

ADVERSE CHILDHOOD EXPERIENCES AND CHRONIC DISEASES AMONG ADULTS

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Abstract:

Adverse experiences during childhood have a profound effect on adult health. Worldwide, there is growing interest in understanding the influence of early adversity on development of physical and mental disorders across the life course. For the past 15 years this has been a particular focus of researchers at the US Centers for Disease Control and Prevention and recently the World Health Organization. The “Adverse Childhood Experiences” (ACE) study demonstrated clear and possibly causal associations between multiple adversities (such as childhood exposure to domestic violence, family disharmony, sexual abuse, physical maltreatment, bullying and witnessing community violence) and the onset of chronic diseases in adults. This includes respiratory, cardiovascular, autoimmune, endocrine and psychiatric disorders. There are several reasons why this occurs: early life stress increases the risk of unhealthy behaviours; it may cause permanent changes in neuroendocrine regulation; certainly, early adversity lower educational achievement and interpersonal skills, and these in turn limit socio-economic advancement for individuals and their families.

Until recently, most of the evidence has been gathered in economically developed countries. In this paper we discuss the main concepts and review trends in research in Asian countries. In general, the findings are consistent with those worldwide. In Viet Nam, there is a need for further in-depth study to inform policy and community-based programs to minimise the exposure of children to harmful life events.

INTRODUCTION

A fundamental truth in health science is that most common diseases have complex causes. These ‘risk factors’ include genetic predisposition, programmed cell death, exposure to toxins through the environment and unhealthy behaviour, and accumulated psychological stresses that impair the body’s immunological and physiological protective mechanisms. Determinants of health can be placed in a spectrum from proximal events (those that occur near the time the disease develops) to more distant social, biological and environmental conditions that precede the onset of disease by years or decades. Stated

most simply, what happens to the health of people as they get older is determined by the course of their lives.

Not long ago, research into the health consequences of early life experience was considered to be on the margins of serious health science. When the first studies uncovered correlations between childhood adverse events and adult chronic disease, they were thought to be interesting but lacked explanatory power and had little relevance to mainstream health services and disease prevention programs. However, these attitudes are changing. Working closely together, researchers in biomedicine, public health and

social sciences are now convincingly showing the impact that experiences in childhood have upon the onset of chronic physical and mental diseases among adults.

This is now part of mainstream medical science. Important reviews have been published in *The Lancet* (Gilbert et al, 2009), the *Journal of the American Medical Association* (Shonkoff et al, 2009), the *American Journal of Preventive Medicine* (Anda et al, 2010) and other leading journals.

The most comprehensive and sustained research effort into Adverse Childhood Experiences (ACEs) and adult health and well-being has been conducted by the US Centers for Disease Control and Prevention (see www.cdc.gov/ace/index.htm and Anda et al, 2010). The ACE study has been productive in many ways. The linkages between adversity and health have been shown to extend across a wide variety of life-threatening and disabling conditions in adulthood, such as Ischaemic Heart Disease, Chronic Obstructive Pulmonary Disease, Lung Cancer, Liver Disease, Autoimmune Disease, Depression, Alcohol Dependence, self-harm and morbid obesity. The program of research has also shown some of the pathways that link life events to disease, including elevated rates of ACE and inability to quit smoking tobacco and excessive alcohol use, and to low levels of physical activity.

The ACE study has also made gains in identifying which types of adversity are the most important to measure. Recognising that the negative things that happen in childhood range from very serious to mildly unpleasant, the ACE study does not try to measure everything. Rather, it focuses on factors that show robust and strong linkages to ill health. These include childhood abuse (emotional, physical, and sexual), parental neglect, witnessing domestic or community violence, and living with substance abusing,

mentally ill, or criminal household members. For researchers and clinicians interested in this field, the ACE study has succeeded in reducing measurement of the complexity of adverse early experiences into a fairly brief checklist, for which adults are asked to reflect on particular experiences in their childhood. The core ACE tool produces a score that is a simple count of the total number of adverse experiences and is called the ACE score.

Strength of the association between ACEs and common adult chronic diseases

In this brief paper we provide some examples of research showing the strength of the links with common, chronic diseases in adults. Interested readers should consult the ACE study website (shown above) for the accumulated evidence, and see the *Lancet* review by Gilbert et al., (2009).

Ischemic Heart Disease: Dong et al, (2004) found a dose-response relationship between ACEs and the risk of IHD. Nine out of 10 categories of adverse experience significantly increased the risk of IHD by 1.3- to 1.7-fold, compared to people with no ACEs. Among the minority of people with seven or more ACEs, the odds ratio was 3.6 (95% CI, 2.4 to 5.3), indicating a clinically meaningful increase in IHD risk as a function of early life adversity.

Chronic Obstructive Pulmonary Disease (COPD): ACE scores have a graded relationship to risk of occurrence of COPD. Compared to people with an ACE score of 0, those with five or more experiences have 2.6 times the risk of developing COPD and 2.0 times the risk of hospitalizations for this disease (Anda et al, 2008). There is a strong indication that, as the ACE score increases, the average age of hospitalisation for COPD is younger. In part, the association is mediated by links between ACEs and smoking, but

not all of the risk is explained that behaviour (Anda et al, 2008).

ACE and Lung Cancer: Compared to people who report little or no adversity, people with six or more ACEs have a three-fold increase in risk for lung cancer. In a study by Brown et al (2010), this was evident when ACE self-reports were linked with hospital records and death registers. Similar to COPD, as the ACE score increased, the average age at hospitalization for lung cancer decreased. The size of the effect is very significant from a clinical point of view: people with six or more ACEs were hospitalised on average 13 years earlier than were people with lung cancer who had no ACEs (Brown et al, 2010)

Mental Disorders: Chapman et al (2004) reported a strong, dose-response relationship between ACEs the risk of severe depression. Many other studies have shown ACEs to increase the risk of development of alcohol dependence and other drug abuse disorders, chronic pain syndromes unrelated to observable pathology, and the likelihood of self-harm and suicidal thinking and behaviour.

Potential years of life lost due to ACEs: Brown et al (2009) carried out a remarkable longitudinal study in the USA. More than 17,000 adults were interviewed in 1996-97, during which they reported their experience of early adversities. These people were followed up 9 to 10 years later through search of death records. Of the initial sample, 1,539 had died. People with six or more ACEs died *nearly 20 years earlier* on average than those with no ACEs (60.6 years compared to 79.1 years). The magnitude of that effect is extraordinary and demands closer analysis in further research. Brown et al (2009) found that some of the effect, but certainly not all, was mediated by an effect of ACEs on health-risk behaviours and low socio-economic position.

Putting adverse events in context

Taken together, this and other research

into ACEs makes you stop and think about how such strong and clinically significant associations can best be explained. Surely, not all stress is bad. Surely, some adversity in early life is beneficial in making stronger, more resilient adolescents and adults. After all, stress is a part of everyday human life. How then, can these ideas sit alongside the emerging findings about ACEs and disease?

Research in health psychology supports both points of view. Not all stress has negative effects. However, the type, intensity and duration of adversity determine its effects on development of chronic disease. The US National Scientific Council on the Developing Child has identified three major categories of stressful experience (Middlebrooks and Audage, 2008)

1. Positive stress: This arises from adverse experiences that are short-lived in duration. It causes minor physiological changes such as increased heart rate or elevation of levels of stress hormones. Mild stressors include vaccination or minor medical procedures, going to a new school, loss of a pet or toys and so on. Most children learn to manage and overcome such positive stress; indeed, coping with such stress is an important part of the development process of the child.

2. Tolerable stress: Tolerable stress occurs when a child has experiences that are more intense and sometimes severe but, generally, occur over a short period of time. Examples include death or injury of a family member, living through an accident or natural disaster, and random acts of interpersonal violence. With proper caring and support the child can overcome tolerable stress. According to Middlebrooks and Audage (2008), children who overcome tolerable stress can become stronger as a result. However, if children in such circumstances do not receive adequate care and support, tolerable stress can become "toxic" (that is, damaging to brain and body

development) and lead to long term negative health effects.

3. Toxic stress: Toxic stress occurs as a result of adversity that is severe and sustained over long periods of time. Examples include serious physical and emotional abuse, sexual abuse, chronic physical and emotional neglect by parents or other care-givers, and exposure to prolonged periods of interpersonal violence, war or breakdown in community safety. Children often lack the ability to cope with this type of stress by themselves. Care and support for those who suffer such trauma can be effective in limiting harm to health and well-being, but in many cases, this care is either not available, or not appropriate to the needs of the child.

Research into childhood adversity in East Asian countries, including Viet Nam

The evidence from English-speaking and economically developed countries has had far-reaching effects, not just upon health sciences but in relation to public policy and disease prevention programs. This includes multi-level programs to protect children in their early years through prevention of severe physical discipline, bullying and sexual abuse and support for parents and teachers to adopt positive ways to nurture children. Much is also being done in East Asian countries, although the local evidence that is fundamental to design of culturally appropriate programs is relatively lacking.

In-depth research in this region first emerged in Hong Kong (Lau et al, 2003; Tang 2002, 2006). However, the past five to seven years have seen substantial gains in knowledge from studies in mainland China, particularly regarding physical and sexual abuse of children (Chen et al, 2004, 2006; Chen et al, 2010; Luo et al, 2010; Leung et al, 2009;) and several studies are currently being done in Thailand and The Philippines. In Viet Nam, Nguyen et al (2010) reported

the first Asian study of the effects of multiple childhood adversities of adolescent mental health. Choo et al (2011) conducted the first Malaysian study of multiple childhood victimisation experiences of adolescents. In Viet Nam more recently, the nationwide SAVY2 survey (2010) and surveys in Ho Chi Minh City (Masters thesis by XL Kim, 2011) and Long An (TT Thai et al, 2012, manuscript in preparation) have examined a variety of ACEs, the predisposing social and family factors and the relationship of adversity to health risk behaviours and poor mental health.

Each of those sources can be consulted for detailed analysis. The more recent ones will be published soon. Here we outline several trends. First, it is abundantly clear that most ACEs are common in Asian societies. In general, it seems that physical maltreatment occurs at higher rates than are found in Europe and North America, while child sexual abuse occurs less frequently. Children in East Asia are exposed to domestic violence and bullying at comparable levels, while in general, Asian children report lower rates of parental substance abuse and mental illness and less exposure to community violence.

A second, strong conclusion is that in East Asia, the linear, dose-response relationships between multiple adversity and poor mental health and health risk behaviours such as depression, anxiety and drug use are exactly the same as found in other countries. Although the particular types of adversity vary between cultures, that variation is not, by itself, important. The nature of the individual acts (possibly with the exception of severe child sexual abuse) does not determine poor health. What matters is that the effects of multiple adversities accumulate to damage health and well-being, and this seems to be invariant across all cultures.

A third outcome of the recent work in East Asia is practical. The researchers have

demonstrated the feasibility of surveys with young people about traditionally sensitive personal matters, when this is done in ethical and methodologically appropriate ways. There has been a lot of interest by young people in the opportunity to answer questions about their health, well-being and life experiences.

Future directions in ACE research in Viet Nam

The World Health Organization has recently completed a substantial task that should help to foster research into ACEs and health in developing and linguistically diverse countries. The starting point was to recognise that the core ACE tool applied so successfully in the USA and some similar countries had limited utility in different cultures, particularly those affected by poverty and the stresses of economic development. The Violence Prevention Division of the WHO coordinated an international team of researchers in seven low and middle income countries to rigorously

adapt, translate and field test a modified ACE tool. Outcomes of this work, including evidence from Viet Nam, were published on the WHO website early in 2012 http://www.who.int/violence_injury_prevention/violence/activities/adverse_childhood_experiences/en/index.html.

The intention is to technically enhance the quality of research in many countries and in particular, to enable the eventual collection of comparable international data that should improve knowledge of these phenomena worldwide. The *Hue University Centre for Community Health Research* is involved in this effort. During 2011-2013, the Centre is working with researchers in several sites in Vietnam to undertake ACE studies with young adults and adolescents. In the near future, it may be feasible to adapt the approach to research with older adults who have experienced the onset of chronic diseases, and thereby produce evidence that is needed to inform the health sector and policy-makers.

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