



Editorial on “Optimism and cause-specific mortality: a prospective cohort study”

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The research interest in the effect of psychological factors such as optimism on physical health has increased substantially over the past decades. Studies based on cross-sectional or longitudinal data have demonstrated that optimism not only has an impact on general well-being and mental health, but also is associated with physical health. A meta-analysis published in 2009 summarized results from 83 studies investigating the effect of dispositional optimism on physical outcomes. This review showed that optimism was a significant predictor of positive physical health outcomes, including lower incidence of metabolic syndrome, reduced level of painfulness, better physical functioning, reduced risk of diseases, and reduced rate of death (1).

Recently, an original research paper by Kim and colleagues (2) has been published in the *American Journal of Epidemiology*, which adds to the evidence on this topic by utilizing the prospective data from the Nurses' Health Study with a large sample on women (N=70,021). Kim and colleagues evaluated the association between optimism measured by using the Life Orientation Test-Revised scale at baseline in 2004 and cause-specific mortality assessed from 2006 to 2012. They observed a strong and significant association between higher level of optimism at baseline and lower risks of all-cause mortality (29% reduction in models with adjustment for sociodemographic confounders). Such a relationship was also found in cause-specific mortality including cancer, heart disease, stroke, respiratory disease, and infection. They also found that the association attenuated (9% reduction in risk for all-cause mortality) but

remained significant after additional control for depression, certain healthier behaviors, and health conditions.

The study by Kim and colleagues has several major strengths. It generated new knowledge in this field by examining a broader range of causes of death among a large sample of women. It not only focused on chronic-disease related deaths which were the major target of previous research, but also on deaths related to respiratory disease and infectious disease that were rarely investigated. In addition, most of the previous studies explored the effect of optimism on mortality among study populations with existing diseases, while Kim and colleagues excluded the diseased population at baseline and those who died within the first two years of follow up. They analyzed the effect of optimism on mortality among generally healthy women. Moreover, they controlled for a large number of confounding factors (demographic characteristics and depression) and intermediate factors (health condition and healthier behaviors) in their models. All of these approaches reduce the possibility of reverse causality or alternative explanations between optimism and mortality, making the evidence more robust.

This large study with relatively robust analyses also raises several noteworthy issues warranting discussion. First of all, the study sample, albeit a large one, was based almost entirely (97%) on white women in the United States. Thus, generalizability of the findings may be limited. Although such a limitation was acknowledged by the authors, the following statement “there is no clear basis for believing that

the effects of optimism on health differ by sex or race (page 7)” is not supported by the literature. Evidence have shown that optimism and pessimism are influenced by gender (3), the genomic element (4), race (5), the socio-economic status of the family in childhood (6), religious belief (7), etc. These studies raise the question of whether such an association identified in a white female sample could also be found in other populations who have distinct genetic elements and grow up in different cultures and environments. Future studies should extend to male population and people from other regions of the world.

Second, the concept of dispositional optimism was regarded as a single bipolar trait with optimism and pessimism at the two ends which followed the concept initially proposed by Scheier and Carver (8). Although most previous studies analyzed optimism in this fashion, a number of researchers have argued that optimism and pessimism could be two separate constructs and may affect health outcomes differently (9,10). The Life Orientation Test-Revised scale used in the present study has both positively framed statement (e.g., “In uncertain times, I usually expect the best”) and negatively framed statement (e.g., “If something can go wrong for me, it will”) (11). The responses to the two sets of statements generally form two factors and allow the separate measurements of optimism and pessimism (9,12). Some studies have attempted to treat optimism as two dimensions separately, but the results are still controversial (1,13). Therefore, further analyses by regarding optimism and pessimism as two separate constructs may shed new insights on this issue.

Third, mechanisms underlying the relationship between optimism and physical health—a topic beyond the scope of the present study—remain unclear. One explanation is that optimists and pessimists cope differently with problems and have distinct health behaviors. Studies have found that optimism is positively associated with health-promoting behaviors, such as doing regular exercise, engaging actively in social connections, taking vitamins, and eating more fruits and vegetables (13–17). The study by Kim *et al.* (2) found that these intermediate factors could partially but not completely explain the association. Another possibility, as discussed by Kim and his colleagues, is that optimism may boost the immune response system and thus prevent or slow down the development of the diseases. Clearly, more studies exploring the bio-behavioral mechanisms underlying the effects of optimism on health are needed.

What are the implications of the study for researchers, psychologists and clinicians? Considering the beneficial

effects of optimism on physical health and longevity, improving health outcomes through optimism interventions seems promising. A few studies suggest that the level of optimism is able to be manipulated, at least for a short time, in experimental settings (18). For example, researchers found that engaging in positive future imagery such as writing about or imagining a “Best Possible Self”, could immediately boost the level of optimism and such effect remains over the two weeks of the intervention (19). There are also a few studies investigating the physical benefits from psychological interventions among patients with existing diseases (20). However, much more work in particular how to design interventions to increase optimism to improve physical health is needed as well as randomized controlled trials to evaluate innovative interventions.

The study by Kim and colleagues enriches our understanding on the effect of optimism on all-cause and cause-specific mortality and reminds us the outstanding gaps of knowledge in this field. Despite recent advances, questions on bipolar or unipolar construct of optimism, underlying mechanisms on the effect and generalizability of the effect of optimism on mortality in other under-investigated populations remain unanswered. We also call out for more interventional studies to explore how this significant association between optimism and mortality could be applied in the real world, both clinical and non-clinical settings, to improve people’s health.

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