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Alexithymia and 7.5-year incidence of compensated low back pain in 1,207 urban public transit operators

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Abstract

Objective—Alexithymia, a lack of emotional awareness, was positively associated with self-reported low back pain (LBP) in cross-sectional studies. We assessed the association of alexithymia with 7.5-year incidence of LBP prospectively in a cohort study of 1,207 San Francisco transit operators.

Methods—Alexithymia was measured by the Toronto Alexithymia Scale (TAS-20). LBP was assessed by physician-confirmed diagnoses from administrative workers' compensation data. Cox proportional hazard analyses controlled for demographic, behavioral, and physical and psychosocial job factors measured by questionnaire and interview.

Results—27.7% of all drivers (n=334) filed compensated claims for LBP injuries with workers' compensation insurance during the 7.5-year observation time. The hazard ratios from the fully adjusted model were 0.73 (0.56-0.96) for the TAS-20 scale and 0.82 (0.69-0.98) for the subscale “difficulty describing feelings”. Alexithymia scores did not predict the duration of compensated work disability.

Conclusion—In contrast to previous cross-sectional positive associations between alexithymia and LBP, alexithymia is negatively associated with compensated LBP claims. We hypothesize that shame and reporting behavior may explain these inconsistent results.

Keywords

Alexithymia; Coping; Emotions; Low Back Pain; Occupational Medicine; Psychosocial Risk Factors

Introduction

The annual estimated prevalence of acute severe disabling low back pain (LBP) in the adult US population is estimated to be around 8%[1] corresponding to 16.6 million US adults. A significant proportion of LBP sufferers experience continuous or recurrent symptoms and place a huge burden on society[2, 3]. For the prognosis of LBP, psychosocial predictors appear to be more important than findings from physical examination.[2, 4, 5] or imaging studies[6].

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Numerous psychological factors are implicated as predictors (not necessarily as determinants) in the onset, chronification, recurrence, and responsiveness to treatment of LBP including: depression[7], anxiety[8], fear-avoidance[9], catastrophizing[10], somatization[11], acceptance[12], ignoring/endurance[13], anger[14, 15], job problems[16] and job dissatisfaction[17], and screening methods for early identification of prognostic factors in the development of chronic pain have become a key theme in occupational LBP research[18, 19]. Several theoretical models have been proposed[9, 20, 21]. However, much uncertainty still remains about the weight and functions of the studied variables within these models and about the potential of confounding by unmeasured psychological variables[22-24].

We previously reported a cross-sectional positive association of alexithymia, particularly the difficulty identifying feelings, with the prevalence of LBP[25]. Alexithymia, literally (from Greek) no (a-) words (-lexi-) for feelings (-thymia), is a construct introduced in 1973 by Sifneos and stands for unawareness of emotions[26]. It consists of three sub-domains: difficulty identifying feelings, difficulty describing feelings, and external-oriented thinking (a mode of thinking not guided by reflection of emotional cues or introspection). According to functional brain-imaging studies, alexithymia seems to be associated with dysregulations in the direct experience of emotions ("phenomenal awareness") and the reflection of the emotion's content ("reflexive awareness")[27]. Alexithymic individuals seem to be quasi-blind to emotions[28] and are not able (1) to evaluate them and (2) to incorporate such analysis into their adaptive behavior. Alexithymia seems to be related to acute pain severity[29] and the affective rather than sensory dimension of chronic pain[30].

Our earlier cross-sectional findings[25] confirmed several studies in which an association between alexithymia and LBP was suggested. In summary, three descriptive or cross-sectional studies using instruments of limited psychometric quality showed a positive association between alexithymia and LBP, and one clinical trial showed delayed recovery from chronic LBP in alexithymic patients[31-35]. More recent studies found a cross-sectional association of the difficulty identifying feelings with fibromyalgia[36], an association between alexithymia and acute experimental pain tolerance in healthy students[29], and a cross-sectional association of alexithymia with chronic pain in locations other than the low back but not in patients with chronic LBP[37].

The question of a possible causal relationship between alexithymia and LBP cannot be resolved by cross-sectional studies. If indeed a causal relationship exists, cognitive-behavioral interventions could potentially be improved by including a form of training for emotional awareness[30]. This prospective cohort study of the same population of municipal bus drivers in San Francisco[38]used for previous cross-sectional analysis[25], examines whether alexithymia at baseline prospectively predicts the *incidence* of physician-diagnosed LBP (time to a first compensated LBP injury) and whether the duration of compensated work disability is predicted by alexithymia.

Methods

Study Design and Population

The TAS-20 questionnaire was integrated into a cohort study of San Francisco Municipal transit operators designed to test physical and psychosocial risk factors for work-related back injuries[38]. After excluding supervisors, other non-active transit operators, and drivers without social security number, the study population consisted of 1,841 active operators of diesel buses, electric trolley buses, light rail streetcars, and historic cable cars. They underwent a mandated biannual medical examination between August 1993 and September 1995. Immediately following the medical evaluation and after the decision on license renewal as transit vehicle driver was made, 1,502 (81.6%) participants answered an epidemiological baseline

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questionnaire including the TAS-20 items. Subjects were followed until February 2001. 163 participants were excluded from analyses due to missing data on alexithymia, and an additional 132 because of incomplete information on covariates used in our Cox regression models leaving a total of 1,207 public transit workers with complete data for analyses.

Measurement of LBP incidence

Primary study outcome was the incidence of LBP, defined as the hazard of a first compensated LBP injury during 7.5-years of follow-up. First compensated LBP injuries with work absence of at least 3 months and duration of work disability constituted secondary outcome measures. Hazard rate is defined as each individual's instantaneous probability of the event at precisely time *t*, given that the individual was at risk at time *t*[39]. The time at risk started with the day of the baseline examination and was censored at the day of the first LBP claim, the day of separation from active duty, or the end of the follow-up period, whichever came first. These dates were retrieved from company employment records and workers' compensation insurer's claim files. Medical bill records were reviewed to determine physicians' diagnoses of “definite” LBP based on ICD-9 codes. The list of ICD-9 codes indicating definite LBP and a severity ranking of these codes is provided elsewhere[38].

Measurement of alexithymia

Alexithymia was measured as (1) the continuous summary score of the 20-item Toronto Alexithymia Scale (TAS-20)[40] and (2) three subscales, using a 4-point Likert scale. The subscales measure the difficulty identifying feelings (TAS-DIF), difficulty describing feelings (TAS-DDF), and external-oriented thinking (TAS-EOT). The three-factor structure has been confirmed in college students and psychiatric patient samples. The TAS-20 scale has acceptable construct validity (in students better than in patients[41]) and internal consistency, at least for the factors measured by TAS-DIF and TAS-DDF.[25] Cronbach's alpha for the TAS-EOT subscale was low (0.48) across all ethnicities in San Francisco public transit workers [25]. A low reliability for this subscale was found in other studies as well[41-44]. Alexithymia as measured by the TAS-20 is generally seen as a relatively stable trait supported by test-retest reliability of 0.74 ($p < 0.001$)[41], however modifiable by psychotherapy enhanced by mind-body techniques[45] or body-oriented psychotherapy[46]. Questions have been raised whether a self-report instrument can assess the difficulty of symbolization and communication[47, 48], and a performance-based assessment of emotional awareness was at best weakly correlated to the self-rated TAS-20[49-51]. However, for larger epidemiological studies the internationally widely used Toronto Alexithymia Scale (TAS-20) is still the best psychometrically acceptable test[43, 52, 53].

Measurement of covariates

The following potential confounders were assessed by questionnaire and interview at baseline: age, gender, marital status, level of education and income, smoking, alcohol intake, physical workload, years and weekly hours of professional driving, vehicle type, job strain (Job Content Questionnaire, Karasek 1985,1998[54]). Details of the respective instruments have been described elsewhere[16, 38, 55-57]. As coping styles have been reported to be associated with both alexithymia [58, 59] and chronicity of LBP [5, 20, 60, 61] and were important negatively confounding covariates in our cross-sectional study[25], we again assessed the following coping style variables: denial, behavioral disengagement, planning, and seeking social support (COPE Scale[62]).

Analyses

Cox regression models were used to examine the association between alexithymia and incidence of first compensated LBP. The three alexithymia subscales were treated as separate

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independent variables[63]. The developers of the TAS-20 scale suggested cut-off scores for classifying individuals as alexithymic that were derived from college students[40] and not based on a critical evaluation of relative sensitivity and specificity. Therefore, rather than classifying individuals as alexithymic or not, we used the TAS-20 scores as continuous variables or compared those individuals with high scores (upper quartile) to those with low scores (lower quartile of the distribution). The latter method had been used previously in studies of alexithymia[25, 64, 65]. Furthermore, the association between the degree of alexithymia (continuous measure) and the duration of compensated work disability was assessed using multivariate regression analyses.

Covariates to be entered into the models were chosen on theoretical grounds (e.g. demographic variables) or if they changed the hazard rate of alexithymia by more than 5%. As done previously in similar studies and following prior recommendations from a work group of the International Low Back Forum for Primary Care Research (Pincus et al.) [16, 66, 67], we entered groups of related covariates incrementally into the final model, adjusting for demographic (age, sex, ethnicity), physical work-related (vehicle type, ergonomic problems, hours and years of driving), psychosocial work-related (job strain, social support from coworkers and supervisors at work), psychological coping (denial and planning), and behavioral (alcohol, smoking) factors. We tested the proportional hazard assumption for the final models by Schoenfeld tests. We conducted subgroup analyses by ethnicity. Data were analyzed using Stata Statistical Software, version 9.2 (Stata Corporation; College Station, TX).

Results

Table 1 shows the characteristics of 1,207 study participants. Non-responders were more often women, African-Americans, and diesel bus drivers (see Table 1 in [25]). The average age was 46.5 years, 85% drivers were male, and 55% were African-American. Nearly a third of drivers experienced LBP in the 12 months before baseline. 334 (27.5%) transit operators had a compensated LBP claim during the 7.5-year observation period (average time to censoring 4.9 years).

Table 2 presents the results from Cox regression analyses assessing the hazard of filing a claim for LBP injury associated with a 1-point increase of the alexithymia score (within a range from 1 to 4 using the individual unweighted means of the total scale and subscale items). The first row shows unadjusted hazard ratios. The second row shows hazard ratios after adjustment for age, sex, and ethnicity. The following rows show hazard ratios with incremental adjustment for additional covariates; the last row displays the results after simultaneous adjustment for all covariates (full model). Higher alexithymia scores were consistently associated with a reduction in LBP claims in all multivariate analyses, and these associations were statistically significant in the fully adjusted models for the summary TAS-20 scale (HR = 0.73; 95% CI 0.56-0.96) and sub-scale TAS-DDF (difficulty describing feelings; HR = 0.82; 95% CI 0.69-0.98). Analyzing TAS-20 and subscale scores in quartiles (with cutoffs 1.5, 1.85, and 2.2 on a 1-4 TAS-20 scale range) did not change the direction of the association.

LBP prevalence during the past year increased the incidence of a first compensated claim by 45% ($P = 0.001$; not in table). Adding other covariates to the regression models (level of education, weight, height, overtime hours, self-rated ergonomic demands) did not change substantially (<0.1 change in HR) the strength of the association between alexithymia and LBP incidence.

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Alexithymia scores were slightly higher ($P = 0.01$) in men (1.91 ±0.47[1]; range 1-4) than in woman (1.81 ±0.49), lower (1.84 ±0.45; $P = 0.002$) in more experienced drivers (over 15 years of driving) and higher (2.13 ±0.48; $P < 0.001$) in those drivers who rated higher on the denial-of-stress coping scale. Based on Schoenfeld tests, the variables denial coping and job seniority violated the proportional hazard assumption. After stratification for these variables, we obtained P-values consistently above 0.6 for the global Schoenfeld test confirming the proportional hazard assumption for our models. We ruled out an interaction between alexithymia and denial coping (p=0.98 for the product term) and found no improvement of our models by adding a quadratic term for alexithymia or logarithmic transformation (Likelihood-ratio test p=0.22 and 0.26, respectively). The hazard of a LBP injury claim due to alexithymia did not differ between men and women.

132 claims (39.5% of claims, 10.9% of all drivers) resulted in at least 90 days off work and, thus, can be defined as *chronic* disabling LBP. We found a further decreased adjusted hazard ratio of 0.64 (0.43-0.98) for the TAS-20 scale and the incidence of chronic disabling LBP claims. For the subgroup of drivers with claims, we found no association between alexithymia scores and duration of work disability in linear regression analyses (fully adjusted: coefficient −31.3; 95% CI −92.5 – 29.1; $P = 0.32$).

Table 3 presents the analyses stratified by ethnicity based on the same unadjusted and fully adjusted models. The effect of alexithymia on LBP claims appears to differ considerably between ethnic groups even after adjustment for demographic, workplace, psychological, and behavioral factors. The association is particularly strong and statistically significant in Caucasians for both continuous measures of TAS-20 (HR=0.21; CI 0.06-0.68) and TAS-20 in quartiles (HR = 0.68; 0.60; 0.20 for lowest to highest quartiles, respectively).

To summarize the main results: The hazards of filing a claim for a LBP injury (regardless of the duration of associated work disability) are reduced among drivers who have difficulty describing feelings compared to drivers without that difficulty after adjusting for a wide range of potentially confounding factors. The effects of alexithymia considerably differ by ethnicity and a strong and statistically significant effect was only seen for Caucasians. Duration of compensated work disability was not associated with alexithymia scores.

Discussion

Contrary to our expectation and in seeming contradiction to our previous cross-sectional analysis in the same cohort[25], this prospective study showed a negative rather than a positive association between alexithymia and occupational LBP, particularly for the factor “difficulty describing feelings”. From our previous cross-sectional and this new prospective study a paradoxical set of findings emerges: Reduced emotional awareness was associated with an increased 1-year prevalence of self-reported LBP in the cross-sectional analysis and a decreased incidence of compensated LBP claims in the prospective analysis. Several considerations are presented to understand these paradoxical findings.

First, we have to consider the validity of the TAS-20 instrument in assessing the ability to put one's emotion into words. The items for the factor “difficulty describing feelings” (factor 2 of TAS-20) do not distinguish the difficulty in symbolizing emotions from the difficulty in communicating emotions; in fact, they were only weakly or not at all associated with the observation-based Levels of Emotional Awareness Scale (LEAS).[46, 49]Instead, they were strongly associated with shame anxiety (Corr. = 0.58) and shyness-embarrassment (0.69)[50]. Our findings might therefore reflect fears of being ashamed and of self-devaluation in

[1]All “±” statements relate to standard deviation

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communicating emotions rather than difficulties in symbolizing emotions as the basis for the difficulty in emotional self-disclosure in social interactions[50].

Second, in previous cross-sectional research alexithymia was associated with increased symptom reporting[68]. Alexithymia has previously been found to be stronger related to subjective pain and complaints of symptoms than to physical functioning and disability[42, 68]. Our results seem to show a similar pattern, with alexithymia positively associated with self-reported LBP symptoms but not or negatively associated with compensated work disability from LBP.

Third, findings regarding the prevalence of self-reported LBP symptoms are not readily comparable to findings regarding the incidence of compensated LBP claims, even within the same study population. Filing a claim and receiving compensation is at least two steps removed from experiencing LBP symptoms. One possible interpretation is that the proneness or willingness to or the efficacy in filing a claim and navigating the bureaucratic process, rather than the onset of symptomatic LBP, might be negatively associated with the difficulty describing feelings. Or in other words: if one is less able to describe one's feelings, could one also be less apt and able or willing to complete the somewhat cumbersome process of filing a claim or convincing the examining physician of one's predicament? Recalled or present, the experience of LBP, the degree to which it is disabling, and the capacity or need of filing a claim are discernable consecutive steps in a chain of events, and personality traits can have different and maybe even opposite effects at each step.. Such time-dependent or “disability phase-specific” effects have been shown in a cohort of Californian low back pain claimants examining psychosocial and physical job factors.[69, 70]

Consequently, a possible interpretation of the result of this study is that the fear of being ashamed and self-devaluated, the shyness and anxiety around verbally expressing emotions is associated with a decreased willingness to file a claim with workers' compensation for a LBP injury. Thus the difficulty identifying feelings can be positively associated with recalled LBP prevalence, which is strongly predictive of LBP later on, but the difficulty in expressing emotions from fear of being ashamed may negatively modify the efficacy in successfully filing for workers' compensation.

The independent negative association between alexithymia and LBP incidence becomes stronger after controlling for the coping-with-stress strategy of denial. Denial of stress has a strong positive association with the incidence of compensated claims (separate publication in preparation). Denial and alexithymia are moderately and positively correlated ($r = 0.38$) but they seem to have opposite effects on LBP claim incidence. Alexithymia and denial are not mediators for each other, as including one of these variables to a model using the other as predictor strengthens rather than weakens the effect of the predictor on the outcome (Sobel-Goodman tests: negative value). Furthermore, they are not effect modifiers to each other as their product terms are not significant ($P = 0.91$). Rather, they are negative confounders to each other and mask each other's effect on the outcome.

Drivers with difficulties describing feelings likely also have difficulties identifying feelings ($r = 0.68$). One possible interpretation is that they might be more willing to complain about LBP in the past year and prefer to ignore the actual stress of it and avoid the stress of going through the hassles involved in filing a claim, in-line with a strategy of denial and disengagement.

A secondary aim of the study was to answer the question whether alexithymia might be a risk factor for the chronification of compensated LBP. We found that among workers filing a first claim for LBP, duration of work disability associated with this claim was unrelated to alexithymia.

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Again, as reported in previous cross-sectional studies of different samples and diagnoses[25, 42, 43], ethnicity seems to play an important role for the effect of alexithymia on health outcomes and its role remains to be explored. Our findings from both cross-sectional and prospective analyses consistently contradict reports suggesting that variations in emotional awareness and expression may be more important for pain reports among African Americans than among Caucasians[42].

The major strength of this study is its prospective design, its relatively large sample size compared to the smaller samples used in alexithymia research, its ethnical diversity, and our ability to control for several important psychological and workplace factors.

Limitations

A major limitation of this study is that depression or negative affect were not separately assessed. Both factors are associated with alexithymia[30, 71, 72] particularly when assessed by TAS-20[46] and are associated with low back pain as well[22, 30, 73-75]. Depression and alexithymia scores have been reported as being correlated (Pearson) at 0.40 to 0.59 [76]. Several studies found an effect of alexithymia on symptom report even after controlling for depression: Alexithymia predicted self-report of somatic symptoms in depressed patients [77], independently from depression[78], and remained stable among depressed patients when level of depression declined[79]. Furthermore, the association between a distinct neuro-endocrine pattern and alexithymia was strengthened in men after controlling for depression[80]. However, depression has also been suggested to mediate the association between alexithymia and the affective component of chronic myofascial pain[30, 81] or symptom complaints in somatoform disorders[46]. These latter studies found no additional contribution of alexithymia when controlling for depression but persistent contribution of depression when controlling for alexithymia: alexithymia, interfering with adaptive emotion regulation, resulted in negative affect such as depression, which in turn influenced the affective pain experience[30]. These findings suggest that depression may be a mediator between alexithymia and the affective component of pain. In this case, adjustment for depression would be a methodological mistake.

The primary predictor variable alexithymia used for this report was collected by self-assessment. Observation- or performance-based measures, such as LEAS, clearly would be preferable. However, this was not feasible in such a large sample.

Respondents tended to be proportionally more men, less African-American, more light rail and less diesel-bus drivers. Therefore, our ability to generalize our findings to all San Francisco municipal transit operators is limited. However, since we controlled for vehicle type and ethnicity in our analyses and response rates were rather high we feel confident that our findings were not materially influenced by any response bias. The observed variation of effects across ethnical groups may have several explanations. In order to examine them it will be necessary to validate the concept and measurement of alexithymia (and of LPB for that matter) for different ethnic groups.

Conclusions

Our results did not confirm previously reported findings of a positive association between deficiencies in emotional awareness and LBP, at least regarding the incidence of work-related, compensated claims of LBP injuries with workers' compensation insurance. To the contrary, high alexithymia may reduce the incidence of such claims, at least among Caucasians. One plausible explanation in light of the literature is that shame rather than level of emotional awareness explains the discrepant findings in our cross-sectional and prospective studies.

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Also, we found no positive relationship between alexithymia and duration of disability or the incidence of *chronic* disabling compensated LBP. This does not entirely rule out the possibility of alexithymia being a risk factor for non-disabling LBP when no formal insurance claim is filed and compensated, i.e. in a primary care clinic rather than occupational setting. The latter is a different outcome and may have different predictors.

As in our previous report[25], this study again demonstrated the importance of including coping styles in analyses of alexithymia and LBP. We will report separately about the relationship of coping styles with LBP.

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Table I

Characteristics of Study Participants (n = 1,207)

	Mean (SD) or Percent
Age	46.5 (± 7.7)
Sex	
female	15.2%
male	84.9%
Ethnicity	
African-American	55.3%
Caucasian	12.7%
Hispanic	12.0%
Asian/Pacific Islanders	11.0%
Philippino	7.6%
others	1.4%
Vehicle Type	
diesel buses	44.4%
electric trolley buses	33.7%
light rail streetcars	13.1%
historic cable cars	8.8%
Years of Driving	13.2 (±8.0)
Driving Hours per Week	43.2 (±11.6)
Job Iso-Strain*	−5.1 (±1.4)
Coping Styles**	
denial	1.83 (±0.76)
behavioral disengagement	1.70 (±0.70)
planning	3.04 (±0.79)
seeking support	2.78 (±0.98)
LBP in past 12 Months	31.8%
Years to Censoring (mean)	4.9 (±2.2)
Compensated 1st LBP injury	27.5%
TAS-20**	1.89 (±0.47)
TAS-DIF**	1.64 (±0.65)
TAS-DDF**	1.97 (±0.67)
TAS-EOT**	2.07 (±0.44)

* Job iso-strain (Karasek): combination of high psychological demands with low decision latitude and low social support from coworkers and supervisors at work, range −11 to 2,

** Unweighted average of all item scores for summary or sub-scale, range 1-4, higher scores indicate higher alexithymia or coping style

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Table 2

Alexithymia* and 7.5-Year Incidence of Compensated Low Back Pain: Hazard Ratios (and 95% Confidence Intervals) with Incremental Adjustment for Demographic, Workplace, Psychological, and Behavioral Factors: San Francisco Public Transit Operators 1993-2001 (n=1,207)

	TAS-20 (95% CI)	*P*	TAS-DIF (95% CI)	*P*	TAS-DDF (95% CI)	*P*	TAS-EOT (95% CI)	*P*
Crude Hazard Ratios	**0.83 (0.66-1.05)**	**0.114**	**0.97 (0.82-1.15)**	**0.706**	**0.84 (0.71-0.99)**	**0.040**	**0.82 (0.64-1.03)**	**0.092**
Hazard Ratios adjusted for**								
sex, age, ethnicity	0.91 (0.72-1.15)	0.422	0.99 (0.84-1.17)	0.942	0.91 (0.77-1.07)	0.252	0.91 (0.71-1.16)	0.428
+ low back pain in past year	0.89 (0.70-1.12)	0.322	0.97 (0.82-1.15)	0.731	0.90 (0.76-1.06)	0.208	0.91 (0.71-1.15)	0.421
+ vehicle type, seniority, hours/week	0.91 (0.72-1.15)	0.427	0.99 (0.83-1.17)	0.903	0.91 (0.77-1.07)	0.263	0.92 (0.72-1.17)	0.485
+ job strain	0.91 (0.72-1.15)	0.431	0.99 (0.83-1.18)	0.908	0.91 (0.77-1.08)	0.267	0.92 (0.72-1.17)	0.483
+ coping styles	0.77 (0.59-1.00)	0.052	0.89 (0.73-1.07)	0.218	0.83 (0.70-1.00)	0.047	0.83 (0.47-1.08)	0.164
+ smoking (**fully adjusted HR***)	**0.73 (0.56-0.96)**	**0.025**	**0.86 (0.71-1.05)**	**0.139**	**0.82 (0.69-0.98)**	**0.030**	**0.80 (0.61-1.04)**	**0.101**

* Alexithymia as a continuous variable (range 1-4)

** incremental adjustment: each line includes the previous adjustments.

*** Fully adjusted models stratified for denial coping and job seniority. Schoenfeld test $P > 0.6$.

TAS = Toronto Alexithymia Scale; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing feelings; EOT = External-Oriented Thinking

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Table 3

Alexithymia* and 7.5-Year Incidence of Compensated Low Back Pain by Ethnicity: Crude and Fully Adjusted** Hazard Ratios and 95% Confidence Intervals in San Francisco Public Transit Operators 1993-2001 (n=1,207)

	n	Crude Hazard Ratios (95% CI)	*P*	Adjusted Hazard ratios (95% CI)	*P*
Entire sample	1,207	0.83 (0.66-1.05)	0.114	0.73 (056-0.96)	0.025
African-American	663	0.88 (0.65-1.22)	0.462	0.83 (0.59-1.16)	0.271
Caucasian	152	0.33 (0.13-0.88)	0.027	0.21 (0.06-0.68)	0.010
Asian/Pacific Islanders	227	0.96 (0.44-2.08)	0.913	0.75 (0.29-1.95)	0.553
Hispanic	147	0.93 (0.46-1.89)	0.841	1.13 (0.48-2.68)	0.781

* Alexithymia as a continuous variable

** adjusted for demographic, workplace, psychological, and behavioral factors as in fully adjusted models in Table 2