Survey and analysis of visual acuity of Kazakhs in different lighting environments

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ABSTRACT. The effect of different lighting environments on the vision and refractive error were investigated in 427 Kazakhs (828 eyes) aged from 40 to 60 years old, of which 279 were pastoral (546 eyes) and 148 were urban (282 eyes). Pastoral Kazakhs use natural illumination, whereas city Kazakhs mainly use artificial illumination. Of all cases, 19.1% (54 cases) had a vision of 0.4 to 0.5, 20.9% (59 cases) had 0.6 to 0.8, and 17.7% (50 cases) had above 1.0. However, the visual acuity distribution of the pastoral Kazakhs had a more obvious characteristic, which was mainly concentrated above 0.6. The vision of 25.1% (137) of cases was 0.6 to 0.8, whereas 58.4% (319) of cases had vision above 1.0. There were more cases with vision above 1.0 in the pastoral Kazakhs compared to the city Kazakhs (P < 0.05). The diopter of the city Kazakhs was between 0 D and -4.0 D, whereas that of the pastoral Kazakhs was between +2.0 D and -2.0 D. Diopters between +2.0 D and 0 D or less than 3.0 D differed significantly between the two groups. Daylight lamps were the main illumination photosources of the city Kazakhs. Artificial light illuminated 70.9% (105 cases) of the city

Kazakhs for more than 6 h. By contrast, natural light illuminated 75.3% (210 cases) of the pastoral Kazakhs for an outdoor activity time of more than 9 h. These results suggest that poor lighting environment is a very important factor contributing to refractive error.

Key words: Light environment; Refractive error; Visual acuity