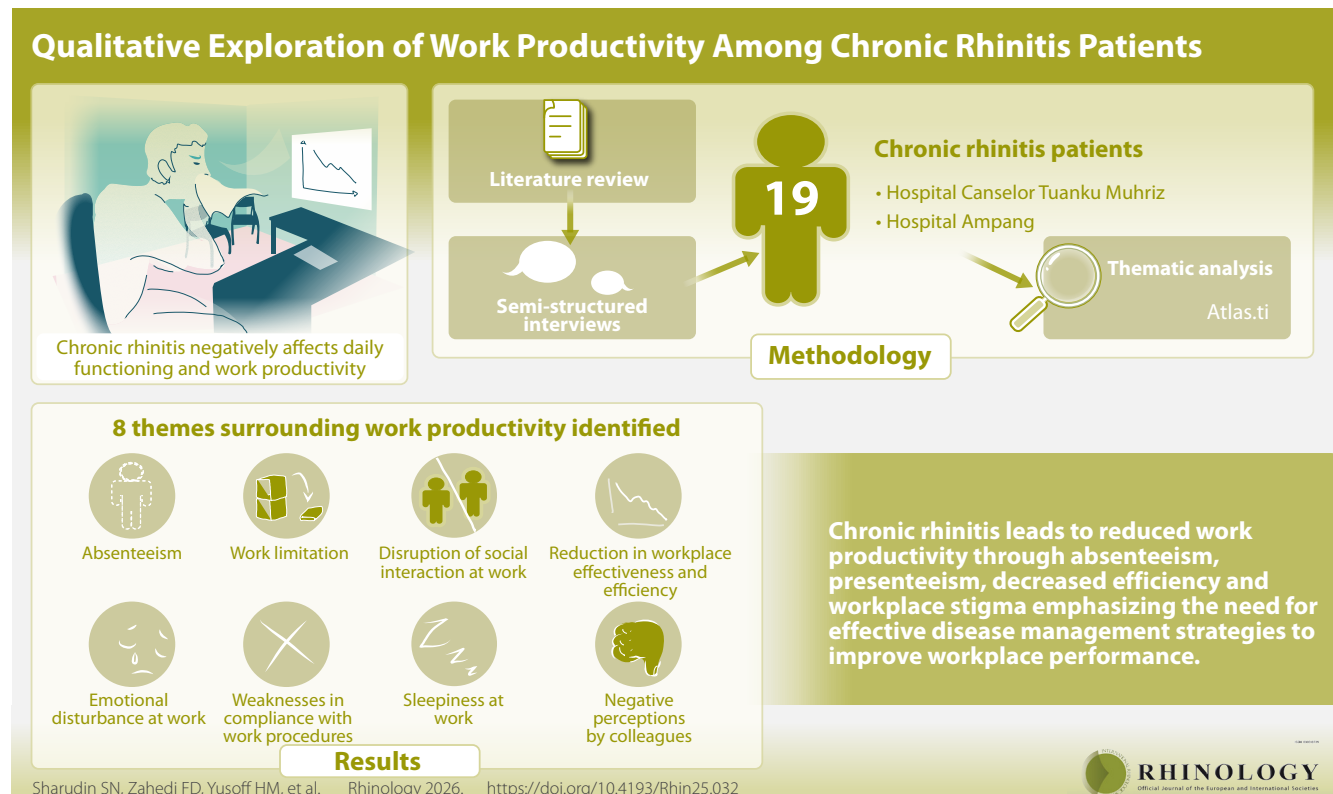


The qualitative exploration of work productivity among chronic rhinitis patients

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Abstract

Background: Chronic rhinitis is a global public health concern affecting sleep, cognitive function, mood, quality of life, and work performance. It contributes to socioeconomic costs through decreased productivity, including absenteeism and presenteeism. This study explores the impact of chronic rhinitis on work productivity and employee performance to inform better management strategies.

Method: A literature review and semi-structured interviews were conducted with 19 chronic rhinitis patients from Hospital Canselor Tuanku Muhriz and Hospital Ampang. Data saturation was reached, and thematic analysis was performed using Atlas.ti.

Result: Eight themes were identified: absence during working hours, work limitations, disruption of social interactions, reduced work efficiency, emotional disturbances, weaknesses in compliance with work procedures, sleepiness at work, and negative perceptions from colleagues.

Conclusion: Chronic rhinitis significantly affects work productivity, leading to absenteeism, reduced efficiency, and workplace stigma. These findings highlight the need for targeted management strategies to improve work performance and reduce the negative impact of chronic rhinitis on affected individuals.

Key words: absenteeism, occupational health, rhinitis, presenteeism, work productivity

Introduction

Chronic rhinitis is a common condition marked by persistent nasal inflammation, with symptoms such as congestion, rhinorrhea, sneezing, and nasal or eye itchiness. Diagnosis requires at least two symptoms lasting one hour daily over 12 weeks annually. It includes several subtypes. Allergic rhinitis (AR) occurs in sensitized individuals exposed to allergens and confirmed clinically with positive skin prick tests or allergen-specific Immunoglobulin E (IgE). Nonallergic noninfectious rhinitis (NANIR) includes drug-induced, hormonal, and occupational rhinitis, without signs of infection or allergic inflammation. Mixed rhinitis involves both allergic and non-allergic symptoms, requiring thorough evaluation ⁽¹⁾.

Studies in the United States report that up to 52% of adults and 40% of children are affected by rhinitis, making it a significant global public health issue ⁽²⁻⁶⁾. Its impact extends beyond physical discomfort, adversely affecting sleep, cognitive function, mood, and overall quality of life, thereby impairing work and school performance ⁽⁷⁻⁹⁾. Socioeconomic burdens such as absenteeism and reduced productivity account for 76–93% of the total costs associated with rhinitis, which are estimated to be 3.2 to 13.5 times higher than direct medical expenses ^(5,6,10-12). Current productivity measures often overlook issues like symptom variability and workplace triggers, limiting effective interventions. This study evaluates the impact of chronic rhinitis on employee productivity, quantifies productivity loss, and to guide better management strategies.

Materials and methods

Study design and participants

This qualitative study included a literature review and focus group discussions conducted between January and September 2022 at the Otorhinolaryngology (ORL) clinics of Hospital Ampang and Hospital Canselor Tuanku Muhriz (HCTM). Participants were working Malaysians aged ≥ 18 years, proficient in Malay, and diagnosed with chronic rhinitis. Exclusion criteria included sinonasal infections, tumours, asthma, systemic inflammatory diseases, and end-stage renal failure.

Purposive sampling in the Klang Valley used maximum variation to capture diversity in age, education, income, race and occupation. Recruitment continued until data saturation, defined as no new themes or subthemes emerging ⁽¹⁸⁾. Five focus group discussions were conducted with 19 participants (about 4-5 participants per group). Healthcare workers were overrepresented comprising 7 out of 19 participants. To minimize bias, each focus group included participants from different occupational backgrounds to ensure varied perspectives and minimize the influence of any single occupational group.

Research tool and data collection

Literature review

A systematic literature search was conducted following the PRISMA guidelines to explore the impact of chronic rhinitis on work productivity. PubMed and Scopus were searched using the terms “work productivity AND rhinitis AND work productivity

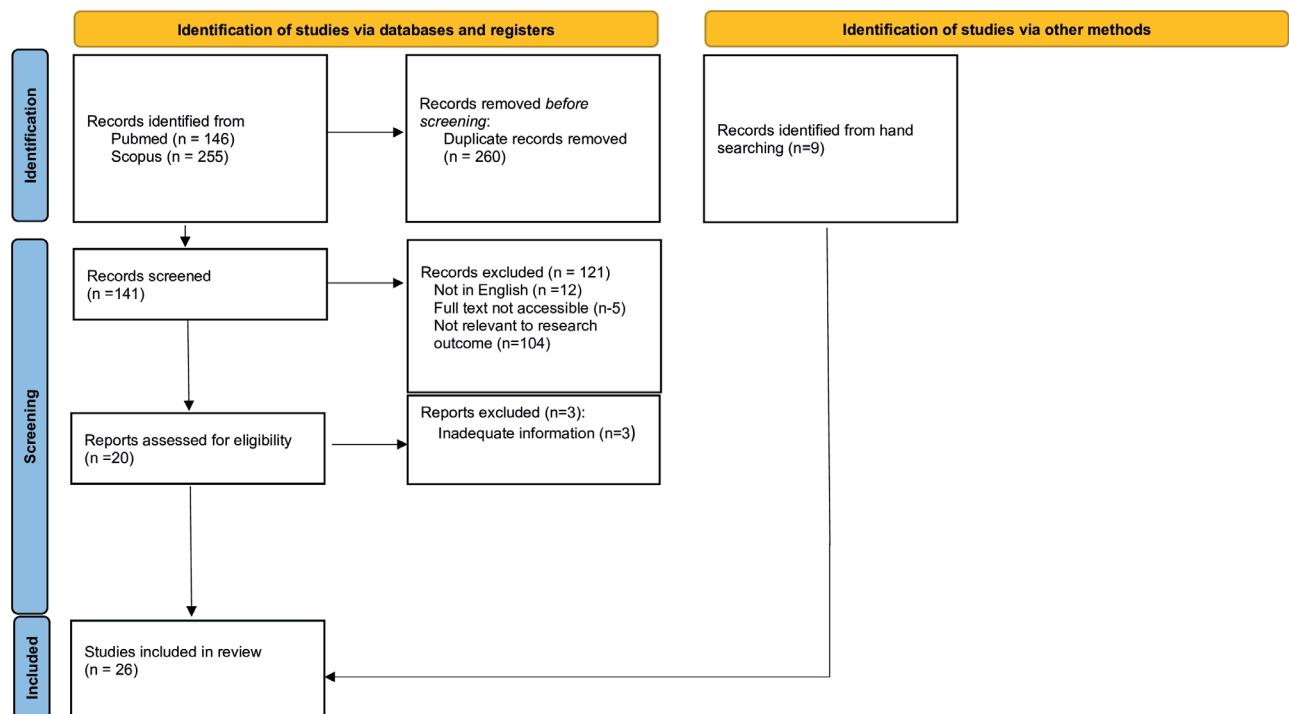


Figure 1. Systematic approach.

Table 1. The grand tour and probing questions.

No	Interview topic	Grand Tour Questions	Probing Questions
1	Understanding Chronic Rhinitis	1. How would you describe your experience with chronic rhinitis? 2. What triggers your symptoms at work?	How do your symptoms affect your daily life? Are there specific environment, activities or time worsening your condition?
2	Impact on Work productivity	1. Can you discuss how chronic rhinitis affects your work productivity 2. What specific tasks or activities do you find most challenging when your symptoms are active 3. Have you had to make any adjustment or changes at work due to your condition?	Do you experience missed workdays? If so, how often Do you experience working while unwell? What does this manifest in your work Are there particular times of day when your symptoms are more disruptive For example, changes in your work environment, working hours or job responsibilities
3	Support and management	1. What strategies or coping mechanisms do you use to manage your symptoms while at work? 2. How supportive is your workplace in accommodating your needs related to chronic rhinitis 3. What additional support or resources do you think would help improve your work productivity	For examples; Medication, breaks, changes in workload Are there specific accommodations that have helped you Are there any tools, policies or programmes you wish

and activity impairment”, limited to original studies with English abstracts published between January 2005 and 2020. PubMed identified 146 articles and Scopus 255 articles. After removing duplicates (totalling 260 articles), 141 studies remained for further screening with 17 relevant studies met the inclusion criteria. Hand searching added 9 articles resulting in 26 studies included in the final analysis examining the relationship between chronic rhinitis and work productivity (Figure 1).

Focus group discussions

Semi-structured interviews followed an interview guide with open-ended questions on 1) understanding of chronic rhinitis, 2) its impact on work productivity, and 3) support and management strategies (Table 1). Questions were piloted and refined to encourage in-depth discussion.

Participants completed a sociodemographic pro forma before the interview, which were conducted in Malay, audio-recorded and lasted approximately 120 minutes. The researcher used grand tour and probing questions, with neutral prompts to maintain a non-biased approach. Observational notes, non-verbal cues, and general impressions were documented in memos for reflective analysis.

Sessions involving three to five participants were transcribed verbatim and analysed using Atlas. Ti software with data collection and analysis conducted concurrently until data saturation was reached.

Results

Literature review

The literature review identified 26 relevant papers, with 11

using validated questionnaires (Table 2). Overall, AR consistently reduces work productivity. Absenteeism is generally low, whereas presenteeism is much more prevalent, causing 30-70% impairment while working. Across studies, 20-30% of patients report missing work and reduced concentration. Both validated and non-validated scales demonstrate a similar overall pattern, namely that AR is mainly affecting productivity through presenteeism, leading to a significant workplace and economic burden. Virchow et al. reported that AR patients with both nasal and ocular symptoms experienced greater work impairment than those with nasal symptoms alone. In Spain, these patients had 2.98% absenteeism, 11.73% presenteeism, and 11.65% total work impairment with higher activity impairment (7.09%) (20). In occupational AR, absenteeism averaged 9.98%, while presenteeism was higher, with mean work impairment of 46.7% and total work impairment of 48.88%. Older workers had more absenteeism, while severe nasal obstruction correlated with greater activity impairment. Women and those with severe symptoms reported higher productivity loss, with poorer quality of life and increased absenteeism and presenteeism (21). Okubo et al. reported that seasonal AR significantly impaired daily functioning, with activity limitation around 40% and work productivity loss of 37-39% (22). Patients receiving placebo experienced worsening work impairment whereas fexofenadine-treated patients showed improved work productivity and job performance (22). Overall, chronic rhinitis increases absenteeism and presenteeism, causing loss of work time and reduced productivity. Validated tools like the WPAI-AS are commonly used to measure these effects.

Table 2. Summary of literature review.

No	Literature	Work time missed (absenteeism)	Impairment at work productivity (presenteeism)	Questionnaire instrument
1	Collins et al. 2005 ⁽¹⁵⁾	Mean (95% CI) missed work time 0.9h (0.7-1.1) in the last 4 weeks	Mean (95% CI) work impairment 18.2h (17.5-18.8)	SPS
2	Okubo et al. 2005 ⁽²²⁾	NA	Baseline impairment while working: 39.1% (fexofenadine) and 36.6% (placebo)	RQLQ, WPAI:AS
3	Kakutani et al. 2005 ⁽⁷⁾	Percentage workday missed 10.2%	Percentage work impairment 69%	Mini RQLQ, Medical outcome study short form -36, WPAI: general
4	Lamb et al. 2006 ⁽²³⁾	Average missed work time: 3.6 day	Unproductive work due to AR: 2.3 hour/ day	WPSI
5	Stull et al. 2007 ⁽⁹⁾	Mean (SD) % missed from work 6.8 (14,6)	Mean (SD) % work impairment: 40.	WPAI:AS
6	Szeinbach et al. 2007 ⁽⁵⁾	Average missed work time: 1h/wk (range 0-32h) estimate 5.5day	NA	10 Point scale: non validated
7	Valovirta et al. 2008 ⁽²⁴⁾	taking time off work in the past year due to AR: 26%	Work affected (unable to concentrate): average 49%	Non validated
8	Meltzer et al. 2009 ⁽²⁵⁾	Mean (SD) entire workdays missed due to AR: 0.4 past 4 weeks (estimated 4.4 days) and 0.2 for non-AR (estimate 2.2 days)	NA	Non validated
9	Van Cauwenberge et al. 2009 ⁽¹⁷⁾	Absence from work, late arrival or early departure: 27%, average 6h work missed per symptomatic week	Moderate or considerable effect of AR on concentration: 31%	Non validated
10	Bousquet et al. 2009 ⁽²⁶⁾	NA	Percentage of missed productivity: 30%	WPAI: AS, RQLQ
11	Neffen et al. 2010 ⁽²⁷⁾	Missed work because of AR (past 12 month): 20%	Interference with work performance: 33%; 30%-point decrease in work productivity related to AR	Non validated
12	Katellaris et al. 2011 ⁽²⁸⁾	Missed work because of AR (past 12 month): 25%	Interference with work performance: 50%; 25% decrease in work productivity related AR	Non validated
13	Virchow et al. 2011 ⁽²⁰⁾	Percentage work time missed 2.46%	Percentage impairment while working 11.73%	WPAI:AS, mini RQLQ, Pittsburgh sleep quality index (PSQI)
14	Demoly et al. 2011 ⁽⁶⁾	Sick leave at the time of physician visit; 5.1% for an average of 4.5 days	NA	Non validated
15	Bhattacharyya et al. 2012 ⁽²⁹⁾	Mean (SE) incremental workdays lost/day: 0.6 (0.4) vs non-AR participants	Proportion SE of participants with work limitation: 13.9 (1.0) % vs 10.4 (0.3) in non-AR participants: Adjusted OR: 1.43 (95% CI): 1.2-1.7)	Non validated
16	Keith et al. 2012 ⁽³⁰⁾	NA	reduced productivity during the allergy season: 2% very troublesome .8% moderately troublesome	Not validated 3-point scale
17	Meltzer et al. 2012 ⁽³¹⁾	Missed work because of AR during the past 12 month: 30%	Interference with work performance: 42%, 23%-point decrease	Non validated
18	De la Hoz et al. 2012 ⁽³²⁾	Adjusted mean: 4.6 (1.1%)	Adjusted mean: 23.5 (1.6) %	WPAI- GENERIC
19	Bielory et al. 2014 ⁽³³⁾	Missed work because of AR :3%	Reduce productivity by 26% points (from 91 to 64) when allergy sx at their worst vs no Sx	Non validated 100 – point scale
20	Jantunen et al. 2014 ⁽³⁴⁾	Mean (SD) missed work time L 0.8 (5.1) days	Means (SD) % reduction in work productivity: 15.2 (14.5) % when Sx	Non validated 100 – point scale
21	Price et al. 2015 ⁽¹⁶⁾	Mean (SD) missed work time: 4.1 (16.4) days in moderate/severe AR vs 2.5 (7.7) days in mild AR	Decrease work performance >50% in 32.8% of mild/moderate AR vs 12.2% of mild AR	Categorical scale of impairment from 10% to 100%
22	Yoo et al. 2016 ⁽¹⁴⁾		Percentage of work productivity loss 32.6%, SD 30.05	WPAI: AS

Table 2 continued. Summary of literature review.

No	Literature	Work time missed (absenteeism)	Impairment at work productivity (presenteeism)	Questionnaire instrument
23	Colas et al. 2017 ⁽¹²⁾	Mean (SD) % missed work time: 0.8 (1.6)	Mean (SD) % work impairment :8.9 (11.7)	WPAI-AS
24	Romano et al. 2019 ⁽³⁵⁾	Average work time missed (absenteeism) over the past 7 days: 12.0%	Percentage of presenteeism 46.9%	WPAI
25	Avdeeva et al. 2020 ⁽³⁶⁾	Absenteeism increases fourfold with average cost 1329-euro per patient per year	Presenteeism increase eightfold with average cost 2390-euro per patient per year	iMTA Medical Consumption Questionnaire, iMTA Productivity Cost Questionnaire
26	Siddiqui et al. 2020 ⁽³⁷⁾	percentage missed work :4.3%	Percentage impairment during working hours: 35.9%	WPAI:AS, SFAR

Table 3. Demographics of respondents.

Respondent	Age	Gender	Diagnosis	Occupation
F01	38	Male	Allergic rhinitis	Dispatcher
F02	36	Male	Allergic rhinitis	Administrator
F03	36	Male	Allergic rhinitis	Doctor
F04	42	Female	Allergic rhinitis	Nurse
F05	30	Female	Allergic rhinitis	Doctor
F06	33	Male	Allergic rhinitis	Doctor
F07	32	Female	Allergic rhinitis	Doctor
F08	34	Male	Allergic rhinitis	Doctor
F09	43	Female	Allergic rhinitis	Nurse
F10	28	Female	Non allergic rhinitis	Receptionist
F11	40	Female	Allergic rhinitis	Paint seller
F12	35	Female	Non allergic rhinitis	Teacher
F13	42	Female	Allergic rhinitis	Teacher
F14	35	Female	Allergic rhinitis	Laboratory assistant
F15	37	Female	Allergic rhinitis	Laboratory assistant
F16	43	Female	Non allergic rhinitis	Research assistant
F17	26	Male	Non allergic rhinitis	Management coordinator
F18	40	Female	Allergic rhinitis	Clerk
F19	45	Male	Allergic rhinitis	Contractor

Focus group discussion

Nineteen patients from two hospitals participated in focus group discussions, including six males and thirteen females aged 20–45 years, with a mean age of 36.5 (Table 3). Five sessions were conducted to reach data saturation. Semi-structured in-depth interviews and literature reviews identified eight domains with a total of 43 items, including Absence During Working Hours, Work Limitation, Disruption of Social Interaction at Work, Reduction in Work Effectiveness and Efficiency, Emotional Disturbance at Work, Weaknesses in Compliance with Work Procedures, Sleepiness at Work, and Negative Perception by Colleagues (Table 4).

1. Absence during working hours

This domain includes various forms of absenteeism, including the use of annual leave during illness, medical leave, late arrivals, early departures, and the need for medical follow-up. These factors collectively reduce workplace efficiency and employee performance.

One respondent reported using annual leave due to frequent nasal congestion and sleep disturbance. Another took medical leave due to dizziness and watery eyes from persistent runny nose. A third respondent left work early due medication-induced drowsiness that impaired concentration.

'If there are like four days in a row I can't sleep because my nose is

Table 4. Summary of domain and items.

Domain	Item
Absence during working hours	1. I often take annual leave due to symptoms of rhinitis 2. I often take sick leave due to symptoms of rhinitis 3. I often arrive late to work due to symptoms of rhinitis 4. I often leave work early due to symptoms of rhinitis 5. I often take leave due to follow-up treatment of rhinitis
Work limitation	1. I avoid performing tasks due to symptoms of rhinitis 2. I avoid tasks that trigger symptoms of rhinitis 3. I need to limit the quantity of work due to symptoms of rhinitis 4. I need to limit the duration of work due to symptoms of rhinitis 5. I need to limit the type of work due to symptoms of rhinitis
Disruption of social interaction at work	1. I avoid interacting with colleagues due to symptoms of rhinitis 2. My colleagues exclude me due to symptoms of rhinitis 3. I experience difficulty communicating at work due to symptoms of rhinitis
Reduction in work effectiveness and efficiency	1. My work quality decreases due to symptoms of rhinitis 2. I am unable to complete tasks within the specified time due to symptoms of rhinitis 3. I am unable to focus on tasks due to symptoms of rhinitis 4. I need to take longer breaks while working due to symptoms of rhinitis 5. I find it difficult to work continuously due to symptoms of rhinitis 6. My work performance is lower than what I expect 7. I need to stop working to take medication for rhinitis
Emotional disturbance at work	1. I feel uncomfortable while working due to symptoms of rhinitis 2. I feel easily irritated while working due to symptoms of rhinitis 3. I feel less motivated while working due to symptoms of rhinitis 4. I feel stressed at work due to symptoms of rhinitis 5. I feel anxious at work due to symptoms of rhinitis 6. I feel disappointed at work due to symptoms of rhinitis 7. I project a negative image while working due to symptoms of rhinitis 8. I feel embarrassed by the symptoms of rhinitis I experience at work
Weaknesses in compliance with work procedures	1. I have difficulty using personal protective equipment at work due to symptoms of rhinitis 2. I violate standard operating procedures at work due to symptoms of rhinitis 3. I find it difficult to adhere to the established work schedule due to symptoms of rhinitis 4. I need to leave the workspace without permission to relieve symptoms of rhinitis 5. I need to remove personal protective equipment from time to time to relieve symptoms of rhinitis
Sleepiness at work	1. I feel drowsy while performing tasks due to symptoms of rhinitis 2. My level of intelligence decreases while working due to symptoms of rhinitis. 3. I need to take short naps during work hours due to symptoms of rhinitis 4. I fall asleep while performing tasks due to symptoms of rhinitis 5. I feel drowsy while performing tasks due to taking medication for rhinitis 6. I need to take short naps while on duty due to taking medication for rhinitis 7. I fall asleep while on duty due to taking medication for rhinitis

Table 4 continued. Summary of domain and items.

Domain	Item
Negative perception by colleagues	1. My colleagues blame me as if I am careless about taking care of myself, leading to experiencing symptoms of rhinitis 2. I am blamed for my low work productivity due to symptoms of rhinitis 3. My colleagues look down on me because of poor work performance due to symptoms of rhinitis

blocked or I wake up frequently to blow my nose, I will take annual leave' [Respondent F01]

'When the runny nose gets too bad, we must blow more frequent. Then it starts to feel dizzy and my eyes start to become watery. I need to take medical leave' [Respondent F03]

'I used to go back early to rest because at that time I couldn't focus on work. I took flu medicine, and I became sleepy. So, I went back and rested' [Respondent F05]

2. Work limitation

The second domain, 'work limitation,' refer to ways rhinitis symptoms impair work performance. These include avoiding tasks due to symptoms, such as postponing patient appointments. One respondent reported avoiding tasks that trigger symptoms, such as working in dusty laboratories, which restricts the type of work performed. Several respondents also reported reducing workload and work duration due to persistent rhinitis symptoms. Collectively, these findings illustrate how rhinitis directly limits work performance.

'If I have an appointment to see a patient for the first time, I will postpone the appointment because I have rhinitis at that time' [Respondent F06]

'Certain time, I told my employer that if I do this, my nose will not be comfortable' [Respondent F11]

'Sometimes I avoid doing any work that can make my nose sneeze, I will avoid it and give it to others' [Respondent F14]

3. Disruption of social interaction at work

The third domain, 'disruption of social interaction at work,' highlights how rhinitis affects workplace relationships. Symptoms such as runny or blocked nose can make conversations difficult and reduce concentration during interactions. Some respondents reported avoiding colleagues because persistent nasal discharge interfered with communication. Others felt excluded by colleagues who reacted negatively to their symptoms. For example, one respondent avoided meeting new people, fearing of being mistaken for having Coronavirus Disease 2019 (COVID-19). Another was asked to leave by a colleague due to rhinitis symptoms during the COVID-19 pandemic. One respondent shared that friends tend to distance themselves when nasal discharge becomes noticeable.

'If it was the first time I met that person, I would avoid them because they might suspect I was infected with Covid' [Respondent F15]

'It used to be okay, now it's Covid, if he sees me, he will tell me to go back' [Respondent F12]

'One more thing, if we have a lot of snot, friends will run away' [Respondent F01]

4. Reduction of work effectiveness and efficiency

Rhinitis symptoms significantly impair work performance and efficiency. Respondents reported difficulties concentrating and completing tasks due to persistent nasal discharge, sneezing, and headaches from nasal congestion. Some described needing tissues during work, which hindered interaction with patients, while others reported delays in tasks, such as COVID testing, due to sneezing and difficulty focusing on small details. Extended breaks were often required to relieve symptoms or manage medication side effects, further reducing productivity. A teacher reported modifying teaching methods, providing written materials instead of verbal explanations to cope with headaches. These findings highlight the substantial impact of rhinitis symptoms on work effectiveness and task completion.

'So I will stuff a tissue in my nose and then use a face mask. He will affect me to talk to the patient because I cannot focus because there is tissue in the nose' (Respondent F03)

'Aaa, the work will get slower, while it can be finished in 1 hour, it will be 1 hour 30 minutes' (Respondent F19)

'If my nose is very itchy, I will stop working for a while sometimes I will take a long break. If the lunch break is from 1 o'clock to 2 o'clock, I will extend it until 3 o'clock' (Respondent F14)

'If we continue working, we cannot either. After taking medicine, our runny nose did not go away immediately, so I had to stop working first and rest for a while' (Respondent 12)

'It is annoying because I am busy sneezing. Sometimes I fear I will develop headaches due to frequent sneezing. I do not see what I will label and test, right? Especially for COVID test. The tape is small. It makes difficult to work' (Respondent F15)

'One, we change our teaching method because we can't talk because of headaches. The information did not reach the students. We only give in writing. Explanation due another day' (Respondent F13)

5. Emotional disturbances at work

The fifth domain, 'emotional disturbance at work,' highlights the psychological effects of rhinitis on work life. Symptoms such as runny nose and sneezing often cause discomfort and irritation. One respondent reported using hot oil instead of cold medicine, fearing drowsiness, but still feeling frustrated when runny nose affected communication. Another described anger when required to work despite continuous nasal discharge, as it affected their performance. Respondents expressed embarrassment over constantly carrying tissues and concerns about projecting a negative image at work due to their symptoms.

'Runny nose, but it does not stop. I force myself to work and I cannot do well, I will start to get angry' (Respondent F10)

'If I have runny nose, I will use hot oil because I fear of falling asleep if I take cold medicine. I feel like getting angry because I cannot say what I want to say because of the runny nose' (Respondent F12)

'He is difficult when you have to look at the patient sitting in front of you. If you bow down, you will get quite severe rhinorrhoea, so the water will always flow. I will feel irritated, very irritated' (Respondent F05)

6. Weaknesses in compliance with work procedures

Rhinitis symptoms create challenges in adhering to workplace protocols, particularly in the use of personal protective equipment (PPE) and standard operating procedures. Participants reported nasal irritation from masks, leading to temporary removal of PPE and workflow disruption. Frequent sneezing triggered by mask discomfort also required unscheduled breaks. Some respondents described difficulties complying with restricted movement policies, such as leaving workspaces during designated hours due to uncontrollable symptoms. These findings highlight how rhinitis can affect adherence to workplace requirements, impacting productivity and procedural compliance.

'I wear a mask during work, my nose will itch causing me to take off the mask for a while. It interfered with our work' (Respondent F05)

'This mask makes me sneeze a lot because it's hairy. Very disturbing. I do not properly wear my mask at work' (Respondent F03)

'My work is in the laboratory; I cannot go out from 11 am to 2 pm but I have to go out because I cannot stand sneezing so many times' (Respondent F13)

7. Sleepiness at work

From semi-structured interviews, the domain of 'sleepiness at work' was identified among individuals with rhinitis. This includes drowsiness during tasks due to rhinitis symptoms. One respondent reported insufficient sleep from nocturnal nasal symptoms, leading to daytime drowsiness. Another described reduced cognitive function, sharing those frequent awakenings

to blow their nose at night caused them to fall asleep while driving, resulting in two accidents. Drowsiness may be triggered by medications used to treat rhinitis, particularly antihistamines, which further reduce alertness and productivity. One respondent reported taking medication in the afternoon to relieve severe nasal blockage but later falling asleep while driving, only waking up to the sound of a car horn.

'If I didn't sleep enough that day due to a nose problem, the next day it was confirmed that I would be sleepy' (Respondent F10)

'When I cannot sleep well at night because I often wake up because I have to blow my nose, I fall asleep while driving the car and I've been in an accident twice because of this' (Respondent F03)

'It was an afternoon teaching session, my block was very bad, so I took medicine at 4pm. While driving I fell asleep, then I heard a car horn, I opened my eyes, there was no car in front of me' (Respondent F13)

8. Negative perception by colleagues

Employees with rhinitis often face judgment and misunderstanding from colleagues, leading to workplace stigma. Negative perceptions include being blamed for poor health management, reduced productivity, and diminished performance. Some respondents reported being questioned about their inability to control symptoms, such as not taking vitamins, while others encountered colleagues who dismissed rhinitis as a minor issue, equating it to a common cold. Avoiding tasks that trigger symptoms led to dissatisfaction among colleagues. One male respondent hesitated to disclose the severity of his condition in a predominantly female workplace, fearing it would make him appear weak. These findings highlight the emotional burden of rhinitis and lack of awareness about its impact on job performance.

'When our nose often has problems, even friends will ask 'why don't you take care to eat, why don't you take vitamins' (Respondent F03)

'If my colleague, he just thinks, 'Hey, it's just a nose problem, like a cold, why don't you come to work' He doesn't understand, we're very uncomfortable. Not just the nose but the eyes too' (Respondent F13)

'When I am busy avoiding work that can trigger my nose problem, my friends are not happy' (Respondent F14)

'I told them I had Allergic Rhinitis, because they were always asked why my eyes were red like I didn't sleep enough. But I didn't explain how bad my problem was. At my workplace all the workers are female, and I am the only male. He will look weak if I tell'. (Respondent F03)

Discussion

Chronic rhinitis is a prevalent condition that significantly affects daily function and workplace productivity. Symptoms such as

nasal congestion, sneezing, and itchy eyes impair work performance and highlight the need for targeted assessment tools. Although several questionnaires measure productivity loss, many do not capture the specific challenges faced by these patients. This study provides a broader perspective by identifying specific domains reflecting the multifaceted workplace impact of this condition.

Limitations of existing tools

The literature review identified gaps in existing tools assessing rhinitis-related productivity loss. These tools do not explore the underlying drivers of productivity loss, including specific rhinitis symptoms and workplace triggers. Domains like social interaction, emotional disturbances, and procedural compliance are underexplored, limiting their ability to guide targeted workplace interventions.

Contribution of the current study

This study expands existing research by examining broader and more specific impacts of chronic rhinitis on work productivity. Beyond absenteeism and presenteeism, eight key domains were identified including disruption of social interactions, emotional disturbances, difficulties in adhering to workplace protocols, sleepiness, and negative perceptions from colleagues. By incorporating these additional domains, this study offers a more tailored understanding of workplace burden of chronic rhinitis.

Key findings and implications

Our findings identified 43 items across eight domains, capturing the diverse impacts of rhinitis symptoms on workplace performance. Absenteeism was linked to persistent nasal congestion, interrupted sleep, or medication-related drowsiness. Work limitations included avoiding symptoms-triggering tasks or modifying workflows. Social interactions were affected by embarrassment and stigma while emotional disturbances including frustration and irritability were frequently reported. Participants also reported difficulties adhering to workplace protocols and experiencing daytime sleepiness caused by nighttime symptoms and medication effects. These findings highlight the complex impact of rhinitis and the need for workplace accommodations, improved symptom control, and greater awareness to reduce productivity loss and support affected employees.

Limitations

This study has several limitations. Organizing focus group discussions was challenging because each session lasted 2-3 hours, required time commitment from working participants. Diversity within groups may also have influenced interpretation and depth of the responses. The study was conducted in an Asian setting, finding may not be fully generalized to other cultural or

healthcare contexts.

Conclusion

This study provides a detailed understanding of how chronic rhinitis affects workplace productivity and social interactions. By identifying previously overlooked domains, it supports the development of more effective workplace strategies for affected individuals. Future research should focus on validating these findings and implementing targeted interventions to reduce the burden of chronic rhinitis on both employees and employers.

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Author contributions

All authors have made significant contributions to the research and preparation of this manuscript.

SNS: Reviewed the literature, conducted data collection, performed data analysis, draft and edited the manuscript.

FDZ: Conceptualized and designed the study, supervised data collection, participated in manuscript editing, critical revisions and contributed to the final review of the manuscript. HMY: Provided expert input on methodology, assisted in data analysis, interpretation of results, provided feedback on the manuscript and ensured compliance with ethical standards. SH, AKWH, RH: Provided expert input on methodology and contributed to the final review of the manuscript. All authors have reviewed and approved the final manuscript and take responsibility for the accuracy and integrity of the work.

Conflict of interest

The authors declare no conflict of interest related to this study.

Ethical approval and consent to participate

This study was reviewed and approved by the Institutional Review Board (IRB) of Research Ethic Committee, The National University of Malaysia (IRB approval number: UKM PPI/111/8/JEP-2022-074). All procedures performed in this study involving human participants were conducted in accordance with ethical standards of national research committee. Informed consent was obtained from all individual participants included in the study prior to data collection.

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