

Association between wheezing and environmental tobacco smoke exposure among preschool children in Mpumalanga Province, South Africa

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In both urban and rural areas children who lived with one or more people who smoked in the same household were found to have an increased likelihood of having Wheeze Ever, Current Wheeze and Asthma Ever as compared to those who lived with non-smokers.

BACKGROUND

The study aimed to investigate the prevalence of wheezing and its association with environmental tobacco smoke exposure among rural and urban preschool children in Mpumalanga province, South Africa, an area associated with poor air quality.

Preschool wheezing is a common condition, and environmental tobacco smoke (ETS) exposure is a significant risk factor for wheezing disorders in preschool children. ETS possess comparable toxic components to those found in conventional tobacco smoke, consequently resulting in similar detrimental consequences akin to those observed in individuals who engage in active smoking. It is advisable to enact legislation aimed at the elimination and regulation of children's exposure to ETS. There is a tendency for wheezing prevalence to be lower in rural areas, with some evidence suggesting the presence of an urban-rural gradient.

METHODS

In this study, parents/caregivers of preschool children (n=3145) completed a modified International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire. Data were analysed using multiple logistic regression models.

RESULTS

- The overall prevalence of Wheeze ever was 15.14%, with a higher prevalence in urban pre-schoolers than rural pre-schoolers (20.71% vs 13.30%, $p < 0.000$) and the total prevalence of asthma ever was 2.34%.
- The prevalence was greater in urban pre-schoolers than in rural pre-schoolers (3.92% vs 1.81%, $p < 0.001$).
- In the final adjusted model, both urban and rural area children who lived with one or more people who smoked in the same household (WE: OR 1.44, 95% CI 1.11-1.86) (CW: OR 2.09, 95% CI 1.38-3.16) and (AE: OR 2.49, 95% CI 1.12-5.54) were found to have an increased likelihood of having Wheeze Ever, Current Wheeze and Asthma Ever as compared to those who lived with non-smokers.

CONCLUSION

The presence of ETS exposure among preschool-aged children in various settings, including their homes, restaurants, and during transportation, increased the probability of experiencing wheezing.

The implementation of smoking limits and prohibition is crucial in areas that are frequented or utilized by children. Hence, it is imperative for healthcare providers to actively champion the rights of individuals who do not smoke within the society, while also endorsing legislative measures aimed at curtailing tobacco smoke exposure.

Conflicts of Interest: The author(s) declare no potential conflicts of interest concerning this article's research, authorship, and/or publication.

Acknowledgements: The authors would like to thank everybody who participated in the study, the South African Medical Research Council and the University of Pretoria.

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Table 1 presents participants' (combined Rural and Urban areas) prevalence of current wheeze with their respective odds ratios.

Variables	Total ^a	Prevalence (%)	Crude OR ^b (95% CI)	P	Adjusted OR ^{b,c} (95% CI)	P
Female parent ever asthma						
No	2453	8.35	1		1	
Yes	79	26.58	3.97 (2.36-6.67)	0.000	5.59 (2.77-11.26)	0.000
Child used Analgesic/antibiotic in the past 12 months						
Never	440	1.81	1		1	
At least once a year	906	6.95	4.03 (1.91-8.49)	0.000	3.41 (1.17-9.95)	0.024
At least once per month	1656	12.86	7.97 (3.90-16.27)	0.000	4.74 (1.68-13.40)	0.003
Female parent job industry						
Private sector	567	8.28	1		1	
Government sector	347	12.96	1.64 (1.06-2.54)	0.024	1.38 (0.73-2.60)	0.317
Self-employed	301	9.96	1.22 (0.75-1.98)	0.409	1.18 (0.73-2.32)	0.629
Not employed	1721	9.18	1.11 (0.79-1.57)	0.519	0.69 (0.41-1.17)	0.177
Dog in the house (past 12 months)						
No	2742	8.75	1		1	
Yes	320	14.68	1.79 (1.28-2.51)	0.001	1.27 (0.70-2.32)	0.419
Female parent smoke						
No	2884	9.01	1		1	
Yes	93	23.65	3.12 (1.90-5.12)	0.000	0.65 (0.20-2.15)	0.488
People living in the same house as your child smoke?						
Zero	2008	7.86	1		1	
One or more	823	13.12	1.78 (1.36-2.29)	0.000	2.09 (1.38-3.16)	0.000
Child exposure to smoking at the car (past 30 days)						
Never	1368	9.50	1		1	
One or more days	69	11.59	2.37 (1.31-4.30)	0.004	2.27 (1.17-4.38)	0.014

^a The Totals for individual risk factors differ owing to the absence of values. Missing data were excluded from the data analysis. ^b The statistically significant values for the crude OR and less than 0.05 for the adjusted OR are highlighted (only risk factors and confounders that showed association with health outcome were included in crude OR and adjusted OR). ^c Model adjustments were made for all the variables in the table. 1: Unless declared in another manner, the referent category for individual risk factors is the lack of the risk factor.

Table 2: Prevalence of wheeze ever (rural and urban combined) along with adjusted odd ratios (aOR's).

Variables	Total ^a	Prevalence (%)	Crude OR ^b (95% CI)	P	Adjusted OR ^{b,c} (95% CI)	P
People living in the same house as your child smoke?						
Zero	2011	13.60	1		1	
One or more	817	18.60	1.44 (1.16-1.40)	0.001	1.35 (1.07-1.7)	0.011
Female parent smoke						
No	2878	14.62	1		1	
Yes	92	34.78	3.11 (2.00-4.83)	0.000	3.11 (2.00-4.83)	0.000
Sex of child						
Female	1512	13.49	1		1	
Male	1572	16.73	1.28 (1.05-1.57)	0.012	1.34 (1.07-1.67)	0.010
Child used Analgesic/antibiotic in the past 12 months						
Never	435	5.28	1		1	
At least once a year	909	14.41	3.01 (1.90-4.77)	0.000	2.43 (1.41-3.71)	0.000
At least once per month	1650	18.24	3.99 (2.57-6.19)	0.000	3.26 (1.92-4.81)	0.000
Cat in the house (past 12 months)						
No	2830	17.18	1		1	
Yes	220	21.36	1.58 (1.12-2.21)	0.008	1.83 (0.65-5.12)	0.246
Female parent level of school completion						
Secondary	1846	12.56	1		1	
University	449	22.71	2.04 (1.57-2.65)	0.000	1.84 (1.36-2.49)	0.000
Other	413	17.43	1.46 (1.10-1.96)	0.009	1.30 (0.94-1.80)	0.106
Primary	241	18.67	1.59 (1.12-2.27)	0.009	1.39 (0.90-2.16)	0.129
How does the child get to school^d						
Walk	1633	13.16	1		1	
Taxi/bus	828	15.57	1.21 (0.96-1.54)	0.103	1.31 (1.00-1.71)	0.066
Motor car	518	21.62	1.81 (1.41-2.34)	0.000	1.70 (1.25-2.31)	0.001
Combination	57	12.28	0.92 (0.41-2.06)	0.846	1.07 (0.46-2.49)	0.863
Other	23	11.4.34	0.29 (0.04-2.23)	0.240	0.32 (0.04-2.48)	0.279

^a The Totals for individual risk factors differ owing to the absence of values. Missing data were excluded from the data analysis. ^b The statistically significant values for the crude OR and less than 0.05 for the adjusted OR are highlighted (only risk factors and confounders that showed association with health outcome were included in crude OR and adjusted OR). ^c Model adjustments were made for all the variables in the table. ^d Other refers to all forms of informal education. ^e Combination includes motorcar and Taxi/bus; Other includes animal cart. 1: Unless declared in another manner, the referent category for individual risk factors is the lack of the risk factor.