

Prevalance of exposure to cigarette and hookah smoke in children hospitalized with pneumonia in Zahedan

Authors:

Elham Shafighi Shahri¹, Hoda Sufi^{2*}, Parvaneh Raeis³, somaye talae pur⁴

¹Children and Adolescents Health Research Center, Research Institute of Cellular and Molecular Science in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran.

²Children and Adolescents Health Research Center, Research Institute of Cellular and Molecular Science in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran.

³medical student zahedan university medical sciences

⁴Children Growth Disorder Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Corresponding Author:

Hoda Sufi

Children and Adolescents Health Research Center, Zahedan University of Medical Sciences, Zahedan, Iran.

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ABSTRACT:

Introduction and Objective: Pneumonia is the most common fatal respiratory tract infection and, when it occurs in children, especially in low-income countries, it carries a large economic burden on the family and the health system. Exposure to tobacco smoke is associated with childhood disabilities and mortality. The aim of this study was to investigate the prevalence of exposure to cigarette and hookah smoke in children under 2 years of age with pneumonia hospitalized in the pediatric ward to show its importance in the occurrence of respiratory symptoms in children. **Materials and Methods:** This study was a descriptive cross-sectional study that was conducted on 141 children under 2 years of age with pneumonia without a history of previous illness hospitalized in the pediatric ward of Ali Ibn Abi Taleb Hospital through interviews with mothers. The mean and number (percentage) were used to describe the variables according to their nature (quantitative or qualitative). **Findings:** Among the 141 children studied, 25.31% were exposed to cigarette and hookah smoke, of which 76.7% were boys and 23.3% were girls. 27.9% of their mothers were illiterate, 48.8% had High school education and 20.9% had a University education, and 2.3% had High university education. Among the fathers, 7% were illiterate, 41.9% had High school education, 41.9% had a University education, and 3.9% had High university education. In terms of household size, 30.2% had 4 people and 30.2% had 6 people. 25.6% were exposed to cigarette smoke, 58.1% were exposed to hookah smoke, and 16.3% were exposed to both. In terms of exposure history, 7% were exposed during pregnancy, 3.9% were exposed after birth, and 83.7% were exposed both during and after birth. 65.1% were hospitalized for 4 days. **Conclusion:** The results of this study showed that exposure to cigarette and hookah smoke is an important factor in the incidence of pneumonia in children under 2 years of age, therefore this factor should be considered in the process of preventive health and treatment interventions for pneumonia.

Keywords: pneumonia, cigarette, hookah, second-hand exposure.

INTRODUCTION:

Pneumonia is a lower respiratory tract infection that involves the airways and parenchyma and causes alveolar space thickening (1).

It is the most common fatal respiratory tract infection (2) and, when it occurs in children, especially in low-income countries, it places a significant economic burden on families and health systems (3). According to the World Health Organization, in 2013, 6.3 million children under 5 years of age died worldwide (from the end of infancy to the first 5 years of life), with pneumonia being one of the leading causes of death, and 99% of these deaths occurred in developing countries. Millions of children under 5 years of age

worldwide die from pneumonia each year, 70-75% of whom are children under one year of age (2).

The first year of life is crucial for establishing health and improving quality of life. The United Nations Children's Fund believes that the mortality rate of children under one year of age is one of the most important indicators of development. According to available statistics, more than 42% of child deaths occur in the first 5 years of life, of which 80% occur in the first year of life. According to a 2015 World Health Organization report, the mortality rate of children under one year of age in Iran was 13.5% per thousand live births (4).

Cigarette smoke contains many toxic components such as carbon monoxide, hydrogen cyanide, benzopyridine,

and oxygen radicals, which can cause systemic disorders such as heart disease, cancer, and lung disease (5).

Hookah is an old method of smoking that is used to use tobacco. The side effects of hookah are numerous because tobacco smoke contains more than 4,000 different chemicals, most of which are produced during the burning process. Studies have shown that hookah smoke has a high concentration of carbon monoxide, nicotine, tar, and heavy metals (6). The amount of carbon monoxide in hookah smoke is higher than that of cigarette smoke, but they are equal in terms of nicotine (7).

In recent years, hookah use has become widespread among adults in Asian and African societies, especially in the Middle East and Arab countries. In Iran, cigarette and hookah use is very close to global statistics (7). According to studies conducted in 2013, the prevalence of tobacco use in Sistan and Baluchestan province was 20.3 percent (8).

Second-hand smoke exposure is defined as the involuntary inhalation of tobacco smoke, and according to available statistics, 40% of children in the world are exposed to tobacco smoke, especially cigarettes and hookahs (9), most of which occurs in their homes, and most of these children belong to poor families (10). According to the World Health Organization, exposure to tobacco smoke threatens the health of half of the world's children. 47% of children in the Eastern Mediterranean region are exposed to tobacco smoke (11). Second-hand exposure occurs in 41.7% of homes in Iran (12). Exposure to tobacco smoke increases health-related costs in the first years of life (11) and is associated with childhood disabilities and mortality. Cigarette and hookah smoke affects processes related to child development and has adverse effects on various body organs, including the ears and lungs. In addition, it is one of the causes of unexplained mortality in childhood (12).

Study population:

This study was Descriptive cross-sectional

Inclusion criteria: Children under two years of age who were hospitalized for the first time in the pediatric ward of Ali Ibn Abi Talib Hospital due to severe bacterial or viral pneumonia confirmed by a pediatrician (according to clinical manifestations of fever, cough, grunting, shortness of breath, moderate to severe respiratory distress, and ill appearance and relevant radiographic and laboratory signs) and had no previous illness and were healthy at birth.

Exclusion criteria: Children who were preterm at birth or had cystic fibrosis and any anomaly of the upper respiratory or digestive tract and neurological problems such as cerebral palsy and various types of neuropathy and immune deficiency diseases and were exposed to smoke from other substances except cigarettes and hookahs were not included in the study.

METHOD OF CALCULATION:

All children under the age of two who had no underlying disease and were healthy at birth and lived in Zahedan city and were hospitalized for the first time due to pneumonia in the pediatric ward of Ali Ibn Abi Talib Hospital .

However, given that an appropriate estimate of the prevalence of exposure to cigarette and hookah smoke in children under the age of two was not obtained in other places and studies, the P-value ratio or prevalence ratio can be set equal to the maximum value that reason and logic accept, i.e. $p < 0.50$. Considering the inclusion and exclusion criteria and the duration of the study, a sample size of 200 was considered. The study was approved by the ethics committee of Zahedan University of Medical Science with code IR.ZAUMS.REC.1397.409

The relevant information form measures the child's age in months, the child's gender, the parents' education level, the number of family members, the type of substance used (cigarettes, hookah, or both), exposure history (during pregnancy, after birth, or both), and the length of hospitalization in days.

Findings :

Due to the qualitative nature of the variable and the use of the percentage method, among the 141 children studied, 23.3% were girls (10) and 76.7% were boys (33).

Mother's education level: Due to the qualitative nature of the variable and the use of the percentage method, 27.9% (12 people) of the mothers were illiterate. 48.8% (21 people) had less than a High school education, 20.9% (9 people) had a University education, and 2.3% (1 person) had more than a High university education.

Due to the qualitative nature of the variable and the use of the percentage method, 7% (3 people) of the fathers were illiterate. 41.9% (18 people) had less than a High school education, 41.9% (18 people) had a University education, and 9.3% (4 people) had more than a High university education.

Due to the small number of variables and the use of the percentage method, 4.7% of families were 3-person families, 30.2% were 4-person families, 23.3% were 5-person families, 30.2% were 6-person families, 2.3% were 7-person families, 2.3% were 8-person families, 4.7% were 10-person families, and 2.3% were 16-person families.

Considering the qualitative nature of the variable, using the percentage method, 25.6% (11 people) of the children were exposed to cigarette smoke, 58.1% (25 people) to hookah smoke, and 16.3% (7 people) to both cigarette and hookah smoke.

Based on the qualitative nature of the variable and the use of percentages, 7% of children were exposed during their mother's pregnancy, 9.3% after birth, and 83.7% at both times.

Based on the quantitative nature of the variable and the use of percentages, 4.7% of children were hospitalized

for 3 days, 65.1% for 4 days, 27.9% for 5 days, and 2.3% for 6 days.

Table 1: Duration of hospitalization

%	Number	Admission (day)
4.7%	2	3
65.1%	28	4
27.9%	12	5
2.3%	1	6
100%	43	Total

The minimum age of the children was 2 months and the maximum was 23 months, and the average age was 9.53 months.

In the study in terms of the type of heating device, using the percentage method, it was determined that 81.4% of the families of children studied use oil heaters and 18.6% use non-oil heaters.

In another study in terms of the relationship between the mother's education level and the type of substance consumed, it was determined that among illiterate mothers, 27.3% were exposed to cigarette smoke, 20% to hookah smoke, and 57.1% to both cigarette and hookah smoke.

Among mothers with High school education, 36.4% were exposed to cigarette smoke, 60% to hookah smoke, and 28.6% to both smoke. Among mothers with a University education, 36.4% were exposed to cigarette smoke, 16% to hookah smoke, and 14.3% to both cigarette and hookah smoke. Among mothers with High university education ,0% were exposed to cigarette smoke, 4% to hookah smoke, and 0% to both. According to the significance level of 0.35, there was a relationship between the mother's education level and the type of substance consumed.

The relationship between gender and type of exposure was also examined and it was found that among girls, 36.4% were exposed to cigarette smoke, 20% were exposed to hookah smoke, and 14.3% were exposed to both cigarette and hookah smoke. These figures for boys were 63.6%, 80%, and 85.7%, respectively. With a significance level of 0.59, there was a relationship between gender and type of exposure.

Table 2: The relationship between gender and type of exposure

Significant	Both	Hookah	Cigarette	sex
0.59	14.3%	20%	36.4%	Female
	85.7%	80% %	63.6%	Male

DISCUSSION :

The results of this study showed that cigarette and hookah smoke were one of the factors affecting pneumonia in children under 2 years of age.

These results are important because, according to data from the World Health Organization, one of the most important causes of death in children, especially at young ages, is respiratory infections, especially

pneumonia (13). Therefore, by controlling one of the important factors affecting this disease, the incidence of it can be reduced and, as a result, the related complications can be reduced. On the other hand, the higher exposure to cigarette and hookah smoke in families with lower levels of education showed that one way to reduce exposure is to increase the level of awareness of parents, especially mothers (14).

Another issue is that the rate of exposure to hookah smoke was higher than cigarette smoke, which could indicate that families have little knowledge of the effects of hookah smoke on their children. In other words, the prevalence of hookah use in the world has increased due to the misconception and belief that it is safe. In Iran, cigarette and hookah use is also very close to global statistics. The high consumption of hookah is due to social acceptance, the availability of different flavors, and its low cost, which should also be communicated to families (7).

Another issue that can be addressed is that most of the children studied were exposed to cigarette and hookah smoke both before and after birth. According to studies, 50% of people who use tobacco continue to use it during pregnancy (15). according to a study conducted in 2003, children whose mothers use tobacco have a 50% higher risk of developing respiratory diseases (16). Several factors affect tobacco use during pregnancy, including young maternal age and low levels of education and income (17). Many of these mothers continue to smoke after pregnancy (18). The effects of smoking during pregnancy include impaired fetal lung function, reduced lung capacity, and increased hospitalization for future respiratory infections, including pneumonia (19). In this context, mothers should be informed about the harms of exposing their fetus to tobacco smoke and its effects on their child's health after birth.

In this study, most of the children were under one year old. According to previous studies, millions of children under 5 years old worldwide die from pneumonia every year, 70-75% of whom are children under one year old (2). Considering that the first year of life is very important for establishing health and improving the quality of life, and the mortality rate of children under one year old is one of the most important indicators of development, according to a 2015 World Health Organization report, the mortality rate of children under one year old in Iran is 13.5% per thousand live births (4). Now, considering the importance of this age group both in terms of health promotion and the development of the country, a special program should be implemented to reduce exposure to tobacco smoke at this age, including family education and expressing the importance of the issue that being healthy in this age range is very effective in the quality of life and health of the child in the future.

Considering the issues raised about the sensitivity of the age group under 2 years, and in particular under 1 year, and the importance of being healthy at this age in

improving the quality of life, health of the individual, and the growth and development of the country, and the fact that pneumonia is one of the most important causes of mortality in this age group (16), and on the other hand, one of the most important risk factors for pneumonia is exposure to cigarette and hookah smoke, and in our country, especially in Sistan and Baluchestan province, cigarette and hookah use is high (20), addressing this issue can play a significant role in improving the general health of the community and reducing the mortality and disability rates caused by pneumonia and its related costs.

According to an article published by Marianos et al. (2017), about a quarter of children who were admitted to the emergency department with a diagnosis of asthma, bronchiolitis, and pneumonia had a history of exposure to tobacco smoke (14).

The statistics on the exposure of children to tobacco smoke in the above study are very close to the statistics obtained in this study.

In the above study, in addition to pneumonia, asthma and bronchiolitis were also examined, and children with a younger age range who were admitted to the emergency department were also examined.

In this study, only children under 2 years of age who were admitted to the pediatric ward with a diagnosis of pneumonia were examined, and family demographic characteristics were also studied. On the other hand, the exposure to cigarette and hookah smoke was examined separately.

This study, like the above study, showed that the socio-economic status of the family is related to the child's exposure to tobacco smoke.

This study, like the studies discussed, stated that in families with low socioeconomic status, especially families in which the mother had a low level of education,

children were more exposed to cigarette and hookah smoke, and that the effects of these children were also exposed to cigarette and hookah smoke during the fetal period.

This study was conducted on children who were in one of the most sensitive ages in terms of growth and development. The amount of exposure to cigarette and hookah was done separately, and the history of exposure was also taken into account in order to identify children who had second-hand exposure to cigarette and hookah smoke during the fetal period. Also, children who had a history of previous illness and hospitalization were not included in this study so that only the effects of exposure to cigarette and hookah smoke with the child's hospitalization were shown.

CONCLUSION

According to this study, most of the children studied were exposed to hookah smoke. The majority of the gender was male.

The literacy level of the mothers and fathers was low. Most of the families were of average size and most of the children were exposed to tobacco smoke both

before and after birth, and most of them were also exposed to hookah smoke. This is because hookah is widely used in our culture and people have little information about its harmful effects. Many people feel that cigarettes are worse than hookah, so hookah is used regularly in many families without being aware of its effects.

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