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GENDER AS A DETERMINANT OF COMMON RESPIRATORY AILMENTS AMONG SCHOOL GOING CHILDREN IN PUDUCHERRY

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ABSTRACT

Introduction: In the last few decades, 'gender' differences in respiratory health are less explored. Differences do exist physiological or anatomical variations in body size, lung size and airway diameter. **Objective:** To determine the respiratory discomforts among school children in Puducherry with gender as a variable. **Methodology:** A cross sectional study was carried out among 871 school going children aged 10-14 years in Puducherry. The data was collected by using structured pre-validated questionnaire to elicit details on socio-economic conditions, health attributes, physical activity and dietary pattern. Stadiometer, weighing scale and flexible tape were used for anthropometric measurements like height, weight and chest circumference. PEFR was measured using Mini-Wright Peak Flow Meter and Pulse Oxymeter was used to measure Oxygen Saturation and Pulse rate. Logistic regression analysis was used to find the risk factors of the same. **Results:** A total of 871 children surveyed of which, 469 were boys and 402 were girls. The respiratory discomforts included wheezing, allergic rhinitis, sinusitis, ear infection, runny or blocked nose and dry cough which were found to be higher in girls 211(53.4%) when compared with boys 184 (46.6%).Similarly, the mean parameters like height (137.6±8.4 > 137.2±8.0 OR=2.1) weight(39.0±7.9 > 30.37±6.3 OR=1.02), chest circumference (24.2±6.9 > 26.7±8.1 OR=1.3), Oxygen Saturation (98.7±19.3> 96.4±13.4 OR=2.07), Pulse Rate (94.5±20.2 > 90.3±19.3 OR=1.9) and Peak Expiratory Flow Rate (329.4±64.2 > 319.7±61.9 OR=2.3) were also higher in boys than in girls.Odds Ratio revealed that girls with lower body composition parameters and pulmonary functions were prone for higher risk of respiratory discomforts. Therefore, gender difference is a key factor to determine respiratory health.

KEYWORDS: *Gender, Respiratory discomforts, School going children.*

INTRODUCTION

Gender refers to the array of socially constructed roles and relationships, personality traits, attitudes, behaviours and values that society ascribes to the sexes on a differential basis.[1] There are very few studies that highlight the gender differences on health status, health service, health benefits etc. Among these the study with primary data as source is very much limited. These studies that are based on community survey though few in number have observed the interrelationship between health and socio, demographic, economic and cultural parameters like age, marital status, ordinal position, income etc.[2] Similarly, gender differences in respiratory health have also been explored through sporadic in number. This differences arise due to differences in physiology or anatomy, in terms of body size, lung size and airway diameter.[3]

In most of the studies, approximately two-thirds of children with asthma or wheezing are boys and one-third are girls. Lower rates of prevalence and incidence are consistently observed in girls in comparison to boys, whereas in adulthood the rates are reported to be higher in women than in men.[4,5] In both developed and developing countries respiratory symptoms are a substantial cause of mortality and morbidity in young children.[6,7] Several studies have reported that the presence of respiratory problems were higher among Indian children (4-20%).[8,9]

OBJECTIVE

To determine the respiratory discomforts among school children in Puducherry with gender as a variable.

METHODOLOGY

A cross sectional study was carried out among 871 school children aged 10-12 years for the period of six months (July 2013 to December 2013). The study was conducted in six different Government urban schools of Puducherry. Stratified random sampling technique was adopted to pick the samples.

Prior permission was obtained from the Director of School Education, Government of Puducherry and

Headmasters of concerned school. The objective of the study was briefed and informed consent was obtained from the parents and children. The pre-validated questionnaire in bilinguals (both Tamil and English) was used for data collection. The questionnaire included socio-economic conditions, health attributes, physical activity and dietary pattern which may be responsible for common respiratory ailments.

The children were assessed with biometric data (height, weight, body mass index and chest circumference using stadiometer, weighing scale and flexible inch tape) and pulmonary function test (Peak Expiratory Flow rate, Oxygen Saturation and pulse rate using Peak Flow Meter and Pulse Oxymeter).

The gathered data was analysed using SPSS 17.0. Logistic regression analysis was used to find the risk factors of the same.

RESULTS

A total of 871 children surveyed of which, 469 were boys and 402 were girls. The Overall prevalence of respiratory symptoms were found to be45% (N=395) included wheezing (27.7%), allergic rhinitis (36.3%), sinusitis (24.2%), ear infection (22.7%), runny or blocked nose (31.6%) and dry cough (17.9%).

The respiratory symptoms were found to be higher in girls 211(53.4%) when compared with boys 184 (46.6%). Table 1 depicts the determinants of respiratory symptoms among girls included family history of respiratory ailments (83.7%), literacy level of mother (81.3%), inadequate ventilation in home (75.5%), absence of smoke outlets in kitchen (85%), presence of pets or domestic animals (79.2%), frequent intake of locally made drinks and fried foods (73.2%).

The risk factor analysis revealed that the children who suffered from respiratory discomforts had significant association with various determinants. Alike the present study, Vandana chauhan etal (2013)[10] also reported that the highest prevalence of chronic cough, wheeze, shortness breathe was found in girl child having family history of respiratory ailments.

Prevention is best treatment for respiratory symptoms, if mothers had adequate knowledge regarding respiratory ailments they can provide good care to the children (Asha D Souza etal, 2014).[11] Similar findings were also observed by Wadgave etal, (2007)[12]; Prasad Pore etal, (2010)[13]; Bipin Prajapati etal, (2011).[6]

Table 1: Determinants of respiratory discomforts of the study group.

Factors	Boys (n=184)		Girls (n=211)		p-value	Odds ratio	Class Interval (95%)
	N	%	N	%			
Family History							
Yes	151	82.3	177	83.7	0.001	2.4	0.081-1.825
No	33	17.7	34	16.3			
Mother Education							
Literate	45	24.3	39	18.7	0.000	1.8	0.122-1.543
Illiterate	139	75.7	172	81.3			
ventilation in home							
Adequate	52	28.1	93	24.5	0.00	1.7	0.291-1.532
Inadequate	132	71.9	287	75.5			
Smoke outlets							
Presence	22	12	32	15	0.001	2.3	0.411-1.476
Absence	162	88	179	85			
Pet allergens							
Exposed	138	75.2	167	79.2	0.000	2.1	0.249-1.500
Not exposed	46	24.8	44	20.8			
Locally available soft drinks and Cola's							
Yes	136	73.8	154	73.2	0.000	1.7	0.078-1.275
No	48	26.2	57	26.8			

The studies conducted by Revathi etal, (2012)[14]; Dhananjaya sharma etal, (2013)[15]; Bergroth etal, (2012)[16]; Stewart Jackson etal, (2013)[17] and Sugana etal,(2014)[18] revealed that there is a significant difference between boys and girls in relation with respiratory ailments and inadequate ventilation, pets rearing and absence of smoke outlets which is also reflected in the present study.

The mean anthropometric parameters are summarized in Table 2. Boys appeared significantly taller, heavier, increased BMI and lower chest circumference than girls. Comparing the height and weight data, it is clear that children from Puducherry were almost as par with children from other regions of India included Kerala[19], Andhra Pradesh[20], Gujarat[21] and Tamil Nadu.[22]

Table 2: Anthropometric measurements of the study group.

Parameters	Boys N=469		Girls N=402	
	Mean	SD	Mean	SD
Age	11.15	0.9	11.01	0.6
Height	137.6	8.4	137.2	8.0
Weight	39.0	7.9	30.37	6.3
BMI	17.4	8.7	16.1	9.2
Chest Circumference	24.2	6.9	26.7	8.1

Pulmonary function test is one of the indicator of the health status of the individual and could be used as a tool in general health assessment.[23,24] Table 3 represents the mean PEFR score was 325.1±66.8 L/min. Statistically high significant difference were observed between boys and girls (329.4±64.2 > 319.7±61.9 L/min; OR=2.3).

Pulmonary function tests (PFTs) is influenced by body build, muscular strength and nutritional status thereby showing a higher value of PEFR in boys as compared to girls whose body framework is fragile and muscle mass is replaced with more of fat deposits.[25]

From Table 3, it was found that the level of Oxygen saturation (SpO2) were higher in boys than in girls (98.7±19.3 > 96.4±13.4 %; OR=2.07). The possible reason can be associated with lower arterio-venous oxygen difference of girls, which also leads to smaller muscle mass, lower capillary density, and lower oxidative potential.[26] Similar observation was noted by Lammers et al (2008).[27]

The present study showed significant difference in pulse rate between boys and girls (94.5±20.2 > 90.3±19.3 bpm; OR=1.9). Pulse rate differentiation is anatomically related to size of the heart which is smaller among girls than boys. The smaller the heart, the lesser in the pumping of blood in each beat. This difference can be matched by respiratory exercises.[28]

Table 3: Pulmonary Function test of the study group.

Parameters	Gender			Odds Ratio	Mean difference	95% Confidence Interval
	Boys Mean±SD	Girls Mean±SD	Both Mean±SD			
PEFR (L/Min)	329.4±64.2	319.7±61.9	325.1±66.8	2.3	-32.0	30.0-33.7
SpO_2(%)	98.7±19.3	96.4±13.4	97.7±16.4	2.07	-2.4	19.2-21.9
Pulse rate(bpm)	94.5±20.2	90.3±19.3	91.5±19.7	1.9	-26.3	22.7-28.1

CONCLUSION

Odds Ratio revealed that girls with lower body composition parameters and pulmonary functions were prone for higher risk of respiratory discomforts. Therefore, gender difference is a key factor to determine respiratory health.

RECOMMENDATION

The school children spend nearly one-third of the day in the school. Therefore good ventilation, regular gender neutral outdoor games and exercise, less-stressful environment, nutritious food intake should be reviewed seriously by school authorities for good health and specifically the respiratory health of the children.

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