



Low cancer suspicion following experience of a cancer ‘warning sign’



Katriina L. Whitaker^{a,*}, Kelly Winstanley^b, Una Macleod^c, Suzanne E. Scott^d, Jane Wardle^b

^a School of Health Sciences, University of Surrey, Guildford, Surrey GU2 7XH, UK

^b Health Behaviour Research Centre, Department of Epidemiology and Public Health, University College London, London WC1E 6BT, UK

^c Centre for Health and Population Sciences, Hull York Medical School, Hull HU6 7RX, UK

^d Unit of Social and Behavioural Sciences, King’s College London Dental Institute, London SE5 9RW, UK

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Abstract *Aim:* Lower socioeconomic status (SES) is associated with a higher risk of late-stage cancer diagnosis. A number of explanations have been advanced for this, but one which has attracted recent attention is lower patient knowledge of cancer warning signs, leading to delay in help-seeking. However, although there is psychometric evidence of SES differences in knowledge of cancer symptoms, no studies have examined differences in ‘cancer suspicion’ among people who are actually experiencing a classic warning sign.

Methods: A ‘health survey’ was mailed to 9771 adults (≥ 50 years, no cancer diagnosis) with a symptom list including 10 cancer ‘warning signs’. Respondents were asked if they had experienced any of the symptoms in the past 3 months, and if so, were asked ‘what do you think caused it?’ Any mention of cancer was scored as ‘cancer suspicion’. SES was indexed by education.

Results: Nearly half the respondents (1732/3756) had experienced a ‘warning sign’, but only 63/1732 (3.6%) mentioned cancer as a possible cause. Lower education was associated with lower likelihood of cancer suspicion: 2.6% of respondents with school-only education versus 7.3% with university education suspected cancer as a possible cause. In multivariable analysis, low education was the only demographic variable independently associated with lower cancer suspicion (odds ratio (OR) = 0.34, confidence interval (CI): 0.20–0.59).

Conclusion: Levels of cancer suspicion were low overall in this community sample, and even lower in people from less educated backgrounds. This may hinder early symptomatic presentation and contribute to inequalities in stage at diagnosis.

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* Corresponding author: Tel.: +44 1483 684622.

E-mail addresses: k.whitaker@surrey.ac.uk (K.L. Whitaker), k.winstanley@ucl.ac.uk (K. Winstanley), Una.Macleod@hyms.ac.uk (U. Macleod), suzanne.scott@kcl.ac.uk (S.E. Scott), j.wardle@ucl.ac.uk (J. Wardle).

1. Introduction

Studies in which cancer patients report retrospectively on the process of symptom appraisal indicate that not recognising a symptom as possibly due to cancer is an important determinant of delay in presentation [1–3]. Prolonged intervals from symptom onset to help-seeking may increase the risk of late stage diagnosis [4]. In Denmark and the United Kingdom (UK), where cancer survival rates are lower than other western countries with similar healthcare systems [5], there are ongoing campaigns to encourage public awareness of cancer ‘warning signs’ and prompt help-seeking [6,7].

People from lower socioeconomic status (SES) backgrounds are more likely to be diagnosed with later-stage disease for several cancer sites [8]. A number of factors potentially contribute to inequalities in stage of cancer diagnosis, but one that has attracted interest in recent years is how quickly people with symptoms present to their doctor (the so-called ‘patient interval’) [9]. Factors such as life stress and competing priorities – which tend to be higher in lower SES groups – have been considered as potential deterrents to prompt help-seeking [10], although as the overall primary care consultation rate is higher in lower SES groups, this is not a strong candidate for explaining long patient intervals [11]. An extended patient interval could also be due to individuals with lower levels of education being less equipped with the necessary ‘cancer literacy’ to recognise a cancer warning sign [10].

Surveys of public awareness of cancer, show that lower SES groups recall fewer cancer warning signs when tested with standardised psychometric measures [12–16]. However, this is ‘knowledge in theory’ and may not translate into differential symptom recognition in daily life. Evidence to date indicates that when people experience a warning sign in everyday life, very few suspect cancer [17], but there have been no studies examining SES differences in cancer suspicion in response to such a symptom.

In the present study, we combined data from two primary-care-based symptom surveys that used common methods of recruitment, and the same symptom assessments, to test the hypothesis that people with less education are less likely to suspect cancer when they experience a cancer ‘warning sign’.

2. Methods

2.1. Study population

Questionnaires were mailed to a total of 9771 men and women aged ≥ 50 years, registered at seven General Practices across London, the South East and the North West of England, in surveys conducted in April 2012 and October 2013. Index of Multiple

Deprivation 2007 (IMD 2007) scores at practice level were used to ensure a range of deprivation in participating practices. All patients registered at the participating practices who were ≥ 50 years old, without a registered cancer diagnosis, and deemed suitable to complete the questionnaire by the doctor (e.g. did not have a mental illness, learning disability or terminal illness), were eligible. Non-responders were sent a reminder after 2 weeks. The study materials and protocol were approved by NHS London Bridge Research Ethics Committee (Reference: 11/LO/1970) and all patients gave informed consent.

2.2. Measures

2.2.1. Demographics

The two surveys used the same questions on marital status (categorised for analysis as married/cohabiting versus not married/cohabiting), current employment (working versus not working), ethnicity (white versus non-white ethnic background) and education (university versus below university). Practices gave information on age and sex for each individual. Education was used as the marker of individual-level SES as it is considered more appropriate in an older sample, many of who are no longer in the workforce [18].

2.2.2. Symptom experience and cancer attributions

Details of the questionnaire used in the first survey have been published [17]. Both questionnaires included questions on symptom experience phrased as: “*In the last 3 months have you had the following*” followed by a list of symptoms. The symptom list included the 10 symptoms from the Cancer Awareness Measure (CAM), which had been based on warning signs from Cancer Research UK’s website [19,20]. All had yes/no response options (see Table 2 for a full list of symptoms).

For each symptom that respondents had experienced, they were asked “*What do you think caused it?*” in a free-text response (termed open attribution item). ‘Cancer suspicion’ was defined as any instance where the respondent indicated that they had considered ‘cancer’ as a possible cause. People could give more than one attribution per symptom, and we coded any mention of cancer.

2.3. Data analysis

Descriptive statistics were completed for demographic characteristics, symptom frequency and symptom attributions. Non-responder analyses used chi-square and *t*-tests. Responses to the open attribution item were coded by two independent coders (KW and KeW), and divided into attribution categories [21]: ‘physical’, largely medical but excluding cancer (e.g. haemorrhoids for unexplained bleeding), ‘external/normalising’ (e.g. age

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