UNIVERSITY OF BATH

Link to publication

The original publication is available at www.springerlink.com

University of Bath

Title: Common health problems, yellow flags and functioning in a community setting

Authors: Rhiannon Buck, Maria C Barnes, Debbie Cohen, & Mansel Aylward CB

Affiliation: Centre for Psychosocial and Disability Research, School of Psychology, Cardiff University, UK *(where RB was affiliated at the time)*.

Correspondence: Dr Rhiannon Buck, Mental Health Research and Development Unit, School for Health, University of Bath, Bath BA2 7AY, UK, r.buck@bath.ac.uk, +44(1225) 385431.

Running head: Common health problems and yellow flags in the community

Word count: Abstract – 238, main text – 3064

Number of tables: 4

Abstract

Introduction: Common health problems such as pain, depression and fatigue have a high impact on daily life, work and healthcare utilization. The objective of this study was to investigate whether psychosocial risk factors known as 'yellow flags' moderate the impact of common health problems on functioning in a community setting.

Methods: 467 working age adults (290 women, 177 men) with one or more common health problems over the last month participated in a cross-sectional survey in the UK in 2007. Data were analysed using moderator multivariate regression.

Results: Statistically significant models emerged for both interference with daily life (F=47.68, df 6,460, p<0.001, adjusted R^2= 37.5) and time off work (F=31.22, df 4,462, p<0.001, adjusted R^2= 20.6). Age (β=.238) and socio-economic status (β=-.216) were associated with time off work. The extent (frequency and severity) of common health problems and yellow flags were independently associated with interference with daily life (extent β = .28, yellow flags β = .363) and time off work (extent β = .150, yellow flags β = .201). However, no moderating effect of yellow flags was found.

Conclusions: Common health problems and yellow flags can be briefly and simply assessed in a community setting. A broader approach is needed in managing these complaints in community and work contexts, which moves beyond reducing complaint severity. Interventions need to acknowledge and address people's beliefs and affective responses to their complaints, as well as wider social and economic issues.

Key words: Functioning, work, psychosocial factors, catastrophizing, causal attributions

Introduction

Common health problems such as pain, fatigue, anxiety, and depressed mood have a high prevalence in the general population and are typically mild and self-limiting [1-6]. However, they can become chronic and distressing complaints. They are often cited as reasons for seeking medical advice, sickness absence, and long-term incapacity for work [7-10]. Long-term worklessness poses a serious risk to physical and mental health, while returning to work can improve recovery for people with common health problems [11]. Therefore, managing these complaints effectively is an important clinical, social and economic issue. The majority of people with common health problems do not demonstrate an identifiable pathological basis which would account for the array and severity of the subjective complaints they report [10]. Why, then, do some people not recover from common health problems as expected?

In the context of musculoskeletal pain, a number of risk factors for disability have been identified, often referred to as 'flags'. Red flags are signs of serious pathology, while yellow flags refer to psychosocial risk factors, including maladaptive beliefs, avoidant and emotional coping, fear, and catastrophizing [12, 13]. Yellow flags relate primarily to the 'threat value' of symptoms in terms of their potential consequences for physical and psychosocial well-being, along with negative evaluations of ability to cope with symptoms. According to the fear-avoidance model of chronic pain [14], if pain is not viewed as threatening, people are likely to continue with their usual activities, which facilitates recovery. However, if catastrophic interpretations are made, a vicious circle of fear, hyper-vigilance and avoidance can ensue. The association between fear, avoidance, catastrophizing and disability in the context of musculoskeletal pain is well established [15]. There is some evidence that catastrophizing also influences responses

to sleep problems, fatigue and negative affect [16-18]. At the opposite end of the spectrum, acceptance and adjustment are important aspects of managing chronic or recurrent health problems for which there is no medical solution or 'cure' [19-21].

Causal attributions form part of the complex representations that people develop around somatic sensations, thereby contributing to their threat value [22]. In clinical populations, beliefs that symptoms are caused by physical harm can lead to more frequent healthcare usage and impede recovery [22-24]. However, less is known about casual attributions for common health problems in the general population and how these relate to functioning.

Common health problems have a high impact on functioning on a population level, particularly when capacity for work is taken in to account. Research in clinical populations, such as those with somatization and chronic functional disorders, represent the most severe and disabling common health problems [6]. However, this is likely to be the tip of the iceberg; these complaints have a very high prevalence in the community [1, 4, 6]. An association between an increasing number of symptoms and poorer physical, emotional and social well-being was found in a community survey in the Netherlands [6]. It was suggested that this could be due to a process of somatisation in people with multiple symptoms; that is to say, a generalized hyper-vigilance to somatic information and a tendency to assign a high threat value to symptoms [6]. However, this was not directly investigated.

The aim of the present study was to gain a better understanding of how common health problems impact on functioning in a non-institutionalised working age sample. The following research questions were investigated:

1. are common health problems, yellow flags, and causal attributions independently associated with functioning?

2. do yellow flags moderate the association between common health problems and functioning (i.e. the alter the strength and/or direction of the relationship)?

Method

Participants and sampling

467 working age adults who reported at least one common health problem over the last month were included in this analysis. This sample originated from a community survey of 1000 people in the UK, 816 (81.6%) of whom were of working age (18 to 65 years). 467 (57.2%) of these working age adults reported at least one common health problem over the last month. Systematic response biases were found during piloting and have been reported in previous research using probability sampling methods. Therefore, a quota sampling method was employed in the original survey (n=1000) based on age, gender and employment status to ensure representativeness of the UK general population.

Procedure

Face-to-face on-street interviews were carried out in major cities in the UK in 2007. Data collection was carried out by a market research company in a stand-alone survey using trained interviewers.

Measures

The Cardiff Health Experiences Survey (CHES) was systematically developed as a brief multi-dimensional assessment of common health problems [25]. The interviews contained no specific reference to medical terms such as 'symptoms', 'illness', 'disability' in an attempt to assess the experiences that are considered part of daily life, as well as those perceived to be signs or symptoms. Participants with multiple complaints were asked to focus on the problem that bothered them most.

Assessment of common health problems

Common health problems over the last month were assessed using an inventory of 14 items; headache, neck pain, feeling sad or low, back pain, breathlessness, skin problems, chest pain, sleep problems, pain in other joints (i.e. apart from neck or back), feeling worried or anxious, stomach or abdominal pain, tired or lacking in energy, bowel problems, and cough, sore throat or runny/blocked nose. Severity (1 mild, 2 moderate or 3 severe) and frequency (1 occasionally, 2 often, 3 all the time) of complaints were rated on three-point Likert scales. Following Eriksen et al. [1] a score between 1 and 9 was generated to indicate the 'extent' of each complaint (severity*frequency), as these items are highly correlated.

This inventory was based on the Ursin Health Inventory (UHI)[26], developed in Scandinavia, which has been used in a number of community based studies [1, 27]. The inventory was modified by removing pre-labelled syndromes and illnesses (e.g. migraine) and upper respiratory tract and skin problems were added. Piloting was carried out using cognitive de-briefing interviews and initial validation was conducted via a postal survey using a random sample derived from the electoral register [25]. Item reduction was carried out on the basis of Principal Components

Analysis and by eliminating items with a prevalence rate of <10%, resulting in the final list of 14 complaints.

Yellow flags

Yellow flags were assessed using a brief and simple checklist. Participants were asked whether they agreed or disagreed with the following statements. Theoretical concepts to which statements relate and items where scoring was reversed are shown in brackets.

1. I was worried about it *(worry)*

2. It's just part of normal life *(normalisation, score reversed)*

3. I couldn't stop thinking about it *(attention/awareness)*

4. I have just got used to it *(habituation, score reversed)*

5. I thought it might be something serious *(fear)*

6. My family (or partner) were worried about it *(social component)*

7. I avoided activities or situations that might make it worse *(avoidance)*

8. I knew it would get better over time *(positive expectation, score reversed)*

9. I felt I could control it *(perceived control, score reversed)*

Yellow flags scores were summed (scores for items 2, 4, 8 and 9 reversed), providing a total score ranging from 0 and 9 (Cronbach's $\alpha = 0.779$).

Causal attributions

Perceived causes of complaints were provided via open response. These were categorised as 'biomedical', 'psychological' or 'normal life' attributions, definitions of which are provided in Table 1. This was an adaptation of the 'psychological', 'somatic' and 'normalising' attributions described by Robbins and Kirmayer [28].

Demographics

Data was gathered on age, gender, employment status, marital status, education and ethnicity. Socio-economic status (SES) was assessed using the National Statistics Socio-economic Classification (NS-SEC) system based on current or previous occupation [29]. This is a standardised and widely used system in the UK. However, one disadvantage of the NS-SEC system is that certain groups (e.g. students, never worked) cannot be classified. To avoid undue loss of power in the multivariate analysis, missing data for socio-economic status (n=60, 12.2%) were replaced with the sample mean.

Outcome measures

Interference with daily life

Interference of complaints with usual daily activities, enjoyment of life and relationships with others were rated on three-point scales (1 - not at all, 2 - somewhat, 3 - completely). The three items were highly inter-correlated (Cronbach's $\alpha = 0.84$). Principal Components Analysis revealed they loaded onto a single component with an Eigenvalue >1, which accounted for 75.9% of the variance. Therefore, scores were summed to provide a single 'interference with daily life' score.

Time off work

Participants were asked whether they had needed to take time off work due to their common health problems. Time off work was rated 1 - no, 2 - I needed the odd day, 3 - I needed a lot of time off work, 4 - I have been unable to go to work for a long time because of this, 5 – not employed.

Statistical analysis

Statistical analysis was carried out using SPSS v14. Data was analysed using stepwise multivariate linear regression. Variables were centred around their means to reduce the risks of multi-collinearity and entered in sequence within blocks. Variables were selected for inclusion or excluded from the model on the basis of the probability of F (values set at $p<=0.5$ for inclusion and $p>=0.1$ for exclusion). When a variable was added to the model, the previous variables selected were re-tested to ensure that they were still contributing significantly to the model. Independent variables and interaction terms were entered in the following blocks;

1.) demographics - gender, age and socio-economic status

2.) common health problems - number of complaints, extent (frequency*severity), type of complaint (mental health/musculoskeletal/other)

3.) threat value – yellow flags and causal attributions (biomedical vs. other)

4.) interactions terms to investigate moderating effects of yellow flags – number of CHPs*extent of CHPs, number of CHPs*yellow flags, extent of CHPs*yellow flags

Results

Demographics

Analysis of the original data set (n=1000) indicated that women and people who were not employed were more likely to report common health problems [25]. This was reflected in the demographic characteristics of the sample, which are shown in Table 2. The mean age of participants was 42.36 years (SD 13.66).

Common health problems

52.5% of participants had a single common health problem over the last month, while 47.5% had multiple complaints. The mean number of complaints reported was 3.00 (SD 2.5), with headaches (46.7% of the sample), back pain (24.4%), feeling tired/lacking in energy (22.5%), sleep problems (21%), and pain in other joints (17.3%) being the most commonly reported problems.

Yellow flags and causal attributions

The mean number of yellow flags endorsed was 3.02 (SD 2.45). 31.5% of common health problems were attributed to normal life, 19.9% to biomedical, and 12.2% to psychological causes. However, for 40.5% of complaints, the reason was not known.

Multivariate analysis

Statistically significant models emerged for interference with daily life (F=47.68, df 6,460, p<0.001, adjusted R^2= 37.5) and time off work (F=31.22, df 4,462, p<0.001, adjusted R^2= 20.6). Model summary statistics, β and t values are shown in Tables 3 (interference with daily life) and 4 (time off work).

Increasing age (β=0.24) and decreasing socio-economic status (β=-0.22) were independently associated with time off work. However, the demographic variables were not selected in the interference with life model. The extent (frequency*severity) of common health problems was associated with interference with daily life (β=0.28) and time off work (β=0.154). Mental health (β=0.28) and musculoskeletal complaints (β=0.28) were associated with a higher level of interference with daily life than other types of complaint, but this effect was not seen for time off work. Number of complaints reported was not selected in either model. Yellow flags were independently

associated with interference with daily life ($\beta = 0.36$) and time off work ($\beta = 0.20$). However, none of the interaction terms were selected in either model.

Discussion

This study set out to investigate the relationship between common health problems, yellow flags, causal attributions, and functioning in a community setting. Common health problems and yellow flags were independently associated with time off work and interference with daily life. However, no interaction effects were found, indicating that yellow flags do not moderate (alter the strength or direction) the relationship between common health problems and functioning.

Common health problems

Over half the working age adults in the original survey (n=1000) reported common health problems over the last month, with around a quarter reporting multiple complaints. This high prevalence of common health problems in the general population was consistent with previous research [1, 6, 27]. While it has previously been suggested that a process of somatisation may be occurring in people with multiple symptoms [6], it was the severity and frequency of complaints, rather than the number of complaints, which was associated with functioning in the present study. Interference with daily life was reported to be higher for mental health and musculoskeletal problems. These complaints are known to place a significant burden on individuals and society worldwide, particularly in middle and high income countries [30, 31].

Yellow flags and causal attributions

Rather than being indicative of psychopathology, yellow flags are conceptualised as normal, though potentially maladaptive, responses to symptoms [12]. Yellow flags were commonly reported in this sample, explaining an additional 10.5% of the variance in interference with daily life. The independent association between yellow flags were time off work was slightly less pronounced, explaining 3.2% of the variance in the model. Likewise, the extent of common health problems explained 26% of the interference with daily life, but only 5.1% of the variance in time off work. Age and socio-economic status explained 12.3% of the variance in time off work, both of which are known to be risk factors for long term incapacity for work [32]. This suggested there may be differences in the way that common health problems impact on work absence as opposed to general functioning. The individual's immediate work environment, the organisation within which they work, and wider social and economic factors can all play an important role in influencing whether people take sickness absence or attend work when they are unwell (i.e. 'presenteeism') [33, 34].

In a clinical setting, biomedical causal attributions are associated with help seeking, psychiatric complaints, and poorer recovery from chronic functional disorders [28, 35-37]. However, biomedical attributions were not independently associated with functioning in the present study. For chronic functional and somatization disorders, biomedical attributions may act as barriers to recovery by resulting in persistent ineffective attempts to find a medical 'cure' for subjective complaints, rather than accepting and adjusting to the problem. Beliefs about causality are socially constructed; there is a strong moral dimension to disability, particularly in the context of work [34]. Legitimising 'unseen' complaints can be especially problematic in a society where presenteeism is the norm [34]. Causal attributions which imply personal

11

vulnerability, weakness, or responsibility could devalue people's personal experience

of suffering, and attract stigma, disapproval or withdrawal of support from others.

Thus, biomedical explanations may be used to legitimise persistent and bothersome

complaints. Beyond the realm of chronic functional and somatization disorders,

however, knowing that a symptom has a physical cause is not necessarily threatening

in itself. In fact, physical causes may be less threatening in some cases; for example,

infections can be treated with antibiotics, injuries can heal, but it may be more difficult

to resolve ongoing familial or financial difficulties which impact on well-being.

Furthermore, it has been suggested that normal life (or 'normalizing') causal

attributions are the 'default' position for symptoms [38], but the cause of complaints

was often unknown in the present study. This suggested uncertainty about - or lack of

attention to - the causes of these everyday common complaints in a community setting.

The relationship between causal attributions and the threat value of common health

problems may not be as simple as previously assumed, and this requires further

investigation.

Limitations

It is important to stress that while the cross-sectional design used in this study was

useful in highlighting associations between variables, causality could not be

inferred. Longitudinal and/or experimental designs would be needed to elucidate

the nature and direction of these relationships. Non-participation and response bias

are major challenges in health surveys. To address these important issues, a

purposive quota sampling method was employed. However, this was not a

probability sampling method and did not allow for calculation of response rates. As

the interviews were carried out on-street, the views of people who were severely

disabled and unable to leave their homes would not have been captured, potentially resulting in underestimation of the impact of complaints.

Practical implications

The findings of this study add to a growing body of research highlighting the need for a bio-psychosocial approach to managing common health problems. Difficulty identifying the cause, lack of effective treatments, and mismatches between patient and physician goals and expectations can cause considerable frustration and low satisfaction for patients and health professionals alike [39-42]. Yet there is considerable potential to reduce the impact of these complaints on functioning in the community. Pain and depression are common complaints, and effective treatments exist for these which could reduce their burden on individuals and society [30, 31]. However, accessing such treatments can be difficult due to inadequate resources and availability of appropriate services [30, 31].

This study demonstrated that common health problems and yellow flags can be briefly and simply assessed in a community setting. Clinical guidelines exist for general practitioners for identification of yellow flags in musculoskeletal pain [13], which could be adapted for other common health problems. Public information campaigns founded on clinical guidelines can shift both patient and health professionals' beliefs about the management of common health problems [43-45], which could be useful in addressing yellow flags on a broader community level. There is also evidence that work in itself can improve recovery [11]. Placing a greater emphasis on occupational issues in the clinical management of common health problems may have considerable benefits.

Conclusions

There is significant potential to reduce the impact of common health problems in the community by adopting a broader approach to their management, which acknowledges and addresses people's beliefs and emotional responses to their symptoms. While effective treatments exist for common health problems, improving access to these needs to become a higher priority for policy makers. Finally, the relationship between common health problems and work is complex and multi-factorial. Occupational, organisational and wider socio-economic factors need to be considered during the development of interventions where return to work is a desired outcome.

References

1.   Eriksen, H.R., et al., Prevalence of subjective health complaints in the Nordic European countries in 1993. European Journal of Public Health, 1998. 8(4): p. 294-298.

2.   Eriksen, H.R. and H. Ursin, Sensitization and subjective health complaints. Scandinavian Journal of Psychology, 2002. 43(2): p. 189-196.

3.   Eriksen, H.R. and H. Ursin, Subjective health complaints, sensitization, and sustained cognitive activation (stress). Journal of Psychosomatic Research, 2004. 56(4): p. 445-448.

4.   Ihlebaek, C. and H.R. Eriksen, Occupational and social variation in subjective health complaints. Occupational Medicine-Oxford, 2003. 53(4): p. 270-278.

5.   Wilhelmsen, I., et al., Subjective health complaints are more prevalent in Maasais than in Norwegians. Nordic Journal of Psychiatry, 2007. 61(4): p. 304-309.

6.   van der Windt, D.A.W.M., et al., Impact of physical symptoms on perceived health in the community. Journal of Psychosomatic Research, 2008. 64: p. 265-274.

7.   Aylward, M. and P. Sawney, Support and rehabilitation: Restoring fitness for work, in Fitness for Work, K. Palmer, I. Brown, and C. R], Editors. 2006, Oxford University Press: Oxford.

8.   Gill, D. and M. Sharpe, Frequent consulters in general practice - the effects of psychological well-being and contact with the doctor. Journal of Psychosomatic Research, 1999. 47(2): p. 115-130.

9.   Stanley, I., P. Salmon, and S. Peters, Doctors and social epidemics: the problem of persistent unexplained physical symptoms, including chronic fatigue. British Journal of General Practice, 2002. 52(478): p. 355-356.

10.   Waddell, G. and M. Aylward, The scientific and conceptual basis of incapacity benefits. 2005, London: TSO.

11.   Waddell, G. and A.K. Burton, Is work good for your health and well-being? 2006, London: TSO.

12.   Main, C.J., P.J. Watson, and M.J.L. Sullivan, Pain Management: Practical Applications of the Biopsychosocial Perspective in Clinical and Occupational Settings. 2007: Churchill Livingstone.

13.   Kendall, N.A.S., S.J. Linton, and C.J. Main, Guide to assessing psychosocial yellow flags in acute low back pain: risk factors for long term disability and work loss. 1997, Accident Rehabilitation and Compensation Insurance Corporation of New Zealand and the National Health Committee: Wellington, NZ.

14.   Vlaeyen, J. and S. Linton, Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. Pain, 2000. 85: p. 317-332.

15.   Leeuw, M., et al., The fear-avoidance model of musculoskeletal pain: Current state of scientific evidence. Journal of Behavioral Medicine, 2007. 30(1): p. 77-94.

16.   Garnefski, N. and V. Kraaij, Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. Personality and Individual Differences, 2006. 40(8): p. 1659-1669.

17.   Nijs, J., M. Meeus, and K. De Meirleir, Chronic musculoskeletal pain in chronic fatigue syndrome: Recent developments and therapeutic implications. Manual Therapy, 2006. 11(3): p. 187-191.

18.   Ellis, J.G., M. Cropley, and S.E. Hampson, Sleep catastrophizing as an implicit and explicit process in older insomniacs. Sleep, 2005. 28: p. A115-A115.

19.   McCracken, L. and C. Eccleston, Coping or acceptance: what to do about chronic pain? Pain, 2003. 105: p. 197-294.

20. McCracken, L. and K. Vowles, A prospective analysis of acceptance of pain and values-based action in patients with chronic pain. Health Psychology, 2008. 27(2): p. 215-220.

21. McCracken, L., F. MacKichan, and C. Eccleston, Contextual cognitive-behavioral therapy for severely disabled chronic pain sufferers: Effectiveness and clinically significant change. European Journal of Pain, 2007. 11(3): p. 314-322.

22. Cioffi, D., Beyond attentional strategies: A cognitive-perceptual model of somatic interpretation. Psychological Bulletin, 1991. 109: p. 25-41.

23. Leventhal, H., E.A. Leventhal, and R.J. Contrada, Self-regulation, health, and behavior: A perceptual-cognitive approach. Psychology & Health, 1998. 13(4): p. 717-733.

24. Leventhal, H., D.R. Nerenz, and D.F. Steele, Illness representations and coping with health threats, in A handbook of psychology and health, A. Baum and J. Singer, Editors. 1984, Erlbaum: Hillsdale NJ. p. 219-252.

25. Buck, R., et al., Common health problems in the general population: A bio-psychosocial approach. European Journal of Public Health, 2007. 17(Supplement 2): p. 214.

26. Ursin, H., I.M. Endersen, and G. Ursin, Psychological factors and self-reports of muscle pain. European Journal of Applied Physiology and Occupational Physiology, 1988. 57: p. 282-290.

27. Eriksen, H.R., et al., Are subjective health complaints a result of modern civilization? International Journal of Behavioral Medicine, 2004. 11(2): p. 122-125.

28.	Robbins, J.M. and L.J. Kirmayer, Attributions of Common Somatic Symptoms. Psychological Medicine, 1991. 21(4): p. 1029-1045.

29.	ONS, The National Office of Statistics Socio-economic Classification User Manual. 2005, New York: Palgrave Macmillan.

30.	Phillips, C.J., et al., Prioritising pain in policy making: the need for a whole systems perspective. Health Policy, 2008. 88(2-3): p. 166-175.

31.	World Health Organization, The Global Burden of Disease: 2004 Update. 2008: Geneva.

32.	Waddell, G., A.K. Burton, and C.J. Main, Screening to Identify People at Risk of Long-term Incapacity for Work. 2003, London: The Royal Society of Medicine Press Ltd.

33.	Buck, R., et al., Working with musculoskeletal pain. Reviews in Pain, In press.

34.	Barnes, M.C., et al., Beliefs about common health problems and work: a qualitative study. Social Science & Medicine, 2008. 64(4): p. 657-665.

35.	MacLeod, A.K., C. Haynes, and T. Sensky, Attributions about common bodily sensations: their associations with hypochondriasis and anxiety. Psychological Medicine, 1998. 28(1): p. 225-228.

36.	Sensky, T., A.K. MacLeod, and M.F. Rigby, Causal attributions about common somatic sensations among frequent general practice attenders. Psychological Medicine, 1996. 26(3): p. 641-646.

37.	Butler, J.A., T. Chalder, and S. Wessely, Causal attributions for somatic sensations in patients with chronic fatigue syndrome and their partners. Psychological Medicine, 2001. 31(1): p. 97-105.

38.	Kirmayer, L., et al., Explaining medically unexplained symptoms. Can J Psychiatry, 2002. 49(10): p. 663-672.

39.   Johnston, O., et al., Qualitative study of depression management in primary care: GP and patient goals, and the value of listening. British Journal of General Practice, 2007. 57(544): p. 872-879.

40.   Fink, P. and M. Rosendal, Recent developments in the understanding and management of functional somatic symptoms in primary care. Current Opinion in Psychiatry, 2008. 21(2): p. 182-188.

41.   Breen, A., et al., "You feel so hopeless": a qualitative study of GP management of acute back pain. European Journal of Pain, 2007. 11(1): p. 21-9.

42.   Verbeek, J., et al., Patient expectations of treatment for back pain: a systematic review of qualitative and quantitative studies. Spine, 2004. 29(20): p. 2309-18.

43.   Waddell, G., Preventing incapacity in people with musculoskeletal disorders. British Medical Bulletin, 2006. 77-78: p. 55-69.

44.   Buchbinder, R., D. Jolley, and M. Wyatt, Effects of a media campaign on back pain beliefs and its potential influence on management of low back pain in general practice. Spine, 2001. 26(23): p. 2535-2542.

45.   Jorm, A.F., H. Christensen, and K.M. Griffiths, The impact of beyondblue: the national depression initiative on the Australian public's recognition of depression and beliefs about treatment. Australian and New Zealand Journal of Psychiatry, 2005. 39: p. 248-254.

Table 1: Definitions of categories for causal attributions given in open response

Cause	Definition
Biomedical	Biomedical attributions include accident or injury, allergies, infections, disease, a syndrome/illness (e.g. IBS), genetics, hormones, medical treatments (e.g. surgery, side effects of medication)
Psychological	Psychological or emotional attributions are primarily 'internal' factors relating to the individual themselves, such as changes in mood or mental well-being (e.g. worrying, depression, stress, fatigue, sleep problems), subjective feelings of being generally unwell, or being a certain 'type' of person/personality (e.g. having low self-esteem)
Normal life	These are causal attributions where 'part of normal life' explanations are given. These are generally 'external' factors that impact on the individual. This would include life events (e.g. bereavement, divorce, family problems), normal activities (e.g. over-exercise, carrying heavy shopping, diet, work), age and 'wear and tear', and environmental factors (e.g. damp/cold surroundings)

Table 2: Demographic characteristics of the sample (n=467)

Variable	Category	n	%
Gender	Male	177	37.9
	Female	290	62.1
Employment Status			
Employed		*308*	*66.0*
	Full time > 30 hours	223	47.8
	Part time < 30 hours	71	15.2

	Self-employed	14	3.0
Not employed		*148*	*31.7*
	Retired	57	12.2
	Unemployed	16	3.4
	Can't work due to illness or disability	29	6.2
	Caring for my home, family or dependents	33	7.1
	Full time student	8	1.7
	Other	5	1.1
	Missing/refused	*11*	*2.4*
Marital status	Married or living with partner	250	53.5
	Single	148	31.7
	Separated or divorced	52	11.1
	Widowed	17	3.6
Ethnicity	White (UK)	432	92.5
	White (other)	12	2.6
	Black	11	2.4
	Asian	3	0.6
	Other	8	1.7
	Missing/refused	*1*	*0.02*
Socio-economic status:	1. Managerial and professional occupations	152	32.5
NS-SEC self-coded	2. Intermediate occupations	76	16.3
method	3. Small employers and own account workers	19	4.1
	4. Lower supervisory and technical occupations	45	9.6
	5. Routine and semi-routine occupations	115	24.6
	Not coded (never worked/long term	27	5.8

	unemployed, carers, full time students)		
	Missing/refused	*33*	*7.1*
Degree of professional	Y	161	34.5
equivalent	N	301	64.5

Missing/refused 33 7.1

Table 3: Hierarchical regression analysis for interference with daily life (n=467)

Block and variable	Standardised β	t	DF	F	Adjusted R²
1. Demographics	.	.	1,465	5.627*	0.010
Gender	-0.039	-1.050^{NS}	.	.	.
Age	--0.003	-0.091^{NS}	.	.	.
SES	-0.030	-0.811^{NS}	.	.	.
2. Common health problems	.	.	5,461	35.538***	0.270
Number of common health problems	0.075	1.82^{NS}	.	.	.
Extent (frequency*severity) of most bothersome common health problem	0.280	6.45***	.	.	.
Type: mental health problem	0.189	4.64***	.	.	.
Type: musculoskeletal complaint	0.086	2.11*	.	.	.
3. Yellow flags & causal attributions	.	.	6,460	47.676***	0.375
Number of yellow flags	0.363	8.86***	.	.	.
Biomedical causal attribution	-0.016	-0.419^{NS}	.	.	.
4. Interactions	.	.	6,460	47.676***	0.375
Number of common health problems* yellow flags	-0.088	-1.906^{NS}	.	.	.
Extent of common health problems*yellow flags	-0.007	-0.166^{NS}	.	.	.
Extent of common health problem*number of common health problems*yellow flags	0.036	0.731^{NS}	.	.	.

NB ***$p<0.001$, **$p<0.01$, *$p<0.05$, ^{NS} $p>0.05$

Table 4: Hierarchical regression analysis for time off work (n=467)

Block and variable	Standardised β	t	DF	F	Adjusted R²
1. Demographics	.	.	2,464	33.600	0.123
Gender	0.036	0.854 NS	.	.	.
Age	0.238	5.649***	.	.	.
SES	-0.216	-5.200***	.	.	.
2. Common health problems	.	.	3,463	33.805***	0.174
Number of common health problems	0.018	0.379 NS	.	.	.
Extent (frequency*severity) of most bothersome common health problem	0.154	3.392**	.	.	.
Type: mental health problem	0.030	0.713 NS	.	.	.
Type: musculoskeletal complaint	-0.087	-2.091 NS	.	.	.
3. Yellow flags & causal attributions	.	.	4,462	31.217***	0.206
Number of yellow flags	0.201	4.406***	.	.	.
Biomedical causal attribution	0.048	1.138 NS	.	.	.
4. Interactions	.	.	4,462	31.217***	0.206
Number of common health problems* yellow flags	0.042	0.853 NS	.	.	.
Extent of common health problems*yellow flags	-0.022	-0.506 NS	.	.	.
Extent of common health problem*number of common health problems*yellow flags	-0.034	-0.610 NS	.	.	.

NB ***p<0.001, **p<0.01, *p<0.05, NS p>0.05