

Development of a Computerized Cognitive Skills Package and Evaluation of Its Effectiveness on Selective Attention, Response Inhibition, and Working Memory in Children with Dyslexia

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1. Round 1

1.1. Reviewer 1

Reviewer:

The first methodological paragraph states that “a triangulation strategy was employed to enhance the credibility of the findings,” but the nature and implementation of triangulation are insufficiently described. The manuscript appears to draw on three sources: published studies, existing computerized packages, and students with dyslexia. However, it does not explain whether this procedure constituted data triangulation, method triangulation, investigator triangulation, or a combination of these approaches. The authors should report how data from the three sources were collected, coded, compared, and integrated, identify who performed the analysis, and explain how disagreements or inconsistencies among sources were resolved. Without these details, the credibility of the qualitative development process cannot be adequately evaluated.

The sentence “From these sources, 50 articles were selected on the basis of thematic relevance” requires substantial methodological elaboration. The manuscript should report the databases searched, the exact search period, search terms and Boolean operators, language restrictions, inclusion and exclusion criteria, screening procedure, number of records initially

identified, duplicate-removal process, and reasons for excluding studies. Although this phase may not have been intended as a formal systematic review, the package was partly developed from this evidence base; therefore, a transparent and reproducible search strategy is essential. A flow diagram or supplementary table summarizing the article-selection process would considerably strengthen the methodological rigor of the package-development phase.

The statement “From these packages, 10 were selected through convenience sampling and subsequently reviewed” is methodologically vague and potentially introduces substantial selection bias. The authors should identify the names, developers, countries of origin, intended age groups, theoretical foundations, accessibility status, and principal features of the reviewed computerized packages. They should also explain why convenience sampling was appropriate for selecting intervention packages and how the review findings were systematically extracted and incorporated into the new program. A comparative matrix showing the functions, content, delivery format, target skills, empirical support, and limitations of the 10 packages would make the novelty of the proposed package more defensible.

The paragraph describing the third qualitative population states that students attending the Arman Psychological Center “were selected through convenience sampling to identify and examine their needs and challenges,” but no sample size, demographic characteristics, data-collection method, or analytic procedure is reported. The authors should specify how many children participated, whether parents or teachers were also interviewed, whether information was obtained through interviews, observations, focus groups, clinical records, or performance assessments, and how the resulting data were analyzed. The manuscript should additionally clarify whether data saturation was considered and how children’s assent and parental consent were obtained during this developmental phase.

The diagnostic procedure for dyslexia is insufficiently described. The sentence stating that participants “had attended psychological centers and received a diagnosis of dyslexia” does not specify the diagnostic criteria, standardized reading measures, clinical interview, professional qualifications of the diagnostician, or procedures used to exclude intellectual disability, uncorrected sensory impairments, neurological disorders, inadequate schooling, attention-deficit/hyperactivity disorder, or other developmental conditions. Because dyslexia is the defining characteristic of the sample, the authors should provide a rigorous operational definition and report the diagnostic instruments and cutoff scores used to establish eligibility.

The manuscript reports that “the Wechsler Intelligence Scale was administered to both groups to ensure that the participants had intelligence quotients within the normal range,” but it does not identify the exact version, edition, age-appropriate form, subtests, scoring procedure, normative reference, or cutoff defining normal intelligence. The authors should report whether the Wechsler Intelligence Scale for Children was used, specify the edition and validated Persian version, and provide reliability and validity evidence. They should also present the mean intelligence scores of both groups and test whether the groups were comparable at baseline.

Authors revised the manuscript and uploaded the document.

1.2. Reviewer 2

Reviewer:

In the Delphi-validation paragraph, the sentence “Ten specialists were selected through convenience sampling” requires stronger justification. The authors should define the eligibility criteria for expert participation, including academic rank, years of professional experience, number of relevant publications, clinical or educational experience with dyslexia, and familiarity with computerized cognitive interventions. Table 2 reports only specialization, academic degree, and age, which are insufficient to establish expert competence. The manuscript should also indicate the number of Delphi rounds, response rate in each round, feedback procedure, criterion for consensus, and whether experts were allowed to revise their judgments after reviewing group-level results.

The description of the expert-rating procedure contains a conceptual inconsistency. The manuscript states that specialists evaluated each session on a “six-point Likert scale ranging from 0 to 5” and subsequently describes Lawshe’s three-category classification and a four-category relevance scale. These procedures correspond to different forms of content-validity assessment and should not be presented as though they were a single rating process. The authors should clearly distinguish the

six-point evaluative ratings, the three-category ratings used for the content validity ratio, and the four-point ratings used for the content validity index. The purpose, calculation method, decision threshold, and results of each assessment should be reported separately.

In the same paragraph, the statement “The minimum acceptable content validity ratio was 0.49” appears inconsistent with the reported number of experts. For a panel of 10 experts, the critical CVR value should be justified by reference to the specific Lawshe critical-value table or its revised version used by the authors. The manuscript should verify that 0.49 is the appropriate threshold for a 10-member panel and provide a citation for the selected criterion. In addition, the reported CVR values in Table 1, such as 0.98 and 0.95, are unusual for Lawshe’s CVR when calculated from only 10 expert responses because the possible values should occur in discrete increments. The authors should recalculate these values and verify whether they have mistakenly reported mean ratings, percentages, or transformed scores as CVRs.

Table 1 raises a major inconsistency regarding intervention dosage. The quantitative Methodology section states that the experimental group completed “15 intervention sessions, each lasting 45 minutes,” whereas Table 1 organizes the protocol across Sessions 1–25. This discrepancy must be resolved because it affects intervention fidelity, replicability, participant exposure, and interpretation of treatment effects. The authors should state whether the intervention consisted of 15 or 25 sessions, explain whether some table entries represent activities rather than separate sessions, and report the frequency, total duration, delivery schedule, setting, and person responsible for administering each session.

The intervention protocol requires considerably more detail to permit replication. For example, Table 1 describes Sessions 16–25 as involving “games designed in the computerized package to enhance executive functions,” but it does not identify the specific game mechanics, task demands, adaptive difficulty rules, feedback system, reinforcement structure, duration per game, number of trials, or progression criteria. The authors should explain how each activity theoretically targets selective attention, response inhibition, or working memory. They should also report the software platform, operating system, screen specifications, input devices, language, audio or visual features, data-recording capabilities, and whether the program was pilot-tested for usability and accessibility.

The quantitative sampling paragraph states that participants “were selected through convenience sampling and randomly assigned to an experimental group and a control group.” The authors should provide a sample-size justification based on an a priori power analysis rather than relying solely on convenience availability. With only 15 participants per group, the study may be vulnerable to unstable effect estimates, violations of distributional assumptions, and inflated findings. The manuscript should report the assumed effect size, alpha level, statistical power, number of groups, number of measurements, and software used for the power calculation. The randomization procedure should also be described in detail, including sequence generation, allocation concealment, and the person responsible for assignment.

Authors revised the manuscript and uploaded the document.

2. Revised

Editor’s decision: Accepted.

Editor in Chief’s decision: Accepted.