STROBE Statement—checklist of items that should be included in reports of observational studies

| | Item No. | Recommendation | Page No. | Relevant text from manuscript |
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| Title and abstract | 1 | (*a*) Indicate the study's design with a commonly used term in the title or the abstract | Page 1 | Efficacy and tolerability of esculin and digitalis glycosides eye drops versus sodium hyaluronate in pediatric digital screen-related visual fatigue and dry eye |
| | | (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found | Page 1 | The methods and results sections in the abstract. |
| Introduction | | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | Page 1-2 | The first three paragraphs of the introduction section. |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | Page 1-2 | The fourth paragraph of the Introduction section. |
| Methods | | | | |
| Study design | 4 | Present key elements of study design early in the paper | Page 2 | Children with visual fatigue and dry eye syndrome who visited Jinhua Municipal Central Hospital between December 2022 and December 2024 were screened. Among them, 126 patients had conditions related to digital screen use. After exclusions (2 cases of blepharitis, 1 cases of cognitive impairment and 1 cases of corneal lesion), a total of 122 patients were enrolled and divided into two groups based on the treatment plans documented in their medical records, the sodium hyaluronate group (60 patients treated with sodium hyaluronate eye drops) and the esculin-digitalisglycosides group (62 patients treated with esculin and digitalisglycosides eye drops). Following 1:1 Propensity Score Matching (PSM), 50 patients per group were ultimately included in the analysis (Fig. 1). |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | Page 2 | Children with visual fatigue and dry eye syndrome who visited Jinhua Municipal Central Hospital between December 2022 and December 2024 were screened. |
| Participants | 6 | (*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up<br>*Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls<br>*Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants | Page 2 | Two sections: inclusion criteria and exclusion criteria. |
| | | (*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed | Page 2 | a total of 122 patients were enrolled and divided into two groups based on the treatment plans documented in their |

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| | | *Case-control study*—For matched studies, give matching criteria and the number of controls per case | | medical records, the sodium hyaluronate group (60 patients treated with sodium hyaluronate eye drops) and the esculin-digitalisglycosides group (62 patients treated with esculin and digitalisglycosides eye drops). Following 1:1 Propensity Score Matching (PSM), 50 patients per group were ultimately included in the analysis |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | Page 3-5 | In the observation indicators section, including primary and secondary outcome measures. |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | *Page 2-3* | In the primary and secondary outcome measures section, specify the measurement methods for each indicator in detail. |
| Bias | 9 | Describe any efforts to address potential sources of bias | Page 5-6 | PSM was performed using the nearest-neighbor matching method with a caliper of 0.02. After matching, the standardized mean difference (SMD) was used to assess the balance of baseline characteristics between groups; SMD < 0.1 indicated good balance. |
| Study size | 10 | Explain how the study size was arrived at | Page 2 | The sample size calculation of this study was based on the findings of relevant previous research. A prior study involving 52 pediatric patients aged 9–14 years with dry eye complicated by allergic conjunctivitis demonstrated that both treatment groups receiving eye drops containing 0.2% hyaluronic acid and 0.1% arnica extract achieved a significant reduction in the Ocular Surface Disease Index (OSDI) scores after treatment (study group: 25.11±1.52; control group: 17.12±1.50)(Buzzonetti *et al.*, 2022). Cohen's d effect size was estimated to be 0.79 according to the formula. In this study, G*Power 3.1.9.7 was used to calculate sample sizes. With the significance level (α) set at 0.05 (two-tailed) and the type II error rate (β) set at 0.05, the calculation results indicated that a minimum of 43 patients per group was required to ensure sufficient statistical power. Given the inherent risk of data loss in retrospective studies and the actual number of eligible pediatric patients at our hospital, 50 patients per group were included in the analysis after PSM. This final sample size not only met the requirements of statistical estimation but also enhanced the robustness of the study results. |

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| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | Page 2 | the sodium hyaluronate group (60 patients treated with sodium hyaluronate eye drops) and the esculin-digitalisglycosides group (62 patients treated with esculin and digitalisglycosides eye drops). |
| Statistical methods | 12 | (*a*) Describe all statistical methods, including those used to control for confounding | Page 5-6 | Statistical methods section |
| | | (*b*) Describe any methods used to examine subgroups and interactions | Page 5-6 | Statistical methods section |
| | | (*c*) Explain how missing data were addressed | Page 5-6 | Statistical methods section |
| | | (*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed<br>*Case-control study*—If applicable, explain how matching of cases and controls was addressed<br>*Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy | Page 5-6 | Statistical methods section |
| | | (*e*) Describe any sensitivity analyses | Page 5-6 | Statistical methods section |
| **Results** | | | | |
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | Page 2 | Among them, 126 patients had conditions related to digital screen use. After exclusions (2 cases of blepharitis, 1 cases of cognitive impairment and 1 cases of corneal lesion), a total of 122 patients were enrolled and divided into two groups based on the treatment plans documented in their medical records, the sodium hyaluronate group (60 patients treated with sodium hyaluronate eye drops) and the esculin-digitalisglycosides group (62 patients treated with esculin and digitalisglycosides eye drops). Following 1:1 Propensity Score Matching (PSM), 50 patients per group were ultimately included in the analysis |
| | | (b) Give reasons for non-participation at each stage | Page 2 | Figure 1 |
| | | (c) Consider use of a flow diagram | Page 5 | Figure 1 |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | Page 6 | Baseline characteristics of patients and Table 1 section |
| | | (b) Indicate number of participants with missing data for each variable of interest | Page 2 | Figure 1 |
| | | (c) *Cohort study*—Summarise follow-up time (eg, average and total amount) | Page 2 | The collected data include baseline information, efficacy indicators and safety indicators. With the hospital's electronic medical record system as the core data source, data extraction and verification were independently completed by two uniformly trained ophthalmic researchers to ensure reliable data quality (Amer et al., 2024). Data were collected at baseline (the day of the child’s first visit and initiation of medication) and 3 months after medication administration. |

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| Outcome data | 15* | *Cohort study*—Report numbers of outcome events or summary measures over time | *Page 3-5* | *Outcome measures section* |
| | | *Case-control study*—Report numbers in each exposure category, or summary measures of exposure | | |
| | | *Cross-sectional study*—Report numbers of outcome events or summary measures | | |
| Main results | 16 | (*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | Page 6-7 | Table 1 to Table 7 |
| | | (*b*) Report category boundaries when continuous variables were categorized | Page 6-7 | Table 1 to Table 7 |
| | | (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | Page 6-7 | Table 1 to Table 7 |

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| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | Page 5-6 | Table 1 to Table 7 |
| **Discussion** | | | | |
| Key results | 18 | Summarise key results with reference to study objectives | Page 9 | Research objective section |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | Page 11 | Study limitations section |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | Page 9-11 | Visual fatigue, Dry eye, Comprehensive therapeutic efficacy and safety sections |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | Page 11 | Generalizability of the study was not assessed, which represents one of the limitations of this study. |
| **Other information** | | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | Page 11 | There was no funding. |

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.