Development and Validation of the EXPECT Questionnaire: Assessing Patient Expectations of Outcomes of Complementary and Alternative Medicine Treatments for Chronic Pain

Salene M. W. Jones, PhD,¹ Jane Lange, PhD,² Judith Turner, PhD,³ Dan Cherkin, PhD,¹ Cheryl Ritenbaugh, PhD, MPH,⁴ Clarissa Hsu, PhD,¹ Heidi Berthoud,¹ and Karen Sherman, PhD¹

Abstract

Background: Patient expectations may be associated with outcomes of complementary and alternative medicine (CAM) treatments for chronic pain. However, a psychometrically sound measure of such expectations is needed.

Objectives: The purpose of this study was to develop and evaluate a questionnaire to assess individuals' expectations regarding outcomes of CAM treatments for chronic low back pain (CLBP), as well as a short form of the questionnaire.

Methods: An 18-item draft questionnaire was developed through literature review, cognitive interviews with individuals with CLBP, CAM practitioners, and expert consultation. Two samples completed the questionnaire: (1) a community sample ($n=141$) completed it via an online survey before or soon after starting a CAM treatment for CLBP, and (2) participants ($n=181$) in randomized clinical trials evaluating CAM treatments for CLBP or fibromyalgia completed it prior to or shortly after starting treatment. Factor structure, internal consistency, test–retest reliability, and criterion validity were examined.

Results: Based on factor analyses, 10 items reflecting expectations (used to create a total score) and three items reflecting hopes (not scored) were selected for the questionnaire. The questionnaire had high internal consistency, moderate test–retest reliability, and moderate correlations with other measures of expectations. A three-item short form also had adequate reliability and validity.

Conclusions: The Expectations for Complementary and Alternative Medicine Treatments (EXPECT) questionnaire can be used in research to assess individuals' expectations of treatments for chronic pain. It is recommended that the three hope questions are included (but not scored) to help respondents distinguish between hopes and expectations. The short form may be appropriate for clinical settings and when expectation measurement is not a primary focus.

Keywords: back pain, yoga, acupuncture, complementary and alternative medicine, massage, chiropractic

Introduction

GREATER KNOWLEDGE ABOUT the effects of individuals' expectations regarding outcomes from complementary and alternative medicine (CAM) treatments for chronic pain is needed. Progress in this area has been hampered by the lack

of valid and reliable measures, possibly explaining the inconsistent research.^{1–6} Most measures of individuals' expectations regarding CAM treatments were not developed systematically and were developed for one specific treatment.^{7,8} No questionnaires have been developed to assess individuals' expectations across CAM therapies for chronic

¹Group Health Research Institute, Seattle, WA.

²Fred Hutchinson Cancer Research Center, Seattle, WA.

³University of Washington, Seattle, WA.

⁴University of Arizona, Tucson, AZ.

pain. Many studies used measures developed to assess treatment credibility.^{7,8} However, an individual's views regarding the credibility of a treatment may differ from their expectations about the likely effects of the treatment on their pain. Prior work also supports the importance of distinguishing expectations from other perceptions, such as credibility and hope.^{9–11} Hopes reflect individuals' views of the best-case scenario, whereas expectations are their appraisals of the most likely outcomes, and asking about hope may affect how respondents interpret questions about expectations.^{9–11} To address these gaps in the literature, a measure of expectations for different CAM treatments for chronic low back pain (CLBP) was developed and evaluated. In recognition of the frequent need in research studies to minimize respondent burden, a short form of this questionnaire was also developed.

Methods

Questionnaire development: overview

The draft Expectations for CAM Treatments (EXPECT) questionnaire items were developed through an iterative process, including a review of the literature and interviews with individuals with CLBP and CAM practitioners. Questions were drafted to capture hopes and expectations for CAM treatment effects on three domains identified in previous work^{9,10} (pain relief, improved function, and improved mood and overall well-being). Questions were drafted about specific domains (sleep, mood) and how much change individuals hoped for and realistically expected in their back pain, and the impact of back pain on their life in one year. The draft questions were evaluated using cognitive interviews with individuals with CLBP¹¹ and were reviewed by seven CAM and pain experts. Using this input, the items were revised, and they were evaluated in additional cognitive interviews with individuals with CLBP.

The draft questionnaire included 18 items regarding individuals' hopes and expectations about outcomes of CAM care for their pain. Each item had a 0–10 response scale, and some had an option for selecting “not applicable.” Anchors differed across items, but 0 always represented no change or worse and 10 represented maximal improvement (complete relief or no impact of back pain on the domain). All study procedures and materials were approved by the Group Health Institutional Review Board, and all participants provided informed consent.

Development of EXPECT questionnaire using community volunteers

Participants, setting, and procedures. Between July 2013 and November 2014, individuals were recruited who were planning to begin or who had recently started acupuncture, chiropractic, massage, or yoga for CLBP. They were recruited from several sources, including practitioners, online advertisements, print advertisements, and panelists assembled by a survey research organization. Advertisements directed participants to the study Web site, which contained a description of the study and screening questions. Eligibility requirements included age between 20 and 70 years old; the ability to read English; Internet access; back pain for at least 3 months; back pain intensity in the previous week rated ≥ 3 on a 0–10 scale; plan to begin acupuncture, chiropractic, massage, or yoga for CLBP in the next month or started of one of those therapies in

the past week; and no use of those therapies in the previous 3 years (except for the prior week). Eligible individuals then completed the draft questionnaire and other questionnaires. Participants received \$20 for completed questionnaires. One day later, participants who had completed questionnaires prior to their first treatment were invited to complete the questionnaire again if they still had not started treatment. One day later, they were e-mailed a link to the online questionnaire and asked to complete it again within 7 days. Participants received \$10 for completing the second questionnaire.

Measures. To assess criterion validity, the six-item treatment Credibility/Expectancy Questionnaire (CEQ),⁷ the four-item Acupuncture Expectancy Scale,⁸ and a single question asking how helpful the participant believed the treatment would be for their CLBP were administered.^{4,8,12–17} The CEQ includes two subscales (treatment credibility and treatment expectations). The CEQ has demonstrated construct validity and relationships with clinical outcomes.⁴ The four-item Acupuncture Expectancy Scale, which assesses patients' expectations for the efficacy of acupuncture, has demonstrated validity and reliability.⁸ It was adapted by replacing “illness” with “pain” and, for non-acupuncture treatment, by replacing “acupuncture” with the treatment the participant was beginning. The single CLBP treatment helpfulness question^{12–17} asks respondents to rate their expectations of a treatment being effective for their back pain on a 0 (no change) to 10 (complete change) scale.

Evaluation of EXPECT questionnaire in randomized controlled trials

Participants, setting, and procedures. After the draft questionnaire was developed, it was evaluated in three randomized controlled trials (RCTs) of CAM therapies for chronic pain: Back to Health (BTH),¹⁸ Mind–Body Approaches to Pain (MAP),¹⁹ and Pain Outcomes Comparing Yoga versus Structured Exercise (POYSE; <http://clinicaltrials.gov/ct2/show/NCT01797263>). The BTH trial randomized participants with CLBP to yoga, physical therapy, and self-care education. Questionnaire data, completed before starting treatment, were obtained from 72 people randomly assigned to either physical therapy or yoga. The MAP trial¹⁹ randomized participants with CLBP to group cognitive–behavioral therapy or mindfulness-based stress reduction. Participants ($n=72$) were invited to complete the draft questionnaire within 1 week of their first treatment session, and were paid \$20 for completing the questionnaire. The POYSE trial randomized veterans with fibromyalgia to yoga or structured exercise classes. Participants ($n=100$) completed the paper version of the draft questionnaire after randomization and before treatment began. In all three trials, participants also provided demographic data and pain intensity ratings. Participants in BTH and MAP completed the 23-item modified Roland Modified Disability Questionnaire,²⁰ and POYSE participants completed the Fibromyalgia Impact Questionnaire Revised.²¹ Participants were required to have had pain for 12 weeks and to rate their pain as ≥ 3 on a 0–10 scale.

Statistical analyses

Initial psychometric analyses: community sample. The psychometric properties of the draft questionnaire were

examined in the community sample to develop the final questionnaire. Items with >5% “not applicable” responses were excluded. Next, an exploratory factor analysis (EFA) was conducted to determine the number of factors and to select items for the final questionnaire. The factor solutions were obtained via a minimum residual approach using R v3.2.0²² and the *psych* package.²³ The two-factor solution was obtained using Promax rotation, allowing factors to correlate. One- and two-factor solutions were compared based on the Bayesian information criterion (BIC),²⁴ pro-

portion of total variance explained, factor loadings, and fit statistics. Models with a lower BIC are favored. The fit statistics included those that do not assume multivariate normality (standardized root mean square of the residual [SRMSR]; <0.08 suggests a good fit)²⁵ and other statistics that assume a multivariate normal structure. These included the chi-square test of perfect fit (non-significant *p*-values >0.05 are desirable), root mean square error of approximation (RMSEA; <0.08 suggests a good fit), and the Tucker–Lewis index (TLI; >0.95 suggests a good fit).²⁶

TABLE 1. COMMUNITY SAMPLE AND RANDOMIZED CLINICAL TRIAL SAMPLE CHARACTERISTICS

Characteristic	Community sample		Clinical trials		
	All (n = 163)	Retest subsample (n = 71)	BTH (n = 72)	MAP (n = 72)	POYSE (n = 100)
Age					
20–30 years, % (n)	27.0 (44)	22.5 (16)	15.5 (11)	13.9 (10)	2.0 (2)
31–40 years, % (n)	20.9 (34)	21.1 (15)	21.1 (15)	9.7 (7)	7.0 (7)
41–50 years, % (n)	20.2 (33)	25.4 (18)	25.4 (18)	18.1 (13)	18.0 (18)
51–60 years, % (n)	22.7 (37)	22.5 (16)	33.8 (24)	29.2 (21)	34.0 (34)
61–70 years, % (n)	9.2 (15)	8.5 (6)	4.2 (3)	29.2 (21)	33.0 (33)
≥71 years, % (n)	0	0	0	0	6.0 (6)
Female, % (n)	57.7 (94)	52.1 (37)	62.5 (45)	62.5 (45)	31.0 (31)
Race					
Asian/Pacific islander, % (n)	1.9 (3)	1.4 (1)	4.2 (3)	4.2 (3)	0
Black, % (n)	9.9 (16)	16.9 (12)	55.6 (40)	1.4 (1)	35.7 (35)
More than one, % (n)	6.8 (11)	7.0 (5)	6.9 (5)	0	7.1 (7)
Other, % (n)	2.5 (4)	4.2 (3)	9.7 (7)	1.4 (1)	3.1 (3)
White, % (n)	78.9 (127)	70.4 (50)	23.6 (17)	93.0 (66)	54.1 (53)
Hispanic, % (n)	9.3 (15)	7.0 (5)	12.5 (9)	2.8 (2)	4.2 (4)
PHQ-2 (0–6), <i>M</i> (<i>SD</i>)	2.85 (2.14)	2.53 (2.02)			
Average pain intensity past week (0–10 scale), <i>M</i> (<i>SD</i>)	6.72 (1.75)	6.68 (1.73)	4.9 (2.3)	5.8 (1.4)	6.4 (1.9)
Days with back pain, last 3 months, <i>M</i> (<i>SD</i>)	75.05 (16.76)	74.18 (16.1)			
Receiving disability compensation for pain, % (n)	8.8 (14)	11.6 (8)			
RMDQ, <i>M</i> (<i>SD</i>)	16.47 (5.58)	17.21 (5.36)	15.3 (5.3)	11.1 (4.8)	
FIQR, <i>M</i> (<i>SD</i>)					56.5 (16.6)
Ever had a back injection, % (n)	30.1 (49)	32.4 (23)			
Ever had back surgery, % (n)	12.9 (21)	8.5 (6)			
Pain below the knee in last month, % (n)	44.8 (73)	40.8 (29)			
Use of prescription medicine for back pain in last week, % (n)	74.8 (122)	80.3 (57)			
Treatment initiating					
Acupuncture, % (n)	35.6 (58)	42.3 (30)			
Chiropractic, % (n)	24.5 (40)	19.7 (14)			
Massage, % (n)	20.2 (33)	18.3 (13)			
Yoga, % (n)	19.6 (32)	19.7 (14)	50.0 (36)	0	48.0 (48)
MBSR, % (n)			0	61.1 (44)	0
CBT, % (n)			0	38.9 (28)	0
PT, % (n)			50.0 (36)	0	0
SEP, % (n)			0	0	52.0 (52)
Credibility/Expectancy Questionnaire (7)					
Credibility subscale (range 3–27), <i>M</i> (<i>SD</i>)	19.52 (5.13)	19.27 (5.57)			
Expectancy subscale (range 3–27), <i>M</i> (<i>SD</i>)	11.13 (4.27)	10.65 (4.37)			
Total score (range 6–54), <i>M</i> (<i>SD</i>)	30.64 (8.78)	29.92 (9.29)			
Acupuncture Expectancy Scale (range 4–20, (8)), <i>M</i> (<i>SD</i>)	12.53 (4.15)	12.13 (4.05)			
Helpfulness of treatment (range 0–10), <i>M</i> (<i>SD</i>)	6.72 (2.45)	6.56 (2.63)			

BTH, Back to Health trial; CBT, cognitive–behavioral therapy; FIQR, Fibromyalgia Impact Questionnaire Revised; MAP, Mind–Body Approaches to Pain trial; MBSR, mindfulness-based stress reduction; PHQ, Patient Health Questionnaire; POYSE, Pain Outcomes Comparing Yoga versus Structure Exercise; PT, physical therapy; RMDQ, Roland Morris Disability Questionnaire; SEP, Structured Exercise Program; *SD*, standard deviation.

As detailed in the Results, a two-factor model was selected, and then items for the final questionnaire were selected based on factor loadings. Items were retained that loaded >0.50 on the primary factor and that loaded <0.30 on the secondary factor. The final questionnaire was scored as the mean of the answered expectations questions. Scores could range from 0 to 10, with higher scores indicating more favorable expectations. For the final questionnaire, floor and ceiling effects (defined as $>15\%$ having the highest or lowest possible score²⁷), Cronbach's alpha to assess internal consistency (≥ 0.70 is considered adequate²⁸), and corrected item-total correlations were evaluated. Test retest reliability of the questionnaire was assessed in the test-retest subgroup of the community sample using the intra-class correlation coefficient (ICC), with ≥ 0.70 considered adequate.²⁹ Criterion validity of the questionnaire was assessed by calculating Pearson correlations with the other measures of expectations.

Psychometric evaluation in clinical trials samples. Although the RCT samples completed all 18 draft questions, only the final 10-item questionnaire was scored. Confirmatory factor analyses (CFA) was conducted to assess the factor structure of the final questionnaire in the RCT samples using the *lavaan* package.³⁰ The CFA was fit via maximum likelihood. Fit was examined using the chi-square test of perfect fit, RMSEA, TLI, and SRMSR. To assess fit without the assumption of multivariate normality, robust test statistics using sandwich-based covariance estimates were computed in addition to the standard minimum function test statistics. Floor and ceiling effects, item-total correlations, and Cronbach's alpha were also examined.

Short-form item selection. From the final 10-item questionnaire and the questions about hopes from the draft questionnaire (see Results and Appendix A), three items were selected that were summary or general measures of expectations, rather than expectations specific to one outcome domain (e.g., mood, sleep), based on the rationale that these items were likely to be relevant for all participants and could provide adequate coverage of the construct of expectations with reduced

items. One hope item was also selected to be administered but not scored. The three selected items were "how much change do you realistically expect" in: (1) your back pain, (2) the impact of your back pain on your life, and (3) the impact of your back pain on your daily activities. The short form was evaluated by examining its internal consistency (all four samples), test-retest validity (community sample only), correlation with the long form (all four samples), and correlations with the criterion measures (community sample only).

Results

Table 1 provides descriptive statistics for all samples. Across the samples, diversity in age, race/ethnicity, and sex was represented, although few adults >70 years of age were included by design.

Initial psychometric analyses in community sample

Figure 1 shows the study flow in the community sample ($n = 163$, $n = 71$ for test-retest subsample). Table 2 shows, for each item, the number of missing/not applicable responses, the mean (*SD*) rating, corrected item-total correlations, and factor loadings in the one- and two-factor solutions in the EFA. The corrected item-total correlations were acceptable (0.60 – 0.88).³¹ Before factor analyses, one question (about impact of back pain on family/friends) was excluded because 9.8% ($n = 10$) of the sample reported that the question was not applicable. All other items had $<5\%$ not applicable or missing responses. This left complete data from 141 participants for the EFA. The EFA factor loadings indicated that the two-factor solution consisted of one factor conceptually related to expectations (items 2, 4–8, and 10–13) and the other factor conceptually related to hopes (items 1, 3, 9, 15, and 17). Two items (16 and 18) concerning expectations of outcomes in 1 year loaded on both factors.

The two-factor solution had better fit statistics and explained more variance compared with the one-factor solution (Table 3). In addition to eliminating the question about impact of back pain on family/friends, four other questions

FIG. 1. Study flow in the community sample that completed the online draft questionnaire.

TABLE 2. DRAFT QUESTIONNAIRE PERFORMANCE CHARACTERISTICS AND FACTOR LOADINGS IN ONE- AND TWO-FACTOR EXPLORATORY FACTOR ANALYSES, COMMUNITY SAMPLE (N= 141)

Question number	NA/missing, % (n)	M (SD)	Corrected item-total correlation	One factor	Two factor	
				Loadings 1	Loading 1	Loading 2
Q1	0 (0)	7.4 (2.2)	0.60	0.56	0.08	0.57
Q2	0 (0)	5.8 (2.2)	0.75	0.77	0.61	0.18
Q3	0 (0)	7.6 (2.4)	0.74	0.72	-0.04	0.91
Q4	0 (0)	6.0 (2.3)	0.80	0.83	0.58	0.29
Q5	3.7 (6)	6.5 (2.6)	0.80	0.83	0.88	-0.04
Q6	3.1 (5)	6.5 (2.5)	0.79	0.82	0.92	-0.09
Q7	2.5 (4)	6.2 (2.6)	0.79	0.83	0.94	-0.11
Q8	0 (0)	6.0 (2.3)	0.78	0.81	0.77	0.07
Q9	2.5 (4)	7.2 (2.5)	0.72	0.70	0.04	0.80
Q10	2.5 (4)	5.9 (2.4)	0.85	0.87	0.73	0.17
Q11	2.5 (4)	6.0 (2.6)	0.86	0.89	0.98	-0.08
Q12	2.5 (4)	6.1 (2.5)	0.83	0.86	0.94	-0.06
Q13	0.6 (1)	6.2 (2.4)	0.88	0.90	0.98	-0.06
Q14	9.8 (16)	6.1 (2.5)	0.78			
Q15	0 (0)	7.6 (2.5)	0.78	0.76	-0.05	0.98
Q16	0 (0)	6.0 (2.5)	0.77	0.78	0.39	0.46
Q17	0 (0)	7.5 (2.6)	0.65	0.64	-0.26	1.08
Q18	0 (0)	6.0 (2.5)	0.79	0.79	0.34	0.53

Note: Q14 was not included in the factor analyses.
NA, not applicable.

were eliminated, resulting in a 10-item final questionnaire. Items 16 and 18 were eliminated because they loaded on both factors. Items 15 and 17 were eliminated because although they loaded on the hope factor, they measured hope for a time frame that differed from that for the other three hope questions. Based on these results, 10 items about ex-

pectations were chosen for the final questionnaire to be scored, and three questions about hopes (1, 3, and 9) were chosen to be administered but not scored.

Reliability and validity statistics for the final 10-item EXPECT questionnaire (scored from the 18 draft questionnaire items administered) are shown in Table 4. Cronbach's

TABLE 3. FIT INDEXES FOR THE EXPLORATORY AND CONFIRMATORY FACTOR ANALYSES IN THE COMMUNITY SAMPLE AND THE CLINICAL TRIALS SAMPLES

<i>Exploratory analyses: community sample (17 items)</i>			<i>Confirmatory analysis: clinical trials, one-factor solution (10 items)</i>			
	<i>One-factor solution (n = 141)</i>	<i>Two-factor solution (n = 141)</i>		<i>BTH yoga study (n = 55)</i>	<i>MAP study (n = 41)</i>	<i>POYSE study (n = 85)</i>
Total % variance explained	0.62	0.71	Total % variance explained	0.61	0.65	0.74
Chi-square	926.7	527.8	SRMSR	0.07	0.05	0.05
Chi-square <i>df</i>	119	103	ML chi-square	124.9	57.0	141.2
<i>p</i> -Value	<0.001	<0.001	Chi-square <i>df</i>	35	35	35
RMSEA (90% CI)	0.23 (0.21–0.23)	0.18 (0.16–0.19)	ML chi-square <i>p</i> -value	<0.001	0.01	<0.001
RMSR	0.10	0.05	ML RMSEA (90% CI)	0.22 (0.18–0.26)	0.12 (0.06–0.18)	0.19 (0.16–0.22)
TLI	0.65	0.79	ML TLI	0.75	0.92	0.86
BIC	337.8	18.1	ML CFI	0.81	0.94	0.89
			Robust chi-square	54.36	49.90	80.18
			Robust chi-square <i>p</i> -value	0.02	0.049	<0.001
			Robust RMSEA (90% CI)	0.10 (0.06–0.13)	0.10 (0.02–0.16)	0.12 (0.10–0.15)
			Robust TLI	0.93	0.87	0.92
			Robust CFI	0.94	0.90	0.94

BIC, Bayesian information criterion; CFI, comparative fit index; CI, confidence interval; *df*, degrees of freedom; ML, maximum likelihood; RMSEA, root mean square error of approximation; SRMSR, standardized root mean square residual; TLI, Tucker–Lewis index.

TABLE 4. FINAL 10-ITEM EXPECT QUESTIONNAIRE: RELIABILITY AND VALIDITY STATISTICS

	Community sample, n = 163	Clinical trials, n = 244
Cronbach's alpha	0.96	0.96
Test-retest reliability, ICC (95% CI)	0.75 (0.63–0.84)	
Floor effect (score of 0), n (%)	2 (1.2)	0
Ceiling effect (score of 10), n (%)	3 (1.8)	7 (2.9)
Pearson correlations of the		
Expectations Questionnaire		
with other expectations measures		
Credibility/Expectancy Questionnaire		
Treatment credibility subscale	0.54	
Treatment expectations subscale	0.65	
Total score	0.65	
Acupuncture Expectancy Scale	0.54	
Treatment helpfulness rating	0.60	

ICC, intraclass correlation.

alpha (internal consistency) was very high (0.96). Floor (<2% had a score of 0) and ceiling (3% had a score of 10) effects were low in the community sample. In the community sample subgroup that completed the expectations questions on two separate occasions, the test-retest ICC was 0.75 (95% confidence interval [CI] 0.63–0.84), consistent with expectations being a moderately stable construct over a short time period before treatment. The Pearson correlations of the 10-item EXPECT questionnaire with other measures of expectations ranged between 0.54 and 0.65 (Table 4).

Psychometric evaluation in clinical trials samples

Tables 3 and 5 display psychometric statistics, factor loadings, and fit statistics for the 10 expectation items of the final EXPECT questionnaire completed in the three clinical trial samples. CFA were limited to individuals in the clinical trials with non-missing values (55/72 for the BTH trial, 41/72 for MAP, and 85/100 for POYSE). In all three trials, the maximum likelihood fit statistics demonstrated some lack of fit. In contrast, the robust fit statistics indicated good fit.

Using the combined data from the three RCT samples, Cronbach's alpha was 0.96, indicating high internal consistency. Corrected item-total correlations across the three trials ranged from 0.61 to 0.90, further indicating sufficient reliability. Floor and ceiling effects were minimal; no individuals had a score of 0 and only 7 (2.9%) had a score of 10.

Short-form evaluation

In the four samples combined, the three-item short form showed adequate internal consistency (Cronbach's α =0.89; 95% CI 0.81–0.96). In the subsample that completed the questionnaire twice, test-retest stability was 0.79 (95% CI 0.69–0.89). Pearson correlations between the short form and the parent questionnaire ranged from 0.90 to 0.95 across the four samples. In the community sample, the three-item short form correlated moderately with the CEQ total score (0.64), credibility subscale (0.54), expectancy subscale (0.67), Acupuncture Expectancy Scale (0.51), and the single expectations item (0.56).

Discussion

The EXPECT questionnaire assesses individuals' expectations of outcomes of CAM treatments for chronic pain. The questionnaire showed good reliability in community and clinical trials samples of individuals with chronic pain. The factor analyses supported the conceptualization of hopes and expectations as two distinct, but related, constructs. The questionnaire was moderately correlated with other treatment expectation measures likely due to differences across measures in aspects of expectations assessed by the measures or due to one measure consisting of a single item and the restricted range of another. The short-form version also showed good reliability and validity, and was highly correlated with the parent questionnaire.

The EXPECT questionnaire includes 10 items on expectations for various outcomes relevant for adults with CLBP. It is recommended that three questions about hopes for treatment outcomes also be administered with the expectation items but not scored. The intent of these questions is to increase respondents' focus on answering the 10 expectations questions in terms of their realistic expectations as opposed to their hopes for treatment outcomes. Data to

TABLE 5. FINAL 10-ITEM EXPECTATIONS QUESTIONNAIRE: FACTOR LOADINGS FOR CLINICAL TRIALS SAMPLES

Question number	BTH trial		MAP trial		POYSE trial	
	Factor loadings	Corrected item-total correlation	Factor loadings	Corrected item-total correlation	Factor loadings	Corrected item-total correlation
Q2	0.76	0.72	0.72	0.71	0.78	0.77
Q4	0.84	0.8	0.86	0.84	0.82	0.80
Q5	0.85	0.85	0.59	0.56	0.77	0.76
Q6	0.66	0.64	0.76	0.72	0.85	0.84
Q7	0.79	0.78	0.82	0.82	0.86	0.85
Q8	0.82	0.77	0.54	0.56	0.87	0.86
Q10	0.84	0.79	0.91	0.89	0.9	0.88
Q11	0.64	0.61	0.89	0.85	0.9	0.87
Q12	0.81	0.79	0.94	0.90	0.91	0.90
Q13	0.79	0.76	0.91	0.88	0.88	0.86

support the use of these three hope questions for studying hopes about treatment outcomes are not available. For the short-form questionnaire, the administration of the first hope item ("How much change do you hope for in your back pain?"), followed by the three short-form expectation items, is recommended, giving a total of four items administered. As with the parent questionnaire, only the expectation items in the short form are included in the scoring.

The EXPECT questionnaire has advantages compared with previous measures of treatment expectations. The Acupuncture Expectancy Questionnaire was found to have floor and ceiling effects⁸; the EXPECT questionnaire did not have floor or ceiling effects. Unlike CAM-treatment specific expectations measures,⁸ this questionnaire was developed for use with diverse CAM treatments. In contrast to measures that assess treatment credibility³² (i.e., a treatment's potential ability to improve pain in general), the EXPECT questionnaire asks about expectations in terms of the effects of the treatment on the respondent's own pain outcomes. Finally, the EXPECT questionnaire asks about multiple outcomes related to chronic pain, whereas other measures (e.g., mood and sleep) assess expectations for only a few outcomes.⁸

This study had a number of limitations. In the EFA, many of the fit statistics based on multivariate normality exceeded cutoff values. However, one of the main purposes of the factor analysis was to compare one- and two-factor models to determine whether hope and expectations are different rather than to compare models to cutoffs or to test the multivariate normality. The CFA, despite small sample sizes, showed adequate fit with the robust test statistics. The samples included few individuals ≥ 70 years of age. The study did not evaluate empirically whether including the hope items affected responses to the expectation questions. Finally, the full or short-form questionnaires, once finalized, were not evaluated in new samples.

The strengths of the study include development of the questionnaire using a sequential process of qualitative interviews with practitioners and individuals with chronic pain, cognitive interviews, and psychometric evaluation. Other strengths are questionnaire testing in samples diverse in sociodemographic characteristics and CAM therapies, and confirmatory testing in samples of individuals beginning clinical trials. The POYSE sample consisted of adults with fibromyalgia but showed results consistent with those in the CLBP samples, supporting the use of the questionnaire in diverse pain populations. A strength of the short-form development was selection of items based on item content rather than empirical selection. Selection of items for a short form solely through empirical methods can lead to omission of important aspects of the construct.³³

Conclusions

The EXPECT questionnaire can be used in research to assess individuals' expectations of treatments for chronic pain. Several directions for future research are indicated. Further research is needed to assess the psychometric characteristics of the EXPECT questionnaire and short form in samples with different sociodemographic and clinical characteristics. Examination of the association of EXPECT scores with outcomes after CAM treatments may help increase knowledge about the role of individuals' expectations in their outcomes after CAM treatments. Finally, although

the questionnaire can be used with individuals beginning CAM treatments for CLBP, the questionnaire might be adapted for use with individuals with other pain problems and for use with non-CAM treatments.

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Author Disclosure Statement

The authors do not have any conflicts of interest to declare.

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Address correspondence to:
 Salene M.W. Jones, PhD
 Group Health Research Institute
 Seattle, WA 98101

E-mail: salenewu@gmail.com

Appendix A: Expectations for Complementary and Integrative Treatments (EXPECT) Questionnaire

I am now going to ask you a series of questions about the effects that [INSERT TREATMENT MODALITY] may have on your back pain and on how back pain impacts your life. In each case, the question is asking about the results at the end of the treatment period.											
Back Pain Questions:											
1.	How much change do you <i>hope</i> for in your back pain? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “complete relief.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Complete Relief					
2.	How much change do you <i>realistically expect</i> in your back pain? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “complete relief.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Complete Relief					

Impact of back pain on life questions:											
3.	How much change do you <i>hope</i> for in the <i>impact of back pain on your life</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “pain no longer impacts my life.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Back Pain No Longer Impacts My Life					
4.	How much change do you <i>realistically expect</i> in the <i>impact of back pain on your life</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse”, and 10 is “pain no longer impacts my life.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Back Pain No Longer Impacts My Life					
Sleep/Mood/Energy:											
The next set of questions asks about areas of your life such as sleep, mood, and energy. If any of these questions are not relevant for you because back pain does not impact that area of your life, please answer Not Applicable.											
5.	How much change do you realistically <i>expect</i> in your <i>back-related sleep problems</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer affects my sleep.” If back pain does not impact your sleep, please choose “not applicable.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Back Pain No Longer Affects My Sleep					
	☐ Not Applicable										
6.	How much change do you realistically <i>expect</i> in your <i>mood or irritability</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer affects my mood.” Or you may choose “not applicable.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Back Pain No Longer Affects My Mood or Irritability					
	☐ Not Applicable										
7.	How much change do you realistically <i>expect</i> in your <i>energy</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer affects my energy.” Or you may choose “not applicable.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Change/Worse					Back Pain No Longer Affects My Energy					
	☐ Not Applicable										
Coping Question:											
The next question is about your expectations about coping with back pain.											
8.	How much improvement in your ability to cope with back pain do you realistically <i>expect</i> as a result of [INSERT TREATMENT MODALITY]? Please answer on a scale of 0 to 10, where 0 is “no improvement” and 10 is “extreme improvement.”										
	0	1	2	3	4	5	6	7	8	9	10
	No Improvement					Extreme Improvement					

<p>Limitations due to back pain questions:</p> <p>The following questions are about effects that [INSERT TREATMENT MODALITY] may have on your physical limitations due to back pain. In each case, the question is asking about the results at the end of the treatment period. If these questions are not relevant for you because you do not have any physical limitations due to back pain, please choose “not applicable.”</p>	
9.	<p>How much change do you <i>hope</i> you will have in your back pain–related physical limitations? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “limitations completely resolved.” Or you may choose “not applicable.”</p>
	<p>0 1 2 3 4 5 6 7 8 9 10</p> <p>No Change/Worse Limitations Completely Resolved</p> <p>☐ Not Applicable</p>
10.	<p>How much change do you <i>realistically expect</i> in your back pain-related physical limitations? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “limitations completely resolved.” Or you may choose “not applicable.”</p>
	<p>0 1 2 3 4 5 6 7 8 9 10</p> <p>No Change/Worse Limitations Completely Resolved</p> <p>☐ Not Applicable</p>
<p>Impact of back pain on specific areas of life questions:</p> <p>The next questions to ask about the effects that [INSERT TREATMENT MODALITY] may have on the impact of back pain on specific areas of your life. In each case, the question is asking about the results at the end of the treatment period. If any of these questions are not relevant for you because back pain does not impact that area of your life, please choose “not applicable.”</p>	
11.	<p>How much change do you <i>realistically expect</i> in the <i>impact of back pain on your work, including housework</i>? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer impacts my work,” including housework. Or you may choose “not applicable” if back pain does not impact your work/housework now.</p>
	<p>0 1 2 3 4 5 6 7 8 9 10</p> <p>No Change/Worse Back Pain No Longer Impacts my Work</p> <p>☐ Not Applicable</p>
12.	<p>How much change do you <i>realistically expect</i> in the <i>impact of back pain on your social and recreational activities</i>? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer impacts my social and recreational activities.” Or you may choose “not applicable” if back pain does not impact your social and recreational activities now.</p>
	<p>0 1 2 3 4 5 6 7 8 9 10</p> <p>No Change/Worse Back Pain No Longer Impacts my Social and Recreational Activities</p> <p>☐ Not Applicable</p>
13.	<p>How much change do you <i>realistically expect</i> in the <i>impact of back pain on your daily activities</i>? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer impacts my daily activities.” Or you may choose “not applicable” if back pain does not impact your daily activities now.</p>
	<p>0 1 2 3 4 5 6 7 8 9 10</p> <p>No Change/Worse Back Pain No Longer Impacts My Daily Activities</p> <p>☐ Not Applicable</p>

Appendix B: Short Form of the EXPECT Questionnaire

I am now going to ask you a series of questions about the effects that [INSERT TREATMENT MODALITY] may have on your back pain and how back pain impacts your life. In each case, the question is asking about the results at the end of the treatment period.											
1. How much change do you <i>hope</i> for in your back pain? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “complete relief.”											
0	1	2	3	4	5	6	7	8	9	10	
No Change/Worse						Complete Relief					
2. How much change do you <i>realistically expect</i> in your back pain? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “complete relief.”											
0	1	2	3	4	5	6	7	8	9	10	
No Change/Worse						Complete Relief					
3. How much change do you <i>realistically expect</i> in the <i>impact of back pain on your life</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse”, and 10 is “pain no longer impacts my life.”											
0	1	2	3	4	5	6	7	8	9	10	
No Change/Worse						Back Pain No Longer Impacts My Life					
4. How much change do you <i>realistically expect</i> in the <i>impact of back pain on your daily activities</i> ? Please answer on a scale of 0 to 10, where 0 is “no change or worse” and 10 is “back pain no longer impacts my daily activities .” Or you may choose “not applicable” if back pain does not impact your daily activities now.											
0	1	2	3	4	5	6	7	8	9	10	
No Change /Worse						Back Pain No Longer Impacts My Daily Activities					
☐ Not Applicable											