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Characteristics and risk factors of dry eye diseases among tax officers in East Denpasar in 2018



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ABSTRACT

Purpose: To find out prevalence and risk factors of dry eye disease among tax officer as computer users in East Denpasar in 2018.

Methods: Descriptive cross sectional study.

Results: An 13 east Denpasar tax office officer who had been working in front of the computer for more than 4 hours and break time less than 15 minutes have been interviewed, fill a questionaired and do a general ophthalmology examination with dry eyes test including schirmer test and TBUT. The majority of subjects were 30-50 year age group (midlife), with mild vision loss (<6/9-6/15) was 30.8%. The dry eye disease diagnosed by tear break up time and Schirmer test was 69.2%, and by OSDI score was 38.5%.

Conclusion: The risk factors of dry eye disease among tax officer were gender male, age more than 40 years old and smoking, but statistically insignificant.

Keywords: dry eye disease, computer user, risk factors.

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INTRODUCTION

Dry eye disease (DED) is a multifactorial disease of tears and ocular surfaces characterized by uncomfortable vision, blurred vision and instability of the tear film that can potentially cause damage to the ocular surface. Various risk factors that influence the occurrence of DED have been identified from various studies, including age, female sex, use of certain drugs, refractive surgery, radiotherapy, vitamin A deficiency, hepatitis C infection and stem cell transplantation. In addition, DED can be caused by visual activities such as reading, using a computer, and driving at night. The use of video display terminals (VDT) and staring at screens of technologic devices, including desktops, laptops, tablets, and smartphones have become ubiquitous in a wide range of a group such a offices, schools and households. Many studies have shown a close relationship between computer use and the incidence of DED. A 2010 survey by The European Working Conditions showed 30% of workers were in front of the computer all day during work and 25%

used it for a quarter to three quarters of the time.¹ The incidence of DED in office workers in Japan reaches 10.1-21.5%.² A study of 112 computer users found 68% of SMK incidence in men and 73% in women.³ A review by Blehm suggests that DED related to computer use is caused by reduced blink rate, blink amplitude and blink quality so that it causes instability from tears.⁴

METHODS

This was a descriptive cross sectional study. subject fill a questionaired and do a general ophthalmology examination with dry eyes test including schirmer test and TBUT.

RESULT

During the period August 2018 there were 13 tax office workers who underwent DED screening at the Pratama tax office in Denpasar and were included as subjects in this study. the distribution of computer user tax office employees who undergo DED screening at the Pratama tax office

in Denpasar by sex, women have a greater proportion (69.2%) than men (30.8%). DED screening is done mostly on workers aged 30-39 years (76.9%), who have visual aquity 6/6-6/15 (69.2%), last education level is Bachelor (61.5%) and does not smoke (92.3%). Research subjects who experienced DED based on objective examination were 69.2%, while those who experienced DED based on subjective symptoms were 38.5% (Table 1).

DED distribution found subjects who experienced mild DED by 2 people (40%), moderate DED by 1 person (20%) and advanced DED by 2 people (40%) (Table 2).

Table 3 shown the objective distribution of DED based on the results of the Schirmer and TBUT examination.

The data analysis (Table 4) showed male had a risk of experiencing DED 1.5 times higher than women ($p = 0.6$), age ≥ 40 years have a risk of experiencing DED 1.2 times higher than subjects aged 30-39 years ($p = 0.7$) and active smokers have a risk of experiencing DED 1.5 times higher than nonsmokers ($p = 0.6$).

DISCUSSION

In this study, DED refers to TBUT and Schirmer scores and the results were 69.2%. The study of DED in China uses the same objective DED criteria as this study with a prevalence of objective DED of 30.1%.⁵

Research subjects who experienced DED based on OSDI values of 38.5%. The studies using OSDI questionnaire as a DED diagnostic tool still limited. Some studies state that the OSDI questionnaire alone is not enough to diagnose a DED but OSDI is the most effective questionnaire as a tool.⁶⁻⁸

The prevalence of women experiencing greater DED than men. This is due to hormonal changes that occur in women related to use oral contraceptive, as well as hormonal therapy in menopausal and post-menopausal women.⁹⁻¹¹ Menopause causes estrogen deficiency and changes in the lacrimal gland. This process reduces tear production thereby increasing the risk of DED.¹² In this study, men had 1.5 times greater risk of DED than women. This result is probably due to the female sex in this study is still young. DED is more common in women because they have greater self-assessment and dissatisfaction than men.¹³

The analysis showed that over the age of 40 years had 1.2 times greater risk than individuals age of 30-39 years. This is same studies, which found that older individuals have a greater risk of DED.^{9,14,15} But, the relationship between age and DED was not significant, possibly due to the smaller number of samples. Changes in production and characteristics of tear film occur with age. There is a decrease in tear volume, increased evaporation and meibom gland dysfunction also predisposes to the occurrence of DED in older individuals.^{9,16}

The risk of DED in active smokers was increased by 1.5 times in this study. The level of risk is similar in accordance with other studies also conducted at rural and urban areas in Riau, Indonesia.¹⁴ Smoking was first reported as a risk factor for DED in The Beaver Dam Eye Study, which found active smokers had a DED risk of 1.4 times than individuals who didn't smoke. According to this study, smoking

Table 1. Characteristics of DED Screening of Tax Office Workers Computer Users at the Primary Tax Office in Denpasar Based on Demographics and Clinical Sign.

Characteristics of Research Subjects	n (%)
Sex	
Male	4 (30,8)
Female	9 (69,2)
Age	
30-39	10 (76,9)
≥ 40	3 (23,1)
Education	
High School	2 (15,4)
Associate's Degree	3 (23,1)
Bachelor Degree	8 (61,5)
Smoke	
Ya	1 (7,7)
Tidak	12 (92,3)
DED Subjective	
Ya	5 (38,5)
Tidak	8 (61,5)
DED Objective	
Ya	9 (69,2)
Tidak	4 (30,8)
BCVA ODS	
6/6-6/15	9 (69,2)
<6/15	4 (30,8)
Schirmer	26,38 ± 8,34
TBUT	8,46 ± 2,73
Scoring OSDI	16,80 ± 20,72

Table 2. DED Based on OSDI Scoring Results.

DED Subjective	n (%)
Mild	2 (40,0)
Moderate	1 (20,0)
Advanced	2 (40,0)

Table 3. DED based on the results of the Schirmer and TBUT.

DED Objective	n (%)
Level 1	0
Level 2	6 (66,7)
Level 3	3 (33,3)

Table 4. Data Analysis.

Risk Factor	DED n (%)	Non DED n (%)	OR	P Value
Sex				
Male	3 (75,0)	1 (25)	1,5	0,6
Female	6 (66,7)	3 (33,3)		
Age				
30-39	2 (66,7)	1 (33,3)	1,2	0,7
≥ 40	7 (70,0)	3 (30,0)		
Smoking				
Yes	1 (100)	0 (0)	1,5	0,6
No	8 (66,7)	4 (33,3)		

is an irritant on the surface of the eyeball, and is a modifiable risk factor for DED.⁹

CONCLUSION

The results of the analysis with among tax officer, found that the risk factors for gender male, aged more than 40 years and active smokers have a higher risk for experiencing DED, although statistically not significant. Further studies need to be carried out on DED risk factors in terms of various other aspects, both modifiable and non-modifiable, with a greater number of research subjects.

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