Are difficulties perceiving and expressing emotions associated with low-back pain?
The relationship between lack of emotional awareness (alexithymia) and 12-month prevalence of low-back pain in 1180 urban public transit operators

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Abstract

Objective: To assess the association of alexithymia (deficit in emotional awareness) with 12-month prevalence of low back pain (LBP) cross-sectionally in a cohort study of 1180 San Francisco transit operators. **Methods:** Alexithymia was measured by the Toronto Alexithymia Scale (TAS-20). LBP was assessed in medical histories during drivers relicensing exams. Multivariate logistic regression analyses controlled for demographic, behavioral (smoking, alcohol, coping style), and physical and psychosocial job factors measured by questionnaire and interview. **Results:** Of all the drivers, 31.4% suffered from LBP. Scoring in the upper quartile of alexithymia summary scores was associated with twofold higher odds of LBP (adjusted odds ratio = 2.00, 95% confidence interval: 1.31–3.00). The association was stronger in women (adj. OR = 4.35) than in men (adj. OR = 1.83). The factor "difficulty identifying feelings" showed the strongest association with LBP (adj. OR = 2.23). **Conclusion:** The results support an association between alexithymia and LBP.
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Introduction

Work-related back injuries represent approximately 20% of all workers' compensation claims and are responsible for 33% of all workers' compensation costs in the US [1]. About 2% of the U.S. workforce are compensated for back injuries each year [2]. Disability due to chronic low-back pain (LBP) has been increasing faster than any other form of chronic disability [3]. Traditional therapeutic interventions (NSAIDs, physical therapy, massages, and exercises) have an unsatisfactory success rate, and their therapeutic value has been repeatedly questioned [4]. Clearly, newer concepts in understanding and treating LBP are needed. Recent studies found that patients with (mostly chronic) LBP suffer from a measurable deficit of *proprioception,* which can be seen as a subcategory of "body-awareness" contributing to the clinical course of LBP [5–10]. Clinical studies suggested that these patients exhibit a deficit of *emotional awareness* as well [11–16]. For this unawareness of emotions, Sifneos et al. [17] introduced in 1973 the term "alexithymia", literally (from Greek) no (a-) words (-lexi-) for feelings (-thymia). The alexithymia construct is related

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to and overlaps with two other more recently proposed constructs: "emotional numbness" from posttraumatic stress disorder (PTSD) [18] and "emotional intelligence", which has been far less studied but received considerable attention in the public [19–21]. The current concept of alexithymia is defined, in part, by an insufficient realization that some physical sensations can be the manifestation of emotions [22]. Emotions, in general, have a component of sensory feeling (besides a motivational drive; [23,24]), and, according to most recent neuroscience, emotional awareness relies on the central processing of *interoception* (perception of internal body sensations or "somatic markers" [24]). Intriguingly, interoception uses the same afferent neurological pathways as slow pain does [23,25,26]. Lacking awareness of body sensations (deficit in proprioception) and of emotions (alexithymia, deficit in interoception) might be closely linked. Furthermore, the risk of chronicity of LBP has been found to be associated with an avoiding and repressive coping style [27–31]. Alexithymia might be a personality trait underlying this coping behavior [18,32], if not an independent risk factor for the chronicity of LBP. Addressing these deficits (i.e., attention regulation, discerning emotions, and physical sensations, cognitive modulation of pain, changing coping styles) might offer a new perspective for both treatment and prevention of chronic LBP.

Internationally, the concept of alexithymia has been widely investigated, reviewed [22,33–35], and debated. It was tested in patients with chronic pain, somatoform disorder, rheumatoid arthritis, inflammatory bowel disease, hypertension, coronary artery disease, oligozoospermia, addiction, pathologic gambling, eating disorders, and all-cause mortality [33,36–39]. Alexithymia seems to be associated with dysregulations in the direct experience of emotions ("phenomenal awareness"; [40]), particularly in its arousal dimension [41] and the reflection of the emotion's content ("reflexive awareness"; [40]). Neurobiologically, according to several functional MRI and PET studies [40,42–45], alexithymia is associated with diminished activation in circumscribed brain regions, mostly in the rostral anterior cingulate cortex (ACC). This has been interpreted as representing decreased reflexive emotional awareness.

Several studies examine the association between alexithymia and LBP [11–16]. Using the Thematic Appercetion Test, 41 chronic LBP patients were independently evaluated for alexithymia by two clinicians; both evaluators agreed on alexithymia as one of the main features of these patients [15]. Two cross-sectional studies in the same 33 LBP patients showed significantly higher mean scores of seven alexithymia variables, measured by the Rohrschach test, when compared with healthy controls or depressive patients [11,12]. Another study examined 165 chronic LBP patients applying seeded cluster analysis to Minnesota Multiphasic Personality Inventory scores and found consistent alexithymia scores among empirically derived sub-groups [14]. These four descriptive or cross-sectional studies show a positive association between alexithymia and LBP. However, the results of two prospective studies are inconsistent: One clinical trial among 175 Finnish patients with chronic LBP showed (comparing mean scores from the Rohrschach and the Sentence Completion Tests between good and poor responders by t test) that alexithymia played a hindering role in spontaneous recovery from chronic LBP during 1 year of follow-up; however, the study was limited to women [13]. On the other hand, a life-long prospective cohort study in Finland assessing alexithymia in 13-year-old children as lack of verbal productivity found no association with LBP in their adult life [16].

Several self-report instruments [33], an observer scale [46,47], and a performance test [48] have been developed to evaluate alexithymia. Today, the internationally widely used 20-item Toronto Alexithymia Scale (TAS-20) is the best psychometrically acceptable test [49,50] that can be used in larger epidemiological studies. However, none of the studies described above used the TAS-20, thus limiting inferences from the earlier data. Clearly, more research is needed to determine the possible role of alexithymia in chronic LPB. To this end, Krause and Rugulies [51] included the TAS-20 questionnaire into a larger prospective cohort study of municipal bus drivers in San Francisco. In this paper, we report on the baseline association of alexithymia with 12-month prevalence of LBP.

Methods

Study design and population

In 1993, 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 job-related back injuries [51]. The study population consists of 1841 active transit operators, who underwent a mandated biannual medical examination between August 1993 and September 1995, driving diesel buses, electric trolley buses, light rail streetcars, and historic cable cars. Immediately following the medical evaluation and after the decision on relicensing was made, 1502 (81.6%) participants answered an epidemiological baseline questionnaire including the TAS-20 items. Due to missing data for the outcome variable (LBP) and/or the predictor variable of interest (TAS scores), 86 participants were excluded from analyses. An additional 236 participants were excluded because of incomplete data for the covariates used in our regression models, leaving a total of 1180 public transit workers with complete data for analyses.

Measurement of LBP

The 1-year period prevalence of self-reported LBP was assessed by a medical history form during the baseline