

Content Validity Assessment of a Newly-Developed Patient-Reported Outcome Measure for Dry Eye Disease (DED), Meibomian Gland Dysfunction (MGD), and Sjogren's Syndrome Dry Eye Disease (SS-DED)

PCR25

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Introduction

- Dry Eye Disease (DED), Meibomian Gland Dysfunction (MGD), and Sjögren’s Syndrome Dry Eye Disease (SS-DED) are conditions associated with symptoms of ocular discomfort caused by inadequate lubrication of the eye.<sup>1-3</sup>
- Key symptoms across the three conditions, such as ocular dryness, grittiness, burning sensation, and pain can cause patients to experience difficulties performing activities of daily living and can significantly impact the physical, emotional, and social domains of patients’ Health-Related Quality of Life (HRQoL).<sup>4-6</sup>
- A targeted literature search showed lack of suitable PRO measures for use in DED, MGD, and SS-DED for capturing the patient experience of symptoms and impacts on different aspects of daily life. Additional qualitative research was undertaken to further understand the patient experience and inform the content of a new measure, the Dry Eye Disease Questionnaire (DED-Q).

Objective

- The aim of this research was to evaluate the content validity of the Dry Eye Disease Questionnaire (DED-Q), a newly-developed patient-reported outcome measure for use in DED, MGD, and SS-DED.

Methods

- A first version of the DED-Q was developed based on qualitative literature review in DED, MGD, and SS-DED and previous qualitative research in patients with Chronic Ocular Surface Pain (COSP), some of whom had DED, and aimed to assess patients’ experience of symptoms, ability to perform visual activities, and impact on HRQoL.
- Cognitive debriefing (CD) of the DED-Q was conducted with a sample of 60 US adults who reported experiencing ocular symptoms due to their condition and had a physician-confirmed primary diagnosis of DED (n=20), MGD (n=20), or SS-DED (n=20).
- Interviews were conducted over two rounds and employed a ‘think aloud’ approach to evaluate patients’ understanding of the instructions, items, response options, and recall periods, and to obtain feedback on perceived relevance of concepts assessed across various modules.<sup>8</sup>
- Interviews were also conducted with eight health care professionals to assess clinical relevance of the concepts included.
- Input was sought at key timepoints during the research from three clinical experts (n=1 US; n=1 France; n=1 Greece) to ensure that a clinical perspective of study findings was obtained.
- Verbatim interview transcripts were analyzed in ATLAS.ti v8 using dichotomous codes to assess understanding and relevance of each item, instruction, response option(s) and recall period.

Results

- Participating patients had a mean age of 50 years (range 21-80 years), were mostly female (64%), and were representative of a range of racial, ethnic, and socioeconomic backgrounds. **Table 1.** details the patient demographic and clinical information.

	DED (n=20)	MGD (n=20)	SS-DED (n=20)	Total sample (N=61)
Age (average, range)	47 (21-74)	49 (20-76)	54.5 (29-80)	50.2 (21-80)
Gender (n, %)				
Female	14 (70%)	15 (75%)	9 (45%)	38 (63.3%)
Male	6 (30%)	5 (25%)	11 (55%)	22 (36.7%)
Race (n, %)				
White/Caucasian	7 (35%)	8 (40%)	12 (60%)	27 (45%)
Black/African American	9 (45%)	7 (35%)	3 (15%)	19 (31.7%)
Asian	0 (0%)	2 (10%)	2 (10%)	4 (6.7%)
Hispanic/Latino	3 (15%)	2 (10%)	2 (10%)	7 (11.7%)
Mexican	1 (5%)	1 (5%)	0 (0%)	2 (3.3%)
Other (not specified)	0 (0%)	0 (0%)	1 (5%)	1 (1.7%)
Ethnicity (n, %)				
Non-Hispanic or Latino	14 (70%)	13 (65%)	13 (65%)	40 (66.7%)
Hispanic or Latino	6 (30%)	7 (35%)	7 (35%)	20 (33.3%)
Work status (n, %)				
Retired	1 (5%)	2 (10%)	6 (30%)	9 (15%)
Working full time	12 (60%)	12 (60%)	13 (65%)	37 (61.7%)
Working part time	3 (15%)	1 (5%)	1 (5%)	5 (8.3%)
Looking for work	0 (0%)	2 (10%)	0 (0%)	2 (3.3%)
Homemaker	1 (5%)	1 (5%)	0 (0%)	2 (3.3%)
Student	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Volunteer	1 (5%)	0 (0%)	0 (0%)	1 (1.7%)
Not working due to eye condition	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Not working due to another health condition	2 (10%)	2 (10%)	0 (0%)	4 (6.7%)
Severity of eye condition (n, %)				
Mild	3 (15%)	6 (30%)	5 (25%)	14 (23.3%)
Moderate	11 (55%)	10 (50%)	10 (50%)	31 (51.6%)
Severe	6 (30%)	4 (20%)	5 (25%)	15 (25%)

Cognitive debriefing findings from Round 1

- Most HCPs indicated the selected symptom and impact concepts are relevant to assess in the populations of interest.
- Except for items assessing eye dryness, all items and response options were very well understood by almost all patients, and concepts were largely considered relevant to most patients’ experiences.
- Based on the findings and input of three clinical experts, modifications were made to enable better interpretation and to improve overall concept relevance across the patient groups. (**Table 2.**)

Table 2. Modifications based on the round 1 CD findings in DED, MGD, SS-DED patients

Module	Item/Instruction prior to CD interview	Understanding (n/asked)	Concept relevant (n/asked)	Modifications	Revised item/Instruction post CD (with highlighted changes)
Eye dryness severity module	“Please rate the severity of your eye dryness right now (0=No eye dryness, 10=Worst possible eye dryness)”	8/30	12/12	Item wording revised to focus on eye dryness rather than symptoms related to dry eye disease	“Please rate the severity of your <i>eyes feeling dry</i> right now (0=no dry feeling in my eyes, 10=worst possible dry eye feeling in my eyes).”
Eye dryness frequency module	“How much of the time have you had eye dryness in the past 24 hours?”	8/29	12/12		“How much of the time have your <i>eyes felt dry</i> in the past 24 hours?”
Symptom module	“Please answer the following questions thinking about each symptom at the time it was at its worst over the past 24 hours.”	12/19	Not applicable	Slight wording modifications to instructions to simplify the recall period	“Please answer the following questions thinking about each symptom <i>when it was</i> at its worst over the past 24 hours.”
Symptom module	“Eye dryness: Please rate the severity of your eye dryness at its worst in the past 24 hours. (0=No eye dryness, 10=Worst possible eye dryness).”	12/29	12/12	Item wording and response scale anchors revised to align with changes to the eye dryness module	“Eye dryness: Please rate the severity of your <i>eyes feeling dry</i> at its worst in the past 24 hours (0=No dry eye feeling, 10=worst possible dry eye feeling).”
Symptom module	“Eye redness: please rate the severity of your eye redness at its worst in the past 24 hours.”	28/30	24/28	Item modified to differentiate redness of the eye itself from eyelid redness	“ <i>Eyeball</i> redness: please rate the severity of your <i>eyeball</i> redness at its worst in the past 24 hours.”
Environmental triggers module	“Sensitivity to light: please rate how sensitive your eyes have been to light at its worst in the past 24 hours.”  Sensitivity to wind: (same as above)	21/22	21/21	Environmental triggers could induce a confounding effect in interpretation of clinical trial results.  <i>Module removed</i>	<i>Not applicable</i>
Visual tasking module	“The following questions ask about how much of the time your dry eye disease symptoms and problems affected with your ability to do visual activities in the past 7 days.”	11/15	Not applicable	Additional instructions were added for clarity	“The following....in the past 7 days. <i>Please do not think about any other vision problems you have (such as vision problems that are corrected by wearing glasses, reading glasses, or contact lenses) when selecting an answer.</i> ”

Cognitive debriefing findings from Round 2

- The items were again generally very well understood by almost all patients and most concepts were relevant to greater than 75% of the patients. (**Figure 1.** presents sample quotes from both the interview rounds).
- Despite modifications to the items assessing eye dryness, some patients still tended to refer to their overall dry eye disease symptoms rather than the sensation of eye dryness only.
- As for now, all items assessing eye dryness have been retained without further modification for testing in a larger sample during initial psychometric evaluation analyses of the DED-Q.

Figure 1. Example quotes illustrating patient understanding of DED-Q

Module (recall)	# Items: Concept	Sample quotations illustrating patient understanding
Eye dryness severity module (right now)	(1): Eye dryness severity	“...To rate how bad my—the dryness of my eye is at this moment.” -Female with moderate DED aged 42 interviewed in Round 1 CD
Eye dryness frequency module (past 24 hours)	(1): Eye dryness frequency	“It’s kind of in the middle and for the last 24 hours I feel like, um, maybe approximately 50% of the time my eyes felt dry.” -Female with moderate MGD aged 35, Round 2 CD
Dry eye disease symptom severity module (right now)	(1): Dry eye disease symptom severity	“I’m thinking about, uh, <i>itchy, watery eyes, redness, swelling, um, blurry vision.</i> ” - Male with severe SS-DED aged 69, Round 1 CD
Dry eye disease symptom frequency module (past 24 hours)	(1): Dry eye disease symptom frequency	“...Um, I think yesterday was a good day. So, uh, I think some of the time...” -Male with moderate DED aged 27, Round 2 CD
Symptom module (past 24 hours)	(13): Eye dryness; Eye pain; Eye irritation; Burning sensation; Eye tiredness; Something in the eye; Eye itch; Eye grittiness; Mucus in or around the eye; Eyes feeling scratched; Eyelid redness; Eyeball redness; Watery eyes	<b>Eye irritation:</b> “Um, eye irritation, it would be—past 24 hours, it would be, uh, I’d probably say a six.” -Female with severe DED aged 69, Round 1 CD <b>Eye grittiness:</b> “I would say two ...because when I feel like there’s something in my eye, it feels gritty.” -Female with moderate SS-DED aged 71, Round 1 CD
Blurred vision module (past 24 hours)	(2): Blurred vision severity; Blurred vision frequency	<b>Blurred vision frequency:</b> “Um, some of the time... Because it’s not constant, it’s just like in between like every couple hours.” -Female with severe DED aged 48, Round 2 CD
Visual tasking module (past 7 days)	(8): Read books; Read on screen; Watch TV; Household chores; Hobbies/sports/leisure activities; Watch events at distance; Drive during day; Drive at night	<b>Drive during day:</b> “...A lot of the times because I’m looking at the car ahead of me and so I’m zeroing in on something ahead and it <i>seems to be, uh, blurry</i> sometimes... So that is a problem.” -Female with severe DED aged 71, Round 1 CD
HRQoL module (past 7 days)	(5): Depression; Anxiety; Frustration; Worry; Sleep	<b>Frustration:</b> “It <i>makes you frustrated</i> because sometimes, uh, nothing really helps. Nothing helps, um, you know, in an extreme manner.” -Female with moderate MGD aged 39, Round 1 CD

Conclusions

- No key differences in understanding or concept relevance were identified between rounds of interviews for any items of the DED-Q.
- The CD findings support the content validity of the DED-Q for use in clinical studies to assess the symptoms and functional impacts of DED, MGD, and SS-DED.
- Additional psychometric analysis studies are needed to further refine these measures and confirm their suitability as clinical trial endpoints to support product labeling claims.

References

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