STRESS AND QUALITY OF LIFE IN AFRICAN AMERICAN CANCER SURVIVORS

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The quality of life (QOL) of cancer survivors must be investigated as we learn about the risks and protective factors associated with cancer survival. Little research has included African American cancer survivors, and this group could be more or less vulnerable to the added stress of cancer. By virtue of the greater stress burden imposed by minority status, lower socioeconomic status, and other social/cultural factors, African Americans may be at increased risk for poor QOL and poor health outcomes. Alternatively, they may be protected from some of these negative outcomes. We propose a model to better understand the unique sociocultural features that influence QOL for certain cancer sites where racial disparities are well established. A comprehensive knowledge of QOL among these survivors will guide future research and facilitate the development of interventions to improve QOL, possibly reducing observed health disparities. (*Ethn Dis*. 2006;16:732–738)

Key Words: African American, Ambient Stress, Cancer Survivors, Health Disparities, Quality of Life

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INTRODUCTION

Cancer survival and recurrence vary as a function of many treatment and patient-related factors.[1,2] Even when stage of disease and treatment variables are controlled, disparities in rates of survival across groups are evident; African Americans, particularly, have higher rates of morbidity and mortality.[3,4] These disparities are apparent in the incidence of colorectal, lung, and prostate cancer.[5–7] Genetic factors, stress burden, environmental and economic privation, limited access to health care, quality of care, and distrust of medical care may not only affect who survives but how survival is experienced. Many investigations have centered on these variables as determinants that influence overall quality of life (QOL),[8,9] a subjective, multidimensional construct used to represent nonmedical sequelae of disease-related events, reflecting a general sense of how one functions in different life domains.

The term ''cancer survivor'' is applied at the time of diagnosis and is retained after treatment. Approximately 10 million cancer survivors are living in the United States today; they are a growing subset of the general population.[10] Though QOL research among survivors is increasing, compelling theoretical accounts of the development and maintenance of well-being in the face of extreme threat or daily hassles have lagged behind.[11,12] Prior studies have neglected the role of stressors (eg, racism/discrimination) more frequently observed among minority group members in generating and/or exacerbating health problems. To date, only a few QOL studies have focused on African Americans.[13–19] While these studies have reliably shown health disparities to exist between African American and White cancer survivors, no identifiable conceptual framework guides these studies.

The current challenge to researchers is to develop a practical, economically feasible framework that will optimize QOL, and in turn, medical outcomes and survival, well after treatment has ended. If poor QOL increases the likelihood of cancer recurrence or death, followup and prevention strategies are needed and would require intensive efforts directed toward identifying high-risk subgroups among this population. To the extent that positive outcomes occur, antecedents of positive adjustment should be identified and built into programs designed to enhance adjustment and survival. Such programs may lead to dramatic cost savings if the identification of high-risk survivors results in preventive behaviors, improved access to early detection, and intervention. We propose a conceptual model describing cancer survival in the context of the stressors that characterize the lives of many minorities, which might be particularly relevant to those with a cancer diagnosis with dispropor-

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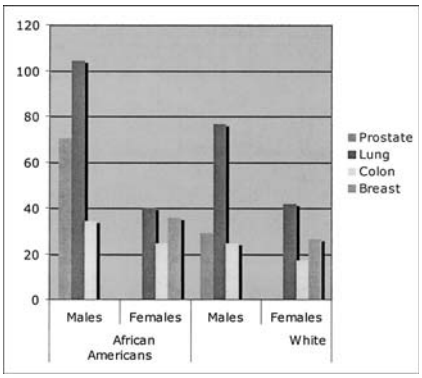

Fig 1. Cancer incidence among African Americans and Caucasians

tionately higher rates among African Americans (eg, see Figure 1). Stress, adaptation, coping, and the pathways by which negative and positive outcomes are generated are the central topic in this review.

DEVELOPING A MODEL OF STRESS AND CANCER SURVIVAL

The characteristics of stress experienced by cancer survivors are similar to those described in transactional models of stress pioneered by Lazarus[20] and Lazarus and Folkman.[21] These models rest on two basic relationships in the stress process. First, they assume that stressors must be appraised or interpreted as threatening, harmful, or as a loss in order to evoke stress responses. Second, coping, a product of cognitive evaluation of the situation and/or one's resources, is elicited to address the sources of stress or reduce its impact on well-being. Factors such as social support, perceived control, and religion probably influence both appraisal and coping, contributing to the extent of emotional distress and behavioral disruption that ensues. Elaboration of these relationships has extended stress responses and its consequences to biobehavioral processes that directly contribute to disease.[22]

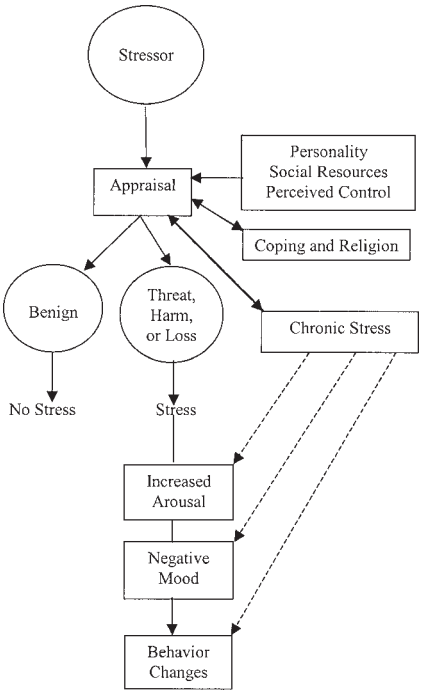

Fig 2. Stress and coping model with chronic stress moderating behavioral/ health outcomes

A more recent development is the notion that chronic stress or previous experience with stress can affect coping and consequences of current stressors.[23–24] For example, the notion that prior trauma may affect responses to subsequent traumatic events and that unresolved aspects of the impact of cancer affect appraisal of and coping with events in treatment or survival suggests that prior stressors affect response to new stressors.[24] Hence, stress burden is composed of the total of ongoing hassles and major and minor stressors, past stressors, and anticipated future stressors.

Figure 2 incorporates these adjustments necessitated by one's life and its demands, making up a background or ambient level of chronic stress upon which new stressors are superimposed. These background levels of stress may affect how new stressors are experienced. One can also think of ambient stress as chronic or cumulative stress burden if

Table 1. Domains of common background (ambient) stressors

1) Occupational factors
2) Environmental conditions (eg, safety, noise, crowding, pollution)
3) Family
4) Financial
5) Health

persistent stressors are "converted" to ambient status once their acute effects have run their course (Table 1). The context in which stress is experienced is affected by situational and personal attributes and their interaction. Cancer is a stressor that will undergo this process as well, and one's appraisal and adaptation to it should be influenced by this stress burden.

Incorporation of the ambient stress burden as a context for new stressors and response to them adds layers of complexity to models of stress and the quality of cancer survival. Life stressors affect the extent and duration of stress-related arousal and the plasticity of response.[25] Ambient stress may directly affect the amplitude and/or duration of acute stress responding by altering neural, hormonal, or other biological pathways that affect arousal. These effects could be due to appraisal-related changes, potentiation of responses at a constitutional level, and/or effects of coping. Greater ambient stress burdens may increase or decrease the extent to which new stressors seem threatening or how people evaluate available resources and thereby influence mood. Finally, ambient stress could influence coping options and the length of time one tries a coping solution before abandoning it to relieve distress. Such effects might translate into behavioral change, which may directly or indirectly influence health outcomes (see Fig 2).

In summary, we propose that ambient stress constitutes a context that affects how new stressors are responded to and how quickly adaptation is achieved. This source of stress could

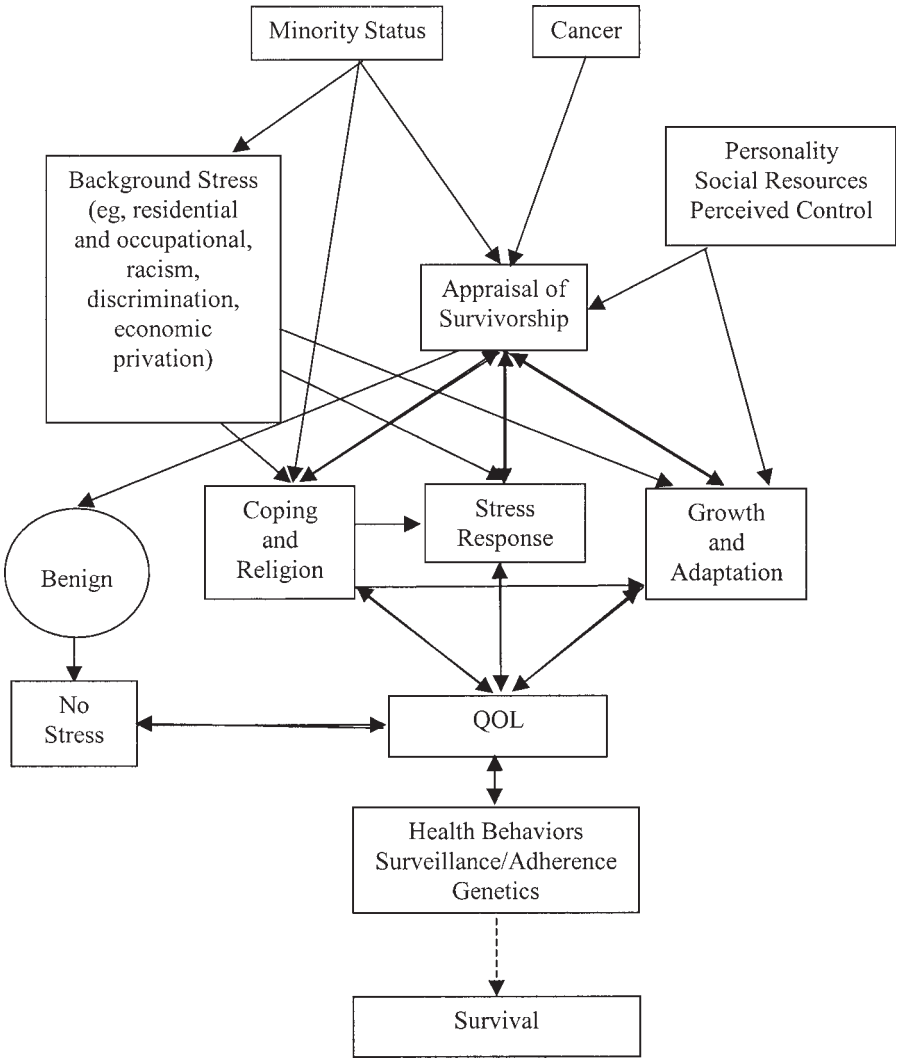

Fig 3. Stress and coping model with background stress as primary mediator of behavioral/QOL outcomes

affect cancer discovery or response to diagnostic-, treatment-, or survival-related stressors. The conceptual model argues that this stressful context is greater in African American cancer survivors compared to other populations in which discrimination, disadvantage, and/or exposure to violence are rare.

A MODEL OF ADJUSTMENT TO LONG-TERM CANCER SURVIVAL

Models that describe cancer survival and its relationship to well-being organize the different pathways and mechanisms that affect both length and quality of survival. The proposed model is not intended to be exhaustive, particularly at this stage of research on cancer survival. Rather, our goal is to organize available research and to advance knowledge and further theoretical development as we learn more about quality of cancer survival.

Cancer and Minority Status

The model (see Figure 3) starts with the assumptions laid out in Figure 2 and suggests that one's experience of stress consists of ambient stress and disease-related stressors. Cancer and minority status affect a range of variables and contribute to appraisal of specific stressors that accompany transition from healthy person to cancer patient and from cancer patient to cancer survivor. Threats associated with diagnosis and treatment gradually give way to more persistent fears about recurrence and the tasks of dealing with residual social issues, job discrimination, and other aspects of survival. These stressors become part of ambient or chronic stress burdens as they persist, albeit at less intense or intrusive levels. Whether the survivor experiences predominantly negative or positive mood will depend on an interaction of factors related to background and social resources.

Personality, Social Resources, Perceived Control

Minority status seems to be one of several variables influencing health. Social resources and dispositional variables (ie, perceived control) also moderate the extent to which chronic stress is experienced and affect QOL in several ways. Socioeconomic status (SES), access to health care, and emotional and cognitive factors affect how well survivors adjust to cancer and post-treatment stressors.[25] These factors affect physiologic systems, health behaviors, and surveillance for recurrent or new disease and contribute to QOL among African American cancer survivors.

BACKGROUND STRESS AND AFRICAN AMERICAN CANCER SURVIVORS

The extent to which the challenges, benefits, and consequences of cancer across minority groups vary is not known. However, considering that ambient stress makes the task of adaptation to cancer and survival easier or more difficult, one might expect differences

between minority and majority group cancer survivors. The possibility that African Americans bear greater levels of background stress is relevant. African Americans experience chronic stress associated with residential environments and lower SES, and are more likely to encounter racism, discrimination, and privation in their daily lives.[26–28] These experiences lead to other manifestations of prejudice that can erode self-confidence and limit a range of opportunities. The high rate of African Americans living in large cities also suggests greater exposure to ambient stressors such as noise and crowding.[29] A combination of discrimination and lower SES results in housing in areas where crime and other stressors are more likely, leaving people to cope with a potentially toxic stressful environment.[28–29]

Socioeconomic status (SES) appears to be a pervasive moderator of health and well-being.[30–31] In general, SES is positively related to health, with higher SES associated with better outcomes and less illness and death.[32] More minority citizens in the United States are in lower SES brackets. Half of African Americans are estimated to fall in the lower SES range, whereas 10% fall in the upper SES brackets.[33] Poverty among African Americans is ≈24% compared to 8% for White Americans.[34] Older African Americans are also disproportionately represented among the underinsured, affecting their access to healthcare services.[35]

Socioeconomic status (SES) is likely to contribute to ambient stress, and some of its effects appear to be at least partly due to the association between lower SES and stressful living conditions.[28] The literature is generally consistent with the idea that lower SES environments are more stressful or that lower SES people experience more stressors.[30–31] Negative mood may, in turn, affect health by way of biological pathways[18] or lead people to rely on health-impairing behaviors as a primary coping strategy.

COPING STRATEGIES, RELIGION AND SOCIAL SUPPORT IN CANCER SURVIVORS

Coping is defined as any attempt to regulate external or internal demands that have been appraised as stressful or that relieve or reduce their impact on distress. How people cope with the sequelae of cancer is important in understanding adjustment in patients and survivors. For example, as distress and perceived threat intensified after cancer diagnoses, younger, less optimistic patients used more cognitive avoidance coping and exhibited more distress before diagnosis.[24] Those who do not effectively cope with negative stressors may have an increased risk for developing mental health problems,[28] poorer health, and increased recurrence and/or mortality rates related to cancer.

Evidence suggests that religion buffers the negative effects of physical illness.[36–37] Levin and Schiller[37] reported associations between religious/spiritual variables and lower mortality among cancer patients. Likewise, many studies examining coping styles among African Americans have identified the high use of prayer, avoidance, and active problem-solving to cope with problems and demands of daily living, discrimination, and other stressors.[38–39]

Several possible mechanisms may help explain the association between religion and health. One possibility is that religion may provide a sense of control during stressful situations, particularly for those in lower SES strata. For people who believe that events or outcomes are the result of chance or under the control of powerful others, religion may be a way for them to gain ''vicarious'' control.[40–41] African Americans generally tend to be more traditional in their religious beliefs, attend church services more frequently, and engage in private prayer more often than their White counterparts.[42]

This emotional and tangible social support has been linked to better physical and psychological health.[28] The importance of belonging to a support system derives from its ability to promote emotional well-being by instilling the feeling that one is cared for and valued by others.[43] Some suggest that social support directly influences psychological status while having a moderating effect on health and disease mortality.[21] Although its mechanisms are not well understood, social support appears to enhance one's appraisals of stressors or capacity to cope with stress.

Theoretically, as long as unresolved threat or harms are appraised as serious or beyond one's ability to cope with them, stress will persist. Arousal of the sympathetic nervous system, cardiovascular, endocrine, and other bodily changes, withdrawal and other aspects of stress response will persist as well.[44] Intense or prolonged stress responses, in turn, could result in clinical syndromes of depression or anxiety, isolation, and maladaptive health behaviors.[45–46] To the extent some experience distress from surviving cancer, these outcomes are likely. Alternatively, if overall and cancer-specific stress is reduced and adaptation is successful, these outcomes are less likely.

Appraisal

Dealing with background stressors and cognitive adjustments under these continuing conditions could lead to less attention to appraisals or coping with new stressors or more focused attention on one stressor and little for other sources of threat. Narrowed attention could result in cognitive processing characterized by making decisions quickly on the basis of relatively little information. Background stress, in turn, could produce more or less effective approaches or inappropriately rigid coping where the same strategies are tried in all or most settings. It may also produce less informed decisions or

quick dismissal of relevant but complex information. At the same time, the wear and tear and costs of coping, even when coping is effective, could affect the vigor or persistence of coping strategies.[47]

Stress Response

The model also assumes that chronic stress burden may influence biological pathways underlying health and well-being. This approach is based on theory proposed by Anderson, McNeilley, and Myers,[48] which postulates that poorer cardiovascular health and greater stress reactivity found in African Americans was related to the experience of environment-related stress. Psychological factors interacted with environmental stressors to increase sympathetic nervous system activity, resulting in increased sodium retention. This retention over time was thought to increase blood volume and vasoconstriction, causing high blood pressure and other cardiovascular complications.

Similarly, mortality rates in African Americans for most cancers continue to be higher than those for Whites, especially in inner cities.[49] Unlike what has been reported in the cardiovascular literature, no well-defined physiologic mechanism exists that might contribute to poorer health outcomes. Stress-related changes in immune function may mediate associations between stressors and cancer.[50] Byrnes and colleagues[50] found that pessimism, not stressful life events, was associated with lower immune status of natural killer cell (NKC) activity in African American women co-infected with HIV type 1 and human papillomavirus, the latter representing a vulnerability to cervical cancer. These findings are particularly notable in that stress is believed to suppress NKC activity.[23] Currently, we cannot identify NKC activity as the key biological contributor to health disparities among African American and White cancer survivors. However, we would argue it warrants further scrutiny in future studies in cancer populations.

QUALITY OF LIFE

Alternatively, aspects of cancer survival (eg, treatment sequelae, fear of disease recurrence, etc) may not be perceived as threats but may be most prominent as an instance of having "beaten" something. This battle for one's life, which assumes additional meaning against the backdrop of stress, turmoil, and constrained coping, may characterize survivors' daily lives. Long-term benefits, such as a reorganization of priorities that lead to a greater appreciation of life, may have ramifications for cancer survivors. In this context, adaptation to the stressors associated with survival may proceed more rapidly because of this sense of efficacy regarding their disease and because coping associated with minority status may help survivors put their experiences in a more manageable perspective. Higher levels of background stress may reduce distress associated with cancer-related stressors. If this occurs, one should expect growth, positive mood, and less stress among minority or lower SES cancer survivors than among White cancer survivors or upper SES survivors.

HEALTH BEHAVIORS, SURVEILLANCE/ ADHERENCE, AND GENETICS

While its pathways are still not entirely understood, data suggest that low SES is related to health-impairing behaviors and poor access to health care.[30] Nutrition may be poorer in lower SES groups, which is associated with longer hospital stays, increased risk of complications and death, and higher healthcare costs.[51] Other behaviors (eg, patterns of tobacco/alcohol use and exercise) are believed to vary with SES and with minority status.[52,53] To the extent that lower SES people live in dense urban settings characterized by crowding, noise, and pollution, these stressors may interact with behaviors (eg, smoking) to lead to more serious consequences.

When minority status is statistically controlled, SES continues to influence recurrence and exerts influences independent of minority status. Cella and colleagues[54] found that income and education were inversely associated with survival. Further, surveillance suffered from constrained access to health care associated with low SES and minority populations, which may have caused delays in detection of new or recurrent disease. This is problematic when early detection and treatment are associated with improved treatment outcome. Further complicating accurate identification of individuals at high risk for disease recurrence or poorer prognosis is the genetic predisposition that might account for some of the observed health disparities.[55] The proposed model does not minimize the genetic contribution to overall well-being but instead, suggests that psychosocial and genetic factors jointly influence QOL and medical outcomes.

FUTURE DIRECTIONS

Our model postulates that the understudied construct of ambient stress may play a pivotal role in influencing several mediating and moderating factors (eg, coping, appraisal, and health behaviors) and might explain a large proportion of the poorer health outcomes among African American cancer survivors. Its strength resides in its incorporation of other sources of stress that confront survivors in their daily lives and treat them as risk or protective factors for other outcomes. Some of these stressors are pervasive across different demographic strata, but many appear to be more strongly linked with minority status and SES. Having lived one's life under stress may provide a testing ground out of which the most effective coping styles are identified.

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The role of religion and spirituality in coping with these stressors appears to be important in this regard.

Arguably, the model needs to be tested in the context of large epidemiologic studies that acknowledge that biological factors alone cannot account for the racial disparities in cancer morbidity and mortality. The absence of racial disparities for certain cancers (eg, lymphoma and leukemia) offers support for our model in that such forms of cancer lack a well-established behavioral component compared to those sites where African Americans bear a poorer health outcome (eg, lung, oral, colorectal, and prostate).[12] Recent studies bolster this argument in that African American women have a lower overall incidence of breast cancer but a higher mortality rate than White women.[17]

While this model offers an innovative examination of how stress and coping may influence health outcomes, we acknowledge a few limitations that should be highlighted. First, our model is predicated upon the premise that when cancer is viewed as a stressor, the subsequent distress will be equal for everyone. However, because of the heterogeneous nature of cancer and its moderating factors (eg, stage of disease, cancer site, prognosis, available treatment options, etc), the distress experienced is likely to vary considerably.

Second, the model does not appear to fully account for all aspects related to coping. African American cancer survivors might cope with ambient stressors quite differently than with specific disease-related factors. Further, ambient stressors represent a collection of minor stressors with which one is coping. Hence, cancer may present as a stressor that overwhelms the survivor and exceeds his/her ability to cope.

Third, the model might only be relevant to those with a cancer diagnosis with disproportionately higher rates among African Americans. Indeed, systematic comparisons of QOL among African American and White cancer survivors are needed to better understand the structure of QOL in these groups and will allow identification of the primary determinants of well-being among African American and White cancer survivors.

Future research studies should include healthy African American and White controls to help gauge the additional stress burden of a cancer diagnosis and how a greater ambient stress context will influence how this stressor is experienced. Such studies would help develop interventions designed to address risk factors and improve well-being. Programs such as the ''Patient Navigator'' represent innovative interventions whose premise overlaps with parts of our model (eg, ''Health Behaviors'') by serving as guides for under-served patients to help them overcome the complexities of the healthcare system.[56] We intend to develop comparable interventions and to extend this program to include mechanisms from the proposed model.

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