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Preliminary psychometric evaluation of the Arabic 5-item dry eye questionnaire (DEQ-5) in a conflict-affected population in southern Palestine

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Abstract

Background: Dry eye symptoms are common among populations exposed to prolonged stress and adverse living conditions, yet brief patient-reported symptom assessment instruments have rarely been evaluated in conflict-affected settings. This study aimed to conduct a preliminary psychometric evaluation of the Arabic Dry Eye Questionnaire-5 (DEQ-5) among internally displaced adults in the southern Gaza Strip, with an emphasis on internal consistency, internal structure, and exploratory cross-language agreement. **Methods:** A cross-sectional observational study was conducted in the Al-Mawasi camps among internally displaced adults using snowball sampling. Data were collected through face-to-face interviews using paper-based questionnaires. The Arabic DEQ-5 was administered to the primary study sample, while a bilingual subset completed the Arabic version

first and the English version 72 hours later for an exploratory fixed-order bilingual agreement analysis. Internal consistency was evaluated using Cronbach's alpha and McDonald's omega total. Item-level analyses included corrected item-total correlations and Cronbach's alpha if item deleted. Internal structure was examined using eigenvalue decomposition, scree plot inspection, and parallel analysis. Bilingual agreement was assessed using the intraclass correlation coefficient (ICC[2,1]), quadratic weighted kappa, and Bland–Altman analysis. Results: Complete Arabic DEQ-5 responses were obtained from 234 participants. Mean (SD) total DEQ-5 score was 8.52 (3.65). Overall, 181 participants (77.4%) met the prespecified symptom-screening threshold of a DEQ-5 score ≥ 6 , including 49 (20.9%) with scores ≥ 12 . The Arabic DEQ-5 showed acceptable internal consistency (Cronbach's alpha = 0.73; McDonald's ω_t = 0.82) and a dominant one-factor structure supported by eigenvalue decomposition, scree plots, and parallel analysis. In the fixed-order bilingual subset, total scores showed good point-estimate agreement (ICC[2,1] = 0.763), with weighted kappa values ranging from 0.364 to 0.840. Bland–Altman analysis showed minimal mean English–Arabic score bias but relatively wide limits of agreement. Conclusions: The Arabic DEQ-5 demonstrated acceptable internal consistency and supportive evidence of a dominant one-factor structure in this conflict-affected displaced population. In the bilingual subset, total scores showed good point-estimate agreement; however, variable item-level agreement and wide limits of agreement do not support individual-level interchangeability between the Arabic and English versions. These findings suggest that the Arabic DEQ-5 may serve as a practical brief instrument for assessing dry eye symptoms in humanitarian and field research settings. However, because external validation measures, clinical assessments, confirmatory psychometric analyses, and test-retest reliability were beyond the scope of this study, the findings should be interpreted as a preliminary psychometric evaluation rather than a comprehensive validation. Further multicenter psychometric validation in diverse Arabic-speaking populations, including larger bilingual samples, is warranted. © Author(s).

Author keywords

Al-Mawasi camp; Bland–Altman analysis; cronbach's alpha; DEQ-5; dry eye disease; internal consistency; questionnaire; translations

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