Published in final edited form as:
Nurs Res. 2007 ; 56(5): 296–306. doi:10.1097/01.NNR.0000289502.45284.b5.

Ethnic Differences in Cancer Pain Experience

Eun-ok Im

Abstract

Background—Inconsistent findings on ethnic differences in cancer pain experience suggest the need for further studies on this topic for adequate cancer pain management.

Objectives—The purpose of this study was to determine ethnic differences in cancer pain experience of 4 ethnic groups in the U.S.

Methods—A feminist perspective provided the theoretical basis. This was a survey of a multiethnic sample of 480 cancer patients asking questions on sociodemographic characteristics and health/illness status, 3 unidimensional cancer pain scales, 2 multidimensional cancer pain scales, the Memorial Symptom Assessment Scale, and the Functional Assessment of Cancer Therapy Scale. The data were analyzed using descriptive and inferential statistics including ANOVA and hierarchical multiple regression analyses.

Results—The results indicated certain ethnic differences in types of pain and symptoms that patients experienced. Also, the results demonstrated significant ethnic differences in cancer pain and functional status. The VDS, VAS, FS, MPQ, and BPI scores of Non-Hispanic (N-H) Asian participants were significantly lower than those of Hispanic and N-H White participants ($p<.01$). The VAS and MPQ scores of N-H African American participants were significantly lower than those of Hispanic and N-H White participants ($p<.01$). The FACT-G scores of N-H Asian participants were significantly lower than Hispanic participants ($p<.01$). The findings also indicated that being N-H Asian or not was a significant predictor of the VDS, FS, and BPI scores.

Discussion—The findings suggest further in-depth qualitative exploration on cultural values and beliefs related to cancer pain in each ethnic group and national-scope studies with a larger number of ethnic minorities on this topic.

Ethnicity is a sociocultural contextual factor influencing persons' pain expression and experience that has recently been recognized, and a few researchers have begun to report ethnic variations in cancer pain experience (Laliberte, 2003; Miaskowski, 2004). In a national study, Cleeland et al. (1994) reported that, in settings with predominantly ethnic minority patients including Hispanics and African Americans, 62% of those patients were undertreated according to the World Health Organization (WHO) standards, and they were three times more likely to be undermedicated than patients seen in non-minority settings with predominantly White cancer patients. In another study by Cleeland et al. (1997), researchers reported that 74% of Hispanics and 59% of African American patients with pain did not receive the WHO-recommended analgesics for their pain. In a subsequent study, Anderson et al. (2000) reported that 28% of Hispanic and 31% of African American patients received analgesics that were insufficient to manage their pain.

Despite these findings, some recent studies indicated no such variation in pain experience by ethnicity: no ethnic differences in cancer pain experience, measures of pain sensation, pain ratings of ethnically diverse groups of men with myocardial infarction, pain ratings during

---

eim@mail.nur.utexas.edu.

childbirth, and behavior responses and pain ratings of children with cancer (Edrington et al., 2004; Rustøen, Fosså, Skarstein, & Moum, 2003; Rabow & Dibble, 2005). As these inconsistent findings indicate, it would be hasty to conclude that there are or are not ethnic differences in cancer pain experience, so further studies are needed to develop reliable knowledge that can be used to more adequately manage the pain of cancer patients. Furthermore, existing studies tend to include only a limited number of ethnic minorities, and very few national scope studies having an adequate number of ethnic minorities for valid comparisons have been conducted.

The purpose of the study reported in this paper was to determine ethnic differences in reported cancer pain experiences among four of the most common ethnic groups in the U.S. (Hispanic, non-Hispanic (N-H) White, N-H African-American, and N-H Asian). Cancer patients have been reported to experience pain with diverse symptoms, impairments in physical and psychological functioning, and other difficulties that can undermine their quality of life across all states and times (Dodd, 2001). Significant positive relationships between cancer pain intensity and psychological and physical symptoms have been reported (Poulos, Gertz, Pankratz, & Post-White, 2001). Thus, in this study, cancer pain was defined as a multidimensional subjective experience, which accompanies symptoms and changes in functional status. To achieve the purpose, it was hypothesized that there are significant differences in self-reported cancer pain, symptoms accompanying pain, and functional status according to self-reported ethnic identity (Hypothesis 1). Then, to determine the effects of ethnicity on cancer pain, symptoms, and functional status while considering the effects of other demographic and health/illness factors, it was hypothesized that ethnicity adds significantly to the prediction of the cancer pain, symptom, and functional status scores after controlling for selected demographic and health/illness factors (Hypothesis 2).

The study reported in this paper relies on a theoretical grounding in feminist perspectives. It was assumed that the inadequate assessment of cancer pain reported by patients does not only come from pure biology, but from their continuous interactions with their environment (Hall & Stevens, 1991). For example, an ethnic minority cancer patient who may have particular difficulty feeling in control in a setting dominated by well-educated professionals may fail to clearly express her/his needs and fail to demand that her/his need for pain control be met (Ramer et al., 1999). In this case, inadequate management of cancer pain could be claimed to result from cancer patients' interactions with their environments. In the study reported in this paper, using a feminist perspective, patients' own views and experiences were respected, and ethnicity was viewed as a significant characteristic that influences cancer patients' interactions with their environments and structures the cancer pain assessment and management processes.

Methods

This was a cross-sectional comparative survey design of a multiethnic sample of 480 cancer patients in the U.S., which was a part of a larger study that aimed at development of a decision support system for cancer pain management. More findings from the larger study can be found elsewhere (Authors, 2006).

Sample and Settings

A total of 480 cancer patients were recruited through both Internet and community settings. To test the differences in cancer pain, symptoms accompanying pain, and functional status according to the four ethnic groups (Hypothesis 1), we assumed a conventional effect size of .20 (Cohen, 1988). With alpha = 0.05, 68 participants per ethnic group would be needed to detect a statistically significant difference with power greater than 0.80 (Cohen, 1988). The reason for setting power at .80 was that a power level of .80 is adequate for most studies (Murphy & Myors, 2004), and higher levels of power (e.g., .90 and .95) are difficult to achieve and require muc larger sample sizes to detect even a small effect size of .20. According to Tabachnick and Fidell (2001), a rule of thumb for conducting multiple regression (Hypothesis 2) is to have $N >= 104 + m$, where N=sample size and m=number of independent variables. Since the number of independent variables that were included in the multiple regression analyses was 10 (4 independent variables tested including dummy variables + 6 independent variables controlled), the sample size needed for the multiple regression analyses was lager than 111 (104+10=124). Since 480 (105 Hispanics, 148 N-H Whites, 109 N-H African Americans, and 118 Asians) cancer patients were recruited, the sample size was enough to test Hypotheses 1 and 2.

Among 480 cancer patients, 204 were recruited through Internet settings, and 276 were recruited through community settings. The Internet settings for recruitment were Internet cancer support groups (ICSGs) identified through Google, MSN, and Yahoo searches. The community settings were cancer clinics and cancer support groups across the U.S. that were also identified by Internet searches. Ten community consultants who were formal or informal leaders of the community clinics and support groups that were identified through the Internet searches and who had direct contacts with ethnic minority cancer patients in the community settings (2 Hispanic, 4 Asian, and 4 African American community consultants) helped the recruitment process. During the recruitment process, if the community consultants requested hard copies of the questionnaires (pen-and-pencil questionnaires), hard copies were provided to potential participants through the community consultants. Participants recruited through the community consultants included both those who filled out the questionnaires through the Internet (30 cancer patients) and those who filled out hard copies (246 cancer patients).

The inclusion criteria for research participants were: cancer patients aged at least 18 years who could read and write English and whose self-reported ethnic identity was Hispanic, non-Hispanic (N-H) White, N-H African American, or N-H Asian. Since the use of multiple languages was impossible due to the inherent diversity and complexities within ethnic groups, only English was used throughout the research process. Thus, only those who could read and write English were recruited.

Sociodemographic characteristics of the participants are summarized in Table 1. The participants included 105 Hispanics, 148 N-H Whites, 109 N-H African Americans, and 118 Asians. About 79% of the participants were women, and about 20% were men. Although a gender-balanced sample was the aim, using multiple recruitment strategies including direct and indirect contacts through both Internet and community settings, women were inadvertently over-sampled. One possible reasons might be that women outnumber men in the cancer population (American Cancer Society, 2006) and in the Internet population (Fallows, 2005).

Instruments

Sociodemographic characteristics—Eight questions on age, gender, education, religion, marital status, work, family income, and access to health care were used to measure and describe sociodemographic characteristics of the participants. Self-reported ethnic identity (ethnic group membership) was measured using the ethnic identity question required in the NIH's reporting guidelines, and there was another question about country of birth.

Self-reported health/illness status—Self-reported health/illness status was measured using one item rating general health, three items about cancer (primary cancer site, stage of cancer, previous medical treatments [e.g., radiation therapy, chemotherapy, surgery and hormone therapy]), and usage of pain medication.

Self-reported cancer pain experiences—In this study, unidimensional (the VDS, the VAS, and the FPS) and multidimensional (the MPQ-SF and the BPI-SF) cancer pain assessment tools were used to measure self-reported cancer pain experience. The reason for using both types of instruments was to increase the validity and reliability of cancer pain measurement through multiple measurements (for confirmation and completeness of data), because very little is known about self-reported cancer pain across ethnic groups.

Verbal Descriptor Scale (VDS): In this study, a VDS consisting of simple terms including *no pain*, *mild pain*, *moderate*, *severe*, *very severe*, and *worst possible pain* was used to measure self-reported cancer pain. For statistical purposes, the terms were assigned a numerical value from 0 to 5 (0=*no pain*, 5=*worst possible pain*). In a study among 71 cancer patients aged 18-85 years with and without pain, the correlation coefficients for test-retest reliability of the VDS was 0.94 (Grossman et al., 1992).

Visual Analog Scale (VAS): In this study, the VAS consisting of a 10 cm horizontal line with word anchors at each end (i.e., *no pain* and *worst pain possible*) included in the McGill Pain Questionnaire-Short Form was used to measure self-reported cancer pain experience. The main advantage of the VAS is that it is relatively easy to complete and score, and it can be useful in measuring pain intensity in relation to treatments. When the VAS was tested with the Face Pain Scale (FS) and the Memorial Pain Assessment Card (MPAC) among multiethnic groups, it was found to be valid and reliable across ethnic groups (Ramer et al., 1999).

Wong-Baker Faces Pain Scale (FS): In this study, the FS consisting of six faces (Wong & Baker, 1989) was used to measure self-reported cancer pain experience as well: the first picture is a very happy smiling face and the last is a sad, tearful face. The pictures between the two faces indicate varying degrees of sadness. The patient was asked to choose which face is most like his or hers. For statistical purposes, the faces were assigned a numerical value from 0 to 5 (0=*a very happy face*, 5=*a sad, tearful face*). Its concurrent validity, construct validity, and test-retest reliability ($r = 0.61$-0.87) were well established (Herr, Mobily, Kohout, & Wagenaar, 1998).

McGill Pain Questionnaire-short form (MPQ-SF): In this study, the MPQ-SF by Melzack (1987) was used as a multidimensional pain assessment scale. The MPQ-SF (17 items) has three components: (a) pain rating index (PRI), (b) visual analogue scale (VAS), and (c) present pain intensity (PPI). The PRI consists of 15 descriptors (11 sensory, 4 affective) that are rated on an intensity scale (0=*none*, 1=*mild*, 2=*moderate*, or 3=*severe*), and the PPI is measured with a 0 to 5 scale of overall pain intensity. In this study, the MPQ-SF pain scores were determined by adding the ratings of all 15 items included in PRI (possible range=0-45). Validity and reliability of the MPQ-SF have been well established among cross-cultural populations (Lazaro, Bosch, Torrubia, & Banos, 1994). Cronbach’s alpha of the MPQ-SF in the study reported in this paper was 0.94.

Brief Pain Inventory-Short Form (BPI-SF): The BPI-SF (Cleeland, 1985) consists of 15 items that can be categorized into: (a) a global “yes” or “no” item asking for a comparison of pain with other minor aches and pains; (b) four items with 0-10 numerical rating scales for sensory component of pain; (c) an item for pain medications or treatments used; (d) a numerical scale rating the effectiveness of pain relief measures; (e) seven items using 0-10 numerical rating scales for a reactive dimension; and (f) a body diagram to indicate location of pain. In this study, the BPI-SF pain scores were determined by adding the ratings of four items on intensity of pain and seven items on interferences in the patient’s life of pain (possible range=0-110). Validity and reliability of the BPI-SF have been established across cultures and languages (Ger, Ho, Sun, Wang, & Cleeland, 1999). Cronbach’s alpha of the BPI-SF in this study was 0.96.

Symptoms accompanying cancer pain—The MSAS (Portenoy et al., 1994) questions patients about their experiences of 32 symptoms commonly associated with cancer in three dimensions: (a) severity; (b) frequency with which it occurs; and (c) distress it produces. Each symptom is scored from 0 to 4 ranging from “no symptom” to “very much.” Distress is rated on a 5-point (0-4) Likert scale. The MSAS symptom scores were determined by adding the ratings of symptom distress of 32 symptoms (possible range=0-128). The validity and reliability of the MSAS have been established among ethnically diverse populations (Chang, Hwang, Feuerman, Kasimis, & Thaler, 2000). Cronbach’s alpha of the MSAS in the study reported in this paper was 0.93.

Functional status—In this study, functional status was measured using the Functional Assessment of Cancer Therapy Scale (FACT-G), which consists of 33 items with five domains assessing physical well-being, social/family well-being, relationships with the physician, emotional well-being, and functional well-being (Cella et al., 1993). The responses to 28 of the items range from 0 (*not at all*) to 4 (*very much*). The five other items, using a linear analogue scale ranging from 0 (*not at all*) to 10 (*very much so*), assess the extent to which each domain affects overall quality of life. In this study, the FACT-G scores were determined by adding the ratings of 33 questions (possible range=0-132). Validity and reliability of the FACT-G have been well established among cross-cultural populations (Mullin, 2000; Yu et al., 2000). Cronbach’s alpha of the FACT-G in the study reported in this paper was 0.70.

Data Collection Procedures

To administer the Internet questionnaire, a website conforming to the Health Insurance Portability and Accountability Act (HIPAA) standards, the SANS/Federal Bureau of Investigation (FBI) recommendations, and the IRB policy of the institution where the researchers were affiliated was developed and published on an independent, dedicated website server consisting of 5 Pentium-based computers. When potential participants visited the project website, informed consent was obtained by asking them to click the “I agree to participate” button. Then, questions on specific diagnoses, cancer therapies, and medications were asked, and the appropriateness of their answers was checked automatically through a server-side program; they were automatically connected to the Internet survey web page if the answers were appropriate. When participants were connected to the survey page, they were asked to answer the Internet survey questions.

Upon request by the community consultants, the pen-and-pencil questionnaires were provided by mail to the consultants, who distributed the questionnaires in person only to those who were identified as cancer patients. These questionnaires accompanied hard copies of the same informed consent form that was included in the Internet format of the questionnaire, and the pen-and-pencil questionnaire included a sentence saying “Filling out this questionnaire means that you are aged over 18 years old and giving your consent to participate in this survey.” After self-administering the questionnaires, all completed questionnaires except 5 (that were directly mailed to the research team by the participants) were retrieved by community consultants in person at the community settings and mailed to the research team by the community consultants. Supplementing pen-and-pencil questionnaires was essential to recruit the target number of ethnic minority cancer patients across the nation who did not have access to the Internet but were interested in participating in the study. Among 276 participants who were recruited through community settings, 246 (49 Hispanics, 6 N-H Whites, 99 N-H African Americans, and 92 N-H Asians) used the pen-and-pencil questionnaires. With an alpha level of 0.05, there were no statistically significant differences in psychometric properties (construct validity and Cronbach’s alpha) between the Internet format and the pen-and-pencil format of the questionnaire. More detailed findings on psychometric properties of the Internet and pen-and-pencil formats of the questionnaire can be found elsewhere (Authors, in progress). It took an average of 30-40 minutes for the participants to complete either the Internet format or the pen-and-pencil format of the questionnaire.

Data Analysis Process

The collected data were saved in ASCII format and databases. The data from the Internet survey were automatically and directly saved in the databases as the participants entered the data into the database system. The data from the pen-and-pencil survey were entered by one RA into the database, and two additional RAs double-checked the data entry separately. Then, if one of the RAs found an error, the three RAs together resolved the errors. For both Internet and pen-and-pencil questionnaires, when the missing fields were less than 10%, mean substitution was used to determine the value of missing data. Participants for whom 10% or more data was missing were not included in the analyses. The reason for using 10% tolerance for missing data was because previous research showed that there was little, if any, impact on significance tests or confidence intervals (Little & Rubin, 2002). Although this method might mildly increase the likelihood of type I error, excluding subjects with small amounts of missing data might actually result in a bias toward more healthy, compliant individuals (McLaughlin & Marascuilo, 1990). Then, before conducting data analyses, descriptive statistics were run to check errors or inconsistence in the data, and the data were cleaned while automatically generating the code book.

Socio-demographic profiles, health/illness status, self-reported cancer pain, symptoms accompanying pain, and functional status of the participants were described using descriptive statistics including frequency, percentage, mean, standard deviation, and range. To test hypothesis 1, the data were analyzed using ANOVA. Tukey’s HSD was used to assist in interpreting any significant effects from the ANOVA analysis. Before conducting ANOVA, Levene’s homogeneity test was conducted to determine the homogeneity of the ethnic groups. For the multiple comparisons, a corrected alpha using Bonferroni method was used. Hierarchical stepwise multiple regressions were conducted to determine the effects of ethnicity on cancer pain, symptoms, and functional status while considering other demographic and health/illness factors (Hypothesis 2). For these analyses, demographic factors including age, income satisfaction, and gender were entered first; health/disease factors including cancer stage, health status, and pain medication were entered second; and ethnicity (four dummy codes: being Hispanic or not; being N-H White or not; being N-H African-American or not; and being N-H Asian or not) was entered at last. The increase in R^2 (ΔR^2) was computed to determine the relative contributions of each set of variables. Standard coefficients (β) were computed to compare the relative importance of each variable in the model. The data were checked for multicollinearity, using tolerance and the variance inflation factor (VIF). VIF-values greater than 10 and tolerance-values smaller than .10 may indicate multicollinearity. There were no signs of multicollinearity in any of the regression models. All analyses were performed with the SPSS program.

Findings

Self-Reported Cancer Pain, Symptoms, and Functional Status—The ethnic-specific means of the cancer pain, symptoms, and functional status scores are summarized in Table 2. The top five most frequently reported pain descriptors (included in the MPQ scale) according to ethnicity are summarized in Table 3. *Aching pain* was the most frequently reported pain descriptor among Hispanics and N-H African Americans, and it was the second most frequently reported pain descriptor among N-H Whites and N-H Asians. The most frequently reported pain descriptor among N-H Whites was *tiring pain*, and that among N-H Asians was *tender pain*.

The top 5 most distressing and bothering symptoms according to ethnicity are summarized in Table 4. The most distressing and bothering symptom among Hispanics and N-H Whites was pain while that among N-H African Americans and Asians was lack of energy. Lack of energy was the second most distressing and bothering symptom among Hispanics and N-H Whites, and pain was the second among N-H African Americans.

Ethnic Differences in Cancer Pain, Symptoms, and Functional Status—There were significant ethnic differences in the VDS score (F=8.81, p<.01), the VAS score (F=9.98, p<.01), the FS score (F=9.37, p<.01), the MPQ score (F=14.64, p<.01), the BPI score (F=7.16, p<.01), and the FACT-G score (F=4.83, p<.01)(Hypothesis 1)(see Table 2). However, there was no significant ethnic difference in the MSAS scores. The post-hoc tests indicated that the VDS, VAS, FS, MPQ, and BPI scores of N-H Asian participants were significantly lower than those of Hispanic and N-H White participants (p<.01). The VAS and MPQ scores of N-H African American participants were significantly lower than those of Hispanic and N-H White participants (p<.01). The FACT-G scores of N-H Asian participants were significantly lower than Hispanic participants (p<.01).

Effects of Ethnicity on Cancer Pain, Symptoms, and Functional Status—Separate hierarchical regression analyses were performed to determine the effects of ethnicity on the main cancer pain, symptom, and functional status scores while controlling for other demographic and health/illness factors (Hypothesis 2) (see Table 5). The overall model fit was still significant once the ethnicity variables were added to the model. With a couple of exceptions, there was a very large F-square change when the cancer stage, health status, and pain medication variables were added to the model. The change in F-square was not as dramatic when the ethnicity variables (being Hispanic or not, being N-H African American or not, and being N-H Asian or not) were present, but there was some indication that the overall model fit was still good (p-values less than .01).

All the variables combined accounted for 35% of the variance in the VDS scores (F=20.92, p<.001). Health status and pain medication were significant predictors of the VDS scores and accounted for 28% of the variance. Being N-H Asian or not was a significant predictor of the VDS scores, and explained about 3% of the variance. A total of 40% of the variance in the VAS scores was explained by all the variables considered (F=22.00, p<.001). Health status and pain medication were significant predictors of the VAS scores and accounted for 33% of the variance. A total of 42% of the variance in the FS scores was explained by the predictor variables (F=27.00, p<.01). Health status and pain medication were significant predictors of the FS scores and accounted for 34% of the variance. Being N-H Asian or not was a significant predictor of the FS scores, and explained about 3% of the variance. All the variables combined accounted for 39% of the variance in the MPQ scores (F=23.80, p<.01). Health status and pain medication were significant predictors of the MPQ scores and accounted for 28% of the variance. All the variables combined also accounted for 43% of the variance in the BPI scores (F=28.16, p<.01). Health status and pain medication were significant predictors of the BPI scores and accounted for 30% of the variance. Being N-H Asian or not was a significant predictor of the BPI scores and accounted for about 3 percent of the variance. A total of 21% of the variance in the MSAS scores was explained by all the variables considered (F=10.117, p<.01). Health status was a significant predictor of the MSAS scores and accounted for 11% of the variance. Finally, a total of 18% of the variance in the FACT-G scores was explained by all the variables considered (F=4.910, p<.01). No significant predictor of the FACT-G scores was identified.

Discussion

The findings of the study reported in this paper strongly support ethnic differences in cancer pain experience. The findings indicated that the cancer pain scores from both unidimensional and multidimensional scales were significantly different according to ethnicity, and being N-H Asian or not was a significant predictor of the VDS, FS, and BPI-SF scores. As indicated in previous studies (Wills & Wootoon, 1999), N-H Asians were the ethnic group who reported the lowest cancer pain scores in all pain scales. The N-H White group reported the highest VDS and MPQ scores while the Hispanic group reported the highest VAS, FS, and BPI scores. The findings on the high VAS, FS, and BPI scores among Hispanics are consistent with previous findings among Hispanic cancer patients (Eversley et al., 2005): Hispanics had the worst pain among multiethnic groups of cancer patients. Yet the finding that N-H African Americans reported lower cancer pain scores than Whites and Hispanics was somewhat different from previous findings among African American cancer patients (Eversley et al., 2005). The possible reason for these findings could be that about 80% of the African American participants of the study reported in this paper were recruited through cancer support groups while about 60% of the Hispanic cancer patients were recruited through cancer clinics.

An interesting finding is that there were no ethnic differences in symptoms accompanying cancer pain and that ethnicity was not a significant predictor of the symptom scores. When considering that Asians reported the lowest cancer pain scores, their symptom scores should be expected to be lower than those of other ethnic groups. However, the findings indicate that there were no significant differences in the MSAS between Asians and other ethnic groups. One possible reason may be that Asians are more hesitant to report pain than they are to report physical and psychological symptoms. In the literature (Lipson & Dibble, 2005), it has been reported that Asians are hesitant to report psychological symptoms such as depression; instead, they report physical symptoms, even when their symptoms are psychological in nature, because psychological symptoms can be stigmatized in Asian cultures. It is possible that Asians do not report pain because it is a signifier of a more serious condition, like cancer, and because pain can be negatively viewed by others (Chung, Wong, & Wang, 2000).

Although very little is known about ethnic differences in the functional status of cancer patients, the finding that Hispanics reported the highest functional status score somewhat agrees with previous findings on family support among Hispanic cancer patients. Functional status has been reported to be influenced by living arrangements and social support (Wan et al., 1999). Compared with other ethnic groups, Hispanic cancer patients tend to be in a better situation in this regard: they were more likely to seek support from family members, friends, and health professionals, to identify a family member as the final treatment decision-maker, and to have strong family support during the diagnosis and treatment process (Maly, Umezawa, Ratliff, & Leake, 2006). Indeed, familialism among Hispanics—strong identity and attachment to the nuclear and extended families as well as loyalty and reciprocity in helping other family members (Maly et al., 2006))— has been frequently reported in the literature. Although Asians and African Americans also have similar cultural values related to their families, they would be different in terms of their behaviors seeking help for their cancer because of the stigmatized nature of cancer (American Cancer Society, 2002; Chung et al., 2000). Subsequently, from this point of view, the findings on the highest functional status scores among Hispanic cancer patients could be understood. However, the finding needs to be carefully interpreted since the hierarchical multiple regression analyses indicated that being Hispanic or not was not a significant predictor of the FACT-G scores despite the finding of significant ethnic differences in the FACT-G scores.

The findings of this study that differed from those of previous studies raised a question about the appropriateness and adequacy of the cancer pain scales, the symptom scale, and the functional status scale for a specific ethnic group of cancer patients. In this study, as reported in the section on the results, Hispanics reported the highest cancer pain scores in the VAS, FS, and BPI-SF while Whites reported the highest scores in the VDS and the MPQ-SF. The finding that a specific ethnic group reported the highest scores in one cancer pain scale but not in another suggests that some scales worked better than other scales in a specific ethnic group. Indeed, recently, some studies have reported this kind of dilemma (Closs & Briggs, 2002). For example, previous studies (Closs & Briggs, 2002) have argued that the MPQ that was developed in Canada may not adequately measure cancer pain even in other English-speaking countries. The variation across the scales is interesting given that each individual scale has high reliability across ethnic groups.

The study reported in this paper has several methodological limitations, one of which is that the participants might not adequately represent ethnic minority cancer patients in the U.S. although a large number of ethnic minority cancer patients were recruited. As described above, we recruited participants through both Internet and community settings to gather equivalent numbers of cancer patients from each of the four ethnic groups. Also, although we designed our multiple recruitment strategies to gather a gender-balanced sample, more women participated than men. As discussed above, this might result from the fact that women outnumber men in the cancer population (American Cancer Society, 2006) and in the Internet population (Fallows, 2005). A third limitation is that there was no control over a child or a family member’s involvement in data collection through the Internet (e.g., a child filling out the survey for the participant) since researchers could not be physically present to witness the activity. However, in the case of the pen-and-pencil questionnaires, all the participants except 5 who returned the questionnaires directly to the research team filled out the questionnaires at community settings while participating in the usual activities (e.g., cancer support groups or treatment modalities), and they returned the questionnaires to the community consultants in person before they left.

Conclusion and Implications

The study reported in this paper indicated certain ethnic differences in types of pain and symptoms that cancer patients experienced. They also reported significant ethnic differences in cancer pain and functional status and indicated that being N-H Asian or not was a significant predictor of several cancer pain scores. Based on the above discussion, this paper concludes with the following suggestions for future research. First, when a specific ethnic group reports the highest cancer pain score in one scale but not another, a question is raised about the appropriateness and adequacy of the scales themselves. Thus, the appropriateness and adequacy of the cancer pain, symptom, and functional status scales need to be further examined in each of the ethnic groups of cancer patients. Second, the findings suggest that cultural values and beliefs that are unique to each ethnic group might have influenced their cancer pain experience. Thus, more in-depth qualitative explorations on cultural values and beliefs related to cancer itself and cancer pain assessment and management process are needed for better cancer pain management. Finally, generalizing study findings needs to be undertaken carefully, given that participants were recruited with a convenience sampling method. National scope studies on ethnic differences in cancer pain experience with an adequate number of ethnic minorities using a systematic recruitment strategy would provide a more comprehensive and generalizable picture of ethnic variations in cancer pain experience.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

American Cancer Society. Estimated New Cancer Cases and Deaths by Sex for All Sites, US. 2006. Retrieved July, 21, 2006, from http://www.cancer.org/docroot/MED/content/downloads/MED_1_1x_CFF2006_Estimated_New_Cases_Deaths_by_Sex_US.asp

Anderson, Mendoza, Valero, Richman, Russell, Hurley, et al. Minority cancer patients and their providers. Cancer 2000;88:1929–1938. [PubMed: 10760771]

Authors. White cancer patients' perception of gender and ethic differences in pain experience. Cancer Nursing 2006;29(6):441–50. [PubMed: 17135816]

Authors (in progress). Psychometric differences between Internet and pen-and-pencil formats of cancer pain measures.

Cella, Tulsky, Gray, Sarafian, Linn, Bonomi, et al. The functional assessment of cancer therapy scale: Development and validation of the general measure. Journal of Clinical Oncology 1993;11:570–579. [PubMed: 8445433]

Chang, Hwang, Feuerman, Kasimis, Thaler. The memorial symptom assessment scale short form (MSAS-SF). Cancer 2000;89(5):1162–1171. [PubMed: 10964347]

Chung, Wong, Wang. The lens model: Assessment of cancer pain in a Chinese context. Cancer Nursing 2000;23(6):454–461. [PubMed: 11128124]

Cleeland. Measurement and prevalence of pain in cancer. Seminars In Oncology Nursing 1985;1(2):87–92. [PubMed: 3849841]

Cleeland, Baez, Pandya. Pain and treatment of pain in minority patients with cancer. Annals of Internal Medicine 1997;127(9):813–816. [PubMed: 9382402]

Cleeland, Gonin, Harfield, Edmonson, Blum, Stewart, et al. Pain and its treatment in outpatients with metastatic cancer. New England Journal of Medicine 1994;330:592–596. [PubMed: 7508092]

Closs, &, Briggs. Patients' verbal descriptions of pain and discomfort following orthopaedic surgery. International Journal of Nursing Studies 2002;39:563–572. [PubMed: 11996877]

Cohen. Statistical power analysis for the behavioral sciences. Vol. 2. Hillsdale, N.J: L. Erlbaum Associates; 1988.

Dodd. Advancing the science of symptom management. Journal of Advanced Nursing 2001;33:668–676. [PubMed: 11298204]

Edrington, Paul, Dodd, West, Facione, Tripathy, et al. No evidence for sex differences in the severity and treatment of cancer pain. Journal of Pain & Symptom Management 2004;28(3):225–232. [PubMed: 15336334]

Eversley, Estrin, Dibble, Wardlaw, Pedrosa, Favila-Penney. Post-treatment symptoms among ethnic minority breast cancer survivors. Oncology Nursing Forum 2005;32(2):250–256. [PubMed: 15759063]

Fallows, D. How women and men use the Internet. 2005. from http://www.pewinternet.org

Ger LP, Ho ST, Sun WZ, Wang MS, Cleeland CS. Validation of the Brief Pain Inventory in a Taiwanese population. Journal of Pain & Symptom Management 1999;18(5):316–322. [PubMed: 10584454]

Grossman, Sheidler, McGuire, Geer, Santor, Piantadosi. A comparison of the Hopkins Pain Rating Instrument with standard visual analogue and verbal descriptor scales in patients with cancer pain. Journal of Pain & Symptom Management 1992;7(4):196–203. [PubMed: 1517641]

Hall, &, Stevens. Rigor in feminist research. Advances in Nursing Science 1991;13:16–29. [PubMed: 1901470]

Herr, Mobily, Kohout, Wagenaar. Evaluation of the Faces Pain Scale for use with the elderly. The Clinical Journal Of Pain 1998;14(1):29–38. [PubMed: 9535311]

Laliberte. Doctors' guide to chronic pain: The newest, quickest, and most effective ways to find relief. New York: The Reader's Digest Association, Inc; 2003.

Lazaro, Bosch, Torrubia, Banos. The development of a Spanish questionnaire for assessing pain: Preliminary data concerning reliability and validity. European Journal of Psychological Assessment 1994;10(2):145–151.

Lipson; Dibble. Culture and critical care. San Francisco: UCSF Nursing Press; 2005.

Little; Rubin. Statistical analysis with missing data. Hobeken, NJ: John Wiley & Sons; 2002.

Maly, Umezawa, Ratliff, Leake. Racial/ethnic group differences in treatment decision-making and treatment received among older breast carcinoma patients. Cancer 2006;106(4):957–965. [PubMed: 16402372]

McLaughlin; Marascuilo. Advanced nursing and health care research: Quantification approaches. Philadelphia: W. B. : Saunders; 1990.

Melzack. The short-form McGill Pain Questionnaire. Pain 1987;30(2):191–197. [PubMed: 3670870]

Miaskowski. Gender differences in pain, fatigue, and depression in patients with cancer. Journal of the National Cancer Institute Monographs 2004;32:139–143. [PubMed: 15263057]

Mullin. Development of three African language translations of the FACT-G. Quality of Life Research 2000;9:139–149. [PubMed: 10983478]

Murphy, KR.; Myors, B. Statistical power analysis: A simple and gneral model for traditional and modern hypothesis tests. Mahwah, NJ: Lawrence Erlbaum Associates; 2004.

Portenoy, Thaler, Kornblith, Lepore, Friedlander-Klar, Kiyasu, et al. The Memorial Symptom Assessment Scale: An instrument for the evaluation of symptom prevalence, characteristics and distress. European Journal of Cancer 1994;30A(9):1326–1336. [PubMed: 7999421]

Poulos, Gertz, Pankratz, Post-White. Pain, mood disturbance, and quality of life in patients with multiple myeloma. Oncology Nursing Forum 2001;28:1163–1171. [PubMed: 11517849]

Rabow, &, Dibble. Ethnic differences in pain among outpatients with terminal and end-stage chronic illness. Pain Medicine 2005;6(3):235–241. [PubMed: 15972087]

Ramer, Richardson, Cohen, Bedney, Danley, Judge. Multimeasure pain assessment in an ethnically diverse group of patients with cancer. Journal of Transcultural Nursing 1999;10(2):94–101. [PubMed: 10476160]

Rustøen, Fosså, Skarstein, Moum. The impact of demographic and disease-specific variables on pain in cancer patients. Journal of pain and symptom management 2003;26(2):696–704. [PubMed: 12906954]

Tabachnick, Barbara G.; Fidell, Linda S. Using Multivariate Statistics. Vol. 4. Boston: Allyn and Bacon; 2001.

Wan, Counte, Cella, Hernandez, McGuire, Deasay, et al. The impact of socio-cultural factors on health-related quality of life reports among Hispanic and African-American cancer patients. Journal of Outcome Measurement 1999;3:200–215. [PubMed: 10431489]

Wills, &, Wootoon. Concerns and misconceptions about pain among Hong Kong Chinese patients with cancer. Cancer Nursing 1999;22:408–413. [PubMed: 10603687]

Wong, &, Baker. Pain in children: Comparison of assessment scales. Pediatric Nursing 1989;14(1):9–17. [PubMed: 3344163]

Yu, Fielding, Chan, Tse, Choi, Lau, et al. Measuring quality of life of Chinese cancer patients: A validation of the Chinese version of the Functional Assessment of Cancer Therapy-General (FACT-G) scale. Cancer 2000;88:1715–1727. [PubMed: 10738232]

Table 1

Sociodemographic characteristics of the participants (N=480)

Characteristics	N (%)	Characteristics	N (%)
Age		*Gender*	
Mean (SD)	51.92 (12.27)	Women	381 (79.4)
		Men	97 (20.2)
Ethnicity		*Employment*	
Hispanic	105 (21.9)	Employed	190 (39.6)
N-H White	148 (30.8)	Unemployed	290 (60.4)
N-H African American	109 (22.7)		
N-H Asian	118 (24.6)		
Education		*Religion*	
No school	4 (0.8)	Muslim	1 (0.2)
Elementary	23 (4.8)	Buddhist	35 (7.3)
Middle-school	29 (6.0)	Catholic	120 (25.0)
High-school	127 (26.5)	Protestant	114 (23.8)
Partial college	110 (22.9)	No Religion	69 (14.4)
College graduates	120 (25.0)	Others	139 (29.0)
Graduate degree	67 (14.0)		
Income Satisfaction		*US Born*	
Totally insufficient	136 (28.3)	Yes	318 (66.3)
Somewhat insufficient	115 (24.0)	No	162 (33.8)
Sufficient for essentials	169 (35.2)		
More than sufficient	43 (9.0)		
Self-reported Health Status		*Cancer Treatment*	
Very unhealthy	51 (10.6)	Radiation only	16 (3.3)
Unhealthy	109 (22.7)	Chemotherapy only	77 (16.0)
Don’t know	66 (13.8)	Surgery only	45 (9.4)
Healthy	211 (44.0)	Hormone therapy only	2 (0.4)
Very healthy	41 (8.5)	Combined	325 (67.7)
		Others	15 (3.1)
Cancer Site		*Cancer Stage*	
Breast	217 (45.2)	0	23 (4.8)
Head & Neck	32 (6.7)	I	79 (16.5)
Lymph nodes	11 (2.3)	II	122 (25.4)
Hematologic	14 (2.9)	III	72 (15.0)
Gastrointestinal	46 (9.6)	IV	61 (12.7)
Lung	30 (6.3)	Recurrent	24 (5.0)
Female reproductive organs	39 (8.1)	Not staged	5 (1.0)
Prostate	10 (2.1)	Unknown	24 (5.0)
Combined	42 (8.8)		
Others	35 (7.2)		
Usage of Pain Medication		*Regular Access to Health Care*	
Yes	179 (37.3)	Yes	450 (93.8)

Characteristics	N (%)	Characteristics	N (%)
No	298 (62.1)	No	29 (6.0)
Place to Seek for Medical Help			
Clinic or Health Center	292 (60.8)		
Hospital Outpatient Dept.	29 (5.8)		
Hospital ER	28 (5.8)		
Others	89 (18.5)		

Table 2

A summary of self-reported cancer pain, symptoms, and functional status according to ethnicity.

Cancer Pain Experience	Means (SD)		SS*	df**	MS***	F-value	P-value
VDS							
Hispanic	1.79 (1.32)	Between Groups	46.24	3	15.41	F=8.81	P<0.01*
N-H White	1.82 (1.40)	Within Groups	830.95	475	1.75		
N-H African	1.39 (1.38)	Total	877.18	478			
Americans N-H Asian	1.09 (1.16)						
VAS							
Hispanic	4.20 (3.20)	Between Groups	31679.20	3	10559.73	F=9.98	P<0.01*
N-H White	4.05 (3.50)	Within Groups	443325.23	419	1058.06		
N-H African	2.57 (3.31)	Total	475004.43	422			
Americans N-H Asian	2.29 (2.92)						
FS							
Hispanic	3.36 (1.49)	Between Groups	67.74	3	22.58	F=9.37	p<0.01*
N-H White	3.34 (1.54)	Within Groups	1132.25	270	2.41		
N-H African	2.75 (1.71)	Total	1199.99	473			
Americans N-H Asian	2.49 (1.46)						
MPQ-SF							
Hispanic	10.86 (1.32)	Between Groups	4148.11	3	1382.70	F=14.64	p<0.01*
N-H White	12.06	Within Groups	42892.81	454	94.48		
N-H African	(10.92)	Total	47040.92	457			
Americans	6.13 (7.92)						
N-H Asian	5.18 (8.80)						
BPI-SF							
Hispanic	42.94 (28.99)	Between Groups	17734.71	3	5911.57	F=7.16	p<0.01*
N-H White	38.85 (28.85)	Within Groups	379626.65	460	825.28		
N-H African	32.74 (30.72)	Total	397361,36	463			
Americans N-H Asian	26.15 (26.25)						
MSAS							
Hispanic	24.45 (22.94)	Between Groups	3423.54	3	1141.18	F=2.82	p=.04
N-H White	20.63 (15.92)	Within Groups	192756.96	476	404.95		

Cancer Pain Experience	**Means (SD)**		**SS**[*]	**df**[**]	**MS**[***]	**F-value**	**P-value**
N-H African	16.55 (19.40)	Total	196180.50	479			
Americans N-H Asian	21.46 (22.77)						
FACT-G							
Hispanic	94.76 (20.04)	Between Groups	4264.40	3	1421.47	F=4.83	p<0.01[*]
N-H White	89.28 (14.91)	Within Groups	73824.03	251	294.12		
N-H African Americans	88.84 (18.26)	Total	78088.43	254			
N-H Asian	81.15 (17.60)						

[*] SS=Sum of Squares

[**] df=degree of freedom

[***] MS=Mean Square

Table 3

Top 5 most frequently reported pain descriptors included in the MPQ-SF according to ethnicity.

Rank	Hispanics	N-H Whites	N-H African Americans	N-H Asians
1	Aching Pain (62%)	Tiring Pain (70%)	Aching Pain (51%)	Tender Pain (35%)
2	Tiring Pain (60%)	Aching Pain (69%)	Tiring Pain (47%)	Aching Pain (29%)
3	Sharp Pain (52%)	Throbbing Pain (34%)	Sharp Pain (36%)	Tiring Pain (26%)
4	Tender Pain (52%)	Sharp Pain (36%)	Throbbing Pain (34%)	Throbbing Pain (25%)
5	Throbbing Pain (46%)	Tender Pain (33%)	Tender Pain (33%)	Cramping and fearful pain (23%)

Table 4

Top 5 most distressing and bothering symptoms according to ethnicity.

Rank	Hispanics	N-H Whites	N-H African Americans	N-H Asians
1	Pain (67%)	Pain (70%)	Lack of energy (47%)	Lack of energy (55%)
2	Lack of energy (52%)	Lack of energy (70%)	Pain (44%)	Difficulty sleeping (54%)
3	Difficulty sleeping (51%)	Difficulty sleeping (61%)	Difficulty sleeping (44%)	Worrying (50%)
4	Feeling sad (43%)	Difficulty concentrating (51%)	Numbness/tingling in hands/feet (39%)	Pain (49%)
5	Feeling drowsy (39%)	Worrying (43%)	Worrying (32%)	Difficulty concentrating (48%)

Table 5

Predictors of cancer pain, symptoms, and functional status: Hierarchical multiple regression

Predictor variables	**β**	***p*-value**	ΔR^2	F_{ch}	***p*-value for** F_{ch}
VDS Scores					
Step 1			.049	5.979	.001
Age	−.055	.236			
Income Satisfaction	−.021	.656			
Gender	−.067	.143			
Step 2			.277	47.533	.000
Cancer Stage	.063	.186			
Health Status	−.272	.000			
Pain Medication	−.351	.000			
Step 3			.028	4.964	.002
Being Hispanic or Not	.002	.962			
Being N-H African-American or Not	−.072	.139			
Being N-H Asian or Not	−.186	.000			
VAS Scores					
Step 1			.054	5.770	.001
Age	−.058	.229			
Income Satisfaction	−.009	.855			
Gender	−.039	.412			
Step 2			.326	52.331	.000
Cancer Stage	.092	.063			
Health Status	−.288	.000			
Pain Medication	−.367	.000			
Step 3			.021	3.447	.017
Being Hispanic or Not	.025	.661			
Being N-H African-American or Not	−.075	.144			
Being N-H Asian or Not	−.150	.006			
FS Scores					
Step 1			.048	5.785	.001
Age	−.007	.868			
Income Satisfaction	−.016	.715			

Predictor variables	**β**	***p*-value**	**ΔR^2**	**F_{ch}**	***p*-value for F_{ch}**
Gender	−.075	.086			
Step 2			.335	62.340	.000
Cancer Stage	.070	.129			
Health Status	−.342	.000			
Pain Medication	−.354	.000			
Step 3			.033	6.439	.000
Being Hispanic or Not	.039	.397			
Being N-H African-American or Not	−.076	.104			
Being N-H Asian or Not	−.183	.000			
MPQ Scores					
Step 1			.062	7.401	.000
Age	−.073	.111			
Income Satisfaction	−.001	.979			
Gender	−.105	.020			
Step 2			.275	46.346	.000
Cancer Stage	.053	.262			
Health Status	−.312	.000			
Pain Medication	−.302	.000			
Step 3			.055	10.063	.000
Being Hispanic or Not	−.010	.829			
Being N-H African-American or Not	−.156	.001			
Being N-H Asian or Not	−.253	.000			
BPI Scores					
Step 1			.096	12.290	.000
Age	−.039	.381			
Income Satisfaction	−.103	.021			
Gender	−.077	.074			
Step 2			.299	56.814	.000
Cancer Stage	.003	.954			
Health Status	−.346	.000			
Pain Medication	−.342	.000			

Predictor variables	**β**	***p*-value**	**ΔR^2**	**F_{ch}**	***p*-value for F_{ch}**
Step 3			.031	6.095	.000
Being Hispanic or Not	.047	.311			
Being N-H African-American or Not	−.069	.137			
Being N-H Asian or Not	−.170	.001			
MSAS Scores					
Step 1			.094	12.108	.000
Age	−.081	.115			
Income Satisfaction	−.156	.003			
Gender	−.066	.194			
Step 2			.113	16.646	.000
Cancer Stage	.064	.224			
Health Status	−.257	.000			
Pain Medication	−.164	.002			
Step 3			.001	.194	.901
Being Hispanic or Not	−.039	.467			
Being N-H African-American or Not	−.001	.896			
Being N-H Asian or Not	−.008	.987			
FACT-G Scores					
Step 1			.063	4.524	.004
Age	−.090	.196			
Income Satisfaction	−.024	.728			
Gender	−.204	.003			
Step 2			.098	7.725	.000
Cancer Stage	.208	.004			
Health Status	−.008	.908			
Pain Medication	−.165	.024			
Step 3			.023	1.863	.137
Being Hispanic or Not	.090	.214			
Being N-H African-American or Not	.066	342			
Being N-H Asian or Not	−.091	.221			

[*] ΔR^2=R square change

[**] F_{ch}=F change