multiple Chemical Sensitivity (MCS). *International journal of environmental research and public health*, *18*(21), 11294. <https://doi.org/10.3390/ijerph182111294>
- Gibson, P. R., Lockaby, S. D., & Bryant, J. M. (2016). Experiences of persons with multiple chemical sensitivity with mental health providers. *Journal of multidisciplinary healthcare*, *9*, 163–172. <https://doi.org/10.2147/JMDH.S100688>



## Protecting Patients

Multiple chemical sensitivity (MCS) is a condition where symptoms occur from exposure to commonly encountered chemicals. Such chemicals include fragrances, pesticides, pollutants, and synthetic compounds. There needs to be increased research into the causes and mechanisms of MCS. We do know that people experiencing MCS become very sick from exposure, and thus there is no reason whatsoever to discriminate against those who are affected by the condition.

Many interviews and case studies have been conducted to understand the plight of MCS patients. Many have described their dissatisfaction with their healthcare providers and medical professionals. They have indicated that most professionals lack knowledge about MCS and fail to address all of their concerns. Worse, patients feel their healthcare providers attach psychological labels to their diagnosis. This significantly hurts their disease outcome as external stressors play an important part in the progression of MCS. Moreover, patients have a severe lack of access to resources due to chemical exposure, and an unfortunate lack of awareness. Healthcare providers rarely provide accommodation, and patients feel a lack of support. Medical professionals have continued to use only technology for diagnosis, and disregarded subjective descriptions. Unfortunately, without proper acknowledgement, diagnosis, and treatment of their condition, MCS symptoms only worsen.

This should not be the case. The United Nations Conventions on the Rights of Persons with Disabilities (UNCRPD) clearly states that no disability should go unnoticed. People experiencing MCS deserve equality and non-discriminatory behaviour. We must raise awareness and increase public knowledge of MCS and we must improve the current treatment for people with MCS in healthcare settings. We must protect the patients from bias, stigma, and exploitation. During



many interviews, patients have emphasized the importance of support groups, and close relations to overcome the difficulties of MCS. Hence, it is imperative to speak about the condition, introduce commentary, and create groups to protect people experiencing MCS.

## References

- Gibson, P. R., Kovach, S., & Lupfer, A. (2015). Unmet health care needs for persons with environmental sensitivity. *Journal of multidisciplinary healthcare, 8*, 59–66. <https://doi.org/10.2147/JMDH.S61723>
- Gibson, P. R., Lockaby, S. D., & Bryant, J. M. (2016). Experiences of persons with multiple chemical sensitivity with mental health providers. *Journal of multidisciplinary healthcare, 9*, 163–172. <https://doi.org/10.2147/JMDH.S100688>
- Imai, N., Imai, Y., Kido, Y. (2008). Psychosocial factors that aggravate the symptoms of sick house syndrome in Japan. *Nursing & health sciences, 10*(2), 101–109. <https://doi.org/10.1111/j.1442-2018.2008.00389.x>
- Lipson J. G. (2004). Multiple chemical sensitivities: stigma and social experiences. *Medical anthropology quarterly, 18*(2), 200–213. <https://doi.org/10.1525/maq.2004.18.2.200>
- Mendelson, M. B., Catano, V. M., & Kelloway, K. (2000). The role of stress and social support in Sick Building Syndrome. *Work & Stress, 14*(2), 137–155. <https://doi.org/10.1080/026783700750051658>
- Shriver, T. E., White, D. A., & Kebede, A. (2007). Power, Politics, and the Framing of Environmental Illness. *Sociological Inquiry, 68*(4), 458-475. <https://doi.org/10.1111/j.1475-682X.1998.tb00480.x>