INDOOR PARTICULATE MATTER PM 2.5 CONCENTRATION AND LUNG FUNCTION IMPAIRMENT AMONG HOUSEWIVES OF SELECTED QUARTERS IN MINGALADON CANTONMENT

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Introduction

- Indoor air pollution may arise from the use of open fire, burning of biomass fuels, coal, kerosene, poor maintenance of gas stove and wood-burning units with insufficient ventilation. It is also influenced by the characteristics of building and households activities of residents.
- Indoor air pollution mainly effect on vulnerable population such as children, housewives and elderly people.

General Objective

- To study the indoor particulate matter ($PM_{2.5}$) concentration and its effects on lung function among housewives of selected quarters in Mingaladon Cantonment

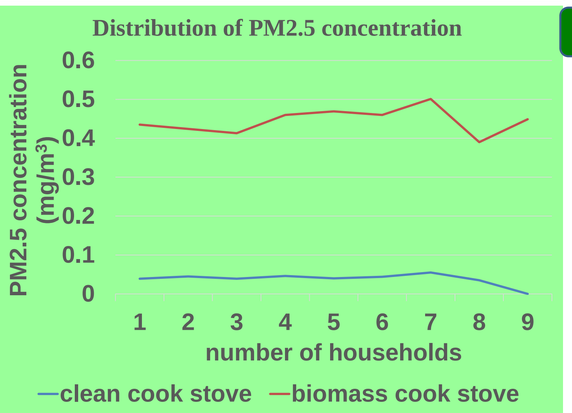
Specific Objectives

- To find out the association between indoor particulate matter ($PM_{2.5}$) concentration and lung function impairment among housewives
- To compare $PM_{2.5}$ concentration and lung function among housewives of selected quarters in Mingaladon Cantonment

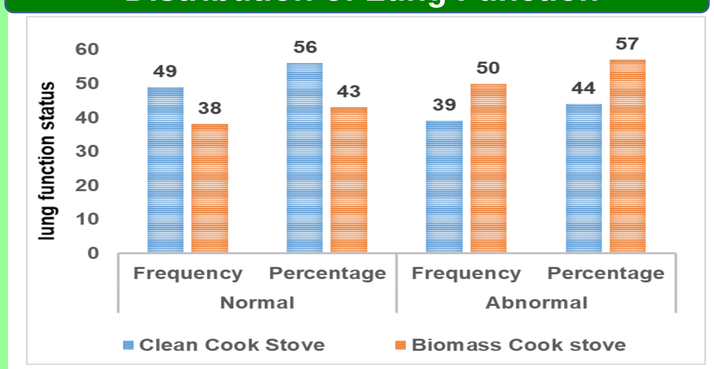
Materials and Methods

- A cross-sectional comparative study was conducted at Mingaladon cantonment, Yangon from June to august 2019.
- Housewives were selected by using the systematic sampling method from two quarters.
- In total, 176 housewives participated in face-to-face interviews using pre-structured modified questionnaire from American Thoracic Society (Environmental and Occupational Health Department).
- 3M airborne particulate monitor was used to detect the indoor PM concentration for each 9th households.
- Micro plus lung function calculator was used to detect the lung function impairment of the housewives.

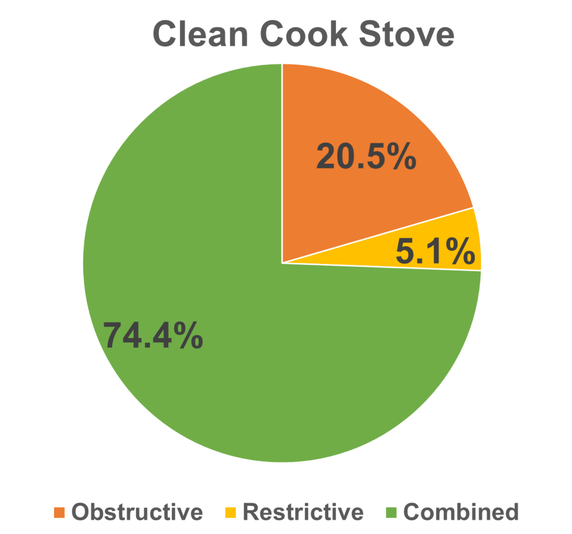
Results and Discussion

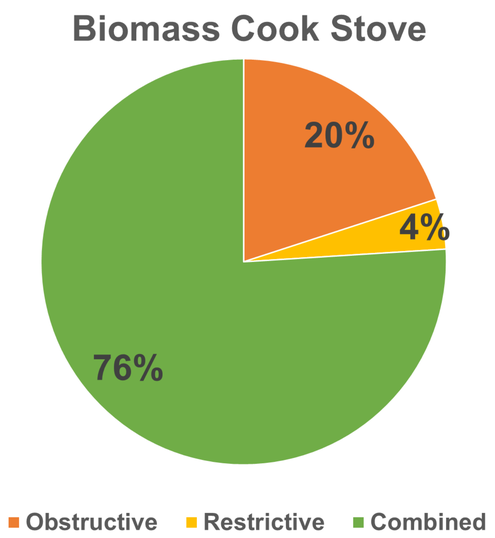


Distribution of Lung Function



- The particulate matter $PM_{2.5}$ concentration was higher in the biomass cook stove group than the clean cook stove group.
- In the clean cook stove group, 49 (56%) of housewives had normal lung function status and 39 (44%) had abnormal lung function status according to their heights and ages.
- In the biomass cook stove group, 38 (43%) of housewives had normal lung function status and the remaining 50 (57%) of housewives had abnormal lung function status by their heights and ages.





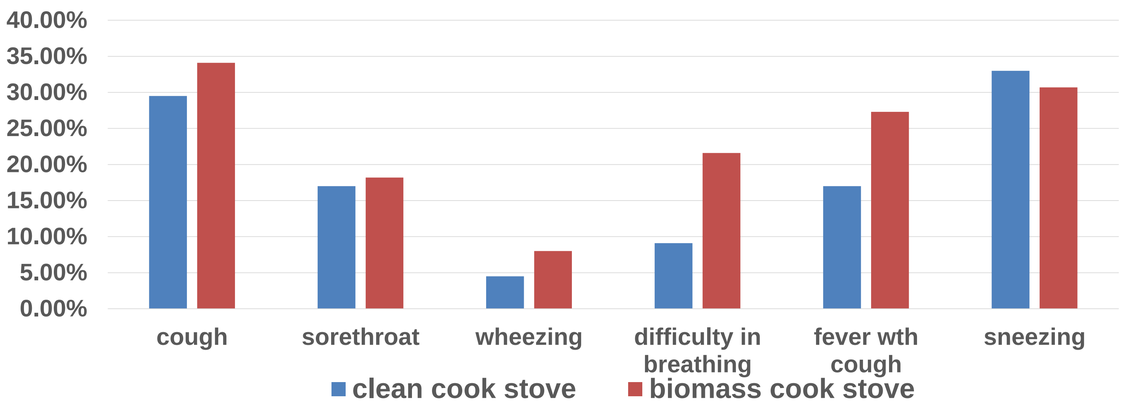
The abnormal lung function status were more occurred in biomass cook stove group than clean cook stove group.

Table 1. Relationship between type of fuel used and $PM_{2.5}$ (n=18)

Type of fuel	No of Households	Mean (mg/m³)	SD	T	p value
Households using Clean cook stove	9	0.038	0.015	-33.4	<0.001
Households using Biomass cook Stove	9	0.445	0.033		

Biomass fuels using for cooking substantially increased to indoor particulate matter concentration than clean fuels using for cooking.

Distribution of respiratory symptoms



Woman who exposed to indoor particulate matter pollution had relatively the high prevalence of one kind of respiratory symptoms.

Table 2.Relationship between lung function parameters and PM2.5 (n=18)

$PM_{2.5}$ Mean (SD)	Lung Function Parameters		r	p value
	Parameter	Mean (SD)		
0.249 (0.213)	FEV_1	1.204 (0.466)	-0.69	0.002
	FVC	1.713 (0.647)	-0.60	0.008

There was the correlation between exposure to fine particulate matter ($PM_{2.5}$) level and lung function impairment of biomass fuel group compared to clean fuel group.

Conclusion

- Indoor particulate matter ($PM_{2.5}$) pollution is one of the environmental risks in the developing countries. Its effects mainly disturb on housewives who spent most of their times in the kitchen within their homes.
- Health impacts of indoor particulate matter ($PM_{2.5}$) will be serious problems for community in the future.
- Health education, community participation, implementation programs and evaluation strategies associated with indoor particulate matter pollution and its health impacts should be done in the community.

References

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