

Smoking Habits and Bronchitis among in-Patients at The General Hospital of Kuala Lumpur

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ABSTRACT

The effect of inhaled tobacco smoke on the smokers and non-smokers was examined. Samples of respondents were chosen from the in-patient data lists at the General Hospital of Kuala Lumpur. Bronchitis is closely related to smoking habits amongst sufferers, especially for the males. The different occurrences of the disease amongst light and heavy smokers is considered small. However, for ex-smokers, higher occurrences of the disease was established among heavy than light ex-smokers.

ABSTRAK

Kajian ini melihat kesan asap rokok yang disedut oleh perokok-perokok dan juga yang tidak merokok. Sampel responden dipilih dari data pesakit dalam berdaftar di Hospital Besar Kuala Lumpur. Bronkitis mempunyai kaitan yang rapat dengan tabiat merokok dikalangan pengidap-pengidap penyakit berkenaan, terutamanya bagi jantina lelaki. Perbezaan kejadian penyakit diantara mereka yang kuat dan kurang merokok adalah kecil. Walau bagaimanapun, bagi bekas perokok, kejadian penyakit didapati begitu tinggi dikalangan mereka yang kuat merokok daripada yang sederhana merokok.

INTRODUCTION

Diseases associated with cigarettes such as bronchitis constitute challenging problems in the developed countries like Britain, the United State of America and Canada. It has been well demonstrated that among important aspects of smoking that are related to bronchitis include the quantity of cigarettes smoked, the type and mode of smoking such as cigarette, cigar or pipe, duration of smoking and frequency of smoking in a day (Doll et al. 1959; Higgins 1959; Lambert et al. 1970; de Hamel et al. 1972; Elmes 1981). Higgins(1959), for example, observed that the frequency of persistent cough with phlegm was as high as 42 percent in

heavy smokers aged 55-64 years. In India, the prevalence of chronic bronchitis has been reported to be significantly higher amongst smokers than non-smokers (Viswanathan 1964; Wig et al. 1964; Nigam et al. 1982). The same pattern was also observed in Lagos, Nigeria whereby 41 percent of male bronchitis sufferers were cigarette-smokers (Femi-Pearse, et al. 1973).

Probably, on this basis, there is a ground to fear of exporting cigarette-induced diseases to the developing nations as voiced by several researchers (de Hamel et al. 1972; BMJ 1971). To what extent this fear is timely or belated can be determined by an epidemiological survey of respiratory symptoms and smoking habits. There is no such study available in the Malaysian context, although a few studies (Pathmanathan 1975; Suphmaniam 1980; Rampal 1983) have indicated habits and attitudes of some groups of people toward smoking. However, they did not attempt any correlation with respiratory symptoms such as bronchitis.

Thus, the present paper will attempt to describe the frequency of bronchitis sufferers and their relationship to cigarette smoking habits with special reference to Kuala Lumpur.

MATERIAL AND METHODS

This paper is a preliminary study of the occurrence of bronchitis in Kuala Lumpur. By using a cluster-stratified sampling technique, approximately 23.0 percent of the samples were chosen from the 516 adult in-patients (20 years and above) who were registered at the General Hospital of Kuala Lumpur, from 1979 to 1985. There were chosen on the basis of different ethnic groups, age and sex, socio-economic background and different planning units area in Kuala Lumpur.

The chosen in-patients were then interviewed by trained interviewers, using the modified Medical Research Council's questionnaire (MRC) for respiratory symptoms (BMJ 1960). Because of the respondents were all bronchitis sufferers, sections on identifying such symptoms in the original questionnaire were deleted in the survey. Instead, questionnaires were focused more on the socio-economic and smoking habits of the respondents. In this study, a smoker was defined as one who has smoked 1 cigarette (or 1 gm. of tobacco) or more daily for one year. On the other hand, ex-smoker was generally defined as the smoker who has stopped smoking at the time of the survey regardless of the exact time of his giving up smoking. It is hypothesized that the bronchitis cases reflect the socio-economic background and smoking habits of the respondents. The respondents were then classified into three groups, namely the non-smoker, smoker and the ex-smoker.

OBSERVATIONS

The survey reveals that smokers and ex-smokers constitute about 56.0 percent of the respondents with a different smoking habits among the two sexes. Males form about two third of the smokers and ex-smokers, whereas the concentration of females sufferers can be seen highly in the non-smoker group. Furthermore, the sex difference was analysed by chi-square test and found to be statistically highly significant (Table 1), implying that female sufferers from the non-smoking group could possibly be better explained by other predisposing factors. In relation to this, the majority of females in all three smoking habit groups were either housewives or unemployed. Hence, factors such as indoor air pollution due to cooking and also unfavourable housing conditions could possibly be important in tracing the causal-factors of the disease among females.

The different percentage of bronchitis prevalence rate among respondents who smoked 12 cigarettes per days (light smokers) and 13 (heavy smokers) was very small, that is only 8.4 percent (45.8 and 54.2 percent, respectively). However, ex-smokers revealed a great difference between the two categories; 17.6 percent for the light ex-smokers while 82.4 percent for the other group. Statistically, the different is very much significant ($\chi^2 = 4.129$; $p = 0.05$).

TABLE 1. Distribution of Smoking Habits by Sex
(Percentage and Chi-square Test)

Smoking Habbits	Sample (%)	Males (%)	Females (%)
Non-smokers	44.0	23.5	76.5
Smoker	41.4	85.4	14.6
Ex-smokers	14.6	82.3	17.7
	$\chi^2 = 43.76$	d.f. = 2	$p = < 0.01$

Source: Shaharuddin 1988.

This is clearly indicated that heavy smokers and ex-smokers had suffered from the disease quite significantly. Most of the ex-smokers gave up smoking due to the advice of doctors with respect to their health conditions. However, a few of them attributed it to financial problem, and family advice.

How serious is the effect of smoking on bronchitis occurrences can also be judged by taking into consideration the frequency of medical visit by respondents who suffered from the disease for about the last five years prior to survey. The highest percentage of respondents visited medical centres during this period is between 11 and 20 times, irrespective of

smoking habits groups (Table 2). The difference between the two groups is statistically significant at the required probability level of 0.05.

TABLE 2. Chi-Square Test between Smoking Habits and Number of Medical Visits

Medical Visits (Times)	Smoking Habbits	
	Non-Smokers	Smokers
1. < 10 (45)	23	22
2. 11 - 20 (56)	26	30
3. ≥ 21 (15)	2	13
$\chi^2 = 6.78$		d.f. = 2
		$p = < 0.05$

Source: Shaharuddin, 1988.

DISCUSSION

Although the relationship between smoking amongst adolescents and old people and bronchitis occurrences, is not statistically proven, the absolute number of sufferers indicates an increase number of cases with age, especially among smokers and ex-smokers (Figure 1.). Several studies (de Hamel et al. 1972; Nigam et al. 1982; Shaharuddin 1988; Payne et al. 1964; Reid 1973) have reported high associations between smoking habits and bronchitis with age groups. On the other hand, the increasing bronchitis cases with increasing age, which is apparent among smokers and ex-smokers, not occur among non-smokers. This could be attributed to more females were suffering from the disease in the non-smoker group. Hence, other causal-factors, such as domestic and out-door air pollution and house conditions, could be the most appropriate explanation to the high occurrences of the disease in this group (Femi-Pearse et al. 1973).

Duration of smoking shows a significant effect on the occurrence of bronchitis in Kuala Lumpur. Using the product moment correlation coefficient, r , technique, the number of hospital visit by respondents were then tested against this independent variable. In spite of a low value of r that is 0.37, the relationship is significant at the 0.001 level of probability ($F = 18.509$). Whilst it is not a dominant bronchitis predisposing factor, it did produce a positive relationship and could then be important in an attempt to trace the incidence of the disease among the respondents.

Individually, the number of cigarettes per day and the duration of smoking did contribute certain weight in understanding the disease

causal-factors. However, the combination of the two might explain clearly the effect of smoking habits on bronchitis. Therefore, the two independent variables can be analysed simultaneously by using multiple regression technique. The relationship was then calculated as follows:

$$Y = 10.7 + 0.163 \text{ CIGARETTES} + 0.09 \text{ DRSMK}; R = 0.41$$

The two independent variables, that is CIGARETTES (number of cigarettes smoked per day) and DRSMK (duration of smoking), to some extent, do contribute significantly to the overall variation of the number of medical visits ($F = 11.509$; $p = < 0.001$). The predicted dependent variables as produced by the model are then compared with the actual ones (Figure 2). The dashed lines on the graph indicate the confidence limits within which actual and predicted rates only differ through chance ($p = 0.99$). Nevertheless, from the degree of fit, it would appear that these predisposing factors can only explain about 17 percent of the frequency of medical visits by the respondents. Furthermore, the analysis of the residuals shows that six outliers were produced by the relationship. By withdrawing the six pairs, the new regression was calculated.

$$Y = 10.5 + 0.159 \text{ CIGARETTE} + 0.069 \text{ DRSMK}; R = 0.41$$

The new regression gives the confidence limits of which only one is truly an outlier, that is 33 (Table 3). Hence, at least, it cannot be 99 percent sure that the others are outliers. And they are actually the same population as the rest of the data.

TABLE 3. Confidence Limits for Six Outliers after the New Regression Equation

Outliers (number of medical visits)	Predicted Values	Lower Limit	Upper Limit
25	10.50	- 4.97	25.98
30	14.26	- 1.47	30.00
30	16.10	0.37	31.82
32	16.52	0.67	32.37
1	13.05	- 2.46	28.56
33	14.62	- 1.30	30.54

Source: Shaharuddin 1988.

The one outlier is probably best explained by other predisposing factors. Further investigation shows that this particular respondent is Chinese who, for the last five years prior to the survey, lived in an unpleasant to his neighbourhood and exposed to poor working

environment. Moreover, he was a self-employed worker, doing construction works. Therefore, exposure to these conditions could explain why this particular respondent has suffered from bronchitis.

CONCLUSION

The study, thus, revealed that occurrences of bronchitis as recorded at the Kuala Lumpur General Hospital is partly attributed to smoking habits among the sufferers, especially for the males. Bronchitis in smokers and ex-smokers may have complications more frequently and earlier than the non-smoker group. Amongst the females, who are considered as a non-smoker group, other causal-factors such as living conditions, outdoor and domestic air pollution perhaps play a major role in causing and aggravating the disease. However, there is also a possibility that the female sufferers contracted the disease by being a passive inhaler at their homes, working places and many public places (Higgins et al. 1977; Lebowitz et al. 1976; Schmeltz et al. 1975).

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