

Cross-Cultural Adaptation and Reliability of a Filipino Dry Eye Screening Questionnaire

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ABSTRACT

Objective: The objectives of this study were to develop a cross-culturally adapted, Filipino version of the Ocular Surface Disease Index (OSDI) questionnaire and to assess its reliability.

Methods: A Filipino-adapted version of the OSDI was developed following guidelines for language-specific questionnaires: forward translation into Filipino by 2 independent bilingual translators, back-translation into English by a language institution, and a final forward translation to Filipino resolved by a review committee. To check for equivalence, the English and Filipino versions of the OSDI were pretested on 16 patients in a dry eye clinic. The Filipino version was then administered to 36 participants, and a Cronbach alpha coefficient for reliability of the overall instrument and the alpha that would result if each item were removed were computed. Finally, the questionnaire was then retested on 11 dry eye patients to see if the coefficient would increase.

Results: All reported no difficulty with the Filipino questionnaire, with 81.3% expressing preference in answering it. Most (81.3%) chose the same answer in at least half of the items in both languages, though the range of similar responses varied from 41.7% to 91.7%. Reliability testing of the Filipino questionnaire showed this to have fair internal consistency ($\alpha=0.5958$). The value increased to moderate internal consistency (0.7576) when 3 items were removed.

Conclusion: A culturally-adapted OSDI in Filipino was successfully produced and was the preferred tool by most patient participants.

Keywords: dry eye, dry eye syndrome, dry eye screening, Ocular Surface Disease Index, OSDI, Filipino questionnaire

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Dry eye is a common cause of ocular discomfort that compels patients to seek ophthalmologic care. The Tear Film and Ocular Surface Society – Dry Eye Workshop (TFOS-DEWS) recently revisited the definition of dry eye disease (DED) and revised this to encompass the multifactorial nature of the condition and the resulting loss of homeostasis of the tear film.¹ Thus, the extensive variability in disease symptoms and etiologies makes it difficult to develop a consistent classification system and measure of disease severity.²

Various questionnaires for dry eye have been in use as screening tools and in measuring disease severity. Validated instruments ensure consistency in evaluation. They can further be used to quantify the impact of the disease on the patient's quality of life (QOL) and monitor progression.^{3,4} Two self-administered screening forms are more popularly used: the McMonnies and the Ocular Surface Disease Index (OSDI).⁵ The McMonnies survey is one of the earliest tools more widely used due to its formalized grading scheme using dichotomous yes or no responses. Validation studies have found this effective as a discriminating tool for dry eye subjects, but not as a measure of symptom or disease severity.⁴ The OSDI is a 12-item questionnaire with a Likert design; higher scores reflect greater disability (Appendix 1). It evaluates frequency of ocular symptoms, impact on vision-related functions, and association with environmental triggers.⁵ Studies on the OSDI have shown excellent test-retest reliability and validity as a measuring tool for severity categorization.

Despite extensive research in determining the reliability and validity of health or disease-related questionnaires, suitable cross-cultural adaptations especially in non-English speaking countries are lacking.⁸ All internationally accepted measures are in the English language and are intended for English-speaking populations.

Following a literature review on cross-cultural adaptations of health-related QOL measures by Guillemin *et al* in 1993, a set of guidelines for obtaining language-specific questionnaires was encouraged. They recognized that simple translation of measures may not have equitable results due to language and cultural differences. Moreover, the manner in which health problems are expressed may vary with local culture. The proposed guidelines thus offered a methodological approach to overcome the inadequacies of simple translation and produce

an equivalent cross-culturally adapted measure. This involved a 5-step process: (1) translation to local language, (2) back-translation to source language, (3) committee review of local and source versions with modifications as necessary, (4) pretesting for equivalence of both versions with bilingual lay people, and (5) re-examination of weighted scores with adaptation of weights of scores to local context as needed.⁸ The KIDSCREEN quality of life survey of the World Health Organization (WHO) for children and adolescents have adapted this for European translations since the year 2000.^{9,10} Likewise, Prigol *et al* in 2011 applied these guidelines for a Portuguese-adapted version of the OSDI on local dry eye patients. They reported good inter- and intraobserver agreement and concluded that the OSDI may be used in Portuguese to evaluate their patients. To our knowledge, there is no published study of a Filipino-adapted version of a dry eye screening questionnaire.

The objectives of this study were to develop a cross-cultural Filipino version of a dry eye questionnaire and ascertain its reliability. Specifically, the OSDI was translated into Filipino using the cross-cultural adaptation guidelines of Guillemin *et al* and tested on a pool of Filipino patients with dry eye disease. The reliability of the new questionnaire was determined by calculating the coefficient of internal consistency.

METHODOLOGY

A Filipino-adapted version of the OSDI was developed in accordance to the guidelines by Guillemin *et al* for language-specific questionnaires. The methodological approach is summarized in a flowchart (Appendix 2). The subsequent testing phase was conducted following the approval of the University of the Philippines-Manila Ethics Review Board (UPMREB).

A. Forward Translation (FT)

To produce a high-quality translation that is culturally representative, 2 non-ophthalmologists were asked to independently translate the OSDI into Filipino. The first translator was a writer for a local television company who was fluent in both English and Filipino, with the latter as her mother tongue. The objectives of the study were only partially disclosed to possibly elicit unexpected meanings from the OSDI.⁸ The second translator was a Filipino cardiologist who

was informed of the objectives underlying the source questionnaire and the concepts involved to possibly produce a more reliable version.⁸ Both parties did not report significant difficulty in the activity. A review committee resolved the 2 outputs into 1 revised forward translation.

B. The Review Committee

A review committee formed by the primary investigator, research adviser, and a lay individual reviewed all translations. The first two are ophthalmologists who see dry eye patients on a regular basis and are well acquainted with the source questionnaire. The third member is a non-medical, adult, female administrative officer who was chosen to represent the target group of patients. This panel produced 1 modified Filipino questionnaire following each forward or back translation process by accepting or editing words or phrases and providing a simple working version that maintained the concept of the questions or items. A decentering technique was employed to render some structure when discrepancies were resolved. This was done by rendering the forward translations, the back translation, and source questionnaire equally important when compared with one another. Thus, the tool was not centered on a particular language, as all were open to modifications. The final forward translation to Filipino was done by the review committee after evaluating all versions.

C. Backward Translation (BT)

Backward translation from the local language to the source has been shown to be a necessary step to improve the quality of the final forward translated version.⁸ Here, misunderstood ambiguous terms are detected or augmented, and failure to adapt to the cultural target and maintain the original intent of the question can be revealed. The edited FT Filipino questionnaire from the review committee was submitted to the Sentro ng Wikang Filipino, a language institution under the University of the Philippines, for back translation. The back translators were not given a *priori* knowledge of the content of the source questionnaire to be free of biases while interpreting the Filipino questionnaire and translating it back into English.

D. Final-Forward Translation (FFT)

The review committee compared the BT version and the source questionnaire and further edited the

FT instrument to produce a final forward Filipino translation. The FFT was tested on dry eye patients, and the results of which were analyzed for internal consistency.

E. Patient Selection, Pretesting and Testing

The FFT version of the Filipino questionnaire and the original English OSDI were administered by the primary investigator in a form of an interview to new and returning patients of the Dry Eye Clinic who consented to participate. Eligible patients were Filipino adults diagnosed with dry eye disease and deemed capable of answering the questionnaire (i.e. with intact sensorium and orientation to time, place, and person). Individuals were ineligible if they were unable to read, write, and speak conversational Filipino or English, were hard of hearing, and had undergone eye surgery as the corneal sensation may be altered and thus interfere with the symptomatology of dry eye.

Patients were selected via time-based sampling from October to December 2013. In order to determine whether a question or term was understood correctly, the interviewee was encouraged to elucidate his/her understanding in a 'think aloud process' as used in cognitive interviews.¹³⁻¹⁵ The interviewer also used scripted probes to standardize the interviews (i.e. Did you have difficulty understanding this question? What does this question mean to you? Is the question relevant to your condition? How would you have worded this question?). Upon conclusion, the patients were also asked for other comments concerning the questionnaires.

Pretesting: The participants were asked to answer both the original English and then the FFT Filipino questionnaires 5 minutes apart. This was done to gauge similar responses per individual for both languages and to determine the value of a Filipino-adapted dry eye questionnaire. They were first asked to self-grade their proficiency in both English and Filipino from a scale 1-10 at the start of the interview. Highest educational attainment was noted as well. The interviewees were also asked which questionnaire they preferred after both were answered. The comments of participants from the pretest determined if the FFT version needed further revision or may proceed to the testing phase.

Testing: The FFT Filipino questionnaire was then administered to a larger group on subsequent clinic days for reliability testing. The results were used to compute

for the overall alpha coefficient of the questionnaire as well as the alpha that would be obtained if each item were removed. The items that produced low alpha values were then omitted and the remaining items were given to a smaller group of patients. Thereafter, the new overall alpha value was computed.

F. Statistical Analysis

The data from the group of patients who answered both the original English and the FFT Filipino questionnaires were analyzed using frequency distribution graphs.

To investigate the internal consistency and precision of a questionnaire, the Cronbach alpha coefficient with a 95% confidence interval (CI) was calculated. This analysis considers the average variance of each item and the average of all covariances between the questions across the current sample of participants. The values fall between 0 to 1 and is expressed as a ratio of 2 variances: the true-score and total-score (error plus true score). Reliability scales of less than 0.6 were considered fair, 0.6-0.8 as moderate, and greater than 0.8 as high. In this study, the alpha of the overall instrument and the alpha that would be obtained if each item were removed were computed. The Filipino questionnaire without the items that would increase the alpha upon deletion was then retested and the corresponding alpha recomputed.

RESULTS

I. DEVELOPMENT OF THE QUESTIONNAIRE

Two similar albeit differently worded forward translations were obtained. The 3 general questions of the original OSDI were: (1) Have you experienced any of the following during the last week? (2) Have problems with your eyes limited you in performing the following during the last week? (3) Have your eyes felt uncomfortable in any of the following situations during the last week? Translator #1 wrote: (1) *May naramdaman ka ba sa alin man sa mga sumusunod noong nakaraang linggo?* (2) *Noong isang linggo, ang mga problema ba sa iyong mga mata ay nilimitahan ka sa paggawa ng mga sumusunod na gawain?* (3) *Noong nakaraang linggo, ang mga mata mo ba ay hindi naging komportable sa ilalim ng mga sumusunod na sitwasyon?* These were differently worded by Translator #2: (1) *Naranasan mo na ba ang mga sumusunod sa nakaraang linggo?* (2) *Mayroon ka bang mga problema sa mata*

na nakasagabal sa paggawa mo ng mga sumusunod na bagay nuong nakaraang linggo? (3) *Nakaranas na ba ng pagkabalisa ang iyong mga mata sa mga sumusunod na pagkakataon nuong nakaraang linggo?* The review committee considered the translations to have semantic equivalence to each other and to the source questionnaire, but utilized that of Translator #2 as these were deemed better phrased. In the FT version of the review committee, all sub-questions of question (1) were obtained from Translator #1.

A back translation to English or the source language was done. This was compared to the original OSDI questionnaire. The review committee reassessed the FT based on the BT version and revised the terms as needed to produce the FFT to Filipino (Appendix 3) of the OSDI, with terms that better fit the intended subjects.

A total of 63 patients participated in the study for the pretest and test phases. A summary of the participant demographics is listed in Table 1. There were 59 returning and 4 new patients from the Dry Eye Clinic who voluntarily answered the questionnaires, of which more than 70% were females per category. All participants fell within the ages of 26 to 80 years. All patients underwent a standardized ophthalmologic examination in the clinic apart from taking the questionnaire.

Table 1. Participant Demographics (n=63)

	PRETEST PHASE	TEST PHASE FOR RELIABILITY	
	FFT Filipino and Original English Questionnaires n=16	FFT Filipino Questionnaire only n=36	FFT Filipino Questionnaire without Q4, Q7, Q8 n=11
Age, mean \pm SD	59.1 \pm 8.9	62.3 \pm 12.7	66.4 \pm 9.4
Sex, No. Female (%)	15 (93.8%)	29 (80.6%)	8 (72.7%)
Dry Eye Classification			
Aqueous Deficiency, No. (%)	1 (6.3%)	1 (2.8%)	4 (36.4%)
Evaporative No. (%)	3 (18.8%)	10 (27.8%)	1 (9.1%)
Mixed, No. (%)	12 (75.0%)	25 (69.4%)	6 (54.5%)

II. PRETESTING

Sixteen patients participated in the pretest phase. The highest educational attainment ranged from elementary schooling to college graduate. Most participants (11/16, 68.8%) had an English

proficiency self-rating of 5, with the lowest score being 2 (1 participant) and the highest 9 (2 participants). Everyone rated their Filipino proficiency as 10. Figure 1 shows the percentage of similar responses for all items per participant while Figure 2 demonstrates the percentage of similar responses per item in English and Filipino. Most individuals (13/16, 81.3%) chose the same answer in at least half of the items in both languages, though the range of similar responses varied from 41.7% to 91.7%. The item Q9 had the lowest percentage of participants giving the same responses, while Q2 had the highest. It was noted however that for Q2, 50% of the participants had to have the word “gritty” translated to Filipino, while 25% asked for a rewording of the term and understood more the phrase “bit of sand in the eye.” From the other items, Q5 had to be translated to Filipino for 2 participants while Q4 and Q6 each had to be translated once to obtain an answer. Upon conclusion of the interview, 13 out of 16 subjects (81.3%) reported they preferred to answer the Filipino questionnaire, while 1 favored the English version and 2 expressed no preference between both instruments. All patients reported ease and preference in answering the FFT Filipino questionnaire, thus the tool was administered without additional revisions to participants of the next phase.

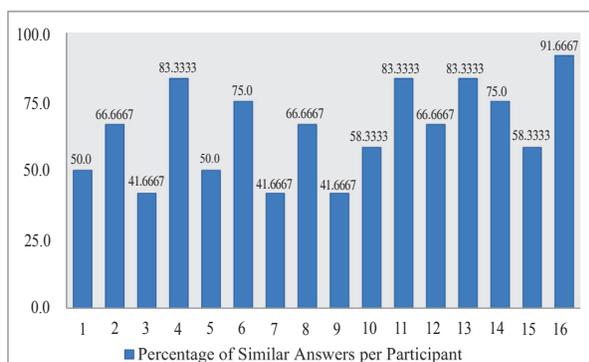


Figure 1. Graph of the percentage of similar responses per participant who answered both the original English OSDI and the FFT Filipino-adapted questionnaires (n=16).

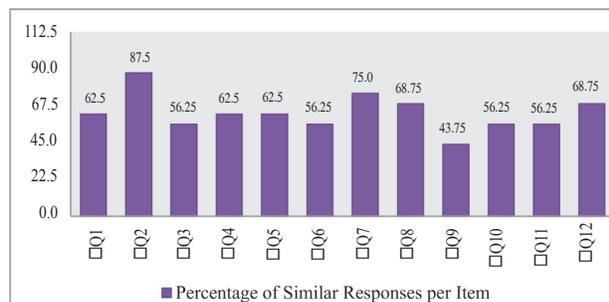


Figure 2. Graph of the percentage of similar responses per item from participants who answered both the original English OSDI and the FFT Filipino-adapted questionnaires (n=16).

III. TESTING FOR RELIABILITY

Thirty-six dry eye patients answered the FFT Filipino questionnaire in the testing phase. The FFT Filipino questionnaire was fairly consistent with the original English OSDI with an overall alpha coefficient of 0.5958. On further analysis per item, some questions had coefficients greater than 0.6, meaning that the alpha of the whole questionnaire may increase to ‘moderately consistent’ if such questions were removed. From the table, Q4, Q7, and Q8 could be considered as possible candidates for deletion, as they will increase the overall alpha to greater than 0.6. The questionnaire without items Q4, Q7, and Q8 was retested to investigate if the overall alpha would increase. In a small set of 11 patients the overall alpha rose to 0.7576, which is moderately consistent.

Table 2. Reliability of the Filipino dry eye questionnaire using the Cronbach alpha coefficient with: A. all items (n=36) and B. with items Q4, Q7, and Q8 omitted (n=11).

A. n=36		B. n=11	
Item	Alpha	Item	Alpha
Q1	0.5156	Q1	0.6837
Q2	0.5580	Q2	0.7473
Q3	0.5359	Q3	0.7298
Q4	0.6023	Q4 omitted	
Q5	0.5774	Q5	0.6402
Q6	0.5787	Q6	0.7232
Q7	0.6667	Q7 omitted	
Q8	0.6610	Q8 omitted	
Q9	0.5765	Q9	0.7820
Q10	0.5215	Q10	0.7479
Q11	0.5205	Q11	0.7514
Q12	0.5732	Q12	0.7556
Overall	0.5958	Overall	0.7576
*Q – question			

DISCUSSION

In a pool of 139 subjects, the study of Schiffman *et al* in 2000 found the OSDI to have a high Cronbach alpha coefficient of 0.92 and an excellent test-retest reliability of 0.82. However, a reliable instrument is one that measures a construct consistently across time, individuals, and situations. Thus, when the tool is given to a population with a different culture and native language, the results may indeed vary.

The present study developed a Filipino-adapted version of the OSDI based on the guidelines of Guillemin *et al* for the cross-cultural adaptation of health-related quality of life questionnaires. A series of translation procedures were employed, utilizing different qualified translators, and a review committee to improve the quality of the final Filipino version.

The pretest phase reflected a fair level of equivalence between the FFT Filipino and the original English versions, with a rather wide range of similar responses per participant. However, participant 16, who had the highest percentage of similar responses, preferred the Filipino to the English questionnaire. Participant 6, who preferred the English questionnaire, was a resident of Cebu, a province with a different local dialect. Item Q2 with the largest percentage of similar responses actually had to be reworded or translated to Filipino in more than half of the time, and should thus have a lower value. The questionnaires were administered by the principal investigator in the form of an interview, thus an item may have more similar responses with some help from the interviewer. The results nonetheless support the value in obtaining a Filipino-adapted questionnaire for dry eye.

The Cronbach alpha for the FFT Filipino instrument overall was fairly consistent. Further analysis revealed that removing items Q4, Q7, and Q8 would increase the overall coefficient to greater than 0.6. Upon retesting with the 3 items omitted, the value indeed increased to moderately consistent. The removed items were: Q4 – *Naranasan mo na ba ang mga sumusunod sa nakaraang linggo: malabong paningin?* (Have you experienced any of the following during the last week: blurred vision?), Q7 – *Mayroon ka bang mga problema sa mata na nakasagabal sa paggawa mo ng mga sumusunod na bagay nuong nakaraang linggo: pagmamaneho sa gabi?* (Have problems with your eyes limited you in performing any of the following during the last week: driving at night?), and Q8 – *Mayroon ka bang mga problema sa mata na nakasagabal sa paggawa mo ng mga sumusunod na bagay nuong nakaraang linggo: paggamit ng computer o pagkuha ng pera mula sa Automated Teller Machine (ATM)?* (Have problems with your eyes limited you in performing any of the following during the last week: working with a computer or bank machine [ATM]?). During

the interview, only 2 patients knew how to drive and most do not use computers or ATMs. When the FFT version was retested with the 3 items omitted, most participants equated *mahinang paningin* in Q3 with *malabong paningin*, which is the omitted item Q4. In these items, answers were usually and inconsistently ‘None of the Time’ or ‘Not Applicable’ which do not equate to the same score. The testing was done in a government hospital in the Philippines, which caters to less financially-abled patients. Results may vary if administered to a population familiar with use of the computer, ATM, and driving.

The new Filipino questionnaire may be further tested for validity as a screening tool and as a measure of severity. Techniques to establish validity in a questionnaire include content validity, criterion validity (measure against a gold standard diagnostic procedure), and construct validity (factor analysis) among others. Schiffman *et al* determined discriminant validity of the OSDI by testing the differences in OSDI scores by disease severity based on physician assessment and through a composite disease severity score created for the study. Their study also included a factor analysis using varimax rotation on the original OSDI and reported 3 subscales within the questionnaire: vision-related function (6 questions), ocular symptoms (3 questions), and environmental triggers (3 questions). These underwent reliability and validity testing as well and were found, along with the overall OSDI score, to be significantly associated with disease severity. As previously mentioned, the alpha of the FFT Filipino questionnaire may also be increased with inclusion participants from private institutions who are likely to use computers and ATMs more often and drive vehicles.

This study was able to develop a Filipino-adapted version of the OSDI. The value of a Filipino questionnaire was reflected in the ease in answering and preference of the new instrument over the original English OSDI. Reliability testing in a tertiary government institution showed the new instrument to have fair internal consistency. The value increased to moderate internal consistency if items Q4, Q7, and Q8 were removed. The new Filipino-adapted OSDI questionnaire may be tested for validity as a screening tool and as a measure of disease severity in subsequent studies.

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