Pain and the relationship with mood and anxiety disorders and psychological symptoms

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ABSTRACT

Objective: The objective of this study was to investigate the association between pain and mood and anxiety disorders, as well as psychological symptoms, in a population-based sample of women.
Methods: This study examined the data collected from 1067 women aged 20–93 years (median 51 years) participating in the Geelong Osteoporosis Study. Mood and anxiety disorders were diagnosed using a clinical interview (SCID-I/NP) and psychological symptomatology was assessed using the General Health Questionnaire. Pain was determined using a Visual Analogue Scale (0–100 mm) and deemed present if score ≥ 40 mm.
Results: Current mood disorders were associated with an increased likelihood of overall (OR = 3.2, 95% CI 2.0–5.1), headache (OR = 2.8, 95% CI 1.6–4.8), back (OR = 4.0, 95% CI 2.5–6.5) and shoulder pain (OR = 2.2, 95% CI 1.2–4.2). In those with current mood disorders, the pain interfered with daily activities (OR = 3.2, 95% CI 1.9–5.5) and was present most of their time awake (OR = 2.5, 95% CI 1.5–4.1). This pattern was similarly observed for those with past mood disorders. Current anxiety disorders were associated with an increased likelihood for overall (OR = 2.2, 95% CI 1.4–3.6), headache (OR = 2.2, 95% CI 1.3–4.0), back (OR = 1.8, 95% CI 1.1–3.0) and shoulder pain (OR = 1.9, 95% CI 1.0–3.5, p = .05). In those with current anxiety disorders, the pain interfered with daily activities (OR = 2.4, 95% CI 1.4–4.1) and was present most of their time awake (OR = 1.9, 95% CI 1.2–3.2). There was no association between pain and past anxiety. Psychological symptomatology was associated with pain at each site (all p<.001).
Conclusions: This study is consistent with studies utilising clinical samples in reporting that mood and anxiety disorders, as well as psychological symptoms, are associated with higher levels of perceived pain.

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Introduction

It is becoming increasingly understood that physical symptoms, typically unexplained pain, are common in the presence of clinical depression, and possibly anxiety [1]. The impact these symptoms have on diagnosis and treatment is significant. Prognosis, management and outcomes in the presence of comorbid pain are complicated, leading to greater health care utilisation [2]. Evidence suggests that the presence of pain symptoms can ultimately increase the range of differential diagnoses or even obstruct the diagnosis of a psychological disorder [3].

A review of the literature on pain symptoms in primary care patients presenting with depression revealed that the prevalence of comorbid pain ranged from 15% to as high as 100%, with a mean prevalence of approximately 65% [4]. A relationship between depression and subsequent pain symptoms has been consistently reported within clinical samples, while evidence from population-based studies is not yet as extensive (see reviews [1,5–7]). Consistent with a diathesis-stress model, depression has not only been recognised as an antecedent of pain, but a common consequence or outcome [4,8]. Pain is associated with certain physical conditions, and considered to be both a physical and psychological stressor that can influence one's disposition and mood [1,6].

In contrast to the literature on depression and pain, it is less clear whether pain symptoms are as common among those with anxiety disorders [9,10]. Highlighting the importance of considering anxiety disorders, a recent study investigating the prevalence of Axis I disorders and non-specific back pain in the population found that anxiety disorders (20.9%) were more frequently observed in the presence of pain than mood disorders (12.7%) [11]. Moreover, specific anxiety disorders, namely panic disorder, post traumatic stress disorder and agoraphobia, have been previously reported to have a stronger relationship with pain (associated with severe arthritis, rheumatism or a bone or joint disease)

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than depression [12]. It is thus possible that chronic pain is associated with a spectrum of psychological disorders, rather than having a specific relationship with depression.

At present, the evidence base tends to be dominated by studies utilising selected patient or treatment seeking (primary care) samples, self-report psychological measures, self-report questionnaires to determine the presence or absence of disorders, such as arthritis, over the lifetime as a proxy for pain or having a depression-only focus. For these reasons, we aimed to investigate the association between pain and both clinically diagnosed mood and anxiety disorders, as well as psychological symptoms, in a large, randomly-selected, population-based sample of adult women.

Method

Participants

This study examined the data collected from women participating in the Geelong Osteoporosis Study (GOS), a large population-based study initially developed to investigate the epidemiology of osteoporosis in Australia, but later expanded to examine other diseases including mental health. Originally, 1494 women (aged 20–94 years) were randomly recruited from the electoral rolls for the Barwon Statistical Division (south-eastern Australia) between 1994 and 1997, with a response of 77.1% [13]. Between 2004 and 2008, 881 of the original sample returned for a 10-year follow-up appointment (participation 82.1%) and an additional sample of 246 women aged 20–29 years was recruited (participation 70.9%), allowing for continuing investigation of the full adult age range [14].

Of the 1127 women who had participated in the GOS 10-year follow-up, participants for whom psychiatric ($n = 32$) or pain ($n = 28$) data were not available were excluded from the analyses, resulting in a final sample of 1067 eligible women aged 20–93 years. This study was approved by the Barwon Health Human Research Ethics Committee and written informed consent was obtained from all participants.

Measurements

Outcome variable

Pain was assessed using the Visual Analogue Scale (VAS), a validated, self-report tool used for assessing pain severity during the past week [15]. It included six items that yield a rating for overall pain severity, head pain (headaches), back pain, shoulder pain, interference with daily activities and time in pain while awake. VAS pain assessments require individuals to describe their pain intensity by placing a vertical mark on a 100-mm horizontal line anchored by "no pain" at 0 mm and "as severe as I can imagine" at 100 mm for the first 4 items; "not at all" at 0 mm and "complete disability" at 100 mm for interference with daily activities; and "none of the time" at 0 mm and "all of the time" at 100 mm for the last item, time in pain while awake. For all analyses, pain was deemed to be present if the score was ≥40 mm [16,17].

Exposure variables

Past and current mood and anxiety disorders were assessed utilising the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Non-patient edition (SCID-I/NP) [18]. The use of this tool enabled identification of those who had ever experienced a mood disorder, including major depressive disorder (MDD), minor depression, bipolar disorder, dysthymia, mood disorder due to a general medical condition and substance induced mood disorder, and/or an anxiety disorder, including panic disorder, agoraphobia, social phobia, specific phobia, obsessive–compulsive disorder, generalised anxiety disorder, anxiety disorders due to a general medical condition, substance induced anxiety disorder and anxiety disorders not otherwise specified. All interviews were conducted by personnel with

qualifications in psychology, who were trained using live and video-taped interviews under the supervision of a psychiatrist.

Psychological symptomatology was assessed using the General Health Questionnaire (GHQ-12) [19]. This is a validated screening tool designed to detect non-psychotic psychiatric disorders in community settings, based on assessment of current state. Binary scoring was used for the 12 items, yielding total scores ranging from 0 to 12, and a cut-off of > 3 was applied to define caseness indicative of mental health dysfunction [19,20].

Information on demographic, lifestyle, medical and other health factors was obtained via questionnaire. Tobacco smoking was documented and grouped as current, past or never. Habitual physical activity level was assessed by self-report questionnaire and ranged from very active through to chair/bedridden or limited activity throughout the home [13]. Participants were described as physically active if light to vigorous exercise was undertaken on a regular basis; otherwise individuals were classified as sedentary. Alcohol intake was ascertained by a validated food frequency questionnaire and documented in grams per day [21]. Medication use was classified as current if used regularly at the time of assessment for analgesics (including narcotics, simple and non-steroidal anti-inflammatory agents) and antidepressants (selective serotonin reuptake inhibitors, serotonin–norepinephrine reuptake inhibitors and tricyclic antidepressants) and was further categorised into number taken [none, one, two or 3 or more medications (any) taken]. Exposure to medical conditions from a number of disease groups including metabolic, cardiovascular, cancer, and respiratory was documented by self-report and grouped as none, one, two or 3 or more present during the past 12 months. Socio-economic status (SES) was ascertained using Socio-Economic Index for Areas (SEIFA) index scores based on the 2006 Australian Bureau of Statistics Census data. SEIFA values were used to derive an Index of Relative Socio-economic Advantage and Disadvantage (IRSAD), which account for high and low income, and type of occupation. A low score identifies the most disadvantaged (quintile 1), while a high score identifies the most advantaged (quintile 5). Body weight and height were measured and body mass index (BMI) calculated as weight/height^2 (kg/m^2). Education (highest level completed) was self-reported, as was country of birth.

Statistical analyses

Statistical analyses were completed using Minitab (Version 15; Minitab, State College PA). Differences in characteristics between those with current, past or no history of mood or anxiety disorders and between those with or without current psychological symptomotology were analysed using Kruskal–Wallis for non-parametric continuous variables or chi-square analyses for discrete variables. Odds ratios (OR, with 95% confidence intervals, CI) were determined using logistic regression models to investigate the association between past and current mood and anxiety disorders and current psychological symptoms and the likelihood of having pain (overall, head, shoulder and back), interference with daily activities and whether the pain was present most of the time awake. In each model, the reference group comprised those without the psychological variable of interest. Age, education, country of birth, body mass index (BMI), number of medical conditions, analgesic and antidepressant use, physical activity, smoking, alcohol use and SES were tested sequentially as potential confounders and interactions were checked in all statistical models.

Results

Mood disorders and pain

Two hundred and seventeen (20.3%) women were identified with a past mood disorder, and 89 (8.3%) with a current mood disorder. Differences were identified across the groups in regard to age, physical activity level, medication use (number and antidepressant use) and pain symptoms; otherwise the groups were similar (Table 1).