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Pain Barriers: Psychometrics of a 13-Item Questionnaire

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Abstract

Background—Research instruments that effectively measure key pain constructs without needlessly taxing participants are invaluable to investigative processes.

Objectives—The purpose of this series of studies was to eliminate the redundancy of the commonly used 27-item pain tool the Barriers Questionnaire (BQ-27), retain its theoretical domains, and maintain its psychometric properties in a new shortened version.

Method—We reduced the BQ-27 to 13 items using data from 259 patients with cancer, by selecting the single item from each domain with the highest frequency of endorsement and including all of the items in the side effects subscale. We tested reliability of the BQ-13 using data from additional studies (N = 221) and (N = 167) and used ANCOVA (N = 221) to determine instrument sensitivity.

Results—Confirmatory factor analysis revealed that the BQ-13 contained two constructs: pain management and side effects. The BQ-13 demonstrated internal consistency as a total scale (α = 0.73) and stability via 4-week test-retest reliability. Additionally, the BQ-13 was sensitive ($F(1, 218) = 7.7$, $p = .006$) to effects of a tailored, multimedia educational intervention.

Discussion—We demonstrated that the BQ-13 retained theoretical constructs, eliminated redundant items likely to contribute to floor effects, maintained adequate internal consistency and stability reliability, and had sensitivity to intervention effects.

Keywords

outpatient; cancer pain; measurement; patient-related barriers

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Introduction

The 27-item Barriers Questionnaire (BQ-27) (Ward et al., 1993) has eight domains and is a valid and reliable measure of patients' beliefs about pain and analgesics. However, it is plagued by redundant items and floor effects. Two shortened versions (Wells, Johnson, & Wujcik, 1998) overcame the tool's redundancy; however, Wells et al. (1998) reported that the sensitivity was reduced with the 17-item tool, and Ward et al. (Ward, Carlson-Dakes, Hughes, Kwekkeboom, & Donovan, 1998) did not report on the sensitivity of their reduced tool. The purpose of this series of research studies was to eliminate the redundancy of the BQ items, reduce the floor effects, retain the domain concepts, and maintain adequate psychometric properties of a new shortened version of the BQ.

Literature Review

Using Johnson's self-regulation theory (Johnson, Fieler, Wlasowicz, Mitchell, & Jones, 1997), Ward et al. (1993) asserted that patient-held beliefs are critical to achieving optimal pain management and demonstrated that many patients held beliefs that were inconsistent with known facts about pain. Patients' misconceived beliefs, such as that pain is an uncontrollable side effect of disease or that use of pain medications leads to addiction, may result in nonadherence to prescribed medication and poorly controlled pain (Ward et al., 1993; Wells et al., 1998). Few tools existed to measure patients' beliefs regarding pain and analgesics, until Ward et al. (1993) developed the 27-item BQ. Since then, researchers (Gunnarsdottir, Serlin, & Ward, 2005; Ward, Donovan, Owen, Grosen, & Serlin, 2000; Ward et al., 1993; Ward & Hernandez, 1994) and clinicians (Glajchen, 2001) have relied on the BQ-27 to guide pain investigations, despite how taxing the redundant items may have been to patients.

Specifically, the 27 BQ items measure patient-held beliefs regarding pain and pain medication in the following eight domains: (a) fear of addiction; (b) medication tolerance; (c) fatalism; (d) desire to be a good patient; (e) disease progression; (f) fear of injections; (g) distracting the provider; and (h) medication side effects. Patients are asked to respond to each item measured with a Likert scale (0 = do not agree at all; 5 = agree very much). Mean scores for the total scale are typically low: 1.65 ± 0.81 in 270 outpatient oncology patients (Ward et al., 1993); 1.94 ± 0.85 and 1.80 ± 0.61 in 35 hospice patients and their caregivers, respectively (Ward, Berry, & Misiewicz, 1996); 1.85 ± 0.76 in 93 cancer and non-cancer patients at Time 1 during a study evaluating stability of the tool and 1.72 ± 0.85 (N = 56) at Time 2 (Ward & Gatwood, 1994). These scores indicate the possibility that many patients did not endorse items, thereby providing a score of zero, which could contribute to a skewed distribution and floor effects of the instrument when it is used as an outcome variable.

The floor effects may help explain the inconsistent findings regarding the tool's sensitivity to intervention effects. The original BQ-27 was not sensitive to effects of an individualized intervention to overcome patient-related barriers to pain management in women with gynecological cancers (Ward et al., 2000); however, the small sample size (N = 43) may have been another contributor to the lack of sensitivity. We did not find additional intervention studies using the original BQ-27 in the literature. However, modified versions of the BQ-27, specifically the BQ-II (Gunnarsdottir, Donovan, Serlin, Voge, & Ward, 2002) and the BQ-17 (Wells et al., 1998), were used in interventional studies. In the BQ-II, investigators replaced the fear of injection and the disease progression subscales with two new subscales: fear that pain medications impair the immune system and pain medication interferes with illness monitoring. The BQ-II was sensitive to the effects of a representational intervention to decrease pain in 170 patients with metastatic cancer (Ward et al., 2008). Wells et al. (1998) deleted the fear of injections subscale and items with less than .70 inter-item and inter-total correlations. The resulting BQ-17 demonstrated mixed

sensitivity results, showing improvement in BQ scores immediately after an educational intervention and significant results only in the medication side effect subscale after an intervention booster four to six weeks later in a group of 150 and 75 registered nurses, respectively (Vallerand, Riley-Doucet, Hasenau, & Templin, 2004). A 24-item BQ was sensitive to a video-based pain management intervention in 93 oncology clinic patients (Syrjala et al., 2008), but the investigators did not report which items were deleted or retained. Lin (2000) deleted the fear of injections subscale, added four additional items to the side effects subscale, and added two additional subscales: religious fatalism and the P.R.N. subscale, which addresses the frequency of analgesic scheduling. Although the resulting 34-item BQ-Taiwan (Lin, 2000) is culturally sensitive, it poses even greater risk for respondent burden than the original BQ-27. Furthermore, the BQ-Taiwan has not been tested for applicability in non-Chinese populations. Ward and colleagues (Ward et al., 2000; Ward et al., 1998) acknowledged that respondent burden was an issue with the BQ-27 and used an eight-item BQ, but they did not report the retained items. The American Pain Society [APS] Quality of Care Committee (1995) used expert panel and literature review to select seven BQ items that they included in a patient outcome questionnaire (McNeill, Sherwood, Starck, & Thompson, 1998). The extensive interest in modifying the BQ-27 indicates that investigators have confidence in the tool but desire refinements to meet the specific needs of their studies.

Researchers have examined the validity of the BQ. Ward et al. (1993) used an expert panel to inform the content validity of the tool. We were unable to locate published literature with evidence of a factor analysis to support the construct validity of the original 27-item BQ. However, Wells et al. (Wells et al., 1998), using factor analyses of the BQ-17 items, demonstrated two constructs that they labeled “communicating with clinicians” and “concerns with analgesic use,” and these constructs were consistent with Ward et al.’s (1993) original conceptualizations. Significant relationships between BQ scores and variables such as pain severity scores (Ward & Hernandez, 1994), hesitancy to report pain, and hesitancy to use analgesics (Ward & Gatwood, 1994) support the tool’s convergent validity.

Evidence suggests that the BQ-27 is reliable, as demonstrated by its internal consistency and stability in test-retest conditions. Ward et al. (1993) reported a Cronbach’s α of .89 for the original BQ-27. For the Spanish version of the tool, investigators reported an α of .82 (Ward & Hernandez, 1994). Similarly, investigators (Ward et al., 1996) reported αs of .82 (n = 35 patients) and .90 (N = 35 caregivers) in their study of patient-related barriers to pain management in hospice settings. Additionally, investigators (Ward & Gatwood, 1994) reported that the tool was stable after a one-week interval, with a test-retest reliability coefficient of 0.90.

Evidence supports the conclusion that the BQ-27 is reliable and valid but also poses subject burden (Ward et al., 1998; Wells et al., 1998). Although several reduced-item versions have been used, insufficient evidence is available to support their sensitivity, which is desirable when the tool is used as an outcome measure. The specific aim of this series of studies, which began before publication of either shortened BQ tool, was to use statistical and analytical approaches to create a shortened BQ tool, maintain the original’s theoretical constructs, and determine the new tool’s validity, internal consistency, stability, and sensitivity.

Methods

Design, Setting, and Sample

In Table 1, we summarize the study design, settings, and sample characteristics for all studies from which we analyzed data for this methods article. All participants were unique and participated in only one study. We obtained Institutional Board Review (IRB) approval and informed consent for all studies referenced in this paper, including approval by the University of Illinois for ongoing analysis of deidentified data collected at the University of Washington. In summary, we performed secondary analysis of data collected from Study A (Table 1) to reduce the number of items because patients in Study A complained about the redundant items and because missing data on repeated measures were a threat to study validity. We also analyzed data from Study A to evaluate the construct validity of the reduced 13-item tool (BQ-13). Subsequently, the BQ-13 was a component of two randomized clinical trials (RCT) (Studies B and C), which facilitated examining its validity, reliability and sensitivity. Study C is ongoing and therefore contributed only baseline data to these analyses.

Procedures

Instrument Reduction—In Study A, 259 patients completed a paper-and-pencil version of the BQ-27 upon entry into the study (Time 1) and 4 weeks later (Time 2). We reduced the BQ-27 by selecting from seven domains the single item with the greatest percentage of patient endorsement. We used this process because items with very low endorsement rates typically do not contribute to the psychometric properties of a tool and increase respondent burden (Streiner & Norman, 2003). The 7 items selected by this process represented each of the original domains except side effects. We selected all 6 items in the side effects domain to facilitate tailoring interventions directed at analgesic side effects such as constipation, drowsiness, nausea, confusion, and embarrassment (Studies B and C). We expected that the 13 BQ items represented barriers reflecting pain management and side effects domains.

Validity—To identify the best constructs represented by the BQ-13 items, we analyzed and compared two models for how well each fit the data. We proposed the first model with one factor representing pain barriers and the second model with two factors representing side effects barriers and pain management barriers. We conducted confirmatory factor analyses using maximum likelihood estimation with AMOS 17.0 (SPSS Inc, Chicago, IL). We used several fit indices to examine how well each of the proposed models fit the current data, including the chi-square goodness-of-fit statistic, the comparative fit index (CFI), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and Akaike's information criterion (AIC).

Reliability and Sensitivity—We used Cronbach's α to evaluate the internal consistency of the BQ-27 and BQ-13 in our samples. We also determined with Pearson correlations the 4-week stability for both versions only in the subjects randomly assigned to the control group who had not had a study intervention between study entry and the 4-week repeat measurement point. With ANCOVA, controlling for Study B baseline values, we determined sensitivity of the BQ-13 to effects of a psychoeducational intervention.

Results

Instrument Reduction

In Study A, we calculated the frequency ($N = 259$) of items not endorsed (0, meaning did not agree at all with the item) by the respondents at the baseline measure. Percentages ranged from 12% to 70%, with the fatalism domain having the largest percentage of non-

endorsed items (answers of 0). As shown in Table 2, 11 items were non-endorsed by at least 48% of the sample ($N = 259$).

We used these data to select items for our reduced tool. The criteria for our selection of retained items included: (1) at least one item to represent each domain and each individual side effect; (2) item with the smallest percentage of zero selected as the response; and (3) readability and clarity of retained item. Thirteen items met these criteria, and we named the tool the BQ-13 (Table 2).

Table 1 lists the descriptive statistics from Study A at baseline for BQ-27 and BQ-13 scores. The BQ-27 ($N = 259$) mean scores ranged from 0.2 to 3.8, with an overall mean score of 1.6 ± 0.7, and the BQ-13 scores were comparable, ranging from 0 to 4.0, with an overall mean score of 1.9 ± 0.8. The mean domain scores of BQ-27 ranged from 0.92 ± 0.96 to 2.5 ± 1.4, and the single-item scores that represented each domain of the BQ-13 were similar, ranging from 1.1 ± 1.4 to 2.7 ± 1.9.

Construct Validity

Model 1 (One-Factor Model)—The One-Factor Model was the base model to be compared with the model with more factors across the three different studies: Study A, B, and C. The chi-square statistics indicated that the data from the studies did not provide an adequate fit of the One-Factor Model (Study A: $X^2 = 198.44$, df = 65, $p = .000$; Study B: $X^2 = 299.50$, df = 65, $p = .000$; Study C: $X^2 = 162.51$, df = 65, $p = .000$). However, chi-square is rarely used in isolation to determine the goodness of fit of a model because of sensitivity to sample size and external variables such as sample distribution. The fit indices also suggested that the One-Factor Model was not a good fit (Study A: GFI = .824, AGFI = .82, CFI = .715, AIC = 250.44; Study B: GFI = .79, AGFI = .700, CFI = .794, AIC = 351.50; Study C: GFI = .86, AGFI = .797, CFI = .74, AIC = 214.51).

Model 2 (Two-Factor Model)—In the Two-Factor Model, the chi-square statistics for each of the studies were significant (Study A: $X^2 = 146.814$, df = 64, $p = .000$; Study B: $X^2 = 189.136$, df = 64, $p = .000$; Study C: $X^2 = 119.070$, df = 64, $p = .000$); however, the value of each study was considerably lower than the chi-square statistics from the One-Factor Model. Compared to those of the One-Factor Model, the fit indices values were high and much improved (Study A: GFI = .917, AGFI = .88, CFI = .82, AIC = 200.814; Study B: GFI = .88, AGFI = .84, CFI = .89, AIC = 243.136; Study C: GFI = .90, AGFI = .90, CFI = .86, AIC = 173.07). Additionally, the ratio of X^2 and AIC of the Two-Factor Model was below the suggested criterion of 2.0 for an acceptable fit (Bollen, 1989). The Two-Factor Model had higher fit indices and a substantially lower AIC value and chi-square ratio than the One-Factor Model. Thereby, the Two-Factor Model demonstrated a better representation of the BQ-13 data.

Reliability

The BQ-13 demonstrated acceptable internal consistency as a total scale and stability over time. The αs for Study A were .73 at baseline and .76 4 weeks after baseline (Table 1). The αs for Study B were .83 and .86 at baseline and 4 weeks after baseline, respectively. For Study C, the α for baseline was .73. Table 3 lists the Cronbach's αs for the two subscales identified from the factor analysis for the baseline and 4-week measures in Study B. The side effects factor was highly reliable, with Cronbach's αs values of 0.9. The internal consistency of the pain management factor (0.66) was slightly lower than the desired 0.70. Table 3 also shows that the reliability indices are highly stable across the two measurement times. In addition to acceptable internal consistency, the BQ-13 demonstrated stability via 4-week test-retest reliability, with coefficients of $r = .59$ for the control group ($n = 133$) in

Study A and $r = .74$ for the control group ($n = 106$) in Study B. The 4-week Study B test-retest reliability for the Pain Management Factor 1 was 0.67 and for the Side Effects Factor 2 was 0.68.

Sensitivity

In Study B (Wilkie et al., In review), the mean BQ-13 scores were 1.7 ± 1.0 for control (n = 106) and 1.9 ± .9 for the experimental (n = 115) groups. We controlled for baseline BQ-13 scores, and using ANCOVA we demonstrated that the BQ-13 total score was sensitive ($F(1, 218) = 7.7$, $p = .006$) to effects of a computerized intervention that was tailored to the patient's misconceptions about pain (PAIN*U*Cope) (manuscript in preparation). We also tested ANCOVA models using factor scores and found that both factors (Pain Management Factor 1 with 7 items [$F(1, 218) = 3.9$, $p=0.049$]; Side Effects Factor 2 with 6 items [$F(1, 218) =4.6$, $p=0.034$]) were also significant, but the significance level were not as strong as the model with the BQ-13 total score. Because factor loadings for two items on Factor 1 was low, we also tested a 5-item Factor 1 model, but it was not significant, indicating that the two items did contribute to detection of group differences.

Discussion

We present strong evidence that the BQ-13 is valid, reliable, sensitive, and psychometrically equivalent to the BQ-27. The BQ-13 is less burdensome for subjects and includes 7 items that measure barriers related to pain management and 6 items specifically related to analgesic side effects. Its 4-week stability is marginally adequate for the total score and for the two factor scores. It is sensitive to a psychoeducational intervention with use of either total scale or factor scores, reduces potential for floor effects, and eliminates the redundancy of the BQ-27 and the respondent burden associated with the longer tool. Additionally, the shorter tool maintained the conceptual framework underpinning the longer tool by including items from all eight domains.

We used confirmatory factor analysis to evaluate the construct validity of the BQ-13. When compared to exploratory factor analysis (EFA), confirmatory factor analysis (CFA) is a more advanced statistical computation that yields a higher degree of certainty regarding the construct validity of a tool (Streiner & Norman, 2003). Additionally, CFA reduces the error associated with EFA, although both methods are subject to sample biased variations (Costello & Osborne, 2005). Lastly, CFA facilitates evaluating tools across a range of populations (Costello & Osborne, 2005). The BQ-13 CFA results of two constructs were fairly consistent across our heterogeneous cancer samples and with findings from Wells and colleagues (1998), who also identified two constructs in their EFA of the BQ-17. Furthermore, the factor structure of the BQ-13 is stable, as evidenced by analysis of data from the measures at baseline and 4 weeks later. The domains validated for all versions of the BQ-27 are widely supported by previous research. Numerous investigators (Anderson et al., 2000; Ward et al., 1993; Wilkie et al., 2001) have documented that patient beliefs mediate pain management. Factor analysis of the 13-item instrument yielded a single factor that contained the 7 core domains of the BQ-27, as well as an additional construct (medication side effects) that may facilitate tailoring pain management interventions. The BQ-13 retained construct validity, which is a foundational component of an effective research instrument.

The reliability of the BQ-13 is comparable to the reliability of the longer instrument. In her original work, Ward reported an α of .89 ($N = 270$), and our BQ-27 results revealed similar αs ($N = 259$) at T1 and T2. The αs of the BQ-13 were higher in Study B and consistent in Studies A and C with the α of .70 that Ward and colleagues reported for an 8-item BQ (Ward et al., 1998). The lower αs are not surprising, given the significant reduction in the

number of items in the reduced tool (Streiner & Norman, 2003). Additionally, comparison of the 4-week test-retest stability of the BQ-27 and BQ-13 in our analysis was not statistically different, with coefficients of .59 and .74, respectively. Our results indicate that reducing the BQ-27 to 13 items does not affect the reliability of the instrument.

Despite various methods employed to reduce BQ-27 items, there are many similarities and some differences in the items selected by the different investigative groups. The APS (1995) used expert panel and literature review to select items from the BQ-27 for their outcome tool. Although such techniques are acceptable methods of tool reduction, expert panels may be plagued with varying degrees of subjectivity (Williams & Webb, 1994). Alternatively, frequency endorsement may be a more empirically based process of tool reduction because the method may improve the discriminative power of the tool (Jadad et al., 1996). Table 2 lists the items in Ward's original BQ-27, the BQ-13, BQ-17, and the items suggested by APS (1995). Determining the superiority of the various reduced-item BQ tools requires additional research, which was not the focus of this series of studies.

In general, we found that both the BQ-13 item scores and the total scale scores were slightly higher than the BQ-27 mean domain and total scale scores. We attributed the higher BQ-13 item scores to the measurement of a single item that was often endorsed with a rating greater than zero, as opposed to the measurement of three items, some of which were rated zero by many subjects, to achieve a mean domain score for the BQ-27. This issue was particularly salient for the items representing the pain management factor because each of the original domains is now represented by a single item rather than the mean of three items. Furthermore, this property of higher scale scores is desirable, as it reduces floor effects.

As with all research, there are limitations to this study. Two of the samples were 90% Caucasian, and one sample was 19% Caucasian. A more diverse sample may have produced different results, but similarities between findings of Study B and Study C suggest that validity and reliability findings were robust. Furthermore, other variables such as patient education level, type of cancer, and stage of disease may affect patients' perceptions, barriers and pain experiences, but have not been evaluated in this series of studies.

Conclusion

Research tools that effectively measure patient beliefs regarding pain and pain control can facilitate the development of interventions that mitigate misconceptions and promote improved pain control. However, lengthy investigative tools can place considerable burdens on patients and discourage patients from participating in research (McMillan & Weitzner, 2000). Therefore, tools that effectively measure research constructs without needlessly taxing participants are essential to investigating pain barriers. The BQ-13 maintains empirically tested theoretical constructs, is concise, and is reliable, which likely will render the tool more amenable to research and clinical endeavors than the original 27-item tool. Its comparability to other reduced-item barriers scales requires additional research.

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References

American Pain Society Quality of Care Committee. Quality improvement guidelines for the treatment of acute pain and cancer pain. Journal of the American Medical Association. 1995; 274(23):1874–1880. [PubMed: 7500539]

Anderson KO, Mendoza TR, Valero V, Richman SP, Russell C, Hurley J, et al. Minority cancer patients and their providers: pain management attitudes and practice. Cancer. 2000; 88(8):1929–1938. [PubMed: 10760771]

Bollen, KA. Structural equations with latent variables. Hoboken, NJ: Wiley-InterScience; 1989.

Costello AB, Osborne WJ. Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis [Electronic Version]. Practical Assessment, Research & Evaluation. 2005; 10:1–9. from http://pareonline.net/pdf/v10n7.pdf.

Glajchen M. Chronic pain: treatment barriers and strategies for clinical practice. Journal of the American Board of Family Practice. 2001; 14(3):211–218. [PubMed: 11355054]

Gunnarsdottir S, Donovan HS, Serlin RC, Voge C, Ward S. Patient-related barriers to pain management: the Barriers Questionnaire II (BQ-II). Pain. 2002; 99(3):385–396. [PubMed: 12406513]

Gunnarsdottir S, Serlin RC, Ward S. Patient-related barriers to pain management: the Icelandic Barriers Questionnaire II. Journal of Pain and Symptom Management. 2005; 29(3):273–285. [PubMed: 15781178]

Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds DJ, Gavaghan DJ, et al. Assessing the quality of reports of randomized clinical trials: is blinding necessary? Controlled Clinical Trials. 1996; 17(1):1–12. [PubMed: 8721797]

Johnson JE, Fieler VK, Wlasowicz GS, Mitchell ML, Jones LS. The effects of nursing care guided by self-regulation theory on coping with radiation therapy. Oncology Nursing Forum. 1997; 24(6): 1041–1050. [PubMed: 9243588]

Lin CC. Barriers to the analgesic management of cancer pain: a comparison of attitudes of Taiwanese patients and their family caregivers. Pain. 2000; 88(1):7–14. [PubMed: 11098094]

McMillan SC, Weitzner M. How problematic are various aspects of quality of life in patients with cancer at the end of life? Oncology Nursing Forum. 2000; 27(5):817–823. [PubMed: 10868392]

McNeill JA, Sherwood GD, Starck PL, Thompson CJ. Assessing clinical outcomes: patient satisfaction with pain management. Journal of Pain and Symptom Management. 1998; 16(1):29–40. [PubMed: 9707655]

Streiner, DL.; Norman, GR. Health measurement scales: A practical guide to their development and use. New York: Oxford University Press; 2003.

Syrjala KL, Abrams JR, Polissar NL, Hansberry J, Robison J, DuPen S, et al. Patient training in cancer pain management using integrated print and video materials: a multisite randomized controlled trial. Pain. 2008; 135(1–2):175–186. [PubMed: 18093738]

Vallerand AH, Riley-Doucet C, Hasenau SM, Templin T. Improving cancer pain management by homecare nurses. Oncology Nursing Forum. 2004; 31(4):809–816. [PubMed: 15252435]

Ward S, Donovan H, Gunnarsdottir S, Serlin RC, Shapiro GR, Hughes S. A randomized trial of a representational intervention to decrease cancer pain (RIDcancerPain). Health Psychology. 2008; 27(1):59–67. [PubMed: 18230015]

Ward S, Donovan HS, Owen B, Grosen E, Serlin R. An individualized intervention to overcome patient-related barriers to pain management in women with gynecologic cancers. Research in Nursing and Health. 2000; 23(5):393–405. [PubMed: 11052393]

Ward S, Gatwood J. Concerns about reporting pain and using analgesics. A comparison of persons with and without cancer. Cancer Nursing. 1994; 17(3):200–206. [PubMed: 8055490]

Ward SE, Berry PE, Misiewicz H. Concerns about analgesics among patients and family caregivers in a hospice setting. Research in Nursing and Health. 1996; 19(3):205–211. [PubMed: 8628909]

Ward SE, Carlson-Dakes K, Hughes SH, Kwekkeboom KL, Donovan HS. The impact on quality of life of patient-related barriers to pain management. Research in Nursing and Health. 1998; 21(5): 405–413. [PubMed: 9761138]

Ward SE, Goldberg N, Miller-McCauley V, Mueller C, Nolan A, Pawlik-Plank D, et al. Patient-related barriers to management of cancer pain. Pain. 1993; 52(3):319–324. [PubMed: 7681557]

Ward SE, Hernandez L. Patient-related barriers to management of cancer pain in Puerto Rico. Pain. 1994; 58(2):233–238. [PubMed: 7816490]

Wells N, Johnson RL, Wujcik D. Development of a short version of the Barriers Questionnaire. Journal of Pain and Symptom Management. 1998; 15(5):294–298. [PubMed: 9654834]

Wilkie DJ, Huang HY, Berry DL, Schwartz A, Lin YC, Ko NY, et al. Cancer symptom control: feasibility of a tailored, interactive computerized program for patients. Family & Community Health. 2001; 24(3):48–62. [PubMed: 11563944]

Wilkie DJ, Schwartz A, Huang HY, Ko NY, Liao WC, Hairabedian D, et al. Computerized exercise education for patients reduces cancer-related fatigue. In review.

Williams PL, Webb C. The Delphi technique: A methodological discussion. Journal of Advanced Nursing. 1994; 19(1):180–186. [PubMed: 8138622]

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Table 1

Study Features, Sample Demographic and Pain Characteristics, and Barriers Questionnaire Scores

Study Name (*N*)		**Study A (*n* = 259)**	**Study B (*n* = 221)**	**Study C (*n* = 167)**
Data Collection Dates		1994–1999	1999–2002	2003–2009
Study Site and Setting		Seattle, WA Outpatient Oncology	Seattle, WA Outpatient Oncology	Chicago, IL Outpatient Oncology
Study Design		4-week RCT, pre- and post-test measurements	4-week RCT, pre- and post-test measurements	4-week RCT, pre- and post-test measurements
Sample Eligibility Criteria		Lung, prostate or head & neck cancer; pain in past week, spoke/read English	Cancer, pain in past week, spoke/read English	Cancer, reported pain level ≥ 3/10 in past week, spoke/read English
Sample Exclusion Criteria		Surgery < two months, physically or mentally unable to complete procedures	Surgery < two months, physically or mentally unable to complete procedures	Surgery < two months, physically or mentally unable to complete procedures
Demographic Characteristics		Mean ± SD (Min-Max)	Mean ± SD (Min-Max)	Mean ± SD (Min-Max)
	Age	60 ± 12 (26–82)	52 ± 13 (19–87)	54 ± 13 (22–87)
		Number (%)	Number (%)	Number (%)
Gender	Male	212 (82%)	137 (62%)	93 (56%)
	Female	47 (18%)	84 (38%)	73 (44%)
	Missing			1 (0.6%)
Education	<= High school	111 (42%)	63 (29%)	77 (46%)
	>= Some college	146 (56%)	154 (69%)	55 (33%)
	Missing	2 (0.8%)	4 (2%)	35 (21%)
Race/Ethnicity	Caucasian	232 (90%)	199 (90%)	32 (19%)
	African	12 (5%)	7 (3%)	108 (65%)
	American	1 (0.4%)	1 (.5%)	17 (10%)
	Hispanic	5 (2%)	10 (5%)	1 (0.6%)
	Asian	9 (4%)	4 (2%)	9 (5.42%)
	Other			
Cancer type	Lung	92 (36%)	10 (5%)	15 (9%)

Study Name (*N*)		Study A (*n* = 259)	Study B (*n* = 221)	Study C (*n* = 167)
	Breast	.	85 (39%)	31 (19%)
	Prostate	70 (27%)	10 (5%)	10 (6%)
	Head/neck	97 (38%)	38 (17%)	13 (8%)
	Sarcoma	.	31 (14%)	8 (5%)
	Cervix	.	6 (3%)	8 (5%)
	Lymphoma	.	9 (4%)	3 (2%)
	Colon/rectal	.	8 (4%)	17 (10%)
	Brain/CNS	.	7 (3%)	5 (3%)
	Stomach	.		5 (3%)
	Liver			4 (2%)
	Uterine			4 (2%)
	Leukemia			3 (2%)
	Other/Unspecified		15 (7%)	14 (8%)
	Missing		2 (1%)	27 (16%) +
		Mean ± SD (min-max)	Mean ± SD (min-max)	Mean ± SD (min-max)
Pain intensity	Current pain	2.6 ± 2.5 (0–10)	2.0 ± 2.2 (0–10)	4.9 ± 2.9 (0–10)
	Least pain	0.8 ± 0.7 (0–4)	1.5 ± 1.9 (0–8)	3.7 ± 2.8 (0–10)
	Worst pain	3.0 ± 1.3 (0–5)	3.0 ± 2.8 (0–10)	6.6 ± 2.7 (0–10)
Number of pain sites		2.3 ± 2.4 (0–16)	1.8 ± 1.9 (0–13)	2.0 ± 1.5 (0–9)
Barriers Questionnaire		@	#	#
13 items:	T1	1.9 ± 0.8 (0–4)	1.8 ± 1.0 (0–4.3)	2.4 ± 0.9 (0–5)
	T2	1.8 ± 0.8 (0–4.5)	1.6 ± 1.0 (0–4.4)	
27 items:	T1	1.6 ± 0.7 (0.2–3.8)		
	T2	1.6 ± 0.7 (0–4.)		
Barriers Questionnaire	BQ-13:	.73	.83	.73
	T1	.76	.86	
	T2			

Study Name (*N*)		Study A (*n* = 259)	Study B (*n* = 221)	Study C (*n* = 167)
Cronbach's α	BQ-27	.85		
	T1	.87		
	T2			

+ data collection not complete

Paper version @

Computer version #

Table 2

Study A: Percentage of "Do Not Agree at All" Responses, Symptoms not Present, Mean Scores, SD, and Medians for 27 BQ Items (N = 259) and Study B: Two-Factor Model Factor Loadings for 13-Item Barriers Questionnaire at Baseline and 4 Weeks Later (N = 221)

Domain	Barrier item	% of do not agree at all	Mean ± SD	Baseline	
				Side Effects	Pain management
Addiction	BQ2: Danger of becoming addicted to pain medicine.	13	3.0 ± 1.8 (3)		.
	BQ9: People get addicted to pain medicine easily. ** † ‡	12	2.5 ± 1.6 (3)		68***
	BQ24: Pain medicine is very addictive.	20	2.2 ± 1.7 (2)		
Tolerance	BQ6: It's good idea to save pain medication.	40	1.7 ± 1.8 (1)		
	BQ15: Pain medication might not work if pain becomes worse. #	37	1.6 ± 1.7 (1)		.68***
	BQ22: Pain medicine should be saved for worsening pain. † ‡	54	1.2 ± 1.6 (0)		
Side effects	BQ3: Drowsiness from pain medication is a bother. # †	21	2.2 ± 1.6 (2)	.89***	
	BQ5: Confusion from pain medication is distressing. # †	26	2.2 ± 1.8 (2)	.84***	
	BQ10: Nausea from pain medication is a distressing. # †	14	2.8 ± 1.7 (3)	.57***	
	BQ14: You embarrass self on pain medication. # †	49	1.1 ± 1.3 (1)	.73***	
	BQ17: Constipation from pain medicines. # †	15	2.7 ± 1.7 (3)	.83***	
	BQ21: Easier to have pain than side effects. # †,‡	33	1.6 ± 1.5 (1)	.82***	
Fatalism	BQ1: Not good to talk about pain with doctor. †	70	0.7 ± 1.3 (0)		
	BQ8: Pain medication can not really control pain. # †,‡	48	1.1 ± 1.4 (1)		.50***
	BQ25: Medicine cannot really control cancer pain. †	54	0.9 ± 1.3 (0)		
Be good	BQ11: Be strong by not talking about pain. #	49	1.2 ± 1.6 (1)		.44**
	BQ18: Good patient avoid talking about pain. ‡,†	64	0.8 ± 1.4 (0)		
	BQ26: Doctors might be annoyed to be told about pain. †	56	1.0 ± 1.4 (0)		
Distract	BQ12: Important for doctor to focus on illness not pain. #,†	36	1.9 ± 1.8 (1)	.52***	
	BQ19: Doctors need to concentrate on curing illness not pain.	54	1.2 ± 1.6 (1)		
	BQ27: Complaints of pain could distract doctor from curing. † ‡	68	0.6 ± 1.1 (1)		

Domain	Barrier item	% of do not agree at all	Mean ± SD	Baseline	
				Side Effects	Pain management
Progression	BQ4: Pain means the disease is getting worse. #	36	1.7 ± 1.7 (1)	.29**	
	BQ13: Having pain means that the disease is getting worse. †	37	1.7 ± 1.6 (1)		
	BQ20: Pain is a sign that the illness has gotten worse. †‡	41	1.5 ± 1.6 (1)		
Fear of injections	BQ7: I do not like having shots. #	19	2.7 ± 1.9 (3)	.17*	
	BQ16: I am afraid of shots.	56	1.0 ± 1.5 (0)		
	BQ23: Having a shot is painful.	31	1.5 ± 1.5 (1)		

#Items selected to create the BQ-13 instrument;

†Items included in the BQ-17(Wells et al., 1998);

‡Items included in the APS BQ-7 (McNeill et al., 1998);

p values:

*** < .001;

** < .005;

* *p* = .054.

Table 3

Study B: Cronbach's α Values of the 13-item Barriers Questionnaire at Baseline and 4 weeks later *(N = 221)*

Factor or Score	Baseline	4 Weeks Later
Factor 1 (pain management)	0.66 (7 items) *	0.66 (7 items) *
Factor 2 (side effects)	0.90 (6 items) *	0.92 (6 items) *
Total Score	0.83 (13 items)	0.86 (13 items)

* Numbers in parentheses are the number of items that loaded on the factor.