Allergic Rhinitis and Work Productivity: Preliminary Analysis of Data from the MASK-air Application

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Introduction: Allergic rhinitis is a health condition more prevalent in developed countries that can impact the activities and quality of life of affected individuals[1]. Although its impact on work productivity is recognized[2], there is still a need for a more detailed understanding and quantification. This cross-sectional observational study investigates the relationship between allergic rhinitis and work productivity, using data from the MASK-air mobile designed for monitoring allergic rhinitis and related respiratory conditions[3]. **Objective:** To investigate the association between the severity of allergic rhinitis symptoms and the impact on work productivity. **Methods:** Data was collected through the MASK-air mobile application[4,5] that contains demographic, environmental and symptom variables on a daily basis, with users providing information on a scale of 0 to 100 each day. A sample of 1000 random observations of users from 30 countries, recorded between May 2015 and December 2023 was analysed. Participants were selected based on specifics criteria, including a minimum age of 15 or 16 (depending on the digital consent age in each country) and self-reported diagnosis of allergic rhinitis. Descriptive statistics and the Spearman correlation coefficient[6] between symptoms and impact on productivity were calculated. **Results:** The sample showed a balanced distribution between sexes, with 435 individuals identified as female (53.5%) and 378 individuals as male (46.5%). The mean age of participants was 41.41 ± 14.50 years. The data included participants from various countries; the most frequent was from Mexico with 141 participants (17.3%), followed by Lithuania with 91 participants (11.9%), and Germany with 79 participants (9.7%). Regarding comorbidities, 535
participants (65.6%) reported having conjunctivitis, and 310 participants (38.1%) reported being asthmatic. Additionally, 200 participants (20%) used immunotherapy. A strong positive correlation was observed between work impact and the severities of global allergic symptoms (ρ_s= 0.82, p < 0.0001) and nasal symptoms (ρ_s= 0.77, p <0.0001); and a moderate correlation was observed between work impact and the severities of ocular symptoms (ρ_s= 0.69, p < 0.0001) and asthma (ρ_s= 0.48, p< 0.0001). **Conclusion:** This study offers an initial understanding of how symptoms of allergic rhinitis affect work productivity. Identifying other associated factors will allow targeting health interventions and policies to improve the well-being and performance of workers affected by this condition.

Keywords: Allergic rhinitis, work productivity, mobile health

References:

1. Baiardini I, Braido F, Tarantini F, Porcu A, Bonini S, Bousquet PJ, et al. ARIA-suggested drugs for allergic rhinitis: what impact on quality of life? A GA2LEN review. Allergy. 2008 Jun;63(6):660–9. https://doi.org/10.1111/j.1398-9995.2008.01649.x
2. Bousquet J, Bewick M, Arnavielhe S, Mathieu-Dupas E, Murray R, Bedbrook A, et al. Work productivity in rhinitis using cell phones: The MASK pilot study. Allergy. 2017 Oct;72(10):1475–84. https://doi.org/10.1111/all.13177 3.Passalacqua G, Durham SR. Allergic Rhinitis and its Impact on Asthma update: Allergen immunotherapy. J Allergy Clin Immunol. 2007 Apr;119(4):881–91.
3. Sousa-Pinto B, Schünemann HJ, Sá-Sousa A, Rafael José Vieira, Amaral R, Antó JM, et al. Comparison of rhinitis treatments using MASK-air® data and considering the minimal important difference. Allergy. 2022 Jun 13;77(10): 3002–14.
4. Vieira RJ, Pham-Thi N, Anto JM, Czarlewski W, Sá-Sousa A, Amaral R, et al. Academic Productivity of Young People With Allergic Rhinitis: A MASK-air Study. J Allergy Clin Immunol Pract. 2022 Nov;10(11):3008–17.e4. https://pubmed.ncbi.nlm.nih.gov/35998876/
5. Mukaka MM. Statistics corner: A guide to appropriate use of correlation coefficient in medical research. Malawi Med J. 2012 Sep;24 (3):69–71.