

Introduction An important group of working women has been laid aside of research: housewives and micro entrepreneurs. Perhaps multiple roles are detrimental to housewives' both physical and mental health; it is supposed that these damaging effects are worst in the case of women taking care of house-keeping tasks and being workers at the same time. Therefore: how housewives, female microentrepreneurs, workers and professionals compare in the above mentioned fields?

Methods 353 women were surveyed in Cuernavaca, Mexico. 25% were housewives, 21% were housewives which sold goods or rendered services (baby sitting, laundry, ironing, for instance) to people outside the family circle, 13% were housewives and micro entrepreneurs at the same time, 5% said were blue-collar workers and housewives, 7% saw themselves as clerks and house-wives, 21% were professionals and housewives, and 5% saw themselves as professionals without being housewives at the same time.

The BREF-WHOQOL, the Siegrist Effort-Reward Questionnaire (slightly modified to adapt it to the sample), a stress, and self-efficacy, self-esteem, sense of life as well as a demographic questionnaire were administered.

Results MANOVAS were calculated for the whole sample. Housewives rendered the lowest scores in mental health and self-efficacy, followed by micro-entrepreneurs, and manual workers. Regarding mental health, office employees, professionals and women without being housewives were better off as well as considering self-esteem, physical health, stress and recognition from their families. Stress correlated egatively with family satisfaction, recognition from their family, physical health, self-efficacy, self-esteem, and mental health. Effort was positively associated with stress, and negatively with the rest of variables. However, from a practical viewpoint scores were minor, mounting to less than a point.

Conclusion Protective factors balance negative ones. Public policies should aim to pay attention to housewives since their important role within families impact in children and husbands as well as to society.

Work and Vision

1688 WORK AND VISION

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Aim of special session Investigate, diagnose work-related and environment-related ocular conditions

Apply appropriate ergonomic work conditions for reducing occupational asthenopia.

Promote healthy work lighting

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1688a OFFICE LIGHTING SURVEYS – REFOCUSING ON THE EYE AND HEALTH

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Introduction Current guidance on office lighting tends to be oriented towards illumination engineering, i.e. achieving a certain lighting environment. The selection of lamps and luminaires from a vast array of current lighting options, as well as their layout, often reflects architectural style and energy efficiency, rather than 'healthy' lighting – which aims to eliminate or minimise adverse health effects, including visual discomfort, arising from visual tasks and ambient light sources.

Methods Firstly, this paper explores the criteria for healthy lighting based on visual anatomy and pathophysiology and characteristics of workers and tasks in office environments. Secondly, survey methods addressing characteristics of light entering the eye are reviewed in the context of outcomes ranging from discomfort to retinal degradation.

Results A primary consideration is characterisation of light sources in the occupational visual field, (OVF) which is mainly determined by the visual tasks. Another consideration is how, and for how long, the source(s) are imaged on the retina (especially the macula). Again this depends on the visual requirements of the task. Indeed, directionality is much more important for lighting than other hazards such as noise. Such assessments are not possible with an integrating light measuring instrument such as a lux metre. Finally, in the cases of blue-rich sources, the assessment should be more about radiometry than photometry.

Discussion A variety of visual, circadian rhythm and psychological disturbances may arise from inappropriate lighting. The concept of 'healthy' lighting serves to integrate the issues, and surveys of lighting should begin with the OVF and systematic consideration of light sources therein. Assessment should involve luminance and where necessary radiance.

1688b PREVALENCE AND RISK FACTORS OF EXTERNAL EYE SYMPTOMS INDOORS

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Introduction Eye irritation is generally among top-3 reported symptoms in office environments. The symptoms are especially among middle and advanced ages and particularly among women more than men. The eye symptoms are the most commonly reported complaints in the eye clinic. A multidisciplinary understanding of potential risk factors is necessary to interpret the high prevalence of eye symptoms.

Methods Literature from 2012 to June 2017 has been updated in context of dry eye (DE) symptom reporting in office-like environments by searches in the public databases and previous reviews.

Results The overview reveals that the external eye physiology (separate from internal eye effects), eye diseases (evaporative dry eye, aqueous-deficient dry eye, and gland dysfunctions) aggravate the stability of precorneal tear film (PTF); this appears to cause hyperosmolarity and initiation of inflammatory reactions. Further, indoor environmental, occupational and personal risk factors may aggravate the PTF stability. These are, inter alia age, contact lenses, cosmetics, diet, draft, gender, low humidity and high temperature, medication, outdoor and combustion pollutants, and VDU work. Psychological stressors may further influence the reporting behaviour of symptoms. The risk factor impact may occur in a combined and exacerbating manner.

Discussion Multifactorial causalities show two key indoor parameters, visually demanding tasks combined with low relative humidity. A substantial fraction of office workers may have unrecognised DE diseases which may further be exacerbated by environmental, occupational and personal risk factors. Dry eye-like related symptoms in office-like environments may be considered a subgroup of 'dry eye' disease.

A number of other risk factors in the office environment are associated with reported DE symptoms. These may in combination exacerbate the symptom reporting. Except for combined events, indoor VOCs, formaldehyde, and acrolein are not expected to cause sensory-related eye symptoms in offices without aggravation of the PTF.

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THE CONTRIBUTION OF TASK- AND WORKER-RELATED ACCOMMODATION TO ASTHENOPIA: A CRITICAL LITERATURE REVIEW

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Introduction Near work is believed to be a key factor in the development of occupational asthenopia as well as being a possible cofactor for the development of adult myopia. Prolonged viewing distances of less than one metre induce visual symptoms by imposing a sustained contraction of ciliary muscles. Small screens on mobile devices are very common in modern work environments, and there are many jobs and tasks that require near work every day. Furthermore, there is an ageing workforce where there is less capacity for visual accommodation. This review critically assesses the published literature on asthenopia attributable to task observation distance and worker-related accommodative capacity.

Methods A systematic search of PubMed, Scopus, and Embase was used, and supplemented with forwards, backwards and hand-searching, including by author. The major search terms were 'observation distance', 'near work' and 'visual work load'.

Results Most published papers reporting on asthenopia in the workplace classify visual effort in broad terms, without objective 'on site' measurement of task-determined visual distances/durations. Similarly, few papers separately consider workers over 45 (presbyopia), and those who are long sighted (hyperopia), where there is a greater requirement of accommodation compared to normal sighted (emmetropes). Even fewer papers juxtapose the observation distance with the worker capacity for accommodation, i.e. combining exposure and susceptibility, which is essential for the characterisation of asthenopia risk.

Discussion In order to assess and manage risks for asthenopia attributable to visual effort, equal weight should be given to task and individual factors. Future studies should utilise objective measurements of task viewing distance and durations. Currently, there is a need for a personal monitoring device that can continuously measure and datalog these parameters. With regard to an ageing workforce, intervention research is needed to determine whether the provision of larger screens, larger images and less visual demanding software reduces asthenopia.

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IS HEAVY VDT USE A RISK FOR VISUAL FIELD ABNORMALITIES AMONG JAPANESE WORKERS?

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Introduction The rapid global spread of information technology (IT), and most recently of new media (e.g., smartphones and tablets), has continually increased exposure to visual display terminals (VDT). This exposure is particularly marked among general workers. The health issues related to long-time VDT use are of great concern. Our previous large-scale, population-based study using frequency doubling technology perimetry (FDT) perimetry in the workplace indicated a possible association between a history of VDT use and glaucoma. Interestingly, we observed a significant interaction effect of myopia on the association between computer use and glaucoma; specifically, an increased risk of glaucomatous visual field abnormality (VFA) was observed only among frequent VDT users with myopia (*J Epidemiol Community Health*, 2004;58(12):1021–7. etc.). However, those studies featured a cross-sectional design. We designed a retrospective cohort study to investigate the association between computer use and VFA using the FDT test.

Methods The study included 2377 workers (mean age 45.7 ± 8.3 years) who initially exhibited no VFA during FDT testing. Subjects then underwent annual follow-up FDT testing for 7 years, and VFA were determined by using a FDT-test protocol (FDT-VFA). Subjects with FDT-VFA were examined by ophthalmologists. Baseline data about the mean duration of computer years during a 5 year period and refractive errors were obtained via self-administered questionnaire.

Results A Cox proportional hazard analysis demonstrated that heavy VDT users (>8 h/day) had a significantly increased risk of FDT-VFA (hazard ratio (HR)=2.85, 95% confidence interval (CI): 1.26–6.48) relative to light users (<4 h/day), and this association was strengthened among subjects with refractive errors (HR=4.48, 95% CI: 1.87 to 10.74). The VDT usage history also significantly correlated with FDT-VFA among subject with refractive errors (p<0.05), and 73.1% of subjects with FDT-VFA and refractive errors were diagnosed as glaucomatous.

Conclusion The incidence of FDT-VFA appears to increase among Japanese workers who are heavy VDT users, particularly if they have refractive errors. These results are consistent with findings of our previous studies. Further investigations of epidemiology and causality are warranted, because causal relationship between VDT use and glaucoma is unknown.