

**VALIDATION OF TWO QUESTIONNAIRES USED FOR
DIAGNOSING THE SICK BUILDING SYNDROME**

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In a one-year follow-up on the Danish town hall study 164 office workers with and without eye symptoms were examined for objective "eye dryness", i.e. unstable tearfilm and/or micro damage of the eye epithelium.

The office workers also answered two different questionnaires with an interval of a few weeks. There was a very strong correlation between the two questionnaires and between the objective eye dryness and the two questionnaires. Furthermore, if the two questionnaires were combined, taking the persistence of eye symptoms into account, there was an even higher correlation between the combined questionnaires and objective eye dryness.

Introduction

The prevalence of the sick building syndrome is mostly assessed using a questionnaire. However, different questionnaires have been used from one study to another and the validity of the questionnaires has seldom been tested (1). Furthermore, the definition of the sick building syndrome varies in the epidemiological studies (1,2). Irritation or dryness of the eye is one of the symptoms connected with the sick building syndrome and is so far the only symptom where objective signs have been associated with complaints (3). In this study the answers concerning eye symptoms in two different questionnaires have been compared and correlated to objective signs in the eyes.

Material and Methods

One year after the first part of the Danish town hall study (2) 164 office workers were selected; half of them had reported frequent eye irritation, half of them no eye irritation at all (1). All of them answered two questionnaires: first a general questionnaire which included questions on presence of symptoms from the mucous membranes and general symptoms and, a couple of weeks later, a special one designed to investigate eye symptoms. Both questionnaires included questions on eye irritation and eye dryness. Immediately after filling out the special questionnaire on eye symptoms, an objective examination of the eyes was made using a binocular eye microscope (Nikon FS-2 slit lamp). The stability of the precorneal tear film and micro damages of the eye epithelium were studied as described in detail previously (3). Chi-square test and rank correlation methods were applied. The level of significance used was $P < 0.05$.

Results and Discussion

As shown in table 1 the prevalence of eye symptoms occurring several times a week or more often was the same in both questionnaires (49% versus 48%) and there was a statistically significant correlation between the two questionnaires.

Table 1 Correlation between two different questionnaires.

		General questionnaire Eye irritation or dryness			
		1	2	3	Total
Special questionnaire	1	39	4	4	29%
	2	12	9	18	24%
	3	15	4	59	48%
	Total	40%	10%	49%	

Statistics: Rank correlation coefficient (Kendall's Tau B) = 0.53 $P < 0.0001$

- 1 = Symptoms less than once a month.
- 2 = Symptoms once a week.
- 3 = Symptoms several times a week or daily.

The eye complaints in both questionnaires were significantly correlated with objective signs of eye dryness ($P = 0.004$ and $P = 0.0002$) where the questionnaire especially designed for eye symptoms had the highest correlation. When the two questionnaires were combined, an even higher correlation between eye symptoms and objective eye signs was found. This is shown in table 2. The office workers who reported eye symptoms several times a week or daily in both questionnaires had a very high frequency of objective eye dryness (71%), which indicates that both the persistence and the frequency of eye symptoms are important.

Table 2

Correlation between eye symptoms and objective signs using two questionnaires combined.

Eye symptoms	n	Frequency of objective eye dryness ¹⁾
Less than once a month in both questionnaires	39	31%
Once a week or once a month in one or both questionnaires	25	40%
Several times a week or daily in one questionnaire	41	59%
Several times a week or daily in both questionnaires	59	71%

Statistics: One-way rank correlation ($t = 3.99$) $P = 0.00006$ ¹⁾ Unstable precorneal tearfilm or micro damage of the eye epithelium.

It is interesting to note that the prevalence of eye symptoms and the correlation with objective eye signs found by using two different questionnaires with an interval of a few weeks were very much the same. This suggests that the findings are casual and that the questionnaires used for investigation of the sick building syndrome are good and reliable tools.

Conclusion and Comments

The findings of this study support that self-reported eye symptoms in office buildings are realistic and consistent and that it is important to consider both the persistence and the frequency of symptoms.

References

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