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Prevalence and Characteristics of Flare-ups of Chronic Non-specific Back Pain in Primary Care: A Telephone Survey

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Abstract

Objectives—To describe the prevalence and characteristics of flare-ups of chronic non-specific back pain (CNSBP) among primary care patients, and to examine associations with measures of pain severity and psychosocial factors.

Methods—Six hundred and thirty-four subjects with nonspecific back pain were interviewed by telephone 2 years after an initial primary care visit for back pain. Subjects experiencing flare-ups in the last 6 months reported on frequency, duration, and other characteristics of flare-ups. Using bivariate and multivariate analyses, we compared individuals with and without CNSBP flare-ups with respect to demographic characteristics, measures of pain severity, and psychosocial factors.

Results—51% of subjects reported flare-ups. Physical activities, including lifting and bending, were the most common perceived triggers of flare-ups. Subjects with flare-ups experienced greater levels of pain intensity, disability, opioid medication use, and psychosocial comorbidities. After adjustment for demographic factors, pain intensity, and pain frequency, subjects with flare-ups were more disabled than those without (mean [95% confidence interval] disability score 4.2 [3.9–4.4] vs. 3.3 [2.9–3.6]; $p < 0.0001$) and demonstrated higher levels of passive coping (mean passive coping score 4.1 [3.8–4.3] vs. 3.4 [3.1–3.7]; $p = 0.0008$).

Discussion—Flare-ups of CNSBP are common among primary care patients, and are independently associated with higher levels of pain intensity, disability, and passive coping. The presence of flare-ups and the perception of activity as a trigger may predispose patients with flare-ups to experience disability not explained by pain intensity alone. Further longitudinal studies are required to better characterize CNSBP flare-ups and determine their clinical implications.

Keywords

back pain; flare; flare-up; exacerbation; disability; coping

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INTRODUCTION

The term ‘chronic back pain’ may convey the impression that such pain is stable and constant. On the contrary, prospective studies have shown that the course of back pain is characterized by change and variation for most individuals¹. Patients with recurrent or chronic back pain may describe pain ‘flare-ups’, defined as “a period when back pain is markedly more severe than is usual for the patient”². Indeed, most primary care physicians are familiar with patients who intermittently present with flare-ups of pain, but are otherwise able to self-manage their symptoms between pain exacerbations.

Although flare-ups have been studied in both inflammatory^{3,4} and non-inflammatory rheumatic disease⁵, little is known about the characteristics of flare-ups of chronic nonspecific back pain (CNSBP). This lack of information is noteworthy, since multiple qualitative studies have confirmed that flare-ups are an important part of the experience of CNSBP for many patients^{6–8}. Prior studies of ‘breakthrough’ non-cancer pain describe short-duration pain exacerbations (<1 day) in carefully selected patients from specialty clinics, who are often on long-term opioid treatment for a variety of pain diagnoses^{9,10}. This research probably does not apply to the typical patient seen for CNSBP flare-ups in primary care. The basic epidemiology of flare-up duration, flare-up frequency, and triggers that may be associated with CNSBP flare-ups has yet to be described in a primary care population.

Compelling evidence from a study of middle aged workers with back pain suggests that the presence of flare-ups captures important information related to functional limitations and utilization of healthcare resources¹¹. This study utilized the term ‘exacerbation’ rather than ‘flare-up’ to signify a period of more severe pain beyond usual levels, and did not specify chronicity of pain. Compared to workers without episodic pain exacerbations, those experiencing exacerbations had significantly greater activity limitations and lost productivity due to back pain, which accounted for a disproportionate amount of back pain-related healthcare costs. Workers with exacerbations also reported more days in pain and higher maximum levels of pain intensity than did workers without exacerbations, but the two groups did not differ on sociodemographic measures. However, this prior study did not examine other important factors that may be associated with back pain exacerbations, including psychosocial factors. Evidence from the pain literature suggests that, for selected patients from chronic pain clinics, psychosocial factors such as catastrophizing and fear-avoidance may be related to the presence of pain fluctuations^{12,13}. Taken together, the available literature shows preliminary evidence for an association between increased pain *variability* (as reflected by the presence of flare-ups) and both greater disability and psychosocial comorbidity, in selected populations of workers with back pain and pain clinic patients. However, we are not aware of any studies that have examined whether pain variability is associated with greater disability and psychosocial comorbidity more generally in primary care patients with CNSBP, and if so, what factors may explain such an association. Characterizing CNSBP variability (as reflected by flare-ups) is important not only to describe the experience of patients, but better understanding of the variability inherent in flare-ups may also shed light on other changes that occur as back pain becomes more chronic. Variability may be one mechanism through which CNSBP disability and psychosocial comorbidity burden can increase over time. Indeed, it seems reasonable that CNSBP that is stable and unchanging would be less functionally limiting and cause less psychosocial stress than CNSBP that is highly variable and cannot be predicted. Flare-ups may be pain experiences that reinforce functional or maladaptive behavior in a way that non-variable pain cannot.

This study examines the characteristics of CNSBP flare-ups and associated factors in a primary care population experiencing chronic symptoms two years after an initial primary

care visit for back pain. The objectives of the study are to: 1) characterize the epidemiology of flare-ups of CNSBP in a primary care population, 2) examine whether sociodemographic characteristics of CNSBP patients who experience flare-ups differ from those of CNSBP patients who do not experience flare-ups, and 3) determine whether the presence of CNSBP flare-ups is associated with measures of pain severity (including pain intensity, disability, healthcare utilization, and medication use), and psychosocial factors.

METHODS

Study Sample

The current study is based on data from a cohort of consecutive patients age 18 to 75 who made a primary care visit for back pain in 1990–1991. Study subjects were members of Group Health Cooperative (GHC), an integrated health care system in the Pacific Northwest. Three to six weeks after their index primary care visit for nonspecific back pain including upper back, mid-back and low back pain, subjects were invited to participate in a standardized 20–30 minute baseline telephone interview about their index back pain episode. These subjects were subsequently interviewed by telephone at 1, 2 and 5 year intervals. Questions pertaining to flare-ups, the focus of the current study, were not included in the baseline interview; they were added partway through the administration of the 2-year follow-up interview. This means that subjects who were interviewed early in the 2-year cycle were not asked the flare-up questions. This research was approved by the GHC Institutional Review Board.

Definition and Characteristics of CNSBP Flare-ups

Subjects at the two-year follow-up who reported having back pain in the past six months were asked ‘Do you ever experience flare-ups of your back pain where your pain is much worse than usual for days, weeks, or months at a time?’. The terminology ‘flare-up’ was specifically chosen to connote a discrete exacerbation of existing pain, due to the fact that patients commonly use this lay term. A subsequent question asked about the number of flare-ups in the last six months. The current study defines persons with flare-ups as those experiencing both CNSBP and flare-ups of pain in the last six months. Persons without flare-ups are those experiencing CNSBP in the last six months, but not having flare-ups during this time. Persons experiencing flare-ups in the last six months were asked about the duration of typical flare-ups, the number of flare-ups in the last six months, and the duration of time elapsed since the end of their most recent flare-up. Subjects experiencing flare-ups were also asked an open-ended question about perceived triggers (up to three) for their flare-ups.

Self-reported Measures of CNSBP Severity

Telephone-administered questions inquired about the following measures relating specifically to ongoing symptoms of CNSBP:

1. *Pain Intensity*- Intensity ratings on a 0–10 scale of 1) pain right now, 2) average pain on days with pain in the previous six months, and 3) worst pain during the previous six months with 0 representing ‘no pain’ and 10 representing ‘pain as bad as could be’.¹⁴
2. *Pain Interference* – Ratings on a 0–10 scale of the extent to which pain interfered with 1) general activity, 2) recreational/social activities, and 3) work/housework activities in the previous six months, with 0 representing ‘no interference’ and 10 representing ‘unable to do any activities’. *Disability Score* is the mean of the three pain interference ratings¹⁴.

3. *Days in Pain*- Number of days with pain in the previous six months¹⁴.
4. *Opioid Use*- Use of an opioid medication for pain in the past month.
5. *Days of Opioid Use*- Number of days of opioid use for pain in the prior month.
6. *Pain Visits*- Number of self-reported back pain visits to a physician or nurse, physical therapist, or chiropractor in the previous six months.
7. *Modified Roland-Morris Scale*- The Roland-Morris Scale is a widely used, reliable, and valid scale of back-related disability^{15,16}. We used a 16-item version of the Roland-Morris Scale modified to be more sensitive among people with recurrent back pain¹⁷. This modified scale allowed subjects to skip the specifically work-related items of the scale, and expressed the score as the percentage of questions responded to with positive ('yes') answers to account for omission of the work-related items¹⁷. Functional limitations were measured over the past two weeks, with higher scores representing a greater level of functional limitations.
8. *Chronic Pain Grade*- Characteristic pain intensity, disability score, and the number of days in the last 6 months the subject was unable to carry out his or her usual activities were used to grade back pain severity into one of four categories: Grade I, low disability/low intensity pain; Grade II, low disability/high intensity pain; Grade III, high disability/moderately functionally limiting pain; Grade IV, high disability/severely functionally limiting pain¹⁴. The Chronic Pain Grade has been previously validated as a predictor of continuing pain and functional limitations¹⁴.
9. *Work Disability*- Work disability was assessed with the question 'Has your back problem kept you from obtaining or keeping full time work in the past year?'

Psychosocial and General Health Factors

Depression was measured by the Symptom Checklist-90-R (SCL-90-R) depression scale¹⁸. Non-pain somatization was measured by the SCL-90-R somatization scale¹⁷. Subjects reported the degree of control they had over their back pain condition on a 0–10 scale, where 0 represented 'no control' and 10 represented 'a great deal of control'. Passive coping is the mean of five items measuring how often the subject engaged in passive coping behaviors on a 0–10 scale with 0 representing 'never' and 10 representing 'very often'¹⁹. These items, previously validated as measures of passive coping, include: 1) 'Focusing on the location and intensity of pain', 2) 'Thinking the pain is wearing you down', 3) 'Telling others how much the pain hurts', 4) 'Wishing the doctor would prescribe better pain medication', and 5) 'Thinking one cannot do anything to cope with the pain'¹⁹. Subjects rated their perception of their general health as 'excellent', 'very good', 'good', 'fair', or 'poor'.

Statistical Analysis

We assessed sociodemographic differences between subjects who reported having both CSNBP and flare-ups in the last six months as compared to those reporting CNSBP but no flare-ups in the last six months using either the chi-square test for categorical variables or the Student's t-test for continuous variables. We then described the characteristics of flare-ups in those individuals reporting flare-ups in the last 6 months, including the duration and frequency of flare-ups, the timing of the most recent flare-up, and 'triggers' reported by subjects to be associated with flare-ups. In the interest of characterizing how flare-ups may be different for older adults, we compared flare-up characteristics of older adults age 65–75, with those of younger adults age < 65. We used chi-square tests and t-tests to examine bivariate associations between flare-up status and measures of CNSBP severity. We restricted this analysis to subjects reporting pain in the last week in order to decrease misclassification, and to ensure that between-group differences were related to flare-up

status (i.e., to limit confounding due to individuals not currently experiencing back pain symptoms). In a similar manner, we also examined bivariate associations between flare-up status and psychosocial factors. We then used multivariate analyses to further examine those factors that were significantly associated with flare-ups in the bivariate analyses. We calculated least squares adjusted means to compare measures of CNSBP severity and psychosocial factors by flare status, adjusting for 1) demographic factors that were associated with flare status in bivariate analyses (age and educational level), and 2) other factors deemed to be conceptually relevant to the observed differences by flare status. The latter included sex, number of pain days per month, current pain intensity, and average pain intensity. We included these pain intensity and frequency measures as covariates in order to examine factors associated with flare-ups above and beyond the contribution of pain intensity and frequency. In addition, this approach should adjust for the effects that current pain may have on recall of past pain. Worst pain intensity was not included as a covariate, because we felt its inclusion would control for a central characteristic of flare-ups. Since we used least squares adjusted means, opioid use was changed from a categorical variable to a continuous variable in the multivariate analysis.

RESULTS

Figure 1 depicts a flowchart of subjects included in the analyses reported in this paper. One thousand and twenty-four subjects were interviewed by telephone two years after an initial back pain interview. Eight hundred fifty five (83.5%) of the subjects completing the 2-year follow-up interview reported having back pain in the last six months. Six hundred thirty four (74.2%) subjects who experienced back pain in the previous six months were asked questions regarding flare-ups of pain; two hundred twenty one (25.8%) subjects who had back pain in the previous six months were not asked the flare-up questions, having been interviewed before incorporation of these questions. There were no material differences in measures of pain severity between subjects who did and did not receive flare-up questions (data not shown), but those who received the flare-up questions were younger (mean [standard error of the mean] 47.9 [0.5] vs. 51.4 [1.0]; $p=0.002$) and less likely to be female (52% vs. 64%; $p=0.002$) than those who did not.

Demographic characteristics of subjects with and without flare-ups are presented in Table 1. Fifty-one percent of subjects ($n=317$) who experienced back pain in the previous six months reported having flare-ups during the same time period. Subjects with flare-ups were significantly younger than those without. A greater proportion of subjects with flare-ups were white; however, the great majority of subjects in both groups were white, reflecting the demographic composition of the study population. There was a trend for subjects with flare-ups to report lower levels of education compared to subjects without flare-ups, but this difference was non-significant ($p=0.06$). Overall, differences in demographic characteristics with respect to flare status were of small magnitude, even when statistically significant.

Tables 2 and 3 present characteristics of CNSBP flare-ups, and reported triggers of flare-ups, respectively. Eighty-nine percent of subjects reported at least one flare-up trigger. Lifting and bending were the most common reported triggers of flare-ups, with each reported by approximately one quarter of subjects with flare-ups. Non-specific actions such as 'over-activity', 'moving wrong', 'movement', or 'physical activity' were also frequently reported as triggers. Subjects were more likely to identify sitting as a trigger (10%) compared to other specific positions such as standing and having 'bad posture.' Eleven percent spontaneously identified "stress" as a trigger of back pain flare-ups.

Flare-ups almost always lasted more than a single day. More than 50% of subjects with flare-ups reported that their flare-ups usually lasted between one and three days, and almost

all subjects (95%) said their flare-ups lasted less than two weeks. About one fifth of subjects reported having only one or two flare-ups in the past six months. In contrast, one third of subjects with flare-ups reported an average of one or more flare-ups per month during the past six months. The fact that about one quarter of subjects reported a concurrent flare-up at the time of the interview, while 62% of subjects reported a flare-up in the past two weeks, suggests that frequent flare-ups (1/month) may occur somewhat more frequently than ascertained by recall of flare-ups over the preceding six months.

98 subjects (16 %) who received flare-up questions were older adults between the ages of 65–75. Older adults were less likely to report flare-ups as compared to younger subjects (44% vs. 62%; $p=0.008$), more frequently reported that flare-ups were triggered by a 'physical condition' (25% vs. 7%; $p=0.0005$), and were more likely to have short duration flare-ups of 2 days or less (47.3% vs. 25.9%; $p=0.002$). Flare-ups were otherwise similar in older adults as compared to younger adults (data not shown)

Table 4 presents measures of CNSBP severity by flare-up status. Among subjects experiencing back pain in the last week, those with flare-ups had both significantly higher mean levels of current pain and average pain intensity compared to those not experiencing flare-ups. As would be expected, worst pain intensity in the past six months was almost two points higher for subjects with flare-ups than for those without. Chronic Pain Grade was significantly higher in subjects with flare-ups; a smaller proportion of individuals with low disability and low pain intensity, and a higher proportion of individuals with high levels of disability were observed compared to those without flare-ups. Mean scores on the modified Roland-Morris scale were higher among subjects with flare-ups compared to those without, indicating greater functional limitations. Subjects with flare-ups were significantly more likely to use an opioid medication in the last month than were persons without flare-ups, and had more physician or nurse visits for back pain. However, the two groups did not differ on number of overall back pain visits (including physical therapy and chiropractic care) or the proportion kept from full- or part-time work due to back pain. Table 5 shows psychosocial and general health factors by flare-up status. Persons with flare-ups reported higher levels of depression, somatization, and passive coping, and lower levels of perceived control, than persons without flare-ups. Persons with flare-ups also reported significantly worse overall health.

Table 6 presents adjusted means for measures of CNSBP severity and psychosocial factors by flare status. Mean Disability Score and the modified Roland-Morris scale remained significantly higher in individuals with flare-ups as compared to those without after adjusting for age, sex, educational level, number of back pain days, current pain intensity, and average pain intensity. Individuals with flare-ups were significantly more likely to engage in passive coping strategies compared to those without flare-ups. Days of opioid use in the past month, depression score, somatization score, perceived control over pain, and activity limitation days were not significantly associated with flare status after adjusting for pain intensity, pain frequency and other covariates, suggesting that differences in these variables by flare-up status may be explained by the correspondingly greater back pain severity. In order to determine whether passive coping was a potential confounder of the relationship between flare-ups and disability, we examined least squares adjusted means while including passive coping as an additional covariate. Least squares means remained significantly different between individuals with and without flare-ups for Disability Score (4.1 vs. 3.4; $p=0.002$) and modified Roland-Morris (0.38 vs. 0.29; $p=0.001$). The lack of confounding by coping status is demonstrated graphically in Figure 2; individuals with flare-ups had adjusted mean Disability Scores that were 25–30% higher than those without flare-ups, irrespective of whether they reported higher or lower levels of passive coping. Similar

findings were seen when using the outcome of the modified Roland-Morris scale (data not shown).

DISCUSSION

The principal findings of this study are that CNSBP flare-ups are common among typical primary care patients who continue to have back pain two years after seeking care, and that flare-ups are associated with psychosocial morbidity and increased pain severity. Flare-ups were associated with greater levels of pain intensity, pain frequency, functional limitations, opioid medication use, number of physician visits, depression, somatization, and self-reported poor health. Even after adjusting for demographic factors, pain intensity, and pain frequency, subjects with flare-ups were more disabled than those without. Subjects with back pain flare-ups were also more likely to exhibit passive coping strategies, even after adjusting for back pain intensity and persistence.

Ricci et al. previously reported associations between the presence of pain exacerbations and greater disability in a sample of middle-aged workers with back pain. A similar association between having episodic exacerbations of back pain and greater disability was also noted in an earlier study²⁰. The findings of our study are consistent with these earlier reports, and demonstrate that pain flare-ups are associated with disability not only in selected back pain populations, but in unselected primary care CNSBP patients. Similar to Ricci's findings in middle-aged workers, we did not note meaningful differences in demographic characteristics between primary care patients who had flare-ups and those who did not. Our findings build upon earlier work by further demonstrating that the increased disability associated with back pain flare-ups is not explained by pain intensity, pain frequency, or demographic factors. Contrary to our expectations, we did not find that flare-ups were associated with a higher frequency of permanent work-related disability. However, accurate assessment of these outcomes may have been limited by our use of self-reported data rather than objectively confirmed records such as state disability documentation.

When treating passive coping as a potential confounder, the higher levels of passive coping seen in subjects with CNSBP flare-ups in our study did not explain the independent association between flare-ups and disability. A recent systematic review of predictors of disabling back pain found that behaviors including fear-avoidance and passive coping were among the most important independent predictors of disability across multiple cohort studies²¹. Although fear-avoidance specifically was not measured in our study, fear-avoidance and passive coping are related constructs with some overlapping domains²², and are sometimes grouped together as predictors of back-related disability²¹. Conceptually, avoidance of activity might be one pathway through which flare-ups are related to disability: flare-ups may be pain experiences that reinforce activity avoidance, and the absence of flare-ups may reinforce activity performance. The fact that lifting, bending, and increased activity were the most commonly reported perceived triggers of CNSBP flare-ups in the current study makes it reasonable to suppose that patients may avoid these activities to ward off a flare-up. The notion that activity performance and the development of fear-avoidance might link flare-ups to greater disability would on first glance appear to be contradicted by our finding that adjustment for passive coping as a potential confounder did not explain the association between flare-ups and disability. On the other hand, the manner in which we adjusted for passive coping may have been inappropriate if passive coping is indeed on the causal pathway connecting flare-ups to disability. Future studies of the association between CNSBP flare-ups and increased disability will benefit from closer examination of the interrelationships between beliefs about pain, coping, and avoidance of perceived flare triggers, including activity.

The prevalence of flare-ups in the current study (51%) is similar to the prevalence of exacerbations reported by Ricci et al. (42%). While Ricci examined a sample of workers age 40–65 with back pain of unspecified duration, the current study population consisted of individuals age 18–75 with continuing back pain two years after a primary care back pain visit (the large majority of the study cohort). This suggests that flare-ups are not just a common part of the pain experience for a select subgroup of workers, but they may affect many individuals regardless of age and occupational status. The similarity in prevalence rates observed in the two studies is noteworthy given that different definitions of flare-ups were used. Subjects in the current study were not given specific numerical criteria to define a flare-up. Ricci et al defined a pain exacerbation as a 2-point increase in back pain intensity over usual pain intensity experienced. Although the similarity in prevalence rates may be coincidental, it is possible that the quantitative threshold of a 2-point increase over usual pain intensity corresponds to patients' subjective determination of whether a flare-up of CNSBP is present. Indeed, maximum pain intensity was approximately 2 points higher for subjects with flare-ups in this sample.

This study presents novel information about the duration and frequency of back pain flare-ups experienced by primary care patients, and this information may be useful for clinicians. First, flare-ups of pain are a common part of the CNSBP experience for a majority of individuals. Furthermore, on any given day, an individual who experiences flare-ups may have substantially increased pain intensity over prior assessments, as compared to individuals who do not experience flare-ups. As an example of this, although average pain in the past week on a 0–10 scale for subjects with flare-ups was only 0.6 points higher than average pain in subjects without flare-ups, worst pain intensity for patients with flare-ups was 1.8 points higher than worst pain for patients without flare-ups. Relative increases in pain intensity alone should therefore not necessarily be taken as an alarming indicator of a concerning change in the processes which may underlie CNSBP, particularly for patients known to have flare-ups. Rather, changes in back pain intensity should to some extent be expected in primary care. Second, clinicians should be aware that CNSBP flare-ups are not fleeting, and generally lasted more than a day but less than a week in our study. They are therefore substantially longer in duration than the phenomenon of 'breakthrough pain' as experienced by non-cancer patients, which refers to short-duration pain exacerbations (< 3 hours), often among patients using opioids⁹. The terms 'flare-up' and 'breakthrough pain' apply to phenomena that may be distinct, and the implications of prescribing "rescue" medications for 'breakthrough pain' lasting a few hours are decidedly different than managing pain flare-ups that may last many days. The finding that CNSBP flare-ups, while not fleeting, tend to resolve for most people within a week, could influence clinicians' decisions to prescribe as-needed pain medications for selected patients who experience occasional pain flare-ups, but are capable of appropriate self-management. However, since a substantial proportion of individuals experience flare-ups frequently-more than 1/3 of the sample reported experiencing a flare within the past week- this suggests that advance provision of as-needed pain medications may not be a practical solution for other patients, risking sustained opioid dose escalation. This caution is supported by the current study's finding of greater use of opioid medications in subjects with CNSBP flare-ups. Further study of flare-ups is needed not only to better understand flare-ups themselves, but also to explain how these episodes can be best managed by clinicians to safely improve patients' control over pain and independence.

Our findings also have some research implications. Individuals with flare-ups of CNSBP appear to have greater variability of pain intensity as compared to those without flare-ups. This may affect precision of pain intensity measurements when assessed at a single timepoint in studies of CNSBP outcomes. Furthermore, flare-ups of pain are common, so this may affect a large percentage of patients in a study of CNSBP outcomes. Flare-ups may

be accounted for in research studies by inclusion of specific questions regarding flare-ups and whether a flare-up is ongoing at the time of pain intensity assessment, or by the use of pain intensity scales which inquire not only about current pain, but average pain and worst pain.

This study has several limitations. First, since no commonly accepted definition of a flare-up exists, this study allowed subjects to self-identify flare-ups without applying specific quantitative criteria. However, from a conceptual standpoint, a patient's perception that he or she is experiencing a flare-up may have greater face validity than a predefined quantitative threshold, which might have very different meanings for different patients. Regardless, the prevalence of flare-ups in our study was quite similar to that of the prior study by Ricci et al. Future studies examining pain fluctuations should incorporate a longitudinal design with a frequent sampling frame in order to better characterize the quantitative changes in pain intensity typical of flare-ups, and to identify flare-ups prospectively, thereby avoiding the possible biases of retrospective flare-up assessment used in the current study. It should also be noted that we used the lay term 'flare-up' rather than a term such as 'exacerbation', both which may signify a worsening of existing pain beyond usual levels of pain, but neither of which are widely used in the back pain literature; these two terms may be equivalent, but this supposition needs to be tested in future work. Second, our survey was conducted by telephone. Although careful steps were taken to establish and confirm subjects' identities before these interviews, the standard limitations of telephone interviewing apply, including the fact that absolute assurance of correct identities in the follow-up assessment was not possible as with in-person interviews. Third, flare-up questions were introduced into the survey after the start of the two-year follow-up, meaning that not all individuals were asked the back pain flare-up items. Although we would not have expected this to result in systematic bias since the interviewing order during the two-year follow-up was random, subjects who received the flare-up questions were younger and more likely to be female than those who did not. This may have been due to younger individuals being more likely to have missed initial phone contacts, and be captured on repeat phone contact attempts; this would increase the chances that their interview occurred later, that is after the start of the follow-up questions. We expect any effect resulting from this to be immaterial, and this is supported by the fact that there were no differences in pain or clinical factors between subjects who received and did not receive the flare-up questions. Fourth, this study did not inquire in detail about work-related factors as has been done in prior studies of flare-ups^{11,20}. This omission is relevant, since flare-ups of pain have implications for work-related absenteeism and presenteeism¹¹. Fifth, this study for practical reasons could not examine all factors possibly related with back pain and with flare-ups. In particular, certain pain characteristics other than intensity and frequency, including pain in other locations (such as lower extremity pain caused by pain referral or nerve root impingement) and multi-site pain^{23,24}, were not examined or considered. We feel it is important that future studies of back pain variability take a broader range of factors into account. Last, this study analyzed data collected in 1990–1991 from the cohort originally used to validate the Chronic Pain Grade¹⁴. Although this data was not recently collected, we believe the existing literature supports the fact that major advances have not been made in recent years that have fundamentally changed the natural history of CNSBP in primary care, which would invalidate the information presented in this study.

Flare-ups, a common feature of the CNSBP experience and pose a concern for many patients with CNSBP^{6–8}. This study presents the first description of CNSBP flare-ups in a primary care sample. Flare-ups of CNSBP are associated with increased pain intensity and frequency, but are also marked by increased disability and passive coping strategies, even after accounting for pain intensity and frequency. Future studies should examine how

CNSBP flare-ups can best be treated so as to limit disability and promote self-management for patients with persistent symptoms.

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Figure 1.
Flowchart of Study Participation

Figure 2.

Adjusted Mean Disability Scores Stratified by Coping Status*

*Subgroups of high passive copers and low passive copers, dichotomized at the mean score for passive coping.

Table 1

Demographic characteristics of Individuals Experiencing Back Pain in the last 6 months by Flare-up Status (n=621) ^{*†}

	Flares-ups (n=317)	No Flare-ups (n=304)	p-value
Age	46.7 (0.7)	49.1 (0.8)	0.03
Race (White)	299 (94.3%)	270 (89.4%)	0.02
Female Sex	172 (54.3%)	152 (50.0%)	0.29
Educational level			
<12 th grade	12 (3.8%)	11 (3.6%)	
High school graduate or some College	207 (65.5%)	171 (56.6%)	0.06
College graduate	97 (30.8%)	120 (39.7%)	

* number (%) or mean (standard error of the mean)

[†] Although 634 subjects reported back pain in the past 6 mos, 13 subjects had missing data on flare-ups

Table 2Triggers of Back Pain Flare-ups (n=317)^{*†}

	N (%) [‡]
Lifting	87 (27.4%)
Bending	73 (23.0%)
Over-activity	65 (20.5%)
Moving wrong	44 (13.9%)
Stress	34 (10.7%)
Sitting	31 (9.8%)
Physical condition	28 (8.8%)
Movement or physical Activity	24 (7.6%)
Strain	21 (6.6%)
Being in a specific Position	19 (6.0%)
Standing	10 (3.2%)
Bad posture	5 (1.6%)
Trauma or jarring	4 (1.3%)
Other	22 (6.9%)
Missing data (no trigger reported)	36 (11.4%)

* As reported by subjects experiencing flare-ups in the past 6 months

[‡]% represents percent of subjects reporting having flare-ups. Subjects could report up to 3 triggers. Percents therefore sum to more than 100%

Table 3

Characteristics of Back Pain Flare-ups (n=317)

Usual duration of flare-up [*]	N (%)
1 day	2 (0.6%)
2 days	87 (27.7%)
3 days	76 (24.2%)
4–6 days	60 (19.1%)
1–2 weeks	73 (23.3%)
3–4 weeks	5 (1.6%)
>4 weeks	11 (3.5%)
Number of flare-ups in past 6 months	
1	60 (18.9%)
2	67 (21.1%)
3	43 (13.6%)
4	29 (9.2%)
5–10	71 (22.4%)
>10 flare-ups	45 (14.2%)
End of most recent flare-up [†]	
Currently in flare-up	82 (26.5%)
1 week	36 (11.7%)
1–2 weeks	73 (23.6%)
3–4 weeks	22 (7.1%)
>4 weeks	96 (31.1)%

^{*} As reported by subjects experiencing flare-ups in the past 6 months, missing=3;

[†] missing=8

Table 4Measures of Back Pain Severity by Flare-up Status ^{*†} (n=415)

	Flare-ups (n=243)	No Flare-ups (n=172)	p-value
Back Pain Severity Measures			
Current pain intensity	3.0 (0.2)	1.7(0.2)	<.0001
Average pain intensity past 6 mos (on days with pain)	4.5 (0.1)	3.9 (0.2)	.0008
Worst pain intensity, past 6 months	7.1 (0.1)	5.3 (0.2)	<.0001
# of pain days, past 6 months	106.6 (4.4)	90.4 (5.7)	0.02
Chronic Pain Grade			
I (low disability- low intensity)	96 (40.0)%	122 (71.4%)	.0001
II (low disability- high intensity)	58 (24.2)%	21 (12.3%)	
III (high disability- moderate limitations)	46 (19.2)%	14 (8.2%)	
IV (high disability- severe limitations)	40 (16.7)%	14 (8.2%)	
Disability score	4.4 (0.2)	2.9 (0.2)	<0.0001
Modified Roland-Morris Scale	0.42 (0.02)	0.24 (0.02)	<.0001
Any opioid use, past month	52 (21.4%)	11 (6.4%)	<.0001
Number of any back pain visits, past 6 months [‡]	5.7 (12.2)	4.1 (13.6)	0.22
Number of physician or nurse back pain visits, past 6 months	1.5 (0.3)	0.8 (0.2)	0.003
Number of physical therapist back pain visits, past 6 months	2.0 (0.4)	1.8 (0.9)	0.85
Number of chiropractor visits, past 6 months	2.2 (0.6)	1.6 (0.5)	0.40
Back pain prevents from obtaining or keeping work	26 (10.7%)	18 (10.5%)	0.93

* number (%) or mean (standard error of the mean)

[†] Excludes subjects who did not report back pain in the past week[‡] visits to physician/nurse, physical therapist, or chiropractor

Table 5Psychosocial and General Health Factors by Flare-up Status ^{*†} (n=415)

	Flare-ups (n=243)	No Flare-ups (n=172)	p-value
SCL-90-R depression score	0.97 (0.05)	0.82 (0.06)	0.03
SCL-90-R somatization score	0.76 (0.04)	0.55 (0.05)	<0.001
Perceived control over pain	5.3 (0.2)	6.1 (0.2)	0.005
Passive coping	4.2 (0.1)	3.0 (0.2)	<.0001
Self-reported health (very good/excellent)	116 (47.7)%	99 (57.9%)	0.04

* number (%) or mean (standard error of the mean)

[†] Excludes subjects who did not report back pain in the past week

Table 6Least Squares Means Adjusted for Back Pain Severity and Demographic Factors *[†] (n=415)

	Flare-ups	No Flare-ups	p-value
Measures of Back Pain Severity			
Disability Score (0–10)	4.2 (0.1)	3.3 (0.2)	<.0001
Modified Roland-Morris Scale	0.39 (0.01)	0.28 (0.02)	<.0001
# of days opioid use, past month	2.1 (0.4)	1.2 (0.5)	0.14
Psychosocial Factors			
Perceived control of pain	5.5 (0.2)	5.8 (0.2)	0.31
Passive Coping	4.1 (0.1)	3.4 (0.2)	<.001
SCL-90-R depression score	0.92 (0.05)	0.91 (0.06)	0.90
SCL-90-R somatization score	0.70 (0.04)	0.65 (0.05)	0.40

Means (standard error), adjusted for age, sex, education, # of back pain days, current pain intensity, and average pain intensity

[†]Limited to people experiencing back pain in the last week.