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Prevalence of Respiratory Symptoms and Associated Risk Factors among Street Food Vendors in Klang Valley, Malaysia

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KEYWORDS

Prevalence

Respiratory Symptoms

Street Vendors

Working Hours

ABSTRACT

The street vendors in Malaysia are at an increased risk of developing respiratory symptoms owing to the continuous exposure to road dust, vehicle emissions, extreme weather conditions, and air pollutants from industrial sites. Hence, the current study aimed to establish the prevalence of respiratory symptoms and the risk factors associated with it among street food vendors in Klang Valley, Malaysia through a cross-sectional study among 237 street food vendors. The socio-demographic data, work characteristics, and information on respiratory symptoms were collected using a self-administered questionnaire. The data analysis was done by using the Chi-square test of association and frequency distribution. The study results revealed that the most frequently reported respiratory symptoms among the street food vendors were sore throat (30.8%), followed by cough (29.1%). No significant association was found between age, gender, duration of job and cough, sputum production, breathing difficulty, chest pain, irritated nose, and sore throat. A statistically significant association was found between working hours and sputum production ($p=0.014$). Further, the working hours were significantly associated with breathing difficulty ($p=0.011$). A significant association was also found between the type of cooking fuel used and the presence of cough ($p=0.001$). Results of this study demonstrated a positive association between work-related risk factors such as working hours with breathlessness and sputum production, and also between cough and the type of cooking fuel used. Based on the aforementioned findings, various control measures such as regular monitoring of lung functions and health education programs can be undertaken. Moreover, vendors need to consider using clean fuels instead of charcoal.

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1 Introduction

Air pollution has emerged as one of the biggest threats that humankind is combating in the twenty-first century (Usmani et al. 2020). As per World Health Organization, 11.6% of all global deaths (translated to 6.5 million deaths) occurred due to 92% of the population breathing in dirty air (WHO 2016). The association between various health-related variables such as mortality rate, reduced lung function, hospital admissions, and traffic-related air pollution, have been well established through various epidemiological studies (Prabhu et al. 2019; Sepadi and Nkosi 2022). Similar to the global scenario, air pollution has also become a prominent environmental challenge in Malaysia as well (Othman and Latif 2021). Industrialization, haze episodes, and the increasing trend of using private transportation have all significantly contributed to the same (Usmani et al. 2020). Klang Valley being an important economic hub in Malaysia has a noticeably deteriorated air quality owing to the fast-paced urbanization, infrastructure development, and industrialization among other factors (Rahman et al. 2015). This region sees varied factors contributing to the increase in air pollutants from commercial, and industrial to motor vehicles and transboundary haze. In 2009, respiratory diseases were among the 10 principal causes of mortality in Malaysia (Rahman et al. 2015). The air pollution in Klang valley significantly contributed to this spike in data vis-a-vis respiratory disease.

Street food vending is a popular business activity in Malaysian cities and to garner more foot traffic, the vendors are usually situated along major roads in thriving urban environs. Although this may lead to an increase in business, it also causes a proportional increase in exposure to traffic emissions which are a known risk to respiratory health (Jones et al. 2008). The roadside vendors in Malaysia are a high-risk population for developing respiratory symptoms due to continuous exposure to the traffic pollutants as well as the particulate matter arising from the use of fossil fuels during cooking. The common respiratory symptoms reported include cough, sputum production, irritated nose, sore throat, and upper & lower respiratory tract symptoms (Kongtip et al. 2008).

A similar study conducted in Bangkok has also concluded that roadside street vendors were at higher risk for developing respiratory and other adverse health-related symptoms (Kongtip et al. 2008). In another survey conducted among street vendors in Bangkok, vehicular emissions were attributed as the major cause of respiratory symptoms (Noomnuai and Shendell 2017). Further studies have also been conducted which support the above findings. For instance, in Serdang, Malaysia, respiratory symptoms, lung function, and their association with traffic-related exposures were studied among the roadside vendors. The study concluded that roadside vendors had impaired lung function, and were at increased risk for developing respiratory symptoms owing

to excessive exposure to the traffic-related pollutants (Amaran et al. 2016).

The literature focusing on the association between respiratory health of street food vendors and air pollution exposures in Malaysia is sparse (Amaran et al. 2016). Therefore, it is prudent to conduct further studies in Malaysia regarding the prevalence and associated risk factors of respiratory symptoms among street food vendors. This will help to close the existing gap of knowledge in the literature and help to provide practical suggestions to the policymakers to safeguard the health of this vulnerable population. This will also help to generate public awareness and enable the street food vendors to understand the threats posed by air pollution and steps to take to minimize the exposure from the same. Hence, the current study primarily aimed to establish the prevalence of respiratory symptoms and associated risk factors among street food vendors in Klang Valley, Malaysia.

2 Material and Methods

The research design utilized in the current study was cross-sectional via the purposive sampling method. The inclusion criteria were healthy street food vendors with age ranges between 20 - 50 years old. Cigarette and tobacco users (past and/or present users); people with a history of any cardiopulmonary conditions, abdominal or thoracic surgeries; passive smokers and/or pet owners were excluded from the scope of this study. Sample size estimation was done using the Raosoft sample size calculator. With a 90% confidence interval; 5% margin of error and 50% response distribution, the sample size calculated was 267.

The data was collected via a self-administered validated questionnaire in the English language, which included questions regarding general demographic data (age, gender), working details (working years, daily working duration in hours), type of cooking fuel used and respiratory symptoms (shortness of breath, wheezing, cough, chest pain, sputum production, nose irritating, sneezing, sore throat). The questionnaire was validated before data collection by three experts in this field. The data was collected between January 2021 and March 2021. The questionnaires were given out physically where street food vendors displayed their stalls or via online platforms. All participants were explained regarding the purpose and procedure of the study, and written informed consent was taken before data collection. This study was approved by the Research and Ethics Committee of INTI International University [INTI-IU/FHLS-RC/BPHTI/7NY12020/004]. IBM SPSS Statistics Version 21 was used for data analysis. The descriptive data such as general and work characteristics as well as the respiratory symptoms were presented by frequency and percentages. The association between the various risk factors and respiratory health symptoms has been determined using the Chi-Square test of association, with the significance level taken as $p < 0.05$.

3 Results

3.1 Respondent characteristics

A total of 300 questionnaires were distributed among street food vendors in Klang Valley. Out of this, 237 met the inclusion criteria and were analyzed in this study. As shown in Table 1, most of the street food vendors were male (59.1%) and were primarily working in the street for 6 to 10 years (40.1%). Most of them were aged around 30 to 39 years old (43.9%), and mostly worked for 5 to 8 hours a day (62.4%). The majority of them used liquefied petroleum gas (LPG) (88.2%) to cook the food.

Table 1 General and Work Characteristics of Street Food Vendors in Klang Valley, Malaysia

Respondent Characteristics	Frequency (%) (n=237)	
Age	20 to 29 years old	52 (21.9)
	30 to 39 years old	104 (43.9)
	40 to 49 years old	81 (34.2)
	50 years old	0 (0)
Gender	Male	140 (59.1)
	Female	97 (40.9)
Duration of job (years)	0 to 5 years	87 (36.7)
	6 to 10 years	95 (40.1)
	11 to 15 years	38 (16.0)
	> 15 years	17 (7.2)
Working hours	< 5 hours	50 (21.1)
	5 to 8 hours	148 (62.4)
	> 8 hours	39 (16.5)
Type of cooking fuel	Charcoal	28 (11.8)
	LPG	209 (88.2)

3.2 Respiratory symptoms

Table 2 represents the prevalence of respiratory symptoms among street food vendors in Klang Valley, Malaysia. The most frequently reported respiratory symptoms among the street food vendors were sore throat (30.8%), followed by cough (29.1%), irritated nose (27.4%), breathlessness (7.2%), sputum production (5.1%), and least was chest pain (1.7%). Further, the case of wheezing was not reported among the selected street food vendor.

3.3 Associated risk factors

3.3.1 Age

No significant association was found between age and cough ($p=0.282$), sputum production ($p=0.387$), breathing difficulty ($p=0.744$), chest pain ($p=0.724$), irritated nose ($p=0.580$) and sore throat ($p=0.737$), as shown in Table 3.

3.3.2 Gender

No significant association was found between gender and cough ($p=0.609$), sputum production ($p=0.616$), breathing difficulty

Table 2 Prevalence of Respiratory Symptoms among Street Food Vendors in Klang Valley, Malaysia

Respiratory Symptoms	Frequency (%)	
Cough	Presence of cough	
	Yes	69 (29.1)
	No	168 (70.9)
	Duration of cough	
	< 1 month	1 (4)
	1 to 3 months	6 (2.5)
	4 to 6 months	15 (6.3)
	7 months to 1 year	19 (8.0)
	> 1 year	27 (11.4)
Occurrence	Before working	6 (2.5)
	After working	63 (26.6)
Sputum production	Yes	12 (5.1)
	No	57 (24.1)
Breathing difficulty	Presence of SOB*	
	Yes	17 (7.2)
	No	220 (92.8)
	Aggravating factor	
	At rest	0 (0)
	With activity	17 (7.2)
	Severity	
	I did not do the activity today	0 (0)
	Not at all	0 (0)
	Slightly	12 (5.1)
	Moderately	5 (2.1)
	Severely	0 (0)
	So severe I did not do the activity today	0 (0)
Wheezing	Presence of chest sound	
	Yes	0 (0)
	No	237 (100)
Chest pain	Presence of chest pain	
	Yes	4 (1.7)
	No	233 (98.3)
	Occurrence	
	Before working	0 (0)
	After working	4 (1.7)
	Duration	
	< 1 month	2 (0.8)
	1 to 3 months	0 (0)
4 to 6 months	1 (0.4)	
7 months to 1 year	0 (0)	
> 1 year	1 (0.4)	
Irritated nose	Presence of irritated nose	
	Yes	65 (27.4)
	No	172 (72.6)
	Excessive sneezing	
Yes	26 (11.0)	
No	39 (16.5)	
Sore throat	Presence of sore throat	
	Yes	73 (30.8)
No	164 (69.2)	

*SOB: Shortness of breath

Table 3 Association between respiratory symptoms and risk factors among street food vendors in Klang Valley, Malaysia.

Parameters	Cough	Sputum Production	Breathing Difficulty	Chest Pain	Irritated Nose	Sore Throat
Age	0.282	0.387	0.744	0.724	0.580	0.737
Gender	0.609	0.616	0.130	0.162	0.635	0.372
Duration of Job	0.223	0.648	0.262	0.308	0.188	0.650
Working hours	0.330	0.014*	0.011*	0.155	0.736	0.829
Type of cooking fuel	0.001*	0.147	0.120	0.460	0.134	0.300

*Chi-square test, $p < 0.05$

($p=0.130$), chest pain ($p=0.162$), irritated nose ($p=0.635$) and sore throat ($p=0.372$) (Table 3).

3.3.3 Duration of job (years)

No significant association was found between duration of job and cough ($p=0.223$), sputum production ($p=0.648$), breathing difficulty ($p=0.262$), chest pain ($p=0.308$), irritated nose ($p=0.188$) and sore throat ($p=0.650$) (Table 3).

3.3.4 Working hours

No significant association was found between working hours and cough ($p=0.330$), chest pain ($p=0.155$), irritated nose ($p=0.736$), and sore throat ($p=0.829$). However, working hours and sputum production showed a statistically significant association ($p=0.014$). Working hours were also significantly associated with breathing difficulty ($p=0.011$) (Table 3).

3.3.5 Type of cooking fuel

No significant association was found between types of cooking fuel and sputum production ($p=0.147$), breathing difficulty ($p=0.120$), chest pain ($p=0.460$), irritated nose ($p=0.134$) and sore throat ($p=0.300$). However, the type of cooking fuel used and the presence of cough demonstrated a statistically significant association ($p=0.001$) (Table 3).

4 Discussion

This study primarily aimed to establish the prevalence of respiratory symptoms and the associated risk factors among street food vendors in Klang Valley, Malaysia. Various previous studies explored the respiratory health of roadside hawkers in countries such as Nigeria (Nwankwo et al. 2018), Ghana (Amegah et al. 2021), Thailand (Kongtip et al. 2008), India (De et al. 2019; Prabhu et al. 2019), Brunei Darussalam (Wahid et al. 2014) Egypt (Serya et al. 2019) and South Africa (Sepadi and Nkosi 2022). However, there are only limited number of studies undertaken in Malaysia to understand the prevalence and risk factors of respiratory symptoms among the high-risk population of street food vendors. To the best of our knowledge, only one comparative study examined the respiratory health symptoms among roadside

vendors in Serdang, Malaysia focusing mainly on traffic-related exposures (Amaran et al. 2016). Therefore, the findings of the present study might provide a deeper insight into the respiratory health of street food vendors in Malaysia and complement the current literature.

4.1 Prevalence of Respiratory Symptoms

The findings of the current study indicated that sore throat (30.8%) was the most common respiratory symptom, followed by cough (29.1%), irritated nose (27.4%), breathlessness (7.2%), sputum production (5.1%), and chest pain (1.7%), among the street food vendors in Klang Valley. These findings are in agreement with the results of a study done in Thailand which showed that sputum production, sore throat, and cough were among the most frequent respiratory symptoms reported by the street vendors. This comparative study also reported no wheezing by residential street vendors which are similar to the present study's findings (Kongtip et al. 2008). Comparable results regarding sore throat were shown in a study undertaken in India (36.3%) (Saxena et al. 2019) and Egypt (31.6%) (Serya et al. 2019). Further studies carried out in Brunei Darussalam (Wahid et al. 2014) and Nigeria (Awopeju et al. 2017) reported the prevalence of cough among roadside hawkers as 28.3% and 29.6%, respectively, which is similar to the present findings. In contrast to the current study, a comparative study undertaken in Serdang, Malaysia showed wheezing (68.3%) as the most common respiratory symptom followed by chest tightness, cough, and sputum production among the exposed roadside hawkers (Amaran et al. 2016). This may be because the current study was undertaken during the lockdown period owing to the COVID-19 pandemic. This resulted in a considerable reduction of vehicular emissions and other air pollutants such as those generated due to construction activities (Othman and Latif 2021). Apart from this, street food vendors were also using face masks, which might have reduced exposure to particulate matters, and hence no wheezing was reported.

4.2 Associated risk factors

Various associated risk factors including age, gender, and duration of job showed no statistically significant association with respiratory symptoms such as cough, sputum production, breathing

difficulty, chest pain, irritated nose, and sore throat. These findings are in agreement with the results of other studies which also showed no significant association between age, gender, and respiratory symptoms (Wahid et al. 2014; Amaran et al. 2016). However, contrasting results were reported in other studies regarding the total job duration (years), showing a significant association with the respiratory symptoms (Wahid et al. 2014; Amaran et al. 2016). A probable reason could be that these studies have included individuals with preexisting medical conditions, smokers, and pet owners. These might be the confounding factors that affected the results for the studied association, whereas the same has been excluded under the present study.

The results of the present study showed a statistically significant association between working hours and sputum production ($p=0.014$). The working hours were also significantly associated with breathing difficulty ($p=0.011$). A prevalence study conducted in Egypt among 152 female food vendors showed that 92.8% of them worked for 8 hours or more per day. The most frequent respiratory symptoms amongst them were shortness of breath (67.8%), tightness of the chest (66.4%), sputum production (54.6%), nasal congestion (47.7%), and cough (42.8%) (Serya et al. 2019). However, the study did not verify the associated risk factors.

In addition, the observed significant association between the type of cooking fuel used and cough ($p=0.001$) in the current study was also consistent with mounting evidence provided via other studies on people with domestic biomass exposure. As per a study conducted in Nepal, the group of participants exposed to biomass smoke showed a significantly higher prevalence of airflow obstruction (8.1%) as compared to the control group (3.6%), with similar findings for males (7.4% vs 3.3%; $p=0.022$) and females (10.8% vs 3.8%; $p<0.001$) (Kurmi et al. 2013).

The present study has limitations due to the use of a self-administered questionnaire which might lead to recall and response bias. Future studies can be done using a longitudinal study design to study the effect of various risk factors on the respiratory health of street food vendors. Based on the present findings, various control measures such as regular examination of the work environment via air sampling, the use of face masks, and health education programs may be undertaken. Apart from this, vendors are also required to consider using clean fuels instead of charcoal.

Conclusion

The present study reported an association between work-related risk factors and respiratory health symptoms. Breathlessness and sputum production were associated with working hours whereas cough was associated with types of cooking fuel used. The results of this study show that street food vendors in Klang valley are at

the risk for various respiratory symptoms that can lead to morbidity or mortality.

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Conflict of Interest

No conflict of interest was declared.

References

- Amaran, N.A., Abidin, E.Z., & Rasdi, I. (2016). Respiratory health symptoms and lung function among road-side hawkers in Serdang and its association with traffic-related exposures. *Iranian Journal of Public Health*, 45(Supple 1), 77-84.
- Amegah, A.K., Dakuu, G., Mudu, P., & Jaakkola, J.J.K. (2021). Particulate matter pollution at traffic hotspots of Accra, Ghana: levels, exposure experiences of street traders, and associated respiratory and cardiovascular symptoms. *Journal of Exposure Science & Environmental Epidemiology*, 32, 333-342. DOI: 10.1038/s41370-021-00357-x.
- Awopeju, O.F., Nemery, B., Afolabi, O.T., Poels, K., et al. (2017). Biomass smoke exposure as an occupational risk: cross-sectional study of respiratory health of women working as street cooks in Nigeria. *Occupational and Environmental Medicine*, 74(10), 737-744.
- De, S., Kushwah, G.D.S., Dharwey, D., & Shanmugasundaram, D. (2019). Respiratory morbidity of roadside shopkeepers exposed to traffic-related air pollution in Bhopal, India. *Journal of Health and Pollution*, 9(21), 1-8.
- Jones, A.Y., Lam, P.K., & Gohel, M.D.I. (2008). Respiratory health of road-side vendors in a large industrialized city. *Environmental Science and Pollution Research*, 15(2), 150-154.
- Kongtip, P., Thongsuk, W., Yoosook, W., Chantanakul, S., & Singhaniyom, S. (2008). Health effects of air pollution on street vendors: A comparative study in Bangkok. *Thai Journal of Toxicology*, 23(1), 5-5.
- Kurmi, O.P., Devereux, G.S., Smith, W.C.S., Semple, S., et al. (2013). Reduced lung function due to biomass smoke exposure in young adults in rural Nepal. *European Respiratory Journal*, 41(1), 25-30.
- Noomnual, S., & Shendell, D.G. (2017). Young adult street vendors and adverse respiratory health outcomes in Bangkok, Thailand. *Safety and Health at Work*, 8(4), 407-409.

- Nwankwo, O.N., Mokogwu, N., Agboghroma, O., Ahmed, F.O., & Mortimer, K. (2018). Knowledge, attitudes and beliefs about the health hazards of biomass smoke exposure amongst commercial food vendors in Nigeria. *PLoS One*, 13(1), e0191458.
- Othman, M., & Latif, M.T. (2021). Air pollution impacts from COVID-19 pandemic control strategies in Malaysia. *Journal of Cleaner Production*, 291, 125992.
- Prabhu, V., Gupta, S. K., Madhwal, S., & Shridhar, V. (2019). Exposure to atmospheric particulates and associated respirable deposition dose to street vendors at the residential and commercial sites in Dehradun city. *Safety and health at work*, 10(2), 237-244.
- Rahman, S.R.A., Ismail, S.N.S., Raml, M.F., Latif, M.T., et al. (2015). The assessment of ambient air pollution trend in Klang Valley, Malaysia. *World Environment*, 5(1), 1-11.
- Saxena, R., Nigam, N., Singh, P.K., & Gupta, N. (2019). Street Peddlers and Poor Respiratory Health Outcomes in Lucknow, India. *International Journal of Contemporary Medical Research*, 6(8), H1-H4.
- Sepadi, M. M., & Nkosi, V. (2022). Environmental and Occupational Health Exposures and Outcomes of Informal Street Food Vendors in South Africa: A Quasi-Systematic Review. *International Journal of Environmental Research and Public Health*, 19(3), 1348.
- Serya, H., El Hadidi, S., & El Bestar, S. (2019). Respiratory health effects among female street food vendors in Mansoura City, Egypt. *Egyptian Journal of Occupational Medicine*, 43, 17-32.
- Usmani, R.S.A., Saeed, A., Abdullahi, A.M., Pillai, T.R., et al. (2020). Air pollution and its health impacts in Malaysia: a review. *Air Quality, Atmosphere & Health*, 13(9), 1093-1118
- Wahid, N.N.N.B.A., Balalla, N.B., & Koh, D. (2014). Respiratory symptoms of vendors in an open-air hawker center in Brunei Darussalam. *Frontiers in Public Health*, 2, 167.
- WHO. (2016). WHO releases country estimates on air pollution exposure and health impact. Retrieved from <https://www.who.int/news/item/27-09-2016-who-releases-country-estimates-on-air-pollution-exposure-and-health-impact>, accessed on 20 October 2021.