Psychosocial Determinants of Socioeconomic Inequalities in Cancer Screening Participation: A Conceptual Framework

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Cancer screening participation shows a strong, graded association with socioeconomic status (SES) not only in countries such as the United States, where insurance status can be a barrier for lower income groups, but also in the United Kingdom, where the National Health Service provides all health care to residents, including screening, for free. Traditionally, the literature on socioeconomic inequalities has focused on upstream factors, but more proximal (downstream) influences on screening participation also need to be examined, particularly those that address the graded nature of the association rather than focusing specifically on underserved groups. This review offers a framework that links some of the components and corollaries of SES (life stress, educational opportunities, illness experience) to known psychosocial determinants of screening uptake (beliefs about the value of early detection, fatalistic beliefs about cancer, self-efficacy). The aim is to explain why individuals from lower SES backgrounds perceive cancer screening tests as more threatening, more difficult to accomplish, and less beneficial. A better understanding of the mechanisms through which lower SES causes negative attitudes toward screening could facilitate the development of intervention strategies to reduce screening inequalities.

early detection of cancer; health literacy; helplessness, learned; psychology; self efficacy; social class; social support

Abbreviation: SES, socioeconomic status.

INEQUALITIES IN HEALTH: A CANCER SCREENING PERSPECTIVE

People from more socioeconomically deprived backgrounds have poorer health and a shorter life span than those who enjoy greater affluence (1, 2). There are large and widening inequalities in life expectancy in the United States (3–5); even in the United Kingdom, where health care is free at the point of delivery, differentials in life expectancy are striking (6). For example, people in the richest areas of the Scottish city of Glasgow live on average 28 years longer than those in the poorest areas (7). Such comparisons are important reminders of the need to understand and improve circumstances for those who are worst off.

However, not only the most deprived suffer poor health, because most health indicators show incremental effects across the entire socioeconomic spectrum (7). Moving beyond treating health inequalities as a binary phenomenon highlights the need to investigate the causal pathways underlying health differences at all levels of socioeconomic status (SES), that is, to understand not only why those living in poverty are less healthy but also why people with middle-range incomes are less healthy than the most affluent. The breadth of possible influences on health was summarized eloquently in a review by Marmot et al.: “[t]he unequal distribution of power, income, goods, and services, globally and nationally, the consequent unfairness in the immediate, visible circumstances of people’s lives, their access to health care and education, their conditions of work and leisure, their homes, communities, towns” (7, p. 1661).

Socioeconomic circumstances are associated with not only health outcomes but also health-related behaviors such as physical activity, smoking, and diet (8–13). In the cancer context, inequalities in incidence and survival (6, 14–16) mirror differences in causal factors such as tobacco smoking, alcohol intake, and diet (17, 18). SES is also related to the proportion of cancers diagnosed at a late stage, when they are less amenable to treatment (6, 15, 19–21) whether because of delays in diagnosis or lower uptake of cancer screening.
Inequalities in screening participation have been demonstrated in numerous studies in the United States (22–24), where financial barriers associated with health insurance status often play a role. However, the same trend is seen in countries where screening is provided without any cost to the individual, pointing to the role of barriers other than affordability. 

In the United Kingdom, participation in the breast and cervical cancer screening programs rose more rapidly in more affluent areas (25–28) and, at least in the case of cervical cancer, has had a measurable impact on disparities in mortality (29). Recent evidence shows a similar socioeconomic gradient in the new colorectal cancer screening program (30–32). In an analysis of the first round of fecal occult blood testing, 49% of test kits were returned by individuals living in the least deprived quintile of residential areas but only 32% in the most deprived quintile, and there was a linear gradient between these extremes that was independent of the ethnic mix in the areas (32). The gradient in participation is particularly striking because the fecal occult blood testing kit is delivered routinely every 2 years directly to the home at no cost to the individual, the test is self-administered, and the kit is returned in a prepaid envelope, all features that would appear to overcome barriers of time, cost, or contact with health professionals. Given that population-based screening using fecal occult blood testing is estimated to reduce colorectal cancer mortality by 23% among those who perform the test (33), inequalities in uptake are likely to increase differentials in cancer survival (34).

A FRAMEWORK TO EXPLAIN SES DIFFERENCES IN PSYCHOSOCIAL PREDICTORS OF CANCER SCREENING

Research into inequalities in cancer screening uptake has been largely directed toward investigating SES differences in attitudes relevant to screening utilization, by conducting either large-scale quantitative studies or detailed qualitative studies focusing on population subgroups with high levels of nonparticipation (i.e., “hard-to-reach” groups). The attitudinal factors investigated most often include negative expectations about undergoing the test (e.g., embarrassment, pain), fatalistic beliefs about cancer (e.g., “there’s not much people can do to reduce their risk”), and lack of recognition of the benefit of detecting cancer early (35–38). However, this work has not been assimilated into the knowledge base on inequalities in uptake in such a way to create a fully articulated framework for understanding—and ultimately reducing—the SES gradient.

This review presents a framework (Figure 1) of possible processes that might link SES, through associated aspects of life experience, to these psychosocial determinants of screening behaviors. It is not intended to be a definitive model of socioeconomic inequalities in screening but rather an illustration of the kinds of testable linkages that can further the goal of understanding inequalities. Specifically, the framework aims to present evidence for a set of pathways that show how lower SES comes to be associated with perceiving cancer screening as more threatening, more difficult to accomplish, and less beneficial.

The goal was not to conduct a systematic review of the complex literatures on SES and attitudinal determinants of screening participation (39) but rather to synthesize the accumulated state of research on social inequalities and cancer screening and illustrate some potentially novel and important linkages between SES and psychosocial constructs with a known social gradient. The psychosocial constructs analyzed were those that had already been identified as predictors of screening (40–42) but had not necessarily been linked with SES. The aspects of SES that we analyzed were those that had already been discussed in the inequalities field but had not necessarily been linked with attitudes toward cancer screening. This approach enabled us to locate literature from both the medical and social sciences and combine it to produce an integrative framework that could lead to the development of better informed and theory-based interventions to reduce SES inequalities in screening uptake.

Overview of the framework

Corollaries of SES. SES is a complex, multifaceted construct and is indexed variously by occupational status, material resources, educational level, and neighborhood characteristics. Some commentators argue that all of these indicators, disparate as they may seem, are manifestations of the same underlying and fundamental construct (43). However, each indicator also has its own set of implications for life experiences, which in turn has potential ramifications for specific perceptions and beliefs about health- or cancer-related behaviors. For this review, we have selected 3 components/corollaries of SES to explore in detail: 1) stressors and resources for change, 2) educational opportunities and experience, and 3) illness experiences. These are not the only important elements of SES, and the pathways are intended to be illustrative rather than exhaustive, but they have been selected because there is evidence for the links that we propose.

Attitudinal mediators. Lower SES is known to be associated with less awareness of the benefits of participating in screening (38, 44), increased worry following a screening invitation (45), and more fatalistic beliefs about cancer (35). Negative attitudes toward the screening process are further compounded by lower SES groups being more concerned about the process of cancer screening itself (e.g., fear of pain, embarrassment) and the medical consequences of receiving a positive screening test or a cancer diagnosis (36, 37).

Information processing, goal setting, and screening participation. Behavioral implications of negative beliefs about cancer screening (e.g., avoidant responses to screening and lack of help-seeking for cancer symptoms) have been documented in other studies (46–52), again highlighting the disjointed state of the science of inequalities in cancer screening. The framework describes how stressors, educational opportunities, and illness experiences could influence the perceived threat associated with screening, self-efficacy for participating in cancer screening, and belief in the value of detecting cancer, which in turn influence information processing and decision making and ultimately screening participation.
The influence of stressors and resources for change

People from lower SES backgrounds experience a higher frequency of stressful events at work and home (53), and they have fewer social or economic resources to cope with these stresses (7). Socioeconomic differences in neighborhood characteristics also exist, such as crime, unemployment, quality of schools, housing, and opportunities for recreational activities (54–56). Life stressors have been found to be associated with both adherence to screening recommendations (57, 58) and social support for screening (59, 60). In this section, we review evidence for potential pathways through which stressful social circumstances or lack of resources could influence the perceived threat and perceived efficacy of cancer screening behaviors.

**Negative expectations.** Given the SES gradient in stressful life events, compounded by limited resources or lower “reserve capacity” (61) to cope with them (62), lower SES is likely to be associated with more pessimistic expectations about future events and outcomes (61, 63–68). A general tendency to expect negative events in the future is likely to lead to feeling more threatened by the possible worrying outcomes of cancer screening or a cancer diagnosis (69). One analysis (70) identified several studies showing that pessimistic expectations about health were associated with pessimism in other domains such as future economic conditions (71, 72), and it concluded that pessimistic individuals would feel more threatened by the results of screening tests and prefer preventive behaviors that do not include information about current or future health. In support of this finding, an SES gradient has been reported in defensive avoidant responses toward abnormal cancer screening results and cancer diagnoses (67, 73). Lower SES is also associated with perceiving the physical, social, and emotional consequences of a diagnosis of cancer to be worse, and expecting the procedures involved in screening to be more unpleasant and embarrassing (44).

**Reactive responding.** The challenge of dealing with numerous daily hassles requiring immediate attention encourages so-called reactive responding, a type of information processing where attention is given to immediate tasks while ignoring long-term goals (74). This type of information processing is thought to be more common in lower SES groups because of the need to deal with immediate problems and limited resources (75).

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**Figure 1.** A framework to explain socioeconomic status differences in psychosocial predictors of cancer screening.
processing characterized by sustained vigilance, stronger emotional responses, and rapid reactions to situational stimuli (74). Reactive responding may also reduce the resources available for anticipatory planning or dealing with novel stressors, and proactive coping has been described as “practically impossible without internal and external resources” (75, p. 412). In line with this, people of lower SES have been shown to engage in less active coping and planning and to take part in fewer activities designed to prevent long-term adverse health outcomes (76–81). Individuals who are finding it more difficult to manage existing demands often feel less able to take on new behaviors (82). This was illustrated in a qualitative study finding that, although middle-class women described exercise and a healthy diet in their accounts of a typical day, working-class women focused on getting through the day without feeling ill (83). It has been argued that “health promotion strategies may not be effective for people with lower SES because of their bigger challenges to meet their basic needs, such as earning a living and providing a home for their family members” (84, p. 238). Health-promoting activities may even be seen as a luxury or a mark of self-indulgence in lower SES groups (85).

**Learned helplessness.** There is evidence for an association between lower SES and a subjective sense of powerlessness, as well as a greater tendency to believe in the influence of chance (5, 86–88). Daily hassles and limited resources are associated with more frustration in trying to influence important life events and with fewer vicarious experiences of self-initiated success (89–92). This set of circumstances can deplete the individual’s sense of resourcefulness and personal control (93, 94), perhaps in part because the “experience of efficacious action is the single most important predictor of self-efficacy” (90, p. 120). Since self-efficacy for specific behaviors is influenced by a general sense of control over the environment (95), socioeconomic circumstances disadvantageous to the development of a sense of control are likely to reduce confidence in the ability to perform a novel health behavior such as participating in cancer screening (96). A sense of control over the environment might also have implications for the perceived value of health behaviors such as cancer screening. Wardle and Steptoe (81), for example, found that lower SES was associated with stronger beliefs in the role of chance in health and that this in turn was associated with less healthy behaviors.

**Prohibitive social influences: lack of support and normative values.** Social support and encouragement for cancer screening are graded by SES (44, 97) and have been shown to be associated with cancer screening utilization (98–102). Support may be emotional, instrumental, or informational, but all types are likely to increase self-efficacy for overcoming barriers to screening and reduce the threat associated with cancer screening procedures. The framework indicates an effect of social norms and support on screening behavior through effects on self-efficacy, which in turn affect the threat associated with cancer screening procedures. As Bandura noted, “converging evidence across diverse spheres of functioning reveals that the social support has beneficial effects only if it raises people’s beliefs in their efficacy to manage their life circumstances” (103, p. 149).

Social norms can amplify the effects of stress and resources on perceived efficacy for screening because chronic neighborhood stressors are likely to affect everyone living in an area, and social networks are usually homogenous and homogenizing (104, 105). More affluent social networks are therefore more likely to expose their members to others who have attended screening (25–28), are more aware of cancer preventive strategies, and have higher self-efficacy for utilizing cancer screening services (59, 98). People who believe that screening is normative within their social network are more likely to participate in screening themselves (59).

**Summary of the influence of stressors and resources.** The differing balance of stressors and resources across the SES gradient is likely to result in those with lower SES having more pessimistic expectations and engaging in reactive responding and learned helplessness. Pessimistic expectations color attitudes toward cancer screening, negative life events reinforce these expectations, and the (lack of) community norms for screening means few models to highlight the benefits of cancer screening participation.

**The influence of educational opportunities**

Education is an important component of the complex construct of SES, and many studies of health inequalities use years of education or educational attainment as the marker of SES (106). Formal education has implications for educational opportunities over the life course. People with more formal education tend to experience greater wealth and occupational status, leading to further exposure to learning opportunities throughout the life course. Prior educational attainment is strongly associated with taking additional adult education courses (107), and there is a social gradient in opportunities for learning new skills and autonomy at work (108). Importantly, poorer education is consistently associated with a complex set of “health literacy” skills, which relate to the ability to obtain, process, and understand health information (109–111), because of the literacy, numeracy, and problem-solving skills learned in formal education (112). Educational background and health literacy have in common that they consistently emerge as important and independent correlates of health and health behaviors (113–116), including cancer screening (112, 117–121). In this section, we review possible pathways through which lack of life-long educational opportunities might influence perceived threat and efficacy to produce inequalities in cancer screening.

**Lack of knowledge about cancer screening.** We noted above that negative expectations about future events and outcomes are associated with heightened concern about screening procedures and outcomes. However, negative expectations are not the only precursor to such attitudes; they are also precipitated by lack of knowledge and awareness. Data from the 2003 US Health Information National Trends Survey showed that individuals from the lowest income and education groups were less likely to seek information about cancer and other health topics, and they were less likely to engage in a range of preventive health behaviors, including cancer screening (22, 122, 123). Lack of opportunities for developing basic skills throughout the life course is a barrier...
not only to seeking health information but also to assimilating it when it is encountered. For example, difficulty in understanding concepts such as “early detection” or “precancerous changes” means that communications about cancer control convey less information for individuals whose health literacy is lower (124–130). Lack of knowledge about cancer or cancer control in turn has been identified as a predictor of nonparticipation in cancer screening (8, 131).

Uncertainty tends to go hand-in-hand with anxiety (132, 133), and increasing knowledge about how cancer screening is performed has been shown to reduce anxiety (134). Individuals with the lowest health literacy and educational attainment expect cancer screening tests to be embarrassing and unpleasant (37, 124, 129, 131), and expected embarrassment has been shown to mediate the association between knowledge and uptake of colorectal cancer screening (130). Focus group findings support this idea; one participant who was commenting on fecal occult blood testing described it as “scarier than a mammogram and Pap test because I don’t know how to do it and don’t know anything about it” (135, p. 268). These findings are in keeping with a review showing that detailed procedural information improved patient adjustment (e.g., nervousness) in 8 of 10 studies (136).

The perceived benefit of cancer screening is also likely to be lower for people with lower health literacy because of their lack of awareness that cancer can be asymptomatic. A review of the impact of health literacy concluded that individuals with low health literacy struggle to understand the value of screening in asymptomatic individuals or the concept of early detection (137). In a number of studies, failure to understand that cancer screening is necessary in the absence of symptoms has been identified as a barrier to participation in cancer screening (131).

Lack of confidence in the ability to understand, persevere, and succeed. In the previous section, we highlighted the role of stressors and resources in developing a sense of control over life outcomes. Experience of social comparison, feedback, and attainment during formal education, alongside subsequent educational opportunities, are also likely to influence self-efficacy to engage in cancer screening and the belief that this action will confer benefits. In their model of associations between education and preventive care, Sabates and Feinstein propose that education increases “power to take control over their lives—and self-confidence, empowering them over future choices” (107, p. 3000), which has been corroborated in several studies (138–140). Educational attainment has long-lasting effects, even predicting perceived global mastery and efficacy among those aged 70–79 years (141). This may be in part because qualifications enable entry into work settings characterized by complexity and control, further promoting personal agency/control beliefs (142).

There has been long-standing interest in the role of education in enhancing perceived control over health and health behaviors. Mirowsky and Ross, for example, pointed to the role of education in producing “learned effectiveness” and enabling individuals “to coalesce health-producing behaviors into a coherent lifestyle” (143, p. 50). Educational attainment is also associated with greater confidence that personal actions can avert a range of negative health outcomes (144). Education’s effects on self-efficacy and response-efficacy for specific health behaviors have been shown to be mediated by general conceptions of self-efficacy and the role of chance. Leganger and Kraft (95) demonstrated that educational attainment influences assessments of personal self-regulatory capabilities, and this accounted for self- and response-efficacy beliefs concerning fruit and vegetable intake.

Low consideration of future consequences. Educational success provides experiences of foregoing attractive short-term alternatives to receive long-term benefits (145, 146). Consideration of future consequences is a related construct that denotes the ability to consider and plan for the future rather than focus on short-term outcomes, which has been found to be associated with SES in general (81, 147–150) and education in particular (151, 152). Sabates and Feinstein suggested that “education can improve access to health services by increasing individuals’ patience and motivation” (107, p. 3000). Patience and motivation contribute to academic success (145, 153), and this success is likely to enhance self-regulatory skills and encourage short-term sacrifices aimed at long-term gain (107).

In one of the few studies addressing associations between education, time perspective, and health behaviors, time perspective was shown to mediate the association between education and both smoking and physical activity (151); in another study, future orientation partly accounted for the relation between educational qualifications and expectation of participating in screening for diabetes (154). Although there have been no mediational analyses carried out in the context of cancer screening, experimental manipulation of the apparent timing of benefits and barriers to cancer screening demonstrated that individuals with low consideration of future consequences responded more favorably to messages emphasizing short-term benefits and long-term barriers, while the reverse was true for those with high consideration of future consequences (155). Thus, it is reasonable to hypothesize that education might promote consideration of future consequences, which in turn could lead to greater value being attached to long-term benefits of cancer screening.

Summary of the influence of educational opportunities. Education is an important component of SES associated with having the skills required to acquire, process, and understand health information and navigate health systems. Lack of these skills is associated with disempowerment and difficulty in understanding informational materials. Formal education may also enhance self-regulatory skills and promote a longer-term time perspective when evaluating health actions, which would provide a better basis to deal with the short-term barriers of screening to reap the longer-term health gains.

The influence of illness experiences

Socioeconomic disparities in beliefs about cancer and cancer screening may also stem from differences in personal and vicarious experience with illness and medical interventions. SES differentials in life expectancy and poor health are striking (2). In the cancer domain, there are SES
differences in stage at diagnosis (21, 156), survival, and quality of medical care, irrespective of insurance coverage (157). Both poor health and bad experiences with the medical system have also been associated with a decision not to participate in cancer screening (158, 159). To understand the role of illness experience in disparities in screening participation, we will present evidence demonstrating that illness experiences affect threat and efficacy perceptions about cancer screening.

Cancer fatalism. Many studies have shown that people from lower SES groups suffer a disproportionate share of the cancer burden. They are therefore more likely to experience cancer within their family (160), their local neighborhood, and their social network (161–163), which can itself fuel fatalistic views about cancer. Fatalistic beliefs such as “if someone gets cancer their time to die is near” (164, p. 388) have clear implications for the perceived value of tests designed to detect cancer early; it is understandable that being doubtful that anything can be done to change the course of cancer would make people less likely to participate in cancer screening (51). In one of the few large-scale studies of attitudes, Wardle et al. showed that lower SES was associated with stronger agreement with statements such as “it’s not worth having the test because ‘what will be will be’” (44, p. 252), and this factor partially mediated the association between SES and interest in colorectal cancer screening.

Fatalistic attitudes have been identified as a contributor to inequalities in cancer mortality by deterring people from going for screening or seeking help for suspicious symptoms (51, 165). This situation could create a vicious cycle, whereby cancer fatalism results from vicariously experiencing cancer diagnosed at an advanced stage when the prognosis is poor and is perpetuated by behaviors associated with a delayed diagnosis of cancer. This notion of a spiraling, self-fulfilling prophecy that cancer is always fatal (165, p.1223) has been noted previously, although direct evidence is limited. Qualitative studies support the idea that the differing personal experiences might explain SES differences in perceptions of the consequences of a cancer diagnosis. For example, among low-income women, those who did not adhere to mammography recommendations were more likely to have experienced the death of family and friends from breast cancer, and these experiences encouraged associations between cancer and death (166).

Lack of confidence in dealing with the medical system. SES differences in worry about attending cancer screening may also reflect previous experience with health care services. Individuals of lower SES tend to have more negative interactions and are less satisfied with medical professionals (167), report more distrust of the health care system (168), and are less confident in talking to physicians (169). A review addressing this issue concluded that “patients from lower social classes receive less positive socio-emotional utterances and a more directive and less participatory consulting style, characterized by significantly less information giving, less directions and less socio-emotional and partnership building utterances from their doctor” (170, p. 139).

A number of factors might explain these differences, including poorer health status and multiple comorbidities (2), lower health literacy, and greater social distance from health care providers (171–174). Lupton suggests that individuals of lower SES may be disempowered because “the world of the surgery is overwhelmingly formal and middle class, including the language, manner and accent of the doctor” (175, p. 118). Two studies found that mammography re-attendance was lower among women who experienced pain and were dissatisfied with their care during the screening examination (176, 177). Presumably, such experiences have a detrimental effect on the individual’s confidence to cope with the procedures in the future, but further research is needed to confirm this possibility.

Satisfaction and trust in health care provision and physicians are important in this context because they have been identified as influencing uptake of preventive health services (178–181). In the screening context, rates of participation are lower among those reporting less satisfaction, poorer communication, and more distrust of health care providers (159, 182–184). Recent evidence also indicates that lack of trust in health professionals partly mediates the association between income and screening uptake (185), which might be due to associations between use of health services in general (e.g., visiting a physician) and screening utilization (186). Reattendance for cancer screening is also dependent on prior experiences of screening (176, 177, 187).

Low perceived personal value of cancer screening. The perceived efficacy of screening in older adults is also likely to be determined by expectations about life expectancy and quality of life in old age, including the presence of other illnesses. Depending on the health condition, people from the most socioeconomically deprived backgrounds can expect to live years or even decades less than those who are the least deprived (4, 6). Socioeconomic deprivation is also associated with health limitations and functional decline occurring earlier in life and progressing more rapidly (188). These objective trends are reflected in self-rated life expectancy and judgments about the onset of old age (81, 189).

Subjective poor health partly accounts for the association between economic hardship and the number of years an individual expects to live (140). Poorer health and pessimistic expectations of future health also explain the “older identities” held by more disadvantaged groups (190). This lower subjective life expectancy has been proposed as a reason for steeper time discounting because a closer end-of-life horizon means that future benefits are less certain to be realized, reducing the extent to which these benefits are valued (151, 191). In terms of cancer screening, deteriorating or poor health has been identified as a reason for ceasing cancer screening (192). This finding suggests that SES differences in expectations of future health and life expectancy could make cancer screening appear less personally beneficial (44). There is circularity in the argument that poor health behavior reduces subjective life expectancy, which in turn leads to a shorter time perspective and less appreciation of the benefits of screening. Future research is needed to clarify cause and effect.

Summary of illness experiences. Ill health and premature death are more common in lower SES groups, leading people to experience a greater sense of fatalism about the consequences of being diagnosed with cancer. A lower life
expectancy or an older identity also reduces the expectation of living long enough to gain any benefit from cancer screening, while negative experiences with health care providers and the health system undermine efficacy beliefs and reduce the sense of involvement in decisions about health care.

EMERGING MEDIATIONAL RESEARCH

The proximal psychosocial determinants of preventive health behaviors have been extensively researched, but only a small number of studies have specifically examined whether they explain the SES gradient in cancer screening participation (8, 44, 193). Commenting on the dearth of evidence in this area, Leganger and Kraft note that “while it is assumed that social cognitive factors mediate the relationship between SES and health behavior, few studies have addressed this issue empirically” and “as far as the whole ‘causal’ chain from SES, social cognitive mediators and health behavior is concerned, this seems to have been the topic in only a very limited number of research articles” (95, p. 362).

The few studies that have examined pathways between SES and cancer screening provide some interesting insights. Stein et al. (193), for example, explored differentials in mammography use among women in an urban community in the United States, finding that perceived cost, pain, and embarrassment partly mediated associations between SES and mammography usage. Extending this work by differentiating between cost and psychological barriers, Lantz et al. (8) progressively controlled for these potential mediators in examining associations between SES and uptake of mammography and Papanicolaou tests. Financial barriers explained a portion of the association, but simulation exercises revealed that removing these barriers would have only a limited impact on coverage if beliefs about the unpleasantness, inconvenience, and inaccuracy of screening tests remained unchallenged. This finding is in line with results from the UK Flexible Sigmoidoscopy Trial (44), which found that the SES gradient in interest in participation was substantially mediated by the perceived benefits and barriers associated with screening, as well as fears and fatalistic beliefs about cancer.

These studies provide a starting point, but they are limited by their retrospective assessment of screening (8, 193) or hypothetical assessment of colorectal screening attendance (44). They are also limited in terms of the number and type of psychosocial determinants measured, which often place particular emphasis on self-efficacy and perceived threat and neglect response efficacy. Assessing so-called barriers to participation is a common approach in cancer screening research, but, as our framework suggests, there are other important factors to take into account in understanding the SES gradient. The construct of SES itself requires careful consideration based on its multifaceted nature. Previous research often used income and education variables as measures of SES (8, 193), but other indices are available and should be considered (e.g., material resources). Constructs such as subjective life expectancy have been acknowledged as potential mediators of the relation between SES and cancer screening (44) but have yet to be investigated in a priori experimental designs. The literature to date suffers from the absence of a coherent, integrated framework to guide research.

DISCUSSION

This review provides a framework of possible pathways through which the differing life experiences associated with SES might impact the psychosocial antecedents of cancer screening participation. We have drawn together disparate strands of research to suggest how stressors, resources, educational opportunities, and illness experiences can each contribute to beliefs about the threat of cancer screening procedures and outcomes, confidence in the ability to engage in screening, and the perceived value of screening. In broad terms, we propose that lower SES—across the entire spectrum—has consequences that make cancer screening seem more threatening, more difficult to accomplish, and less beneficial.

Limitations

This review was not intended to be conclusive or comprehensive, but to highlight some pathways that might generate new research into the determinants of SES inequalities in cancer screening behavior. As a result, we did not explore every possible linkage between our chosen SES corollaries and attitudinal constructs. Furthermore, because the emphasis was primarily on psychosocial and modifiable variables (which apply across different health systems), we did not focus on structural or practical barriers to screening (availability of services, financial resources), although we acknowledge that they are catastrophic deterrents when they are present. We chose to take an exploratory rather than a systematic approach to reviewing existing literature because of both the breadth of the research topic as a whole and the limited number of studies directly addressing mediation, but inevitably doing so excluded some studies that might have made a valuable contribution.

Future research and interventions

This framework provides one approach to moving the social inequalities field forward. The framework is deliberately painted in broad brush strokes, but the individual links can and should be verified; we anticipate further refinements as the framework evolves. Throughout this review, we stressed the lack of research specifically examining the extent to which lower SES affects screening participation through its impact on specific psychosocial variables. We aimed to suggest pathways that can be empirically tested, for example, through large-scale surveys that assess SES alongside relevant psychosocial variables and objective behavioral outcomes, or through intervention studies.

Our research group has recently begun to make use of existing data on attendance for flexible sigmoidoscopy, which includes measures of SES, consideration of future consequences, and perceived benefits and barriers. Path
equation modeling enabled us to test some of the linkages proposed in our framework, including the associations between 1) SES and consideration of future consequences, 2) consideration of future consequences and perceived benefits/barriers of cancer screening, and 3) perceived benefits/barriers and cancer screening uptake. We have adopted a similar approach in examining the mediating role of fatalism in predicting uptake of fecal occult blood testing. Future studies will be designed to take a more systematic approach to testing the elements of the framework. This work need not be limited to cancer screening but could be extended to other health-preventive behaviors such as adhering to recommendations on diet and activity (35).

Sorensen et al. have emphasized how “little work has been done to date to identify methods for redressing social disparities in risk reduction interventions” (194, p. 189). The detail offered in our framework, particularly with regard to psychosocial mediators, should offer health professionals ideas on how to develop specific interventions to reduce SES disparities. In addition, the framework specifies particular components of SES such as stressful life events or limited educational opportunities that could be targeted as part of upstream initiatives (e.g., reducing SES differences in educational opportunities throughout the life span) of the type advocated in Marmot’s recent strategic review of health inequalities (195).

CONCLUSIONS

This review provides a framework of processes linking aspects of life experience associated with SES such as life stress, social and human capital, and illness experience to the established psychosocial determinants of screening behaviors such as attitudes and self-efficacy. Specifically, we cited evidence to illustrate potentially important linkages among SES, the perceived feasibility of carrying out the test, the anticipated threat of an abnormal result, and the anticipated benefit of early detection. The review illustrated ways that these associations could be mapped, highlighted new areas for research, and targeted points for intervention strategies to tackle the social gradient in cancer screening uptake.

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