



PROSIDING
INTERNATIONAL SEMINAR

**THE IMPACTS OF REGULATIONS
ON TOBACCO CONTROL**
**(Review Of Health, Economic, Social
and Cultural Aspects)**

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SUB TEMA 1

**TOBACCO AND ITS IMPACT
ON PUBLIC HEALTH**

THE EFFECTS OF SMOKING HABITS AND EXPOSURE TO ULTRAVIOLET LIGHT OF SENILE
CATARACT OCCURRENCE

(A Case Study On Ophthalmology Poly Of Rsd Dr. Soebandi Jember)

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ABSTRACT

Background: Cataract is a pathological condition in which the lens becomes cloudy as a result lens fluid dehydration or lens protein denaturation. Risk factors that may influence the occurrence of cataracts are nutritional status, long steroid use, inherited metabolic disorders, chronic exposure to ultraviolet light, family history of cataract, alcohol, nutrition, smoking, socioeconomic degree and educational status.

Objective: The purpose of this research was to determine the effects of smoking habits and ultraviolet light exposure on the incidence of senile cataract disease in ophthalmology section at dr. Soebandi Hospital Jember.

Methods: This research was an observational analytic study using case-control study approach. The sample cases were patients who were diagnosed by doctor to suffer from senile cataract for which they were seeking treatment as many as 20 people. Control samples were patients diagnosed by doctors not suffer from senile cataract as many as 60 people. The data obtained were analyzed using bivariate analysis with logistic regression test with a significance level of 5% ($\alpha = 0.05$).

Result: The research results indicated a significant effect on the disease of senile cataract with statuses of passive smokers ($p=0,021$) and ultraviolet light exposure ($p=0,0001$). While the variables which were not significant were smoking status, duration of smoking and the number of cigarettes smoked.

Conclusion: There is a significant effect on the disease of senile cataract with statuses of passive smokers and ultraviolet light exposure. Health education to passive smoker was needed to prevent the increasing incidence of cataract senile

Keywords : *smoking habits, ultraviolet light exposure, senile cataract.*

INTRODUCTION

Health development aimed at improving human resources in Indonesia. This is to achieve optimal health, one through five senses, namely health sense of vision. Therefore, the sense of sight is one of the key factors for the realization of optimal health (Ministry of Health, Republic of Indonesia, 2005). This is because about 83% less than the main route of

absorption of information in the individual learning process occurs through the senses of sight (Wahyu, 2008).

World Health Organization (WHO) estimates there are 45 million blind people in the world, and the third of which are in Southeast Asia. An estimated 12 people become blind every minute in the world, and 4 of them are from Southeast Asia, while in Indonesia is estimated that every minute there is one person to be blind (WHO, 2005). Sense Health Survey in 1993-1996 Sight and Hearing in Agustiawan (2007), showed the blindness of 1.5%. Where the leading causes of blindness are cataract (0.78%), glaucoma (0.20%), refractive disorders (0.14%), and other diseases associated with aging (0.38%). Meanwhile, according to the Basic Health Research (Riskesdas) National in 2007, is known for blindness due to cataract (1.8%), which increased from 1.2% according to the 2001 Household Health Survey.

Cataract is a clouding or loss of transparency of the lens proteins (crystalline). Turbidity is caused by normal metabolic disorder lenses that can arise at various specific age (Elias, 2009). The etiology of cataract is still not clear and is associated with many factors. But the main cause of cataracts is the natural process of age with continued increases cause changes in the eye. Other risk factors that may influence the occurrence of cataracts is nutritional status, steroid use long, congenital metabolic disorders, chronic exposure to ultraviolet light exposure, family history of cataract, alcohol, nutrition, smoking, degree of socio-economic and educational status (Lusianawaty et al , 2007). A study by Hanifah in 2010 known significant relationship between the variables of smoking, exposure to ultraviolet rays, alcohol consumption, diabetes mellitus, and hypertension on the incidence of senile cataract (Hanifah, 2010).

Based on a preliminary survey of the data obtained in patients with cataract during the first three months of 2011, there were 284 people have cataract patients who went to poly RSD eye dr. SoebandiJember, of which 68.66% is of cases the old and the other is a new case (31.34%). While patients with senile cataract were recorded in RSD dr. JemberSoebandi much as 268 patients. This suggests that the incidence of senile cataract in RSD dr. Soebandi still experiencing increased cases in each period.

Aim of this study was to analyze the effect of smoking and sun exposure on the incidence of senile cataract in Poly's RSD dr. Soebandi Jember.

METHODS AND MATERIALS

The research is quantitative research that uses observational analysis of case-control research (case control). The population of the case study is that all patients with senile cataract treatment in Poly's RSD dr. SoebandiJember in 2011. While population control is not senile cataract patients who seek treatment at Poli's RSD dr. SoebandiJember in 2011. While the sample of cases in this study were diagnosed patients suffering from senile cataract patients who seek treatment at Poli's RSD dr. SoebandiJember in May 2011 - June 2011. Control sample of patients diagnosed with a doctor is not the treatment of senile cataracts in Poli's RSD dr. SoebandiJember in May 2011 - June 2011.

The research was conducted in Poly's RSD dr. SoebandiJember during the month of June 2011. Taking a sample of 60 respondents with details of 20 respondents to a sample of respondents for cases and 40 control samples. Sampling Systematic random sampling technique. The independent variables in this study were: respondent characteristics (age, gender), smoking (smoking status, duration of smoking, number of cigarettes smoked, passive smoking status), and exposure to ultraviolet light (long exposure), while the dependent variable in the study This was the incidence of senile cataract.

Data analysis is used to see the effect of smoking and exposure to ultraviolet light on the incidence of senile cataract in the eye Poli RSD dr. Soebandi, by calculating odds ratios (OR) using a 2 x 2 table, while to investigate the influence of the independent variables and the dependent variable calculated using simple logistic regression test with significance level of 5% ($\alpha = 0.05$).

RESULTS AND DISCUSSION

Characteristics of respondents by age are presented in Table1 as follows :

Table 1. Distribution Characteristics of Respondents by Age and Sex

Age	Case		control		Total	
	n	%	n	%	n	%
< 50 years old	5	8,3	19	31,7	24	40,0
≥ 50 years old	15	25,0	21	35,0	36	60,0
Total	20	33,3	40	66,7	60	100
Sex						
Male	9	15,0	19	31,7	28	46,7
Female	11	18,3	21	35,0	32	53,3
Total	20	33,3	40	66,7	60	100

Based on table 1, the distribution of respondents by age is known that the majority of respondents aged ≥ 50 years with a percentage of 60.0%. There are common characteristics in the two groups according to age well in the case group and the control group, where the majority of respondents aged ≥ 50 years, as many as 25.0% in the case group and 35.0% in the control group. Gender distribution of respondents with female sex is slightly more (53.3%) respondents than male sex (46.7%). There are similarities between the two groups in the case where the respondent is a female gender is at 18.3% while the control group was also more respondents with female sex by 35.0%.

Smoking Habits

Distribution of smoking status of respondents is as follows:

Table 2. Distribution of Smoking Habits

Smoking Habits	Case		Control		Total	
	n	%	n	%	n	%
Yes	11	18,3	15	25,0	26	43,3
No	9	15,0	25	41,7	34	56,7
Total	20	33,3	40	66,7	60	100
quit smoking						
Yes	4	15,4	8	30,8	12	46,2
No	7	26,9	7	26,9	14	53,8
Total	11	42,3	15	57,7	26	100
Duration of smoking						
< 10 years	1	3,8	8	30,8	9	34,6
≥ 10 years	10	38,5	7	26,9	17	65,4
Total	11	42,3	15	57,7	26	100
Numbers of cigarettes						
< 10 cigarettes	1	3,8	5	19,2	6	23,1
10-20 cigarettes	3	11,5	4	15,4	7	26,9
≥ 20 cigarettes	7	26,9	6	23,1	13	50,0
Total	11	42,3	15	57,7	26	100
Passive smoking						
Yes	16	26,7	19	31,7	35	58,3
No	4	6,6	21	35,0	25	41,7
Total	20	33,3	40	66,7	60	100

Distribution of respondents by status of smoking can be seen as much as 56.7% of respondents do not have a smoking habit. It there is a difference in the two groups both in the case group and the control group, whereas in the case group contained 18.3% of respondents who smoked while in the control group there were 41.7% who do not smoke. from 26 respondents who smoke or equal to 43.3% of respondents who smoke are up to 53.8% of respondents currently still a smoker. In the case of 26.9% of respondents are still in have not quit smoking or as smokers whereas in the control group there were 30.8% of respondents who had quit as smokers.

Distribution of respondents by the duration of smoking can be seen that most of the respondents had smoked for over 10 years, it's good for the already quit or still smoked today. Where in the case of 38.5% of respondents had smoked for over 10 years, while in the control group by 30.8%, including the smokers who had smoked for less than 10 years. based on the number of cigarettes smoked during the day by the respondent in mind that most of the respondents smoked cigarettes in a day by more than 20 cigarettes amounted to 50.0%. In the case of a group known as much as 26.9% of respondents who smoked cigarettes by more than 20 cigarettes per day, and in the control group where there are 23.1% of respondents who smoked cigarettes by more than 20 cigarettes per day.

Distribution of respondents by status of passive smoking most respondents as passive smokers is equal to 58.3%. But there is a difference in the two groups both in the case group and the control group, whereas in the case of 26.7% of respondents are passive smokers while in the control group by 35.0% instead of passive smokers.

Effect of Smoking Status on Genesis senile cataract can be detected using a simple logistic regression with a value of $\alpha = 0.05$. It is known that smoking status variable has a p value = 0.200 with Odd's ratio (OR) of 2.037 and the lower and upper value Confidence interval (CI) 95%, ie 0.686 and 6.052. The results of the analysis showed that was not statistically significant, and thus variable smoking status did not influence the occurrence of senile cataracts.

The results of this study in line with the research Oktrafrida (2010) which stated if there was no association between smoking and the incidence of cataracts. Based on the results obtained in the field, possibly insignificant statistical results of this study could be possible because the respondents were netted at the time of the study are dominated by

women, while cigarette smoking is often done by men, so that the weakness of the current study could be due to a lack of male respondents.

The effect of smoking on the incidence of old senile cataract can be detected using a simple logistic regression test with a value of $\alpha = 0.05$. It is known that smoking has a variable length p value = 0.081 with Odd's ratio (OR) of 5.143 and the lower and upper value Confidence interval (CI) 95%, ie 0.819 and 32.302. The results of the analysis showed that was not statistically significant, so the old variable smoking does not affect the occurrence of senile cataract.

This research direction of the research Sugihana (2006), where 60.8% of respondents who have a long habit of smoking > 10 years have 3.65 times the risk of developing cataracts compared to those without the habit of smoking. The length of a person having that cigarette smoking causes accumulation of free radicals will be greater in the body. The ability of antioxidants are produced naturally by the body will not be able to offset the amount of accumulation of free radicals that enter the body, so the risk of damage to lens proteins will increase.

If seen from the percentage of respondents who smoked more than 10 years are more prone. The duration of smoking can be linked to the age of starting smoking and age quit smoking someday. Smoking also has a dose-response effect, meaning the young age of smoking will be the greater influence (Bustan, 2000). Smoking is rich in free radicals and other oxidative substances such as aldehydes. Free radicals can damage proteins and smokers are more prone to cataracts than non-smokers (Youngson, 2005).

Effect of number of cigarettes smoked on the incidence of senile cataract can be detected using a simple logistic regression test with a value of $\alpha = 0.05$. It is known that smoking has a variable length p value = 0.063 with Odd's ratio (OR) of 3.079 and the lower and upper value Confidence interval (CI) 95%, ie 0.942 and 10.061. The results of the analysis showed that was not statistically significant, and thus a variable number of cigarettes smoked did not affect the occurrence of senile cataract.

Research is in line with research by Hiller et al (1997), in which he proved that there is a significant relationship between duration of smoking and number of cigarettes smoked per day against nuclear cataract. When viewed from the percentage of respondents most affected by senile cataract is the number of respondents who smoked more than 20

cigarettes. Heavy smokers who smoked more than 20 cigarettes per day will affect the levels of free radicals that enter the body in a matter of days.

Effect of passive smoking status on the incidence of senile cataract can be detected using a simple logistic regression with a value of $\alpha = 0.05$. known that smoking status variables have p value = 0.021 with Odd's ratio (OR) of 4.421 and Confidence interval (CI) 0.255 to 15.573. The results of the analysis showed that a passive smoker 4.421 times greater risk of suffering from senile cataract than those who are not as passive smokers. Smoking status was statistically significantly affect the incidence of senile cataract as p-value <0.05 and senile cataract risk factors for CI values exceed 1. Beside that passive smoking status variables can be continued into the multivariable analysis because the p-value <0.25.

These results are similar to studies by Adisurya (2006) suggest a link between passive smoking with the incidence of cataracts as indicated by the large risk of Katara 4 times greater than nonsmokers passively. Inhaled cigarette smoke affects smokers bad on the eyes. According to the Optometrists Association Australia (2005) and Action on Smoking and Health (2005), some of the substances contained in cigarettes are toxic to the eye tissue. Some substances in it can cause a decrease in the blood's ability to carry oxygen and decrease blood flow to the eye (ischemia). In addition, damage can occur due to oxidative stress, chemical reactions that damage proteins and lipids and antioxidants in the blood decrease. Eyes are organs that are particularly vulnerable to oxidative stress. Linkages smoking with an increased risk of eye disease has been demonstrated. Nuclear cataracts, age-related macular degeneration (Kumala, 2008).

Exposure to Ultraviolet Light

Table 3 Distribution of Exposure of Ultraviolet Light

Exposure of Ultraviolet light	Kasus		Kontrol		Total	
	n	%	n	%	n	%
Length exposure						
< 7 hours	4	6,7	31	51,7	35	58,3
≥ 7 hours	16	26,7	9	15,0	25	41,7
Total	20	33,3	40	66,7	24	100
Occupation						
TNI/ABRI	-	-	1	1,7	1	1,7
PNS	4	6,7	17	28,3	21	35,0
farmers	9	15,0	10	16,7	19	31,7
others	7	11,7	12	20,0	19	31,7
total	20	33,3	40	66,7	60	100

Exposure of Ultraviolet light	Kasus		Kontrol		Total	
	n	%	n	%	n	%
Uses Protective Equipment						
Yes	7	11,7	19	31,7	26	43,3
sometimes	2	3,3	4	6,7	6	10,0
No	11	18,3	17	28,3	28	46,7
total	20	33,3	40	66,7	60	100
Protective equipment variant						
Hats/ caping	6	18,8	13	40,7	19	59,3
glasses	1	3,1	5	15,6	6	18,8
others	2	6,2	5	15,6	7	21,9
total	9	28,1	23	71,9	32	100

Based on table 3 is known distribution of respondents by length of exposure to ultraviolet rays most of the respondents are exposed less than 7 hours is equal to 58.3%. In the case group contained 26.7% of respondents who had been exposed to ultraviolet light for more than 7 hours, whereas in the control group there were 51.7% of respondents exposed to ultraviolet rays is less than 7 hours. Exposure to ultraviolet rays may be associated with the occupation of the respondent. There are 35% of respondents who earns a meager living as a civil servant. In the case of more respondents livelihood as farmers / farm workers by 15%, whereas in the control group more respondents who earns a meager living as servants of 42.5%. Effect on many types of jobs that will be receiving radiation exposure. Certain types of work are at risk for excessive exposure to ultraviolet rays. Workers outside the building and exposed to ultraviolet B radiation from the sun, which is a factor associated with the development of cataracts (Tana, 2006).

It is well known behavior of respondents who did not use personal protective from the sun is equal to 46.7%. In the case of unknown if 18.3% of respondents do not wear protective of UVB rays sting. In the control group by 28.3% did not use personal protective UVB rays. Of the few respondents who use personal protective, there is a 59.3% regularly use the caping / hat. It is similar to those in both groups. There were 18.8% of respondents who use protective cap / hat in the case group and 40.6% of the respondents are wearing hats / hat in the control group.

Effect of long ultraviolet light exposure on the incidence of senile cataract can be determined by using logistic regression is known that ultraviolet exposure variables have p value = 0.000 with Odd's ratio (OR) of 13.778 and Confidence interval (CI) 3.668 to 51.748.

The analysis results show that a gain ≥ 7 hours of exposure to ultraviolet 13.778 times greater risk of suffering from senile cataract than those who exposed ultraviolet light <7 hours. Ultraviolet exposure was statistically significantly affect the incidence of senile cataract as p-value <0.05 and senile cataract risk factors for CI values exceed 1. Beside that variable exposure to ultraviolet light may proceed to the multivariable analysis because the p-value <0.25 . This study is similar to studies by Darmadi (2007), where there is a significant relationship between sunlight exposure on the incidence of cataracts. The role of UV seems more real as a factor in cataract formation senil. Exposure to UVB radiation even at the lowest level from the sun sometimes meningkatkan risk of cataracts and suspected association with cortical cataract types (WHO, 2005). In cortical cataracts, causing electrolyte overhidrasi lens causing melting of the lens. Cortical cataract formation clinically manifested by the formation of vacuoles, gaps, or lamellar which can be seen with the slitlamp. Protein aggregates cause a higher molecular weight protein. The increase in optical density can cause a shift in the index myopia resulting refractive error (Khaliullah, 2010).

Certain types of work are at risk for excessive exposure to ultraviolet rays. Workers outside the building and exposed to ultraviolet B radiation from the sun, which is a factor associated with the development of cataracts (Tana, 2006). In the case of more respondents who earns a meager living as a farmer / laborer of 15.0%. Occupation farmer / farm workers tend to be more exposed to sunlight containing UVB. Also on the case can also be shown as much as 46.7% if not wearing protective respondn to protect against UVB rays sting. This can increase the risk of exposure to UVB rays is higher.

In the control group of respondents more likely to work as a civil servant in the amount of 28.3%. PNS here tend to be a lot as a lecturer / teacher so it can be ascertained if the activities of the teacher is in the room. Nevertheless it is still possible UVB rays penetrate the room. For workers who work indoors and in vehicles, exposure to UVB rays can be suppressed by UVB absorption by the glass windows both in the room and inside the vehicle covered by a UV barrier filter (Tana, 2006). The behavior of respondents who did not use personal protective from the sun is equal to 46.7% can be worsened. There is a 59.3% regularly use the caping / hat, in the case of 18.8% of respondents are wearing protective caping / hat, and there are at 40.6% of respondents who use a caping / hat in the control

group. But it can still be possible still at risk due to exposure to UVB protector used not yet standardized.

CONCLUSIONS AND RECOMMENDATION

Conclusions

Based on the results of research and discussion, it can be concluded as follows:

- a. Distribution characteristics of the respondents are known to suffer from senile cataract occurs more frequently at age > 50 years, and female;
- b. No effect of smoking status, duration of smoking, number of cigarettes smoked and the incidence of senile cataract. However, there is the influence of the status of passive smoking on the incidence of senile cataract risk by 4.4 times;
- c. There is the influence of ultraviolet light exposure on the incidence of senile cataract with a risk of 13.8 times

Recommendation

Based on the above conclusions, the suggestions that can be provided are as follows:

- a. Efforts to prevent the dissemination and extension related senile cataract risk factors.
- b. Prevention efforts by the Department of Health with health education activities associated with the risk of secondhand smoke to develop cataracts, for example by advertising in public places. Besides working with the department of agriculture-related exposure to ultraviolet rays that trigger cataracts, by extension to farmer groups on the use of personal protective equipment from exposure to ultraviolet rays.
- c. Those people should take precautions to avoid exposure to secondhand smoke as an act of anticipation for passive smokers.
- d. There needs to be more research to determine the effect of smoking on certain population groups, exposure to ultraviolet light in a particular occupational groups, as well as the influence of consumption patterns on the incidence of cataracts, as well as the need for further research on the influence of other risk factors with the addition of the respondents in order to obtain a better analysis significant.

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As:

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In The Event
INTERNATIONAL SEMINAR**

**THE IMPACTS OF REGULATIONS ON TOBACCO CONTROL
(Reviews of Health, Economic, Social, and Cultural Aspects)**

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Jember, 7 November 2012



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