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From Biomedical to Psychosomatic Reasoning: A Theoretical Framework

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Qualitative Study

Abstract

Despite a general acceptance of the biopsychosocial model, medical education and patient care are still largely biomedical in focus, and physicians have many deficiencies in biopsychosocial formulations and care. Education in medical schools puts more emphasis on providing biomedical education (BM) than biopsychosocial education (BPS); the initial knowledge formed in medical students is mainly with a biomedical approach. Therefore, it seems that psychosocial aspects play a minor role at this level and PSM knowledge will lag behind BM knowledge. However, it seems that the integration of biomedical and psychosocial-knowledge is crucial for a successful and efficient patient encounter. In this paper, based on the theory of medical expertise development, the steps through which biomedical reasoning transforms to psychosomatic reasoning will be discussed.

Keywords: Biopsychosocial model, Biomedical model, Biomedical reasoning, Psychosomatic reasoning, Medical education

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Introduction

Despite a general acceptance of the biopsychosocial model, medical education and patient care are still largely biomedical in focus, and physicians have many deficiencies in biopsychosocial formulations and care (Waldstein, Neumann, Drossman, & Novack, 2001; McClain, O'Sullivan, & Clardy, 2004; Roter et al., 1997).

Biomedical (BM) or somatic education should precede biopsychosocial (BPS) or psychosomatic education, simply because in order to learn about an illness, one should first know about its bodily clinical presentation and underlying mechanism. Education in medical schools puts more emphasis on providing BM than BPS; the initial knowledge formed in medical students is mainly with a biomedical approach. Therefore, it seems that psychosocial aspects play a minor role at this level and psychosomatic medicine (PSM) knowledge will lag behind the BM knowledge. However, it seems that the integration of biomedical and psychosocial-knowledge is crucial for a successful and efficient patient encounter.

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In addition to the lack of relevant training and education of BPS model during undergraduate and postgraduate training in medical school, the role of BPS in clinical reasoning and medical problem solving has been largely ignored, despite their importance for (understanding its role in) diagnostic accuracy and patient outcomes (Novack, Cameron, Epel, Ader, Waldstein, Levenstein, et al., 2007). Clinical reasoning is the way by which physicians discover facts about the sick or well patient and enter them into the diagnostic and therapeutic process.

The aim of this study was to investigate both PSM reasoning and its integration to BM reasoning. Firstly, the difference between BM and BPS in terms of patient information processing is investigated that will be followed by the differences in their causal models and management possibilities. Then, BM versus BPS in medical education will be unearthed, and finally a summary will be provided.

Patient Information Processing in BM versus PSM

Our starting point was to question whether or not the BPS or PSM focus would lead to a different evaluation of the findings in a case. This is a crucial question as to whether there is any difference between the way BM and PSM evaluate the patient information, and the distinction between BM and PSM in terms of clinical reasoning is artificial. While processing case information, doctors and medical students only had to understand what the patient's problem was. Whatever followed was in a way a reflection of the information that was considered important with the certain focus. However, it is not clear whether or not a change of the focus form BM to PSM would also result in a different evaluation of the findings in a case description. That is, it is unclear if a PSM focus while processing the case information will lead to a different appreciation of the findings than a BM focus.

For instance, suppose a 55-year old man was admitted at 2 am to an emergency room because of retrosternal chest pain that has radiated to his left arm. The pain started two hours ago after a family quarrelling. The patient frequently claimed that he had no serious disease and the new problem was due to a transient angriness. He also denied any previous similar problem or any other diseases. His wife said that he has sometimes had chest discomfort, but he has concealed it. The investigation revealed that the level of CPK and LDH has increased. ST elevation and QS complex were seen in inferior leads of EKG. After that, he was moved to the CCU, where he repeatedly asked the doctor not to do anything because there was no problem.

From a biomedical perspective, there is no need to notice the patient's denial (i.e., the patient frequently claimed that he had no serious disease) in order to diagnose this new complaint. However, from a PSM viewpoint, this information is highly relevant, indicating the problem of coping with a disease that needs medical attention and treatment. In other words, what is important in a PSM approach does not necessarily overlap with what is important in the BM approach.

Biomedical Model versus Biopsychosocial Model

A different evaluation of case information lies beneath the different model or theoretical framework of these two models; biomedicine and psychosomatic medicine have distinct perspectives, employing different explanatory models of disease and evaluating case information differently.

According to the biomedical model of medicine, diseases originate from outside the body, invade the body, and cause physical changes within the body, or originate as internal involuntary physical changes. Such diseases may be caused by several factors such as chemical imbalances, bacteria, viruses, and genetic predisposition. On the other hand, PSM suggests that human beings should be seen as complex systems and that illness is caused by a multitude of factors and not by a single causal

factor. PSM, therefore, attempts to move away from a simple linear model of health and claims that illness can be caused by a combination of biological (e.g., a virus), psychological (e.g., behaviors, and beliefs), and social (e.g., employment) factors. This approach reflects the biopsychosocial model of health and illness, which was developed by Engel (1977).

The biopsychosocial model represents an attempt to integrate the psychological (the 'psycho') and the environmental (the 'social') into the traditional biomedical (the 'bio') model of health as follows: (1) the 'bio' contributing factors included genetics viruses bacteria, and structural defects; (2) the 'psycho' aspects of health and illness were described in terms of cognitions (e.g., expectations of health), emotions (e.g., fear of treatment), and behaviors (e.g., smoking, diet, exercise, or alcohol consumption); (3) the 'social' aspects of health were described in terms of social norms of behavior (e.g., the social norm of smoking or not smoking), pressures to change behavior (e.g., peer group expectations, and parental pressure), social values on health (e.g., whether health was regarded as a good or a bad thing), social class, and ethnicity.

In biomedicine, illness may have psychological consequences, but not psychological causes. For example, cancer may cause unhappiness, but mood is not seen as related to either the onset or progression of the cancer.

The difference between BM and PSM lies not only in the explanatory model, but also in the patient management possibilities that result from them. The biomedical model regards treatment in terms of vaccination, surgery, chemotherapy, and radiotherapy, all of which aim to change the physical state of the body. While, according to PSM, the whole person should be treated, not just the physical changes that have taken place. This can take the form of behavior change, encouraging changes in beliefs and coping strategies, and compliance with medical recommendations.

PSM and Medical Education

In order to explore the development of PSM reasoning, the course of medical education should be taken into account. Differences in clinical practice between biomedicine and psychosomatic medicine may begin during medical school.

In the years of the students' training, students acquire knowledge largely from textbooks and lectures with limited real patient encounter. There is a strong emphasis on BM approach, which is often not accompanied by the same emphasis on developing a PSM approach (Waldstein et al., 2001). Given that approximately 7000 to 8000 hours are dedicated to the undergraduate medical curriculum, it is striking to note that almost 50% of schools endorsed less than 40 hours of total instruction in psychosomatic medicine (Waldstein et al., 2001). Therefore, it can be concluded that medical students are not offered a sufficient scientific foundation for understanding the biopsychosocial model (Novack et al., 2007). Consequently, medical students cannot truly practice within a biopsychosocial perspective without understanding the scientific basis of this perspective (Novack et al., 2007). This is corroborated by the fact that, medical students' training is largely based on the inpatient setting (Holmboe, Bowen, Green, Gregg, DiFrancesco, Alguire Reynolds., 2005; Weinberger, Smith, & Collier, 2006). They spend about 10% of their training time in outpatient (i.e., ambulatory) settings (Cherkin, Rosenblatt, Hart, Schneeweiss, & LoGerfo, 1987). It was estimated that biopsychosocial teaching most commonly comprised approximately 10% of the total medical school curriculum. Consequently, medical students confronted with a clinical task, will most likely act with a BM focus (which is the only mode of processing of a case they have some experience with).

When medical students graduate from medical school and start practicing as GPs, PSM has become more concrete; because GPs have

some clinical experience in an outpatient setting. The primary care practice that is largely based on ambulatory setting, serves as a good basis that PSM or BPS take into account. Concerning PSM reasoning, what occurs at the level of primary care is important for several reasons:

(a) It may be the point that the approach to patient problems in primary care setting is mostly holistic. From the perspective of training GPs and the knowledge bases required for competent clinical practice, the higher they go on the scale of specialist training, the less complex the medical problem becomes and consequently the holistic approach becomes weaker and weaker (Cassel, 2002). As a result of differences between primary care physicians and specialists in terms of mental health certainty, question asking, and lifestyle advice, GPs devote significantly greater time to psychosocial issues (Gaufberg et al., 2001). Conversely, specialists too narrowly focusing on the pathophysiology might miss important psychosocial contributions. A likely explanation for the diagnostic and management differences, that we are observing may be the fundamentally different explanatory models of illness employed by the reasoning of specialists and GPs. Specialists appear to have an intellectual tradition of viewing illness as the manifestation of pathophysiological phenomena. Correct diagnosis requires detailed elicitation and analysis of symptoms, signs, and laboratory tests to deduce the underlying pathophysiology, which in turn informs accurate diagnosis and treatment. GPs' emphasis on the biopsychosocial model of illness gives precedence to life stresses and psychological and behavioral factors (Shackelton-Piccolo, McKinlay, Marceau, Goroll, & Link, 2011)

(b) It may also be the point of most chronic diseases encounters (Gawande, 2009; Noren, Frazier, Althman, & DeLozier, 1980). Acute diseases are generally treated by doctors, nurses, or other caregivers in the hospitals, while, chronic diseases are usually treated with close partnership of the patients and their families and mostly in out-patient settings (Cassel, 2002). In the present era, perhaps 75% of all deaths are attributable to chronic disease. The aged consume the most medical care, and their burden of illness is overwhelmingly attributable to chronic disease. This predominance of chronic illness and disease means that primary care physicians must be trained specially to deal with chronic illness (Cassel, 2002).

"The major difference is that the basic struggle in chronic disease is not against death; it is against disability. By disability I mean the inability of a person to perform a social role, because of functional loss in contrast to impairment, which is the inability of a part to perform normally because of pathology" (Cassel, 2002).

The problem of chronic disease increases when the world of medicine is recognized as a world of diseases, especially acute diseases. Considering chronic conditions (for example, rheumatoid arthritis, diabetes mellitus, COPD, heart failure, and renal failure), it is clear that the treatment is not merely based on the biomedical knowledge of diseases, but also on knowledge about psychosocial aspects of chronic illness (Cassel, 2002).

Altogether, it could be concluded that the integration of psycho-social knowledge with biomedical knowledge may have started at the level of GPs which is corroborated by the fact that GPs devote considerably more attention and time to psychosocial issues (Gaufberg et al., 2001). Furthermore, in one study GPs included somatic reasoning (e.g., cardiac) in their differential diagnosis, but were significantly more likely to rank a psychosocial cause above somatic causes, express more certainty with that formulation, and recommend psychosocial and behavioural interventions (Shackelton-Piccolo et al., 2011). GPs tend to consider and be more certain of alternative diagnoses (e.g., mental illness), which distracts them from the problem at hand. Considering a mental health diagnosis

with a high degree of certainty has been shown to jeopardize somatic certainty, and therefore, somatic treatment; the common and nonspecific nature of many symptoms associated with mental illnesses may make them a safe diagnostic haven in the face of uncertainty (Shackelton-Piccolo et al., 2011).

Discussion

Shifting from a biomedical (BM) focus to a psychosomatic (PSM) focus, the differences between BM focus versus PSM focus in terms of clinical reasoning were investigated in this article. As has been outlined above, a PSM focus while processing patient information does not necessarily concur with a BM focus. Moreover, the development of PSM knowledge is often not completely synchronized with that of BM knowledge. The training in PSM knowledge often starts considerably later (i.e., during the primary care practice) than that in BM knowledge. However, in contrast to experienced physicians, these GPs are still in the middle of the process of linking their BM knowledge with their newly acquired PSM knowledge. GPs who have already acquired some PSM-knowledge will be able to differentiate between both focuses, but are not yet proficient enough to deal with a case in a PSM-focus efficiently, and hence will have to go through the case information very thoroughly.

According to the theory of medical expertise (Monajemi & Rikers, 2011; Schmidt & Rikers, 2007), it seems that the development of psychosomatic reasoning is as follows. Experts in PSM construct their clinical case representations similarly because their BM and PSM knowledge has become well integrated over the years, and therefore, no differences are expected. As a result of a lack of relevant knowledge, medical students will treat all cases with a BM focus. GPs students who have already acquired some PSM knowledge will be able to differentiate between both focuses, but are not yet proficient enough to tackle a case with a PSM focus efficiently, leading to ineffective judgment and problem solving. Hence, at the level of GPs, there is sensitivity towards psycho-social issues that do not reflect in their judgment and decision making. In other words, GPs realize the importance of psychosocial factors in their patients, but do not take these factors into account when the management plan is provided. At the level of expert doctors, where these two types of knowledge become integrated, PSM management displays itself in their plans (See Figure 1).

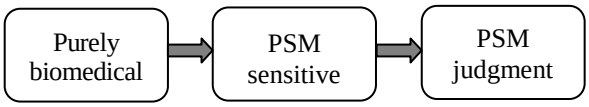

Figure 1. The development of psychosomatic medicine (PSM) reasoning

In conclusion, especially for GPs or intermediates in PSM, there is a possible distinction between a BM and PS (psycho-social) condition; when processing a clinical case information, their more recently acquired PS knowledge is not yet fully developed and integrated with their BM knowledge. In most medical schools, PS knowledge does not seem to play an important role during the medical school years, and the integration of BM and PS knowledge, therefore, mainly starts during the primary care practice as GP. As a result, the development of PS knowledge will lag behind the GPs' BM competence, and will only become fully integrated with BM knowledge after many years of clinical experience.

The concepts, like PSM reasoning or PSM sensitivity, which have been introduced in this theoretical paper should be supported by future empirical evidence. A starting point to examine this theme could be the translation of these theoretical constructs to clinical problem solving in different levels of expertise (i.e., medical students, GPs, and specialists).

What are the implications of this paper for research, medical education, and the practice? First of all, there is a definite need for more

experimental studies to support our argument. Second, concerning medical education, it seems that translation from such a theoretical paper to applications in medical education is not so trivial; however, it opens a new avenue both in training undergraduates and postgraduates, as well as in assessing clinical reasoning. In addition, we need to have a more general discourse on the relevance of this theme for an improvement of medical treatment, something that future research may shed further light on.

Conflict of Interests

Authors have no conflict of interests.

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