Biomedical Perspective

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The Life sciences form the foundation of medical training and medical action. They analyze the composition, structures and functions of the organism on all levels of function. The analysis is systematic, its goal are causal explanations. Against this background a biomedical perspective of disease, risk and health has developed, which is currently the dominant explanatory pattern in medical theory and therapy. It furthermore crucially influences both the thought and decision-making processes in healthcare and in health policy in industrialized societies as well as everyday communication and generally shared assessments and behavioural expectations with regard to health and disease. In modern societies, doctors' diagnoses are tools of legitimacy for insurance and labour-law agreements. Social welfare legislation demands a distinction between health and disease that is as unambiguous as possible.

The biomedical perspective is pathophysiological; at its core it is disease-focused, not health-focused (see Table 1). *Diseases* are seen as disruptions to the life processes in organs or in the entire organism. They have specific causal connections (aetiology), typical symptoms and manifestations (nosology) as well as objectively describable patterns of progression and functional consequences (prognosis). Knowledge of these factors allows experts to infer foreseeable treatment results (therapy, cure), but also to describe conditions for disruptions to the healing and rehabilitation process (chronicity, relapses, disability). From a biomedical perspective, the typical and - if possible - causal anatomical, organic, biochemical, physiological, neurobiological and other scientifically objectively verifiable triggers, causes and deviations of biological or functional variables can be determined for every disease.

The *causes of disease* relevant for the biomedical perspective can be grouped into four domains:

- infections that are transmitted through microorganisms
- biochemical dysfunctions of the body, its organs or its circulation processes (including metabolic disorders and auto-immune diseases) caused by endogenous influences
- those caused by exogenous influences (such as noxious substances, fire, physical objects etc.)
- organ defects or dysfunctions in the organism caused by accidents or (risky) behaviours; genetic predispositions and susceptibilities.

In this perspective, health is not on a continuous scale with disease. It is defined by the reverse, i.e., as the absence of disease, as the absence of biological dysfunctions or homeostatic disruptions, as the absence of negative influences, as the subjective perception of a "silence' and an undisrupted functioning of the organs. In this perspective, disease and health present themselves as dichotomous states in a functional equilibrium that is perceived as "natural'. They are not entangled in a process-oriented, biographically and socially changeable manner in the way that a salutogenic concept of a health-disease-continuum proposes.

1

The body is a natural object: it follows natural laws and is therefore discernible with scientific methods.

2

A disease is a bodily disturbance to the normal functioning of the organism.

3

Every disease is characterized by a particular genetic, biochemical and/or mechanical dysfunction: There is a primary, fundamental systemic defect or organ defect.

4

The processes of action of the pathological processes must be examined and analyzed primarily in the organism: Levels of analysis range from the organism's macro-level, its organs and hormone system, to the micro-level, i.e. cells, molecules and genes.

5

Every disease possesses specific causes and a specific aetiology; it exhibits specific characteristics/symptoms and because of pathogenic causal chains it generally takes a predictable course: There are typical signs (clinical manifestations) and sequences.

6

Because of their symptoms, aetiology and progression, all (known) diseases can be described in an intersubjective manner, classified in a medico-scientific way and arranged in a binding, standardized nosological system.

7

Physical-somatic processes, mental and socio-cultural manifestations of experience and behaviour are dissociated from one another.

8

The sick individual is an instance of a pathological process: Subjective-personal and social components of how the disease is experienced, processed and coped with are subordinate to the causal medical treatment.

9

Detecting and treating diseases are tasks of the medical system: Removing symptoms without medical surveillance and intervention, or inadequate compliance with doctors' instructions on the part of patients will worsen the disease or lead to it becoming chronic, or to the emergence of new diseases.

10

Because of its self-image as a natural science, medicine has to be objective about the disease, and the medical profession has to be neutral towards the patients.

Table 1. General principles of the biomedical perspective (expanded on the basis of Dubos, here: closely following Faltermaier 2005, 138 ff).

In large sections the *general principles* relate back to their origin in the expanded “Koch Model’ of bacteriology dating from the last quarter of the nineteenth century. The developmental background of the biomedical model of disease is the “germ theory’ or “cellular pathology’ of that era. According to this understanding, the following variables interact in the development of infectious diseases: A pathogen with a particular virulence (“agens’), an agent that transmits the pathogen (“vector’), a person with a weakened immunity towards the pathogen (“host’) and environmental conditions that favour infection (“environment’). A person will get sick with an infectious disease such as tuberculosis or AIDS if all the variables come together in the same place at the same time.

Scientific medicine delivers a plausible and historically successful framework model, especially for the *treatment of infectious diseases* and the associated significant increase in global population-wide life expectancy. In these areas of application and the validity it has there, the model, named after the German physician Robert Koch (1843-1910), which describes how diseases are triggered by pathogens and other causes, is still suitable for diagnosis and therapy. At the same time, biomedical diagnoses and treatments are accurate and effective for a large number of problems in internal medicine and surgical problems, such as a duodenal ulcer, a constriction of the coronary arteries because of plaque, type I diabetes, a broken bone or a burn. Requirements for a condition to be classed as a disease and for causal treatments to be initiated are - in every case - scientifically provable structural changes and/or dysfunctions in the organism (cf. Figure 1).

http://www.leitbegriffe-en.bzga.de/pix.php?id=90cc72587335965e9dfcd77f1be6e583

Figure 1. Contents and scope of the pathophysiological-anatomical model of disease (based on Novak, in: Wilker et al, Medizinische Psychologie, Medizinische Soziologie, Munich 1994, 196).

Even though the epidemiological evidence for a “return’ of the infectious diseases is accumulating (global reappearance of tuberculosis and malaria, the HIV/AIDS pandemic, new epidemic diseases etc.), they make up far less than one tenth of the cases of sickness and mortality in the developed industrialized societies. For the chronic, degenerative diseases dominant today and their causal explanations, which are dependent on many other factors, their therapy and prevention, and in the field of functional/somatoform disorders this perspective has limited use. Its range, too, is limited: The one-sidedly biomedical and ultimately monocausal orientation can only capture a small proportion of all causes and predictors of disease. Descriptions of diseases and causes of death that are traceable to microorganisms, accidents and environmental or behavioural factors must also assume an understanding of cultural, political, economic and systemic-organizational framework conditions as well as an understanding of social interaction and lifestyle. Furthermore, biochemical chains of causation, organ defects and genetic causes/“markers’ are either still unknown or not sufficiently verifiable for many physical diseases and dysfunctions, such as in the psychosomatic field, in mental health and in the interplay between concurrent diseases accompanying certain life phases as part of age-related multi-morbidity. In addition, findings from epidemiology and social epidemiology and stress research that indicate the significance of social factors with an unspecific effect are piling up - as risk factors for the immune status, as potential protective factors against a disease developing, and as personal and social resources to successfully overcome health problems, including those with a naturalistic explanation.

In areas such as psychiatry, psychosomatics and psychotherapy, the unfiltered application of the biomedical paradigm could have problematic and even disastrous consequences - individually, culturally and economically. For more than three decades, the American healthcare system, including the mental health field, has been dominated by a biologically focused approach in academia, politics and practice. As a result, there has been a huge increase in the quantity of psychiatric drugs prescribed and a narrowing (i.e., a professional narrowing that inveigled itself into the everyday culture) of the understanding of mental-health problems to, essentially, a biochemical malfunction of the brain that can only be corrected effectively with disease-specific drugs. According to Deacon, the neuroscientific access to clinical fields, however, did not lead to clinical innovation or to mental health practice being “revolutionized’ - quite the reverse, it has led to worse results in this area, as well as to a division between academics and practitioners in aetiology and therapy. Deacon therefore fundamentally doubts the validity and the usefulness of the biomedical paradigm in psychiatric and comparable clinical fields.

Between 1960 and 1990 the biomedical perspective was complemented and enhanced in the *preventive medicine model of risk factors*. The risk factor model determines “predictors’ (on an epidemiological basis) for the most important chronic and degenerative diseases such as coronary heart disease, malignant tumours, diabetes, rheumatism and HIV/AIDS. Factors that were found in large population studies to increase the probability of disease are: risky behaviours (e.g. lack of exercise, poor diet, absence of stress-coping mechanism in the case of coronary heart disease; unprotected sexual intercourse in the case of HIV), behavioural health-risk factors and organic risk factors (e.g. high blood pressure, raised cholesterol), manifest diseases (e.g. diabetes) or syndromes (e.g. metabolic syndrome). The factors act as precursors to disease either on their own or in a multifactorial manner, in combination and with mutual amplification. In its basic assumptions, the risk-factor model sees itself as a further development rather than as in opposition to the biomedical perspective. The biomedical perspective expanded by the risk-factor model has provided the essential foundations of early → Health Education and the health advice given by doctors.

There certainly is an awareness of the *historical changeability* of (bio)medical thinking in certain medical fields and in medicine as a system of knowledge. Internal medicine for example values the modern paradigms of cellular pathology and bacteriology, of psychosomatic medicine and medical anthropology as well as of epidemiology and molecular biology, as complementary models of explanation and action, not as conflicting ones - though still on the basis that the bio-scientific approach is dominant. In the theoretical medicine of Anglo-American and Scandinavian origin a controversy between a “normative, holistic school’ (Nordenfelt’s “holistic theory of health and disease’) and a “descriptivist-naturalist school’ (Boorse’s “biostatistical theory of health and disease’) has been fought and productively developed since the mid-1990s.

The social embedding of diseases and healthy/risky behavior in lifestyles and life circumstances is subordinate in the core biomedical understanding and is therefore largely ignored. If anything, a medicalization of societal and social problems and of individual lifestyles is promoted. Since the models primarily take into account the organic-pathophysiological component of the causes of chronic, degenerative diseases, disease prevention and health advice only have limited use on this reading. Changes in behavior are most likely to prove successful in secondary or tertiary prevention, i.e., after organ damage has already occurred, or when it comes to preventing a manifest disease from getting worse (patient advice and patient education).

In the primary preventive area, such interventions - which do not take into account a patient's biography, life circumstances and structural framework conditions - are not promising and show virtually no long-term efficacy. Studies looking into medical history have used the example of tuberculosis, once a widespread infectious disease, to show that in the late nineteenth century an improvement in living circumstances, especially in sanitation and in conditions in the home, and the battle against malnourishment through altered lifestyles and diets, were effective both sooner and more sustainably than the medical vaccinations and drug treatments that were only developed in the twentieth century. From a modern public-health point of view, the biomedical perspective ultimately has to subordinate itself to the health determinants perspective. The Finnish epidemiologist Pekka Puska, a European pioneer in community-related disease prevention based on the risk-factor model between the 1970s and 1990s, emphasized in 2008 the need for a completely new health paradigm: "Basically, the question of disease prevention and health promotion in the population is about our social and physical environments - how harmful or conducive they are for health".

The bacteriological, epidemiological risk factor-based foundations of the biomedical perspective are under pressure from the rapid progress being made in cell biology, genome research and genetics, molecular medicine and nanotechnology. A rapidly developing field of "individualized' medicine and disease prevention provides five options for knowledge and action in the near future: group formations based on biomarkers associated with specific diseases, genome-based information about health related characteristics (using DNA arrays), determining individual risks of getting sick, differential early detection and (early) intervention on a molecular or biochemical level, development of unique therapies ("tailor-made' drug treatments). In the future, health, disease and the risk of getting sick will be closely connected to our knowledge of genetic and individual, cell-biological dispositions, both on an individual level and a societal one. Therefore, "genetification' comes to the fore as a new component of the medicalization of all life circumstances (predictive medicine).

According to critics, *molecular medicine* is the gateway to human engineering in medicine and society: Human bioengineering - using medical and biological knowledge for human performance-enhancement and to exceed natural boundaries - is developing on a broad scale. This does not just influence our understanding of human beings and the professional ideas of health and disease. It also influences how resources are distributed in health research, and it may soon determine the catalogue of services paid for by the statutory health funds and public healthcare system. It has a bearing on informational self-determination and data protection as well as the definition and design of primary/predictive disease prevention in a way that is not yet fully foreseeable.

In health promotion, in primary disease prevention and in the health sciences, pathogenic concepts and the biomedical perspective cannot be entirely discarded. They are integrated into the comprehensive (bio-psycho-social, interdisciplinary, intersectoral) concepts of health sciences and, also, into public health action. The more holistically an intervention is planned and implemented, the greater the gain for health. In contrast to traditional health education, successful health-promoting interventions no longer just aim to eliminate the epidemiologically identified risky behaviors and risk factors in individuals or groups. The goal is rather to boost competence, strengthen people's ability to help themselves, to develop networks and to engage in capacity building to create and maintain the conditions for health-promoting ways of life and circumstances.

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