

The biopsychosocial model of illness: a model whose time has come

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Abstract

The biopsychosocial model outlined in Engel's classic Science paper four decades ago emerged from dissatisfaction with the biomedical model of illness, which remains the dominant healthcare model. Engel's call to arms for a biopsychosocial model has been taken up in several healthcare fields, but it has not been accepted in the more economically dominant and politically powerful acute medical and surgical domains. It is widely used in research into complex healthcare interventions, it is the basis of the World Health Organisation's International Classification of Functioning (WHO ICF), it is used clinically, and it is used to structure clinical guidelines. Critically, it is now generally accepted that illness and health are the result of an interaction between biological, psychological, and social factors. Despite the evidence supporting its validity and utility, the biopsychosocial model has had little influence on the larger scale organization and funding of healthcare provision. With chronic diseases now accounting for most morbidity and many deaths in Western countries, healthcare systems designed around acute biomedical care models are struggling to improve patient-reported outcomes and reduce healthcare costs. Consequently, there is now a greater need to apply the biopsychological model to healthcare management. The increasing proportion of healthcare resource devoted to chronic disorders and the accompanying need to improve patient outcomes requires action; better understanding and employment of the biopsychosocial model by those charged with healthcare funding could help improve healthcare outcome while also controlling costs.

Keywords

Biopsychosocial model, biomedical model, healthcare organization

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Introduction

Concerned by difficulties he saw facing psychiatry in the 1970s and in particular the lack of an accepted model of illness to support and guide its practice, George Engel published a landmark paper in *Science* in 1977 warning 'of a crisis in the biomedical paradigm'. Engel¹ suggested that psychiatry should adopt the biopsychosocial model of illness,

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which he had distilled from strands of contemporary thinking about health and illness. Indicating that the biomedical model left 'no room within its framework for the social, psychological and behavioural dimensions of illness', Engel predicted that the real challenge to the greater acceptance of the biopsychosocial model lay not with medical or healthcare. He wrote, 'But nothing will change unless and until those who control resources have the wisdom to venture off the beaten path of exclusive reliance on biomedicine as the only approach to health care'.

While evaluations of the model over the past 40 years are mainly positive, with the biopsychosocial approach securing considerable success and traction in several areas of healthcare, an American observer recently wrote, 'the unfortunate reality is that ... since Engel's seminal paper the integration of the biopsychosocial approach into everyday medical care hasn't happened yet'.² The same conclusion applies in Britain: 'Despite this [use], the biopsychosocial model has been written about and used quite widely within some areas of clinical practice, especially rehabilitation' and 'most healthcare staff including managers are unaware of it, commissioners and other funding organisations are unaware of it, and the public are unaware of it'.³

This editorial reviews the historical context, achievements and recent developments of the biopsychosocial model, with a view to explaining how the model could be better employed to help (re-)organize and improve both the efficiency and the effectiveness of healthcare systems. This could improve patient outcome while also controlling costs.

Historical context and alternative models

Illness, the experienced condition of being unhealthy either in body or in mind, has typically relied in Western medicine on naturalistic explanatory models shaped by and constrained by social culture.⁴ The Western social culture developed a reductionist approach starting with the Scientific Revolution in the 16th and 17th centuries.⁵ At the same time, and as part of the Scientific Revolution,

the idea that mind and body were separate phenomena evolved, and this idea is still influencing healthcare.^{6,7} The biomedical model is characterized by a reductionist approach that attributes illness to a single cause located within the body and that considers disturbances of mental processes as a separate and unrelated set of problems.

As Engel wrote, the biomedical model 'not only requires that disease be dealt with as an entity independent of social behaviour, it also requires that behavioural aberrations be explained on the basis of disordered somatic (biochemical or neurophysiological) processes'. Although Engel did not deny that this reductionist approach had resulted in great advances in the diagnosis and treatment of some life-threatening and debilitating diseases, he and others were aware that the model was incomplete in not being able, even in 19th century, to account for well-recognized illnesses, such as 'hysteria' and 'neuraesthesia', where there was no evidence of disease.

Engel was not alone in highlighting this challenge, and he was not the first. One hundred years ago, the *Journal of the American Medical Association* highlighted the weaknesses of the scientific approach to medical care.⁸ Kleinman et al.,⁹ a fellow American psychiatrist and a professor of medical anthropology, made a similar point in 1978 writing that 'Modern physicians diagnose and treat diseases (abnormalities in the structure and function of body organs and systems) whereas patients suffer illnesses (experiences of disvalued changes in states of being and social function)'.

Many other authors have highlighted the importance of choosing an appropriate model of illness writing, for example, that 'discordance in patient and physician explanatory models may hamper this process [collaborative definition of a person's healthcare problem] and lead to poor health outcomes'.¹⁰ Collaborative healthcare for chronic illness can be effective¹¹ and requires the patient and the healthcare team to share a common understanding of the illness – to use the same model; when the models differ, management may fail.¹² The need for models to be broader than the biomedical model is widely canvassed. Ethnographic evidence from 139 non-industrial societies around the world

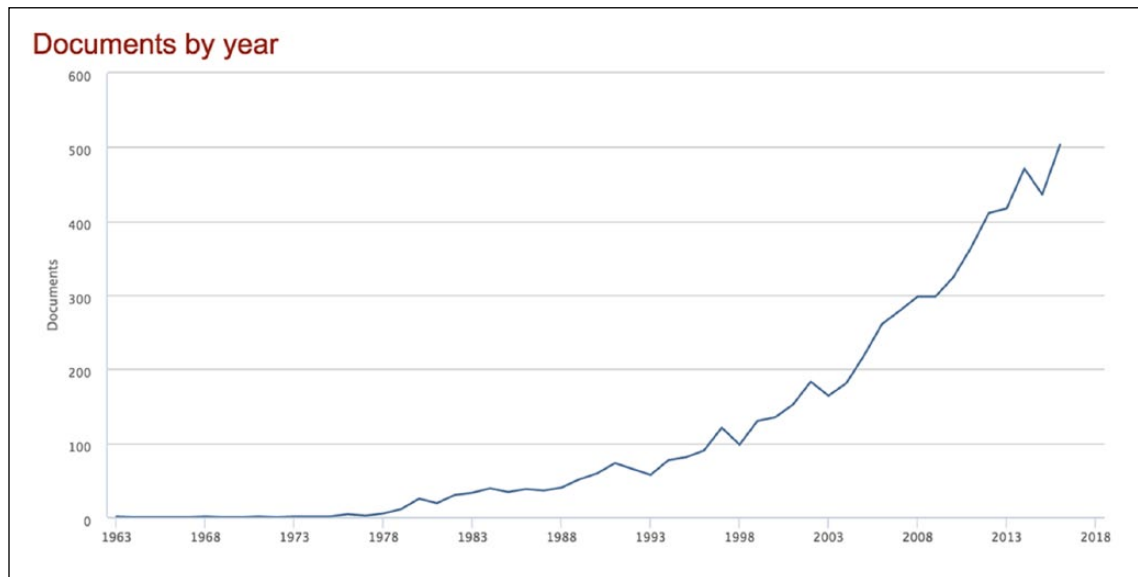


Figure 1. Results of Scopus search for term 'Biopsychosocial' in article titles, Abstracts, and Keywords (1963–2016).

shows that the most prevalent attribution of illness was to psycho-social causes,¹³ and the weaknesses and failures of biomedical medicine are repeatedly articulated.¹⁴

The biopsychosocial model is not the only alternative to the biomedical model; there is a social model,¹⁵ and there are many others,¹⁶ some better developed than others. However, the biopsychosocial model is now the best established alternative model, and publications relating to it have grown steadily (see Figure 1). Nonetheless, the biomedical model remains dominant in the public understanding of illness and is so entrenched that most people do not even realize that they are using it.

Achievements, criticisms, evolution, and challenges

In 2002, the World Health Organization published its International Classification of Functioning, Disability and Health (WHO ICF), which is explicitly related to the biopsychosocial model¹⁷ (p. 9). The model has been used to structure guidelines,¹⁸ is used clinically,¹⁹ and is discussed in relation to person-centred care²⁰ and in other contexts.²¹ It forms the foundation of two

measures of case complexity, the INTERMED²² and the Oxford Case Complexity Assessment Measure (OCCAM).²³ It is probably the most widely mentioned and used model in research into rehabilitation and disability including chronic pain, psychiatric disorders,²⁴ and, possibly, functional disorders.

It is not without its critics. Some of these criticisms²⁵ are about its (ab)use. One series of criticisms cast doubts on its scientific basis and was concerned that disease is being marginalized,²⁶ but this argument and evidence have been addressed.²⁷ It has also been criticized for being an unjustified attack on biomedicine²⁸ and not being a universally useful model. Some people have suggested that its use may harm patients.²⁹ It is likely that both models may be associated with harm, but the harm arises from a misuse, the failure to recognize the limitations of a model.

It should never be forgotten that the biopsychosocial model was intended to be a more complete account of healthcare and illness behaviour. It was never intended to *replace* biomedical matters. Disease (the 'bio') is an important and equal part of the model, which extends but does not replace the biomedical model.

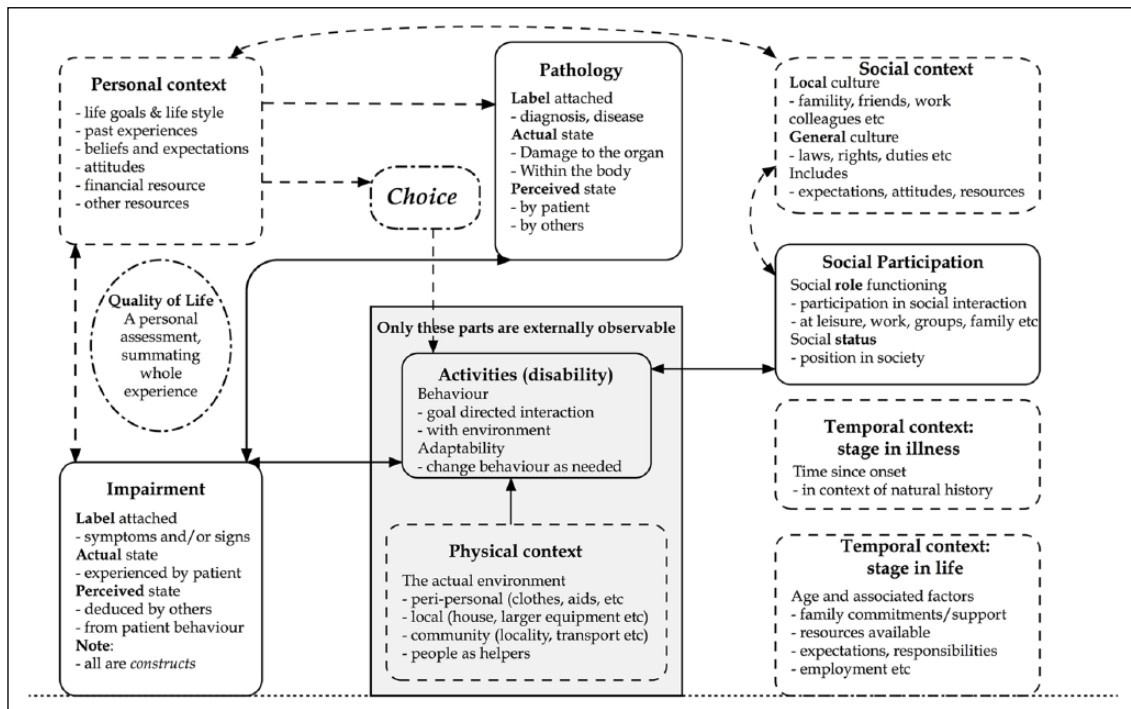


Figure 2. Holistic, biopsychosocial model of illness: components of importance.

Comment on figure:

Text = one of four levels concerning the person.

Text = one of four contextual domains.

Text = a construct outside model-not accessible.

→ = direct influences. Note that they are two-way.

---→ = indirect influences.

Note:

1. Pathology, impairment, personal context, and choice are all within the person and are not directly observable.
2. Activities and physical context are both directly observable.
3. Social participation and social context concern meaning and require interpretation or inference of observed actions or situations.
4. Temporal context is a given, but is often overlooked.
5. Potentially there are relationships and influences between all variables, and many can be reciprocal.

Not surprisingly over the last 40 years the biopsychosocial concept has evolved – and it will hopefully continue to evolve in the light of experience. Engel was concerned with psychiatry and identified the need to consider psychological and social contextual (cultural) factors when analysing the patient's presenting problems. The basic model has since been combined with the framework used by the World Health Organization as it developed its classification schemes.^{17,30} Moreover, as limitations and difficulties have been identified, it has expanded further;^{31,32} for example, the importance

of time, which is central to a paediatric analysis of illness,³³ has been added.

The most recent version of the model³ (Figure 2) is critically centred on the person, who inhabits body, which in turn is composed of a series of organs. This person has a personal context – their 'personality' and their experiences, attitudes, expectations, and so on – and a temporal context – their stage in life and their stage in the illness. The person interacts with objects and people in the physical environment in a goal-directed way. This is their behaviour. In the social context, both the

person and other people observing the behaviours can and will attribute meaning to such behaviours, all of which constitute the role or roles being enacted at that moment. The person can then exercise choices in relation to their actions and can evaluate their quality of life against whatever is their own metric – money, social position, interpersonal relationships, and so on.

The major current difficulty with the model, at least as perceived by some, is in the concept of participation, as named and described by the WHO ICF.¹⁷ There are numerous debates about what the term means, usually framed in the context of how it should be measured.^{34–36} To resolve this, it is helpful to separate the concept of participation from its measurement.

The concept concerns the most complex, highest level within the model, a person's social role or social status. It refers to the meaning attributed by the person and by others to the behaviour of the person in a particular social context (their role), and more generally over time (their status). Considered as such, it is obvious that measurement is almost impossible because it would require obtaining the views of all actors in every situation, including the person concerned. It is a powerful and useful construct, but not a measurable one.

The basic WHO ICF model also omits choice and quality of life. Defining and measuring quality of life is difficult. Ultimately only the person can rate their own quality of life and it is not externally measureable. Moreover, it is well established that people may re-normalize over time in the presence of persistent disability.^{37,38}

Evidence of validity

The limited use of the model could reflect concerns about its validity, especially in comparison with alternative models. Larson³⁹ identified four classes of models of health, including the biopsychosocial model. The other three – biomedical, wellness, and environmental – can easily be considered as subsystems within the larger more inclusive, holistic biopsychosocial model and will not be considered further. The data relating to the validity of the

biopsychosocial model are extensive, and only a small fraction can be given here.

The biopsychosocial model is considered by Engel and many others as a systems model (General Systems Theory), and one notable feature of all complex systems (such as hospitals) is that the system can fail even if all subparts are functioning normally. Most medical accidents fall into this category. The holistic biopsychosocial model predicts that people will be ill without underlying pathology. This is observed and is commonplace, being present in around 25% of all hospital outpatient encounters.⁴⁰ Most models, and especially the biomedical model, cannot explain this phenomenon, whereas it is clearly predicted by the biopsychosocial model.

Other models can easily be included into this model, which also supports its validity. Other models may highlight a specific system within this model, but they do not lead to any testable alternative hypotheses about illness. Although not very widespread, the use of this model in classification systems and guidelines supports its validity as a management tool and its increasing use in research involving complex health interventions supports its validity as an analytic and explanatory model.

There is much other evidence. A version of the biopsychosocial model

- Underpins and leads to person-centred care^{20,41,42} which can improve patient outcome.⁴³ It also underpins the goal-setting process widely used in rehabilitation.⁴⁴
- Is the theoretical basis for at least two validated measures, the OCCAM²³ and the INTERMED,²² the latter having much empirical evidence to support its utility.⁴⁵
- Predicts that many of the consequences of disease could be ameliorated without reducing the tissue damage at all. Spinal cord injury is the most obvious example, where rehabilitation has transformed life expectancy and quality of life in the presence of an immutable loss.
- Identifies different levels of an illness, a hierarchy of systems that is supported by empirical studies of inter-relationships between different constructs.

- Predicts that altering social attitudes might alter illness in patients.⁴⁶
- Provides a rationale for treatments such as cognitive behavioural therapy, which is focussed on altering 'personal context'.
- Would suggest that structuring the temporal context, for example, through enforcing routines, might help people with difficulties understanding or keeping to time.
- Is used in managing and/or researching many disabling conditions, such as chronic low-back pain where the evidence supports the model.⁴⁷

Organization and funding of healthcare

The concepts used within this model are used, partially at least, in some areas of medical practice, such as rehabilitation, some chronic pain services, palliative care, learning disability services, and psychiatry. Unfortunately, despite its use and endorsement in some areas of healthcare, in other areas such as acute medical and surgical services it is almost unknown. It is not used in the political and managerial arena, which is the most important arena because it ultimately controls resources.

Healthcare of patients could improve if all healthcare teams were more aware of and used the biopsychosocial model of illness. It underlies person-centred care.^{20,41} Reviews of the literature show that the concept of patient-centred care is still ill-defined,^{41,48} but there is some evidence in support of its benefits both for patients and for resources;^{49,50} even a minor move to being patient-centred may improve outcomes.⁴³ The improved outcomes seen critically include reduced use of resources.

As Engel realized, healthcare systems are controlled by those who oversee funding. While decisions are currently made using the biomedical model, it is difficult to see how the current funding crisis will improve. One difficulty is that politicians and executives do not realize that they are using this specific model, because it is so culturally ingrained and dominant. Senior, influential actors in healthcare are also relatively unaware of and unfamiliar with the idea of models of illness, and the various alternative models, and so they have

not pushed for a reconsideration of the assumptions made by those who allocate resources. Many problems can be traced back to the continuing influence of the biomedical model.³²

One important example is healthcare administration which only records, in a systematic way, pathological diagnoses. It may include some named functional disorders (whose boundaries and diagnostic reality are both uncertain), but it has no record of other aspects of illness. Thus, it is impossible to determine from administrative information, in the United Kingdom at least, details that are of clinical and resource importance such as how many patients are admitted to hospital and/or are discharged from hospital

- With a prolonged disorder of consciousness;
- On a ventilator or with a tracheostomy;
- With urinary incontinence;
- Unable to walk independently;
- Without having a home to go to;
- Unable to communicate their needs;
- Lacking mental capacity to make healthcare decisions.

Information about these crucial matters is essential for planning and delivering more efficient and effective services. Using a biopsychosocial model of illness framework within (electronic) hospital record and information systems, and using it to commission and monitor service performance would, over time, help develop more appropriately designed services. The World Health Organization's International Classification of Functioning is too detailed to use, but basic information could be collected and used.

Healthcare funding is still primarily based upon pathological diagnoses, but service costs are primarily related to levels of impairment and/or disability and dependence. Using a biopsychosocial model to record and analyse information would start to reveal where and how costs are generated; it would almost certainly demonstrate the cost associated with disability and might stimulate a change in service organization.⁵¹

The boundaries between different organizations and budgets derive from the biomedical model and

are increasingly based on the premise that health-care is strictly limited to the diagnosis and treatment of disease. There is no acknowledgement that many real problems faced by patients and their families are multi-factorial and that a simple categorization (health/non-health) is inappropriate and impossible. Categorization within health is also increasingly difficult when patients have multiple disorders, and the common argument about financial responsibility for post-acute healthcare between mental health and acute services for patients with brain damage is one example.

This failure to accept that a collaborative and shared care approach is needed¹¹ follows directly on from the biomedical model and leads to much wasting of time, and other resources while arguing about who will take responsibility for the whole cost. Budgets for equipment (for example) are allocated to different organizations (or none) with no rational basis, even though there is (limited) evidence that immediate supply will not only benefit the patient but also reduce healthcare costs.⁵²

Apart from what appears to be ignorance of the biopsychosocial model, there could be other reasons for not changing. Change always threatens a loss of control – ‘better the devil we know than the devil we do not know’. The biomedical model offers apparent certainty and clear boundaries, whereas the biopsychosocial model highlights unpredictability and uncertainty. People may recognize the difficulties with the current system but may prefer to tolerate it rather than change.

A biopsychosocial model also requires collaborative sharing and working across existing boundaries, which requires trust and sharing, an agreed understanding of the situation. This takes time to develop – years – and needs to be incremental. It also makes it obvious that patient-related factors are important – and patients can be unpredictable! Politicians and managers may say that everything should be patient-centred, but their actions belie their words and accepting this model would make it much harder to ignore the patient.

Fineberg⁵³ recently drew attention to the major cost and service implications associated with chronic illness. He also pointed out that innumerable attempts to improve cost-effectiveness of current

health services have failed. Interestingly, he headed his Shattuck Lecture with a quotation from Albert Einstein ‘A new type of thinking is essential if mankind is to survive and move toward higher levels’. His lecture suggested several organizational solutions to the problems associated with current services, but not a new way of thinking. Possibly using the biopsychosocial model of illness might stimulate a new way of thinking.

Some uncomfortable truths also need to be recognized. Many diagnoses currently funded are not objective, easily proven entities. Many mental health diagnoses lack any diagnostic confirmation other than reported symptomatology and observed behaviours; the diagnostic certainty of major psychosis may be reasonable. Moreover, 25% of hospital outpatients have problems that are not accounted for by any disease.^{40,54,55} About 7%–9% of hospital admissions may have no disease,^{56,57} and these are not coded as this but have incorrect disease codes.⁵⁷

Conclusion

Carel,⁵⁸ a philosopher with a chronic illness, wrote in the context of understanding illness, ‘The human being is by definition embodied and enworlded, so trying to provide an account of a human being that lacks these elements will result in a deficient account’. The biopsychosocial model might help to provide that account.

It has evolved into a more progressive and holistic model of illness. While its initial uptake was slow and cautious, there is evidence of a growing uptake by medical specialities, particularly in the context of patient-centred care. It has become incorporated into research on complex and chronic health interventions and is used in some clinical guidelines. There is now a wealth of evidence supporting its validity as a powerful model. Unfortunately, as Engel foresaw, it has not yet influenced those who fund or commission healthcare or are responsible for organization of services and budgets.

This may be changing. In 1990, Goldsmith⁵⁹ wrote, ‘Looking back on this century in the year 2015, we shall see that our society underwent two historic transformations in health care during the

present century'. The first was the defeat of acute illness which he attributed, correctly in our view, to the biomedical model of illness. The second legacy was that the biomedical 'concept of disease remains to this day, though most of the diseases that fit the concept have been conquered'. He concluded that 'our health care system has changed less dramatically than our ailments have'. As Fred Hersch⁶⁰ wrote for the Skoll World Forum in 2014, '... There has never been a greater need for innovation in health care. Existing models of care around the world have been shown to be both financially unsustainable and inequitable'.

The current health systems were founded on the biomedical model approach and are increasingly troubled. Although a biopsychosocial model may not be compatible with the current market-oriented competitive service model with payment for each item, by increasing attention upon the patient as a person and requiring greater collaboration and sharing of care and resources, it will provide a more holistic approach that has the potential to contribute to a more successful and sustainable health system.

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