

Role of biopsychosocial factors in health and illness



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A person's health cannot solely be viewed from a biological perspective: psychological, social, and contributing environmental factors also affect a person's life (Bernard & Krupat, 1994). The premise that these subsystems are layered within each other and inextricably connected has resulted in a new way to look at health and illness. Health is traditionally equated to the absence of disease. It is a biomedical model based exclusively upon biological factors. Its primary advantages are that it provides an effective means for diagnosing and treating disease; its disadvantages are that psychological effects are not taken into account, hence resulting in a reactive, versus proactive, model.

George Engel was one of the pioneers in the development of the biopsychosocial model (Dowling, 2005, p. 2039). He opined that the dominant model of disease today is biomedical, and it leaves no room within its framework for the social, psychological, and behavioral dimensions of illness. A biopsychosocial model is proposed that provides a blueprint for research, a framework for teaching, and a design for action in the real world of health care. (Engel, 1977, p. 129).

This biopsychosocial model allows physicians to explain diagnostic conditions, such as depression for example, by examining all of the relevant contributing biological, psychological, and social factors. Concerning depression specifically, classic clinical medicine often finds that individuals have endocrine, immune or neurotransmitter malfunctions. Research suggests that there may be a genetic component (Manke & Plomin, 1997, pp. 129-135): depression can cross generations (Nemade & Dombeck, 2007).

Research suggests that many mental disorders arise in part from defects not in single genes, but in multiple genes (Rutter & Plomin, 1997, pp. 209-218; National Institute for Mental Health, 1998). Psychological factors include coping skills deficits, judgment problems and impaired emotional intelligence (Nemade & Dombeck, 2007). There may be mutual dependency between biology and psychology: biologically based personality characteristics may influence depressive symptoms (Nemade & Dombeck, 2007). Research has further shown that social stressors may act as triggers, causing changes in brain functioning, and hence depressive symptoms (Nemade & Dombeck, 2007). Social factors are variables that modify the expression and outcome of disorders. However, one single factor in isolation may not be significant, depending on the behavioral trait or mental disorder; that is, the relative importance or role of any one factor in causation often varies.

Three factor must be differentiated: correlation, causation, and consequences. These terms are often confused. A biological change in the brain, such as a lesion, is considered to be the “ cause” of a mental disorder, based on finding an association between the lesion and a mental disorder (Alonso, 2002 p. 241). No simple association, or correlation, equates to causation. The lesion could be a cause of, or an effect of the mental disorder (National Institute for Mental Health, 1998). If a correlational study is conducted, and it shows that a stressful event is associated with an increased probability for depression, and that the stress usually precedes the onset of depression, then this stress is labeled a “ risk factor” for depression. Risk factors are variables that increase the probability for developing a disorder and precede its onset (Werner & Smith, 1992, p. 196). For each

mental disorder, there are likely to be multiple risk factors (Trejo et al., 1994, pp. 63-69). Some risk factors may be more important than others, and the interaction of risk factors may be additive or synergistic (MacMahon & Lip, 2002, pp. 510-515). Progress in understanding depression offers examples of how findings from different disciplines may have a common basis (Andreason, 1997, pp. 27-33).

Over the last 25 years, much research has resulted from this concept of biopsychosocial development. From August 1997 to August 1999, a survey of United States of America medical schools concerning the incorporation of biopsychosocial medicine topics into medical school curriculum was conducted. The perceived importance and success of this curriculum, barriers to teaching these topics, and curricular needs were also assessed. Information received from 54 out of 118 contacted medical schools, with biopsychosocial topics comprising 10% of the sample. They found that faculty resistance was substantial (Waldstein et al., 2001, pp. 335-343).

A five-year study was conducted in Finland of 382 75 year-old persons on two dimensions: how the self-rated their health and how they self-assessed changes to their health. At the end of five years, 20% reported perceived health deterioration, while 20% reported perceived improvement. A conclusion of this study was the physical activity is an important factor (Leinonen et al., 2001, pp. 1329-1340).

In 2002, Alonso conducted a study amongst clinicians who practice biopsychosocial techniques. He found that in a review of published papers, 65. 5% did not describe a " healthy status;" instead they inferred so by

excluding negative variables (Alonso, 2002, p. 240). He noted that although contemporary medicine is now taking a more holistic approach, it competes unfavorably with the former biomedical model which is still prevalent among practitioners.

In 2003, Vitulano reviewed chronic health conditions in childhood and concluded that children with these problems have a three to four times greater risk of psychiatric problems, as compared with those that did not, and suggested that the biomedical model be expanded to include the “dimensions of adjustment, socioeconomic status, visibility of condition, social support, and family functioning” (Vitulano, 2003, p. 398).

Also in 2003, Inui posited that successful aging includes the ability to function adequately in changing conditions. He emphasized persons take responsibility for their life styles, along with clinicians’ holistic, rather than reductionistic approaches to health (Inui, 2003, pp. 391-394).

Covic, Spencer and Hall conducted study on 157 rheumatoid arthritis patients to determine depression and pain could be predicted. They found that feelings of helplessness and passive coping were significant mediators between physical disability and future depression and pain. They concluded that the patient’s perceived mental state affected levels of pain and depression (Covic et al., 2003, pp. 1287-1294). In another 2003 study, correlation was shown between neuroendocrine functioning and age-related alterations to the immune system. Effects of aging include

decreased signaling and regulatory abilities of T cells, decreased lymphocyte response to mitogens and cytokines, and dysregulation of B cells, resulting in

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elevated levels of auto-antibodies and diminished production of antibodies to exogenous antigen (Lutgendorf & Costanzo, 2003, p. 227).

Suggested is that variability in immune alterations may be attributed to psychological factors; Repetitive patterns of short-term negative emotions also are thought to constitute chronic stressors (Lutgendorf & Costanzo, 2003, p. 228). The study suggests that behavioral interventions may enhance elderly immune response (Lutgendorf & Costanzo, 2003, p. 230).

In 2005, Uchino investigated social support in terms of health outcomes. His findings concluded that social support is negatively associated with cardiovascular death (Uchino, 2005, pp. 297-298).

A 2006 study concerning chronic unipolar depression concluded that biogenetic, psychological, somatic, and societal conditions must be assessed in a coherent model for the best outcome for the patient (Schotte et al., 2006, pp. 312-324).

Weiner reported that

the biopsychosocial model has afforded similar advances by placing the disease back into the patient and emphasizing illness experienced within the patient's unique biologic, psychological, social, and economic milieu. Thus, the strength of the model is its service as a clear reminder that clinical decisions about how to manage a patient with persistent low back pain living in difficult social conditions are more complex than those for patients who are not (Weiner, 2008, p. 219).

He concluded that the biopsychosocial model is readily adaptable to all aspects of spine care with positive implications (Weiner, 2008, p. 232).

In another 2008 study, case reporting revealed that psychologic stress is associated with slower or delayed wound healing in older adults. It posited that there are linkage between psychological and social factors concerning recover from soft tissue injuries, with identifiable biochemical and physiological processes mediating this relationship, and suggested that more emphasis be placed upon psychological and social factors in managing chronicity and pain (Finestone, 2008, pp. 767-775).

A review of research during the last 25 years indicates that genetic factor play a crucial role in the onset and maintenance of chronic pain; imbalances between neurotransmitters and neuromodulators contribute to this chronic pain state; neurons are dynamic and subject to constant modification contingent upon incoming signals; and chronic pain is phasic, contingent upon the psychological status of and societal pressures exerted upon the patient (Gatchel et al., 2007, pp. 596-597). Occupational disabilities models in the United States are incorporating the biopsychosocial model as capable to provide progress in disability management (Robinson et al., 2005, pp. 151-162; Schultz et al., 2005, pp. 56-57). In an American study it was found that collaboration between medical service provider and patient in managing pain in chronic diseases such as arthritis, diabetes and heart disease was paramount for achieving an enhanced outcome (Marks & Allegrante, 2005, pp. 148-155).

The preceding has illustrated adaptation of the biopsychosocial model in Western societies. What about its application in other cultures? Historically, Chinese culture has emphasized a holistic approach to medicine, akin to the biopsychosocial model (Kazarian & Evans, 2001, p. 389-393). Emphasis is placed upon the individual's concern for themselves and their health as a prime responsibility (Kazarian & Evans, 2001, p. 397). This is in consonance with group membership, with every individual in the group contributing and helping others. Somatic problems are considered along with their psychological loading factors (Kazarian & Evans, 2001, p. 400).

A study in the Micronesian Marshall Islands found a nexus between stress reactions and the immune system, consequently leading to disease (Yamada & Palafox, 2001, p. 703). Suggested were therapeutic reinforcement of the patient's role in the control of disease.

A 2007 study in Japan was conducted to investigate the effect of juggling therapy for anxiety disorder patients. The patients were taught to juggle three balls, which was a popular 3,000 year old Japanese (otedama) game. Findings suggested that visual motion information and physical movement might improve the psychoneurological network (Nakahara et al., 2007, p. 2). The study was conducted over a six-month period using 17 female outpatients who met the DSM-IV criteria for either panic disorder, post-traumatic stress disorder, or obsessive-compulsive disorders. Their focus through the juggling exercise resulted in relaxation. Their conclusion was that such forms of culturally linked exercises as adjuncts to therapy could be used to reduce anxiety (Nakahara et al., 2007, p. 4).

In a 2001 study of 249 Korean men with chronic disease concluded that exercise self efficacy was positively related to gender, education, and regular exercise (Shin et al., 2001, pp. 68-75). A similar study was conducted in 2005 using 400 adults with chronic disease with similar results (Shin et al., 2005, pp. 117-124). Another study in Korea in 2006, was conducted using 154 women over 40 years of age who were diagnosed with either osteoporosis and osteoarthritis. It was found that exercise self-efficacy was present and this responsibility for self contributed to a better quality of life (Shin et al., 2006, pp. 3-10).

A survey of older adults was conducted in 2000 over the Philippines, Taiwan and Thailand to study whether determinants of self-assessed health were similar across the three countries. The results were that these determinants were similar, suggesting that culture has a distinct loading factor in self-perception (Zimmer et al., 2000, pp. 465-479).

A survey conducted in Thailand over 37, 202 adult respondents resulted in the finding that

socioeconomic inequalities exist related to demographics. The study compared and contrasted self-reported morbidity and health outcomes. An interesting outcome was that there was an inverse relationship between socioeconomic status and perceived wellness. It seems that the poorer the subject was, the higher perception of good health was maintained (Yiengprugsawan, 2007). In a study using data from 20 family caregivers in Thailand, results were that caregiving is perceived as an integral part of life, associated with family, kinship and community support and is an important

factor in managing chronic disease in Thailand (Subgranon & Lund, 2000, pp. 166-172).

Reviewing the literature, it is evident that self-image, responsibility for self and the application of biopsychosocial methodology are not the same in Western and Asian cultures. So, the question remains: how much responsibility does an individual have for their self-image and health maintenance?

A 2000 American obesity study concluded that parent perception of obesity and health were paramount to the outcomes of obesity (Young-Hyman et al., 2000, 241-247). Ablon studied stigma attached to medical conditions and concluded the individuals may benefit from support groups (Ablon, 2002, p. 9). Another 2000 study investigated perceptions of inheritance for a family history of heart disease. The study found that perceptions were common primarily among middle-age women (Hunt et al., 2000, 131-143). A study was conducted in Denmark focusing on patients' illness perceptions. Of 1,785 surveyed, the findings were that 96% of patients' illness perceptions were predictive of health care provider satisfaction (Frosthalm et al., 2005b, p. 904).

A 2005 American study examined the relationship between self-esteem, body image and health among 267 female and 156 male first-year college students. Findings were that self-esteem was consistently related to body image dissatisfaction for women, and had a more negative body image than the men in the study (Lowery et al., 2005, 612-622). A UK study conducted on 514 patients found that specific beliefs result in compliance or

noncompliance with health care provider direction, which is associated with self-image and taking responsibility for themselves (Ross et al., 2004, 607-612). A study conducted on 185 patients for a 2 year period to assess whether patients' perceptions of current health problems were related to health care usage resulted in higher usage of health facilities as a function of psychosocial stress and lifestyle (Frotholm, et al., 2005a, 997-1004).

Research on illness perceptions has confirmed that patients' beliefs are associated with important outcomes in a broadening range of illnesses and risk factor testing (Petrie et al., 2007, p. 166). Patients with chronic conditions make day-to-day decisions about their lives. A central concept in this self-management is the patient's confidence to carry out a behavior necessary to reach a desired goal (Bodenheimer et al., 288, p. 2474).

In conclusion, it is clear from this review of existing studies that there is a direct relationship between how people feel based much upon self-perception, and the course and outcome of illness, particularly chronic illnesses. Much of this is socially or culturally determined and reinforced. Asian cultures seem to have a more realistic overall mind-body perception than those in Western cultures.