Online spectacles ordering is increasingly common. Websites offer low cost ophthalmic lenses and frames shipped to patients, after they enter prescription data and self-measured parameters, including pupillary distance.

Other measurements traditionally measured by professional dispenser (optometrist or optician), such as vertical optical centration, are often not measured on line.

Spectacles dispensed with errors in pupillary distance and vertical optical centration may lead to clinically significant symptoms.

Alderson et al. showed that 13% of spectacles ordered online had significant horizontal prism effect. However, there is no evidence that these prismatic effects are caused by measurement errors, seizure errors, or fitting errors.

Thirty-six participants (n = 72 eyes), aged 18 – 35 and naïve to optics and optometry.

On-line measures:
- Three simulated online spectacles orders in a randomized order, using each site’s method to self-measure their horizontal pupil distance
- A pair of -3.00D spectacles had previously been ordered from each site: their vertical optical height was compared to that measured by a skilled dispenser for each participant

Measures by a skilled ophthalmic dispenser
- Horizontal pupil distances were measured on each participant using a corneal reflection pupillometer and vertical optical centration were measured with a rule in a primary position.

RESULTS

For horizontal pupil distance measurements, differences between self-measured and dispenser-measured monocular measure were statistically significant (Glassify® 1.69 ± 2.11mm, p<0.001; Clearly® 1.08 ± 0.74mm, p<0.001; Zenni® 1.33 ± 0.87mm, p<0.001 – one sample t-test, 0 vs. difference between measurements).

Many measurements were outside of clinically significant tolerance limits (ISO norm, ±1.1mm for monocular horizontal centering): 46% (n = 33) for Glassify®, 39% (n = 28) for Clearly® and 53% (n = 38) for Zenni®

Differences between manufactured and measured vertical optical heights also showed statistically significant differences
- (Glassify® 4.50 ± 2.66mm, p < 0.001 ;
- Clearly® 3.30 ± 2.47mm, p < 0.001 ;
- Zenni® 4.22 ± 2.58mm, p < 0.001)

Most measurements were outside of clinically significant tolerance limits (ISO norm, ± 0.84mm for vertical centering):
- 94% (n = 68) for Glassify®,
- 93% (n = 67) for Clearly®
- 90% (n = 65) for Zenni®

REFERENCES


TAKE HOME MESSAGE

Online spectacles ordering, using patient-measured pupil distance and lack of personalized vertical optical heights, is often outside the recognized optical industry standards and may lead to significant optical errors.