

Understanding the uptake of cervical cancer screening: the contribution of the health belief model

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SUMMARY. *The health belief model, explaining health and illness behaviour, is 25 years old. Criticisms of the model have included its abstract nature and its emphasis on the rationality of patients' behaviour. Its lack of predictive power means it provides a useful framework rather than a true model. The health belief model is used here to review the literature that has advanced our understanding of the factors affecting uptake of cervical screening. The influence of age and social class on perceptions of vulnerability, and the costs and benefits of screening are highlighted. The body of work reviewed has helped expose inherent limitations of screening programmes. The main obstacles to the success of cervical screening are organizational, for example, the inaccuracy of address registers. Numerous ways of encouraging uptake are identified. These include appropriately worded invitations and educational material, personalized approaches from members of the primary health care team and flexible surgery hours. The incentives introduced under the 1990 general practitioner contract are likely to help increase uptake.*

Introduction

VARIOUS theoretical frameworks have been proposed to explain health and illness behaviour. The health belief model developed by Rosenstock, and later refined by Becker and Maiman is the best known.^{1,2} The model describes five elements of patients' health beliefs:

- Health motivation. Individuals vary in their overall interest in health and their motivation to look after their health.
- Perceived vulnerability. Individuals vary in how likely they think they are to develop a specific health problem.
- Perceived seriousness. Individuals vary in how serious they believe would be the consequences of contracting a particular illness or of leaving it untreated.
- Perceived costs and benefits. Individuals weigh up the physical, psychological and social costs and benefits of a particular course of action. They do not necessarily take all relevant considerations into account but an evaluation is made.
- Cues to action. Beliefs do not exist for all possible problems but are prompted by triggers. These may be internal, such as a physical sensation, or external, such as a magazine article or a visit to the doctor.

Becker and Maiman refined the health belief model by incorporating various modifying factors, which influence all the other factors.² These include demographic factors such as age, sex and ethnicity; social-psychological factors such as social class and personality; and structural factors such as knowledge about

disease and prior experience of it. This approach to patients' beliefs was thought to allow estimates of compliance, the likelihood of preventive action being taken and the use of medical services.³ It is 25 years since the publication of Rosenstock's seminal paper. How has it advanced our understanding of the factors influencing the uptake of cervical screening?

Screening for cervical cancer

Over 2000 women in the United Kingdom die each year from cervical cancer. Two decades of organized screening have had little impact on the mortality rate.⁴ Over 80% of women dying of the disease have never had a cervical smear.⁵ The success of cervical cancer screening in Scandinavia and parts of Scotland and its failure in much of the rest of the UK suggest that the main organizational challenges are ensuring high uptake and adequate follow up of cytopathological abnormalities.⁶

District health authorities are responsible for running cervical screening programmes⁷ in accordance with detailed guidelines.⁸ While all districts have implemented computer-managed schemes, they vary in respect of population coverage, quality of testing, and follow up of abnormal results.⁹ The national screening programme relies on the accuracy of family health services authorities' records of patients' addresses. In inner cities particularly, where patient turnover is high, there are problems of inaccuracy.¹⁰

There have been several studies of the reasons for non-attendance for cervical screening.¹¹⁻¹⁵ One methodological problem attends all such studies: the difficulty in distinguishing true refusers from those who are ineligible or inaccessible.¹⁶ Up to a third of those women invited may be ineligible.¹³ Approximately one in five women have had a hysterectomy by the age of 64 years.¹⁷ Women may have the test outside the scope of the scheme's records. Women who cannot be contacted may account for up to half of non-respondents.^{18,19} They cannot attend because they have never received an invitation for cervical screening, usually because their address has changed. Nevertheless the health belief model provides a framework for analysis of these and other studies relevant to the uptake of cervical screening.

Applying the health belief model

Health motivation

Mortality rates from cervical cancer are higher in lower social classes.²⁰ Numerous studies have shown that preventive services including cervical screening are more likely to be taken up by higher social classes.²¹ This has been attributed to various factors: levels of education, the passivity and fatalism of the culture of poverty²² and the greater congruence of higher social class patients' ideas with those of the doctor.²³ None of these theories satisfactorily explain differences in motivation, defined by Becker and Maiman as 'the differential arousal in individuals caused by health matters'.²

Coulter, in a questionnaire-based study of concepts of health and illness, found that people in social classes 1 and 2 were more likely to stress the importance of lifestyle on health while those in social classes 4 and 5 were more likely to mention

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socioeconomic influences.²⁴ Where the experience of adverse social conditions is felt to determine disease susceptibility, there is little motivation to attend screening programmes.

Perceived vulnerability

Several studies have shown widespread misunderstanding about cervical screening and cervical cancer.^{25,26} The women in King's study perceived their risk of cervical cancer to be low.²⁵ Causal attributes are important determinants of perceived vulnerability and they vary with age. King found that younger women were more likely to attribute cervical cancer to promiscuity or the contraceptive pill, while older women cited smoking or a 'germ' as possible causes. Women who have experienced the menopause often believe they are no longer at risk of diseases of the reproductive organs.²⁵

Perceived seriousness

Women perceive cervical cancer to have serious consequences.²⁵ However, fear of detection of cervical cancer has been found to inhibit attendance for screening, particularly among older women and women in lower social classes.^{26,27} Similarly, a study of non-attenders at a breast screening clinic reported that 79% of non-attenders compared with 36% of attenders were afraid of cancer.²⁸

Unnecessary anxiety about the possibility of cancer being detected is heightened by delay between testing and receiving the results, and the way in which the results are reported. A recent study found that 61% of women informed by computerized letter that they had abnormal but not cancerous smears believed they had cancer, compared with 3% who received the results in a more personal letter accompanied by an explanatory leaflet.²⁹

Perceived costs and benefits

Fears about the disease need to be differentiated from fears about the test, which are commonly given as reasons for non-attendance.^{12,30} King found that the strongest predictor of non-attendance was the belief that the test would be painful, embarrassing or unpleasant. Older women, in particular, expressed aversion to undergoing cervical examination by a male doctor.²⁵ The presence of a woman doctor is important for many women.³¹ Attenders are more likely than non-attenders to believe that the test can reveal disease prior to the appearance of symptoms and that early detection is beneficial.^{25,32}

Different perceptions of the costs and benefits involved may explain the social class differences in attendance for cervical screening. The time costs to individuals of health service use may be one reason for persistent inequalities in general health status between different social classes.^{33,34} Women often cite practical reasons for non-attendance for cervical screening, such as family and work commitments, access and transport problems.¹²

Cues to action

Given the inaccuracy of target lists,^{10,19} it cannot be assumed that all women who attend for cervical screening are simply responding to the invitation letter. Beardow and colleagues found that 69% of invitation letters were either inaccurate or inappropriate.¹⁹ Doyle found that only 40% of attenders over 35 years of age were responding to calls from the family practitioner committee in Ealing. A total of 60% of women in this target group and 90% of women under 35 years came on their own initiative.³⁵ Many studies have looked at the reasons for non-attendance but few have asked what prompted attendance. A survey from Tower Hamlets gives some indirect indications. Asked what they thought would improve uptake, 27% of women

suggested more publicity and 15% suggested more encouragement by health professionals. Several older women had learnt about the test from their grand-daughters.³¹

Target payments have provided an incentive for general practitioners to provide the cue to action. Over the first six months of the new general practitioner contract, 54% of practitioners achieved the 80% target for screening while a further 32% reached the 50% target.³⁶ Histopathology laboratories throughout the country report a steadily increasing workload. Uptake rates appear to have risen since April 1990.³⁷ Paradoxically, target payments may act as a disincentive for general practitioners working in areas where uptake is very low. In some inner city areas, less than 10% of general practitioners achieved the higher target. Populations in just such deprived areas are at higher risk of cervical cancer.

Limitations of the health belief model

A major criticism of the health belief model is that it remains highly abstract. As we have seen, concepts such as motivation are difficult to define. This has resulted in few prospective studies and an emphasis on non-attendance. Research has failed to produce the empirical support necessary to weight key variables; this gives the model little predictive value. This can be illustrated in relation to a specific policy issue: whether or not to screen women aged over 65 years.

A powerful argument can be made on epidemiological grounds for screening women aged over 65 years. The prevalence of smears that show invasive cancer rises steeply with age.³⁸ Older women present later with advanced disease and therefore have the poorest survival rates from cervical cancer.³⁹ On the other hand, older women whose disease is detected early do almost as well as younger women.⁴⁰ Of women with invasive cancer, those aged over 50 years are half as likely to have had a smear than those aged under 50 years.⁴¹ Fletcher has calculated that, if opportunistic screening were to identify more cases of cervical cancer at an earlier stage, over 350 lives would be saved annually, with a 63% improvement in five-year mortality in women aged over 65 years.⁴² Among the reasons for not screening women aged over 65 years is the reduced acceptability of the test in older women. However, high attendance rates for a smear test in this age group have been reported.⁴³ An operational model that allowed more specific prediction of uptake would enlighten policy decisions of this nature.

The health belief model has been criticized for over-emphasizing the rationality of patients' behaviour.⁴⁴ Patients may be concerned not only with the perceived value of reducing the threat of disease by attendance but with the perceived value of action to solve other problems. Attendance for cervical screening may be triggered by other factors as well, such as by providing company, an opportunity to present other symptoms, to seek help with housing or to bring children for consultation. Zola has identified some of the non-physiological triggers to seeking medical help⁴⁵ but no model can easily accommodate the full range of conceivable reasons for doing so.

The health belief model has tended to isolate the decision to consult from the individual's ongoing relationship with his or her doctor. Personal instruction is more effective than mass approaches in effecting behavioural change.⁴⁶ Oversimplified, dogmatic health messages may be conceptually unconvincing for many people. Lifestyle modification is more likely to be negotiated over time with a familiar member of the primary health care team.⁴⁷

The proportion of variance in preventive health behaviour accounted for by health beliefs in studies relating the two is generally small. In an effort to improve the predictive power of the model, modifications have been made.

Further developments

The less power individuals exercise over their own lives, the less likely they are to comply with official health recommendations. A further factor influencing health behaviour is the availability of social support and social networks. Studies of general health behaviour⁴⁸ and the use of breast screening facilities⁴⁹ have shown that those women who are socially well integrated are more likely to participate in preventive health programmes than those who are less well integrated.

Later reformulations of the health belief model, particularly the 'locus of control' model, have produced more consistent results⁵⁰ but two conclusions emerge from the literature. First, preventive health behaviour is multidimensional. Variables associated with the performance of one medically-approved behaviour cannot be generalized. Uptake of cervical screening is not therefore necessarily associated with other health behaviour. Secondly, it is clear that a range of beliefs, attitudes and sociodemographic factors are important and that the combination of these antecedent factors will differ for the various preventive behaviours. No single variable, as yet unresearched, is likely to substantially reduce the level of unexplained variance.

Conclusion

The early optimism of research into factors affecting health behaviour can appear naive. The health belief model has provided a useful aide-memoire rather than a predictive model for analysing cervical and other screening programmes. Recent research has focused on the fundamental problems of supportive information systems. More accurate address registers held by family health services authorities will increase uptake rates.

The literature suggests other ways of improving levels of screening. Educational material is now included with more appropriately worded invitations. These stress the benefits of being screened and emphasize the preventive nature of the test rather than the idea that it detects cancer. Personal approaches from practice staff and follow up where necessary may also help overcome anxieties about the test and the disease. Reminders by telephone or personal call are likely to be more effective than standard letters. A wide range of clinic or surgery times should improve response rates. Test results need to be conveyed sensitively.

Paradoxically, this body of research has helped expose the inherent limitations of such programmes.⁵¹ Without coercion and vast expenditure, it may be inappropriate to expect any screening strategy to overcome these administrative, social and psychological constraints. A quarter of a century further on, when we know more about the causes, natural history and which behavioural changes truly reduce the risk of cervical cancer, the health belief model may have helped consign cervical screening to medical history books.

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