Knowledge and Awareness about Lung Cancer: A Study on the Secondary School Teachers in West Bengal

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ABSTRACT   *The main objectives of this study were to determine the level of knowledge & awareness about lung cancer among secondary school teachers in West Bengal. A cross sectional study was conducted among 50 secondary school teachers of Bengali medium school under W.B.B.S.E located in Kolkata district. Self administered questionnaire covering socio-demographic characteristics and general knowledge of lung cancer, were distributed among secondary school teachers. All the data were analyzed using Z-test, ANOVA for univariate analysis & multiple linear regressions through SPSS version 20 was done for multivariate analysis. In this study it was found that overall knowledge of secondary school teachers regarding lung cancer was moderately high. It was also found that there was a significant difference in knowledge & level of awareness regarding lung cancer among male and female secondary school teachers in W.B, but locality of the teachers and ages of the teachers has no significant impact on knowledge & level of awareness regarding lung cancer.*

KEYWORDS: *Lung cancer, level of knowledge & awareness, feedback from school teachers*

INTRODUCTION:

Cancer is emerging as a major health problem globally with over 10 million new cases of cancer and more than 6 million deaths due to cancer worldwide. According to World Health Organization, there is a high incidence rate of cancer throughout the world and it may reach about 20 million by 2030 (WHO, 2008). Lung cancer is the most frequent malignant disease and is also the most common cause of death from cancer, with 1.38 million deaths worldwide (*Ferlay et al., 2010*).   The association between smoking and risk of the development of cancer is well established (H*ymowitz, 2011; Duaso and Duncan, 2012; Durkin et al., 2012; Jensen et al., 2012; Mao et al., 2012; Mitchell et al., 2012*). Cigarette smoking is an international public health problem that has been called the most preventable cause of death (*Pride and Soriano, 2002*). Tobacco is a major risk factor for several other types of cancer including oral cavity, bladder, kidney, pancreas, stomach, cervix, and acute myelogenous leukemia (*Sasco et al., 2004; Gandini et al., 2008*). Therefore, smoking prevention and cessation are important national health policies in many countries. Studies have viewed lung cancer as a multi-factorial disease. Smoking and occupational exposure to potential carcinogenic compounds are considered as major risk factors for lung cancer (Wogan et al., 2004).

In Kolkata 16.2% male and 3.9% female were affected by lung cancer in 2005 & this number of frequency was gradually increased. In 2013, 20.5% male & 6% female were affected by lung cancer. It was also found that till 2005, age of the people between 50-79 years were mostly affected by lungs cancer, after from 2005 to till now 30-39 years aged people were mostly affected by lungs cancer. (Data source: Chittaranjan National Cancer Institute, Kolkata). We know that teachers play a role model for their student. Teachers who smoke may therefore influence adolescents to adapt smoking through direct modeling. So it is essential to study on level of the knowledge and awareness on various aspects about lung cancer among the school teachers in West-Bengal.

OBJECTIVE OF THE STUDY:

The objectives of the present study have been focused on following aspects:
- To assess the knowledge of secondary school teachers regarding lung cancer.
- To identify the relationship between socio-demographic variable (age, locality) of

teachers & knowledge of lung cancer, prevention etc.
➢ To compare the knowledge, level of awareness on lung cancer between male and female school teacher.
➢ To know the reason for starting cigarette smoking among secondary school teachers smoker.
➢ To know the age of the smokers when they started to smoke.
➢ To know the number (%) of smokers in different gender.
➢
HYPOTHESES:
H₀1: There is no significant difference in knowledge & level of awareness regarding lung cancer among the male and female secondary school teachers in W.B.
H₀2: There are no significant differences in knowledge & level of awareness regarding lung cancer among rural & urban secondary school teachers in W.B.
H₀3: There is no significant relationship between the age of the teachers of secondary school and the knowledge & level of awareness regarding lung cancer.

MATERIALS AND METHODS:
A cross-sectional study was conducted based on self-administered questionnaire which was distributed among the secondary school teachers in Kolkata. The study was held at 6 secondary schools in Kolkata. It involved 50 respondents of secondary school teachers. The questionnaires were in English language and distributed to the participants. The questionnaire consists of two parts. The first part was about socio-demographic characteristics such as (age, locality, sex etc). The second part was about the general knowledge of lung cancer, knowledge of lung cancer symptom and knowledge of lung cancer prevention. All data of questionnaires were collected and recorded.

Data was analyzed using M.S Excel 2007 and Statistical Package of Social Science (SPSS) version 20. ANOVA and Z-test were used for univariate analysis; and multiple linear regression was used for multivariate analysis.
➢ **POPULATION:** All the secondary school teachers in west Bengal.
➢ **SAMPLE:** 50 secondary school teachers of Bengali medium school under West Bengal Board of Secondary Education were randomly chosen from both rural and urban areas of Kolkata district only.

VARIABLE:
➢ **Independent variables:** Selection of sample on the basis of **gende**r, **locality, age** & questionnaire which is implemented on teacher.
➢ **Dependent variable:** Feedback of secondary school teacher's i.e. Knowledge of secondary school teachers on lung cancer**.**
➢ **Moderator variable:** level of Intelligence of secondary school teachers.
➢ **Intervening variable:**
  • Environmental variable
  • Socio economic status of teachers
  • School variable
➢ **Extraneous variables:** Previous knowledge of secondary school teachers, which was controlled by random sample selection.

RESULTS:
❖ A total number of 50 secondary school teachers participated in this study. The number of male and female teachers was 28 and 22. More than half (30 teachers) of the participants was belongs to urban area, and the age of the teachers between 30-39 years are maximum's present in this study. The knowledge about lung cancer among school teacher was presented in graph 1

Graph 1:
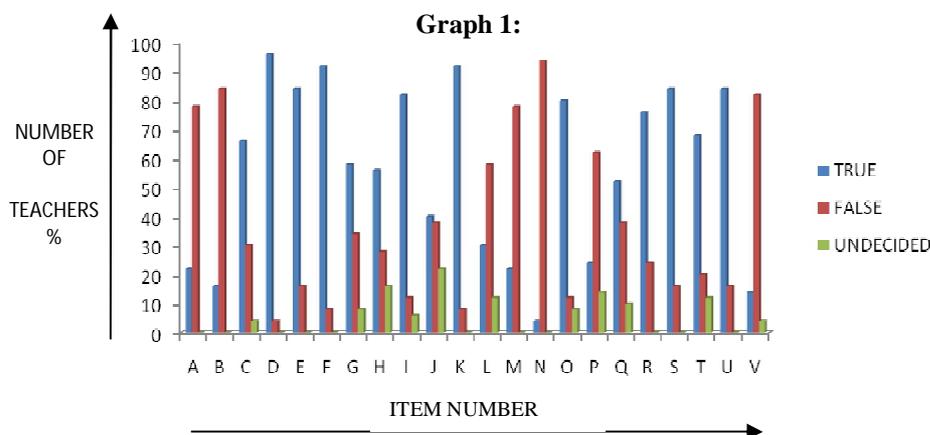
[**Items:** If you have never smoked, you don't need to worry about lung cancer.(A),There nothing people can do to decrease their chances of lung cancer(B),The lung damage that leads to cancer can be repaired by quitting smoking.(C),Lung cancer is one of the deadliest cancers. (D), Lung cancer is a disease in which lung cell grow abnormally. (E), Tobacco smoking is the most common cause of lung cancer.(F), Lung cancer occur most often in people 65 and older(G), Lung cancer has no presenting symptoms (H), Only males are affected by lung cancer(I), Lung cancer can be transmitted from one to another(J), Things around home or work, including asbestos, ionizing radiation and others cancer causing substance(K), Lung cancer is a normal growth of lung cell (L), Lung cancer is a supernatural (magical) disease (M), The teachers who smoke cannot advice others to quit smoking(N), Teachers who smoke affect negatively to quit smoking(O), Stop smoking in difficult (P), Advanced or final stage of lung cancer symptoms are breathing difficulty(Q), One pack of cigarettes a day increase the chance of developing lung cancer by 20 fold.(R), Chemo is one of the method for treatment of lung cancer(S), If woman smokes as much as a man her chance of getting lung cancer is more(T), Having a healthy diet and exercise can lower your risk of lung cancer(U), You do not need to have cancer screening if you live a healthy life style(V)]

❖ It was found that scores obtained from male and female teachers was normally distributed (as the significance value of the Shapiro-Wilk Test is greater than 0.05 in table 1 & in graph 2.1 &2.2 the data points will be close to the diagonal line). Univariate analysis by using Z-test showed that there is a significant difference in knowledge and level of awareness regarding lung cancer among the male and female secondary school teachers in West-Bengal(as our calculated Z value 2.77 is more than critical value in table2).

Table 1: Testing for normality of data using SPSS   **Table 2: Z score of male and female data**

Tests of Normality

	gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
knowledge	male	.134	28	.200[*]	.953	28	.239
	female	.206	22	.016	.915	22	.060

[*]. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

variable	Calculated "Z" score	Critical value of "Z"
Gender	2.77	1.96(0.05 level) 2.58(0.01 level)

Graph 2.1: Graphical representation of data using SPSS (male)   **Graph 2.2: Graphical representation of data using SPSS (female)**
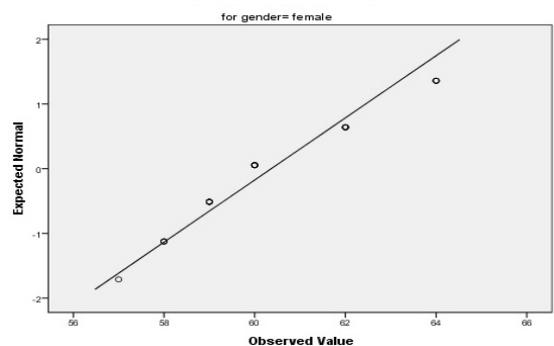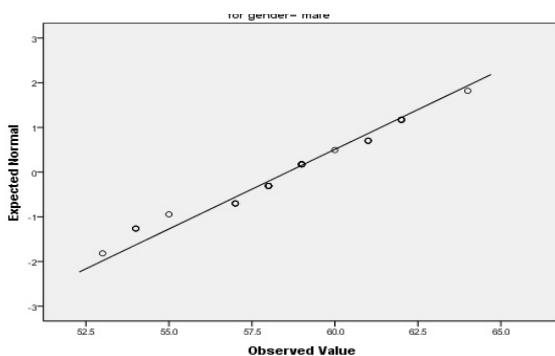
❖ It was also found that Scores obtained from rural and urban teachers also was normally distributed (as the significance value of the Shapiro-Wilk Test is greater than 0.05 in table 3 & in graph 3.1&3.2 the data points will be close to the diagonal line).

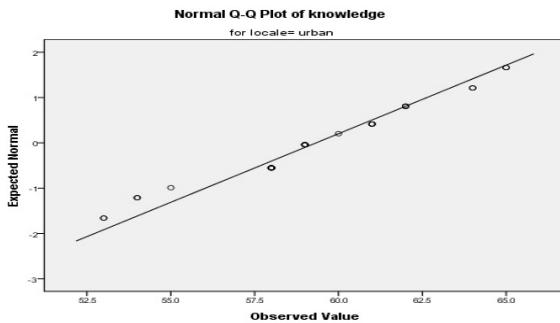**Table 3: Testing for normality of data using SPSS**   **Table 4: Z score of rural and urban data**

Tests of Normality

	locale	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
knowledge	urban	.177	30	.018	.945	30	.126
	rural	.177	20	.101	.925	20	.124

a. Lilliefors Significance Correction

variable	Calculated "Z" score	Critical value of "Z"
locality	0.20	1.96(0.05 level) 2.58(0.01 level)

Graph 3.1: Graphical representation of data using SPSS (urban)   **Graph 3.2: Graphical representation of data using SPSS (rural)**
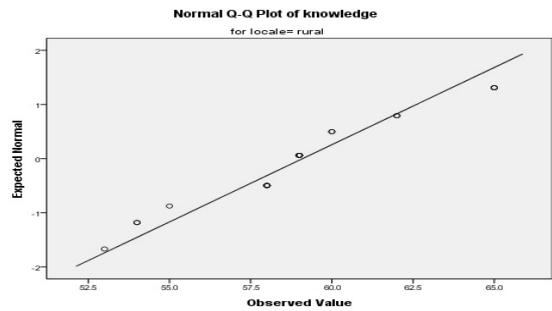
Normal Q-Q Plot of knowledge for locale= urban

Normal Q-Q Plot of knowledge for locale= rural

Univariate analysis by using Z-test showed that there is no significant difference in knowledge and level of awareness regarding lung cancer among the rural and urban secondary school teachers in West-Bengal (as our calculated Z value 0.20 is lower than critical value in table4).

❖ It was found that Scores obtained from teachers under different ages was normally distributed (as the significance value of the Shapiro-Wilk Test is greater than 0.05 in table 5 & in graph 4.1, 4.2 &4.3 the data points will be close to the diagonal line).

Table 5: Testing for normality of data using SPSS   **Graph 4.1: Graphical representation of data using SPSS (age 20-29 yr)**

Tests of Normality

	age	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
knowledge	20-29 years	.211	12	.147	.887	12	.109
	30-39 years	.196	20	.043	.912	20	.070
	40-49 years	.157	18	.200[*]	.909	18	.082

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

for age= 20-29 years
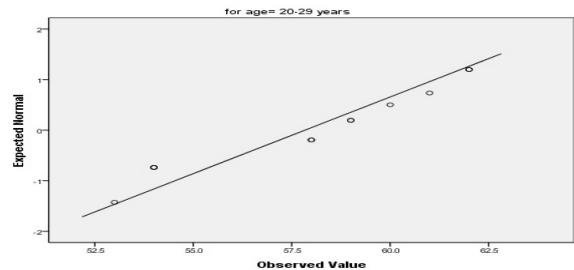
Graph 4.2: Graphical representation of data using SPSS (30-39yr)   **Graph 4.3: Graphical representation of data using SPSS (40-49yr)**
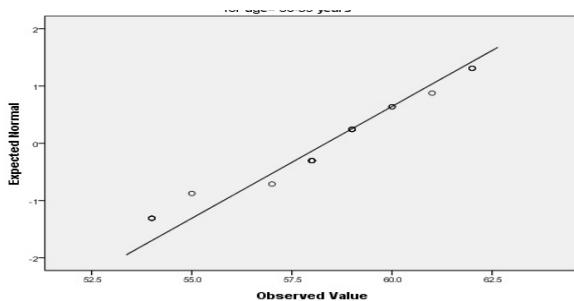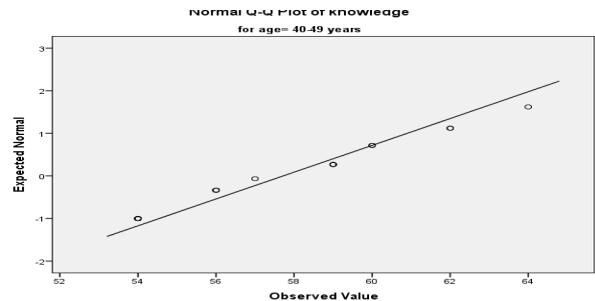

for age= 30-39 years

Normal Q-Q Plot of knowledge for age= 40-49 years

Table 6: Calculation of ANOVA using MS Excel

ANOVA: Single Factor SUMMARY						
Groups	Count	Sum	Average	Variance		
X1	12	694	57.83333	10.87879		
X2	20	1167	58.35	6.555263		
X3	18	1039	57.72222	10.09477		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.172222	2	2.086111	**0.235788**	0.790877	3.195056
Within Groups	415.8278	47	8.8474			
Total	420	49				

- ❖ Univariate analysis by using ANOVA showed that there is no significant difference in knowledge and level of awareness regarding lung cancer among the secondary school teachers under different ages in West-Bengal (as in table 6 the calculated F value 0.235 is smaller than F critical value 3.19).
- ❖ It was also found that reason behind starting cigarette smoking among school teachers was – a break(14%), habit(10%), stress relief(8%), relaxation(6%). The number of smokers in different sex was male (17%) & female (02%).
- ❖ Maximum age of the smokers when they started to smoke was in 19-21 years (graph 5).

Graph 5: Graphical representation of no. of teachers started smoking in different age

- ❖ Multiple analysis using multiple linear regression showed that our independent variable (gender, age, locale) explains 6.7% of the variability of our dependent variable (knowledge) table 7.1. In table 7.2, the F ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The table value shows that the independent variables statistically significantly predict the dependent variable (as $p<0.0005$). Unstandardized coefficient indicate (table 8.3) indicate how much the dependent variable varies with an independent variable when with an independent variable when all others independent variable are constant. In my result the unstandardized coefficient B1 for gender is equal to +1.665. This means that for changing gender (1 to 2) [in SPSS male is label by 1 and female is label by 2] there is an increase in knowledge, i.e. gender has an impact on knowledge about lung cancer. In table 7.3 the t-value & corresponding p-value are located in the "t" column & "sig" column where all independent variable coefficient are statistically significant (as $p<0.05$).

Table 7: Results of multiple regression using SPSS

➡ **Regression**

[DataSet0]

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AGE, GENDER, LOCALE[b]	.	Enter

a. Dependent Variable: KNOWLEDGE

b. All requested variables entered.

Table 7.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.259[a]	.067	.006	3.24129

a. Predictors: (Constant), AGE, GENDER, LOCALE

Table 7.2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.725	3	11.575	1.102	.358[b]
	Residual	483.275	46	10.506		
	Total	518.000	49			

a. Dependent Variable: KNOWLEDGE

b. Predictors: (Constant), AGE, GENDER, LOCALE

Table 7.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	56.021	2.753		20.352	.000
	GENDER	1.665	.924	.257	1.802	.078
	LOCALE	.000	1.018	.000	.000	1.000
	AGE	.180	.652	.043	.276	.784

a. Dependent Variable: KNOWLEDGE

DISCUSSION:

Teachers play a role model for their student. Similar study found reported that teachers are regarded as significant role models (*Oetting & Donnermeyer, 1998*). Teachers who smoke may therefore influence adolescents to adopt smoking through direct modelling. Several studies suggest that the major factors predicting onset of smoking are socio-environmental (*Reid et.al. 1995*).This study found that in some cases very poor knowledge about lung cancer among secondary school teacher. More than half (82%) mentioned that only males are affected by lung cancer, which is incorrect information. Lung cancer can affect both males & females. According to the American Cancer Society's, 2017, about 155,870 deaths from lung cancer on which 116,990 in men & 105,510 in women. Another indication of the poor knowledge among secondary school teachers is that about 40% of them mentioned that lung cancer can be transmitted from one person to another person. Regarding the knowledge about lung cancer and smoking; about 92% of the study participants mentioned that cigarette smoking is a most common cause of lung cancer. A higher percentage was reported by *Chawlaet. al.* Primary risk factor for lung cancer was found to be 100% amongst males. According to the United States Department of health & human services that 90% of all lung cancer is caused by tobacco smoking.

In this study 92% of the participants reported that asbestos, lionizing radiation and other cancer causing substances are some of cause factor of lung cancer. A Malaysian study reported that 75.6% of the participants mentioned that occupational exposure is one of the risk factors of lung cancer (*A1 – Naggar, 2012).*

In this study 56% of the participants reported that lung cancer has no presenting symptoms, but 52% of the participants states that final stage of lung cancer symptoms are breathing difficulty. So in this study the knowledge of school teachers about the symptoms of lung cancer is very low. It is very important for the public to know the symptoms of lung cancer in order to detect the cancer early. Therefore there is a need for the effort of the media and campaign for regular education materials for the general population. A study showed that lung cancer could be picked up much earlier if only the public & health professionals learnt how to recognize the critical symptoms (*Mathieson, 2005*).

In this study 84% of the participants stated that having a healthy diet and exercise can lower risk of developing lung cancer. A studies also indicate that most cancer are not of hereditary origin and that life style factors, such as diet habits, smoking, infections have a profound influence on their development (*Irigaray et. al. 2007*). Various phyto-chemicals have been identified in fruits, vegetables, and grains that exhibit chemo preventive potential, and numerous studies have shown that a proper diet can help protect against cancer (*Greenwald, 2005; Vainio, and Weider pass 2006*).In this study it was seen that mean score of female teacher was slightly more/high than male teacher, & statistical analysis also concluded that there is a significant differences in knowledge & level of lung cancer awareness among the male & female secondary school teacher. The prevalence of smoking among school teachers in W.B was determined to be 38%. The age of onset of smoking in this study was 23±4.47 years (range from 16-30 years) for the teachers. In this study maximum number of teachers started smoking from the age 19-21 years. A previous study showed that individuals who started smoking before age 13 were less likely to stop smoking than those who started after age 13 (Coogan et al., 1998) therefore early identification of this high-risk group in very important.

CONCLUSION AND SUGGESTION:

Overall knowledge of secondary school teachers about lung cancer was moderate. Interventions to increase lung cancer awareness are needed to improve early detection behavior. **In this study it was concluded from both z-score, ANOVA & multivariate analysis using multiple linear regression showed that gender factor has an impact on knowledge & level of awareness regarding lung cancer**.

But locality of the teachers & ages of teachers has no significant impact on knowledge & level of awareness regarding lung cancer. So, conclusion is –

There is a significant difference in knowledge & level of awareness regarding lung cancer among the male & female secondary school teachers in W.B.

There is no significant difference in the knowledge & level of awareness regarding lung cancer among rural & urban secondary school teachers in W.B.

There is no significant difference in the knowledge & level of awareness regarding lung cancer among different ages of secondary school teachers in W.B.

Many teachers have good knowledge about lung cancer & they also know that smoking is major cause for lung cancer but they smoked for different reason.

So, it is important to involve teachers in smoking prevention program in schools and increase their awareness of hazardous smoking as well to discourage them to smoke in school places. Teacher training should be conceptualized as a behavior change processes with explicit teacher motivation components including helping affect the intended behavior. Providing written material for teachers could enhance health education programme aimed at smoking prevention, both in terms of current smoking and future intent to smoke, lectures and talks on smoking should be included in the curriculum of teacher's training courses. Banning smoking totally in public places as well as in institution is highly recommended as primary preventive measures.

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