HEALTH PSYCHOLOGY: PREVENTION OF DISEASE AND ILLNESS; MAINTENANCE OF HEALTH[1]

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Contents

Summary

Many factors contribute to either preserving or losing our health. Some are, by their nature, within our reach and others are difficult to access. One that at the same time constitutes a key element affecting our health and is generally accessible to us is our own behavior. Sometimes we learn health-protecting behaviors and habits from our natural and social environment, but sometimes we acquire ways of conduct that place us at risk or make us sick. Health psychology is the field devoted to analyzing how basic psychological principles and mechanisms are applied to improve our chances of staying healthy. It also involves the design and implementation of interventions aimed at recovering our health when we get sick. In more extreme cases it helps us adapt to chronic conditions, reduce disability or facilitate rehabilitation. In all cases, health psychology bases its interventions on either basic or applied research. The first is aimed at discovering natural or social regulatory mechanisms of the health processes; the second is aimed at designing and implementing effective and practical interventions with the best possible cost-benefit ratios. Health psychology is a fast growing specialty offering promising perspectives for helping preserve or promote health under the widely varying conditions found in the diverse countries and regions of the world.

1. Introduction

It has been said that we tend to appreciate our goods especially (or only) when we lose them, and health does not seem to be an exception. When we are busy and feeling relatively well, we may frequently take our own health (and that of our loved ones) for granted. This lack of concern generally takes the form of doing little to prevent disease or to preserve the well-being and adequate functioning that comes from staying healthy. Indeed, health does not mean only the mere absence of disease but includes a whole array of elements—physical, psychological, and interpersonal—that

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help us go through life functioning well. Whatever we do at home, at work, at school, in the community, in nature, or while traveling is likely to get seriously disrupted, making us suffer and fail to achieve our goals when our health deteriorates or collapses.

The general idea that there is a strong link between health and human behavior has received attention from antiquity. Indeed, thinkers such as Galen, the Greek pioneer of medicine, proposed that in order to conceive of or treat illness one has to consider the psychological aspects surrounding the loss of health. Since these early beginnings, renewed human knowledge and science have found this fundamental tenet gaining strength with fresh scientific findings and new human experience. Indeed, many things we do, believe, and feel contribute to either staying healthy, getting sick, or recovering from illness. The aim of this article is to help clarify how psychological functioning interacts with other factors and circumstances to affect our position on the health–disease continuum, and how some key contemporary health problems can improve through the development of psychological interventions aimed at either preventing illness or recovering health.

2. The Health–Disease Continuum

Except in certain conditions such as in a periodical check-up, it is difficult to say that individuals are definitely healthy, but clear-cut symptoms along well-identified sets usually mean they are definitely ill. The distance between health and sickness is usually proposed as a continuum with varying values along several dimensions. In general, although we can say that to be healthy is when there is a conspicuous absence of disease signs or symptoms, we may well assume the (conceptual) existence of some kind of cut-off point or line that separates health (pre-pathogenic stage) from illness (pathogenic stage). Once we feel or show signs of some disease we are said to have entered a clinical horizon that, if unmodified, may progressively turn into a more serious disease. If such progress is allowed to continue it may lead to severe illness and its extreme values may include permanent disability or premature death. The sequence of these roughly depicted stages constitutes what has been termed the natural history of disease.

Health psychology interventions designed to prolong the healthy (pre-pathogenic) stage work mainly through what is called primary prevention or health promotion. Most such interventions involve educating either the general public or populations targeted as “high risk,” so that they adopt lifestyles that will protect them from risk. These lifestyles vary from appropriate use of available resources (running water, garbage disposal, sewerage systems, etc.) to modifying misconceptions and beliefs on health and disease to establishing health protecting skills and behaviors. If the users of health psychology services are already at some point along the clinical horizon (i.e. suffering from some degree of a condition or disease) interventions are geared toward restoring health through promoting treatment compliance and other behaviors aimed at reducing further risk. Depending on the degree of progress or severity of a disease, interventions are said to involve secondary or tertiary prevention. From the psychological point of view, many such interventions are also known as part of the field called behavioral medicine.

3. Types of Diseases

Although the concept of health and disease may vary according to historic, scientific, philosophical, or cultural concepts, the systematic analysis of the way in which well-identified illnesses get distributed and evolve in different geographical and social groups worldwide (the task of epidemiologists) has led to some widely accepted concepts. Thus, it is generally recognized that two main types of diseases predominate in today’s global scene. The first comprises those caused by the invasion of viruses, bacteria, or other harmful germs, and is known as infectious diseases. Infections can, of course, show many levels of intensity and therefore produce many kinds and severity of damage to our organism. If unaffected by either effective treatment or our body’s natural defenses,

severe infections can cause disability and death. In terms of the social and economic characteristics of the countries whose populations tend predominantly to suffer these diseases, it is said that infections are typical diseases in poor and developing nations. This is usually due to lack of sanitary infrastructure and relatively poor health education, among other factors.

The second type includes those diseases that are usually long lasting and involve a gradual structural or functional deterioration of our body organs or systems. They tend to be associated with life conditions found in industrialized or more developed countries and include such ailments as diabetes, cancer, and heart disease. The health problems caused by the human immune-deficiency (AIDS) virus have the peculiarity of being both infectious in nature and producing chronic and degenerative syndromes. All these illnesses also involve, if not treated, complications leading to disability or death, although for AIDS there is no cure-oriented treatment yet. Both types of diseases exist in all kinds of countries and regions of the world. Their predominance or association with social and economic factors does not mean there is no overlap in the corresponding "reciprocal" countries.

Other types of health problems of high epidemiological significance include psychological dysfunction in general and addictions in particular. More than being actual diseases in the traditional sense, these problems usually take the form of abnormal emotional reactions, interpersonal difficulties or conflicts, or specific behaviors linked to adaptive deficiencies or to somatic (organic) disease, as is the case with addictions. Usually, however, psychological problems tend to include all three types of signs or symptoms.

4. The Five Pillars of Health and Disease

Many types of factors contribute to preserving, losing, or recovering our health. However, five fundamental conditions have proven to be key: heredity, nutrition, the quality of our environment, access to and quality of health services, and human behavior, the last being of foremost importance from the standpoint of psychology. All these elements act together at all times during our lives and whether we stay healthy, get sick, recover from illness, or die an untimely death will depend on the relative weight or contribution of these factors in different combinations at any given time.

4.1. Genetics

Heredity accounts mainly for the structural and functional characteristics of our organism as it interacts with the surrounding (internal and external) environment. We obtain this inherited biological "equipment" and the way it tends to work from our parents, who in turn received theirs from their parents and so on. Thus our inherited resources to cope with illness and illness-provoking situations stem from our biological ancestors. If, for example, a certain ailment tends to "run in the family," we might be likely to get it eventually, especially if the other four conditions (nutrition, environment, health care, and behavior) show high-risk values. Thus heredity tends to determine what system or group of organs in our body are likely to be more vulnerable or prone to decay, and hence to develop relatively specific diseases. This includes how fast we age, how well our body reacts to invading germs, etc. Although modern bioengineering techniques are opening up the possibility of affecting the genetic composition of organisms, for most practical purposes our inherited endowment is stable and relatively non-modifiable.

4.2. Nutrition

Nutrition is another key component determining health. Indeed, the quality, variety, and quantity of nutrients we obtain even as early as when we start developing in our mother's womb (and later on) may well determine a good part of whether we stay healthy or how we recover from illness.

Balanced nutrition not only strengthens our body's immune system providing better defenses against invading harmful germs but also helps us discharge toxins and other substances that make us sick if they do not get eliminated adequately and promptly. Poor diets have long been linked to a wide array of health problems such as heart disease, diabetes, cancer, and infections. Again, the final consequence tends to arise from the combination of risk and protecting factors. There are cases in which, even if our genetic background predisposes us to develop certain diseases, a sustained well-balanced diet and other factors may protect us, resulting in almost indefinite deferral of their onset. On the other hand, even if our genetic endowment tends to protect us against several diseases, prolonged inadequate nutrition will probably make us susceptible to those or other illnesses.

4.3. Environmental Quality

A third group of factors acting on our health–disease continuum originates in the characteristics of our environmental surroundings. Not only will the natural conditions (weather, vegetation, regional fauna, etc.) of the place we live influence how and from what we get sick. Also, conditions that tend to be human-made such as the quality of the air we breathe, the type and amount of nearby toxic waste, the purity of the water we use, and the presence of radiation will affect our position in the health–disease continuum. Indeed, intense or prolonged exposure to adverse environmental conditions are likely to promote the development of disease, be it in terms of sharing our environment with animals that may transmit infectious diseases, by receiving the effect of widespread harmful virus and bacteria, or by being contaminated by toxins and other substances that poison or debilitate us. Again, such conditions combined with poor nutrition will probably interact with our genetic propensities, precipitating relatively specific types of disease.

4.4. Health Care Services

Having access to competent health caregivers and well-equipped health care facilities is a fourth set of factors that will help determine how seriously and how often we get sick, as well as how quickly we recover. In general, difficulties in restoring health when we get ill are likely to lead to chronic (long-lasting) health problems. These, in turn, further debilitate our organism and increase our risk of contracting the same or other diseases, with the inherent additional loss of well-being and quality of life. Getting the services of well-trained physicians, health psychologists, nurses, social workers, etc. will help us get well and recover individual, family, and community functionality. It will also provide the opportunity to ask questions about ways to reduce further risk by either paying attention to early signs of disease (and looking for opportune treatment) or engaging in health-promoting activities.

4.5. The Psychological Element

The fifth element contributing to positioning us along the health–disease continuum, and the most significant from the standpoint of psychology, is human behavior. Indeed, human behavior has the peculiarity of being a component of nearly all human problems. However, since the middle of the twentieth century psychologists worldwide have demonstrated that it can also be part of their solution. In general, the professional contributions of psychologists in the health area depend on what is required or defined by the natural history of disease at its various stages and by the social and environmental circumstances surrounding their status. The term human behavior includes all aspects of psychological functioning, such as attitudes and emotional reactions (including physiological components), cognitions (ideas, convictions, beliefs, conceptions), and instrumental activity (everything we actually do and say).

Thus, in principle, human behavior can be modulated to establish habits and lifestyles aimed at protecting our health at any step of the natural history of disease (including its pre-pathogenic stage). Health psychology involves the development of interventions directed at preventing disease while we are healthy or recovering when we get sick. When we have developed some affliction, health psychology can help us engage in behaviors that will help restore our health. These may include seeking professional help, complying with a prescribed treatment, modulating harmful emotions, abiding by a specific diet, or increasing physical activity. If disease has already led us to a relatively permanent state of disability or serious illness, health psychology interventions can help us adapt to it and recover a reasonable amount of functionality and well-being. Finally, when the end is near, health psychologists or caregivers (including relatives and significant others) they have trained can help us to a more comforted, humane, and dignified passing. Thus health psychology interventions should be able to influence our behavior at practically any time along the health–disease continuum.

5. Emotions, Beliefs, and Behaviors

Health psychology interventions act through modifying one or more aspects or components of human conduct. The three most important and best researched such aspects include emotions, cognitions, and instrumental behavior. Although each of these components may contribute relatively specific changes in the context of health and disease, they actually work together and affect each other at all times during our life.

Emotions can be seen as being comprised of at least two main aspects. The first is the actual interpersonal or social expression of feelings or sentiments such as fear, anger, sorrow, pleasure, despair, sadness, rage, joy, alarm. Such expression usually involves face and body gestures and postures, as well as verbal utterances or declarations. These utterances, as with other social interaction behaviors, are determined by culture in the sense that they are usually learned in childhood and adolescence and therefore tend to be socially and culturally consistent with the emotion being expressed.

Second, emotions also involve well-known physiological changes and reactions. For example, fear and anxiety are associated with, among others, increased heart rate and systolic blood pressure. It also involves increased blood circulation in muscles, and decreased blood circulation in the skin and the bowels. Anger tends to be associated with the opposite changes, although there may be some variation.

5.1. Emotions and Health

There are at least two ways in which emotions play an important role in health preservation, loss, or recovery. On the one hand, long, sustained, or frequent episodes of some emotions may interact with our physiology and lead to debilitating states. Thus, sustained stress or anxiety, for example, may either make our body dump nutrients needed to protect it or modify hormone secretions affecting our body’s ability to fend off disease. On the other hand, emotions can influence our instrumental behavior by interfering with actions we might otherwise take to either avoid getting sick or recover from illness.

Additionally, emotions tend to play an especially important role in health when we are stressed. When life confronts us with any kind of situation or change that clearly demands relatively quick adaptation, we are likely to become stressed and therefore experience emotions that would not be relevant under normal conditions. In this sense adaptation means either actually engaging in actions to solve the problem, changing the way we think or feel about it, or adapting to the new situation by

modulating negative emotions arising from it. Thus, the way in which we manage stress may well contribute to whether we stay healthy or get sick.

5.2. Beliefs and Health

Cognitions comprise another key element contributing our position along the health–disease continuum. Here, too, there seem to be at least two ways in which ideas, beliefs, and personal convictions can take us closer to illness or protect us from it. One occurs when cognitions affect instrumental behavior (what we actually do). Thus, when we hold a belief concerning something that might affect our health, we tend to behave accordingly and therefore either place ourselves at risk or engage in health-protecting behaviors. When we believe, for instance, that cigarette smoking may affect others but not us, not only might we selectively pay attention to anecdotes about people who smoked "all their lives" and died from something else or old age (and assume we are like them), but also actually tend to continue smoking.

A second way involves the effect of ideas, beliefs, and convictions on the regulation of emotions. When we appraise a life transition or personal problem (health related or otherwise) as terrible or catastrophic, we may feel we are unfit to solve it or that the problem is so overwhelming that we lack personal resources to solve it, or that no one can help us even mitigate it. Such a set of ideas is likely to elicit feelings and emotions linked to physiological reactions. If these become too intense or persistent, they may in turn produce debilitating or risky effects. Thus cognitions may affect our chances of staying healthy or getting sick through their effects on instrumental behavior or on emotions (most probably through both).

5.3. Behavior and Health

The third fundamental psychological factor contributing to our position along the health–disease continuum is instrumental behavior. Instrumental behavior is said to comprise all activity serving as an instrument to affect the environment (internal or external) leading to relatively specific consequences. Thus, instrumental behavior is said to operate on the environment and produce outcomes that will, additionally, affect the chances of acting in the same way in the future. Again, although the division of psychological functioning into emotions, cognitions, and instrumental behavior is artificial, it helps us understand the various natural mechanisms determining whether we stay healthy, get sick, or recover from illness.

As most other components of psychological activity, instrumental or operant behavior is learned through our interaction with the environment as a result of the (positive or negative) consequences brought about by such interaction. Thus, for example, such behaviors as smoking, driving too fast, not washing our hands before eating, or abusing alcohol, each combined with other risk factors may respectively lead to such consequences as developing lung cancer (and/or heart disease), having traffic accidents, contracting digestive tract infections, and experiencing marital distress or family break up, respectively. Engaging in the opposite behaviors (hand washing, etc.) will probably help us keep our health, thus acting as protecting factors against the corresponding health risks.

6. The Psychological Interplay

All three components of psychological functioning are not only always in effect and acting together, but they actually tend to affect each other. For example, instrumental behavior affects both a belief (cognition) and our emotional behavior when sustained daily exercising or selectively changing our diet make us understand that we really are competent and effective at caring for our cardiovascular system and our figure, but also at making us feel very good and satisfied about it. By the same token, an emotion can affect both our perception of things (cognition) and what we actually do

about something (instrumental behavior). For example, feeling happy and satisfied about having stopped smoking or having lost excess weight through dieting may facilitate engaging in other behaviors such as taking up postponed chores, redistributing our workload, or exercising daily. All three behaviors may well help us cope with deadline anxiety or stress, further persuade us to believe we are actually in control, and get us to engage actively in solving problems we had perhaps procrastinated about.

Finally, a conviction or belief (cognition) can affect both our instrumental and emotional behavior. For instance, if after suffering a personal loss through death or separation we think we did everything we could to prevent it, this will help us deal with grief, hence reducing the effect of harmful emotions (such as extreme guilt). It may also prompt us take up other pending family matters such as reorganizing our family finances or revising our health care insurance. In another example, the belief that a single instance of unprotected sex will not expose us to HIV contagion may lead to not using a condom in every sexual encounter. The emotional (or attitudinal) effect could be a lack of concern for risk of contagion leading in turn to undue decreased risk perception and further exposure to risky instrumental behaviors.

7. Some Regulatory Mechanisms

As with all effective professional psychological services, health psychology works through the administration of carefully designed interventions that are combinations of variables derived from basic psychological principles or mechanisms. These mechanisms normally regulate our behavior at all times in accordance with the natural and social conditions of our lives. Health psychologists design professional interventions by rearranging our interaction with our biological, social, or other environment in order to optimize the effect of selected values of the variables of such mechanisms. Most of these natural principles or laws became known through years of basic research on their effect on behavior. In general, these mechanisms belong to traditional areas of psychology such as learning, motivation and emotion, psychophysiology, language and concept formation.

A few examples of the way such mechanisms affect our health through our behavior follow. Just as an important part of our behavior is learned, many factors affecting our behavior as it relates to health frequently revolve around learning principles or are affected by them. As mentioned earlier, the modulation or control of emotions and the establishment of appropriate beliefs and conceptual knowledge can also be learned. It should be remembered that all these mechanisms are active at all times during our lives and also tend to affect each other. Thus their effects on our health are likely to result from their combined action at certain specific times in our life. Let us also remember that the action of these psychological mechanisms occurs in combination with the four other sets of overall factors reviewed earlier (heredity, nutrition, quality of the environment, and quality of health services).

When a change or stimulus in our environment occurs monotonously (with extremely small changes or no changes at all), the natural reaction it initially elicits will tend to decrease in intensity and eventually disappear. This effect, called habituation, may well account for a psychological way of modulating health risk behaviors. For example, the very first time individuals inhale cigarette smoke an almost violent reaction ensues, with coughing, sneezing, irritation in the throat, and even nausea. For those who become regular smokers, some two hundred cigarettes later there will probably be zero reaction or a negligible one. The same mechanism may explain why very small changes in the sensation initially caused by a relatively mild clinical sign or symptom may cause us to become accustomed to its presence. If the intensity of the stimulus increases significantly it will gain perceptual saliency, making us notice it again. Thus saliency, a natural characteristic of environmental changes (internal or external), counteracts the effect of habituation.

These mechanisms tend to affect nearly anything we do or notice. Thus, for example, others may initially perceive the behaviors and attitudes of an alcohol abuser while intoxicated as exaggerated or even frightful (e.g. loud arguments or grotesque threatening gestures). With repetition, the interpersonal or social reaction to such episodes is likely to diminish, especially if they occur in a relatively permissive culture. This gradual loss of reactivity is probably the same that regulates the decrease of many alarm reactions in humans. Thus, one interesting implication of the effects of habituation in the health context is that it can equally be used for the benefit of restoring health. An unpleasant tasting medication should encounter less resistance as patients habituate to it. By the same token, a situation producing extreme/irrational fear (e.g. a phobia) tends to lose its fear-inducing power with repeated exposure, a procedure widely used by many therapists.

The relative amount of effort, physical or functional, required to engage in a behavior (called response requirement) constitutes another powerful mechanism applicable to modulating whether we get sick, recover from disease, etc. One of the reasons people do not engage in sufficient physical activity thereby increasing their cardiovascular and respiratory fitness is simply that it requires additional effort to that invested in daily activities. This effort may be planning and redistributing our workload so that we set aside some time to exercise, or the actual physical effort required by some 20 or 30 minutes of daily aerobic activity. In another example, an important part of controlling such diseases as diabetes mellitus is checking levels of blood sugar frequently, a task usually carried out by patients themselves. If the procedure is cumbersome and demanding, the chances that it will be done as needed are lower than if the task is easy to carry out.

As with all other mechanisms regulating human behavior, response requirement can work both ways. One procedure successfully used to decrease harmful behaviors such as those involved in addiction is to devise treatment protocols that include increasing the response requirement of those behaviors that give access to the addictive substance in question. In fact, it is likely that the response requirement involved in having to step out of a building to smoke on a sidewalk or smoking area will decrease the number of cigarettes smoked and maybe even help induce quitting altogether. The effect is likely to be achieved faster by combining other procedures such as rewarding smokers with social recognition, another well-documented strategy to modify behavior derived from the principles of learning.

Health promotion and care frequently require relatively complex behavior, including emotional, cognitive, and instrumental components. In order to teach such behaviors successfully health psychologists frequently resort to the systematic application of numerous procedures derived from other well-researched mechanisms. Let us consider, for instance, proper condom use to reduce the risks of both unwanted pregnancy and the contagion of sexually transmitted diseases. An effective intervention program from the standpoint of health psychology is likely to include components aimed at reducing resistance to condom use arising from prejudices or faulty information about their use or effectiveness. Well-tested procedures may include cognitive restructuring and attitude change through clear, well-articulated, and persuasive information and reasoning presented in easy to follow modalities (school materials, radio and TV ads, sports-related meetings, etc.).

Although cognitive and attitudinal change may be important or even necessary to establish the systematic use of condoms during sexual encounters, it is probably not sufficient. If individuals in the target population lack the specific skills to make proper use of condoms, the effects of the program could be minimal, no matter how much information or persuasion has been provided. The establishment of those instrumental skills is likely to require at least mock modeling of how to wear a condom (resorting to the psychological mechanisms involved in imitation). It may also be necessary to break the whole sequence entailed in properly using a condom, including how to open the container to adequate ways of disposing of the condom, using the procedure called successive approximations.

8. Stress and Health

Stress management, including how to cope with chronic pain, is a frequent and key component of health psychology interventions. In addition to applying various combinations of the mechanisms already revised, two useful procedures are reducing the subjective sensation or perception of pain by inducing deep muscle relaxation and other responses incompatible with perceiving pain as intense, invasive, or crippling. Most research evaluating this type of management has shown that even in patients reporting little change in the actual amount of pain perceived the procedure helps them redirect attention at other more positive aspects of life and engage in other life-enjoying behaviors. This often includes a cognitive change in the sense of helping patients interpret pain as a less than catastrophic situation. Here the psychological mechanism known as response incompatibility (among others) has enabled the development of such procedures.

A useful tool to alter stress-induced dysfunctional physiological reactions such as some types of vascular headache (e.g. migraine) or essential hypertension (high blood pressure not associated with any specific organic cause) has resulted from combining two psychological mechanisms. One is the image-physiological reaction relationship; the other is amplifying somatic signs (increasing their perceptual relevance in order to make them susceptible to change through learning). The first entails the production of a physiological response by visualizing it or imagining it proprioceptively. A typical example is salivating when we imagine (visualize) our hand holding half a lemon over our mouth and squeezing a few drops into it. A similar effect occurs when the skin temperature of our hands increases as a result of visualizing our hands holding a container with our favorite warm or hot beverage on a cool morning and proprioceptively "feeling" the warmth in our palms (caused by skin blood vessel dilation).

Comentario [SW1]: Is "skin vase" correct? If it is, could you explain it? Or clarify if another word was meant than "vase".

The second mechanism involves learning to alter some physiological reading (such as heart rate or temperature of the hands) through reacting to the feedback provided by its electronically amplified signal (in such devices as headphones or screen readouts/graphs). Both of these procedures, and others, widely used by researchers and clinicians trained in the area of biofeedback have been successfully used in the treatment of a number of psychosomatic complaints.

9. The Future of Health Psychology

Health psychology entails a series of professional interventions derived from natural mechanisms examined through basic research carried out with humans or animals as subjects. The tasks of health psychologists include deriving these interventions from their scientific research sources, applying them to prevent or solve health problems, and evaluating their preventive or clinical effect, all in a relatively specific social and cultural context.

Several paths lie ahead for health psychologists worldwide. First, the effectiveness of health interventions, be they preventive or treatment oriented, depends heavily on their link to principles and regulatory mechanisms that are natural in origin but have a strong social ingredient. Innovative scientific knowledge on the relation between the various components and factors affecting health is the natural source for developing such useful interventions. This means that the more we know and articulate the results from both basic and applied psychological research, the more efficient we will be at designing and implementing programs aimed at preventing disease or restoring health. Thus, to the extent that universities, governments, and funding agencies promote and support such research efforts health psychologists, in conjunction with other experts, will make ever-stronger contributions to such a high priority purpose.

Second, in the context of highly diverse social and economic conditions of various regions, cultures, and living conditions, health psychology can partially be used as a sort of equalizer. Indeed, poor

and rich countries may have highly contrasting conditions (specially related to nutrition, health care services, and environmental conservation) leading to various degrees of health risk for their populations. Well-designed educational and preventive programs and campaigns can help reduce the burden of disease in the poorest countries by counteracting the weight of the risk factors derived from the scarcity of resources and other conditions. Under no circumstances should this be interpreted to mean that social programs aimed at reducing poverty, fostering fairness and justice, or promoting and optimizing the use of available infrastructure should be postponed, let alone abandoned. The fact that health is so multi-factorial makes its fulfillment especially susceptible to contributions coming from all fields of human knowledge and action. Good government and policymaking are certainly no exception.

The social status of health in developed nations serves, again, to exemplify the previous reasoning. Although the low weight of peril stemming from factors related to resource abundance may advance good general health levels for these societies, the very lifestyles sometimes associated with such living conditions seem to turn into increased risk. As mentioned earlier, problems such as little physical activity, fat-rich diets, and abuse of some substances that are sometimes allied to affluent living have become high-risk lifestyles associated with various chronic and degenerative diseases. Again, well-designed and properly implemented health psychology programs are highly likely to help reduce risk or recover healthy and functional levels.

Third, the contribution of health psychology to improving quality of life can also be indirect. Just a few examples include programs to establish environmental conservation behaviors, to adopt eating habits based on locally available highly nutritious comestibles, to teach safety behaviors to reduce accidents, or to act effectively in natural disasters, or to explore disease-related family histories in order to adopt protective lifestyles. In all cases, human behavior with its emotional, cognitive, and instrumental components can play a pivotal role and health psychologists are likely to lead or collaborate with incursions into these and other challenging endeavors.

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Glossary

Cognitive restructuring: The modification of a (distorted) belief or conviction on the basis of a systematic analysis of its plausibility, congruency, or rationality.

Habituation: A decrease in the amount and duration of a response or reaction, as an effect of the monotonous repetition of a stimulus or environmental change. The same effect produced by very small (almost imperceptible) changes of the stimulus intensity.

Imagery/physiological response (relation): The property or tendency of imagined or visualized situations to induce the corresponding psychophysiological reactions, similar to those produced by the actual situation.

Perceptual saliency: The prominence or notoriety of a stimulus or environmental change by virtue of its intensity or size.

Response incompatibility: Two behaviors or reactions are said to be incompatible when the occurrence of one interferes (or makes impossible) the occurrence of the other.

Response requirement: The relative degree (physical or functional) of effort demanded by a behavior. It refers to the effort required by either a single response or a frequency or rate.

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Biographical Sketch

Professor Sanchez-Sosa obtained his Licentiate in Psychology degree from Mexico's National University (UNAM, 1970), and his M.A. (1975) and Ph.D. (1983) from the University of Kansas, USA. He is full-time faculty at UNAM and has taught over 15 different courses in both the licensing and postgraduate divisions. He has advised numerous doctoral, master's, and licensing degree theses. He has served as a member of doctoral dissertation defense committees by invitation to universities in Switzerland, the USA, and Spain.

Professor Sanchez-Sosa is author/editor of nine books and some 70 articles/chapters on health, educational, and professional psychology. He was editor of the *Mexican Journal of Behavior Analysis* and has served on editorial boards of scientific journals in psychology edited and published in Mexico, Spain, the USA, Canada, and Germany. Reviewing responsibilities have also included scientific program committees of numerous congresses and conventions, as well as committees reviewing grant proposals and scholarship applications.

He was founding president of the Mexican Academy of Applied Psychophysiology and Biofeedback. He has served as president of the Mexican Psychological Society, the Mexican College of Psychologists, the Mexican Academy of Doctors in Social and Human Sciences, dean of UNAM's School of Psychology, and president of the International Society of Clinical Psychology (ISCP). He is currently secretary general of the Union of Latin American Universities, "Iztacala" Professor (Cathedra) of Psychology and vice-president of the International Union of Psychological Science (IUPsyS) and president of the Clinical & Community Psychology division of the International Association of Applied Psychology.

Among other distinctions, Professor Sanchez-Sosa received a "Wilhelm Wundt" Meissen effigy in recognition as keynote at the 1980 International Congress of Psychology, the Fulbright Senior Scholar in Residence at the University of California, Riverside, USA (1989), and a doctorate honoris causa from the University of Ottawa, Canada (1996).