Social Science & Medicine 272 (2021) 113568

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: http://www.elsevier.com/locate/socscimed

Commentary

Making the biopsychosocial model more scientific—its general and specific models

Robert C. Smith

University Distinguished Professor of Medicine and Psychiatry, Michigan State University, 788 Service Road, B312 Clinical Center, East Lansing, MI, 48824, USA

ARTICLE INFO

Keywords
Biopsychosocial model
Patient-centered interview
Medical communication
Science
General systems theory
Operational models of science
Psychology
Randomized controlled trials

ABSTRACT

Some aver that the biopsychosocial (BPS) model is not fully scientific because it lacks a method to produce BPS information. To resolve this criticism, I propose that we think in terms of general and specific BPS models. What most understand to be the model is the **general BPS model**. It simply indicates that all patients be understood in biological, psychological, and social terms without specifying a method or sources of BPS information. Its fundamental function is to guide medicine away from the effete, 17th century disease-only model in clinical care, teaching, and research. Considerable population-based research data also support its scientific status. Less well understood, but of greater relevance to the clinician, is the **specific BPS model,** which describes the BPS features unique to an individual patient. The specific model, however, requires an interviewing method to achieve this, the method critics believe lacking. In this article, I review how medical communication scholars have established a method to acquire individualized BPS data on each patient. Research identified the patient-centered interviewing (PCI) method to do this. After much progress over several decades, the field was able to test the PCI in several randomized controlled trials—and confirmed it to be evidence-based. Therefore, by definition, because the patient-centered interview defines the specific BPS model in each patient, the model itself is evidence-based. This means we now can, for the first time, identify a scientific BPS model for every individual patient. Joining this scientific support with much existing data for the general model, we now have a fully scientific BPS model.

1. Introduction

We continue to hear papers raising the question that the biopsychosocial (BPS) model is incompletely scientific (Bolton and Gillett, 2019; Creed, 2005; Foss and Rothenberg, 1987; Freudenreich et al., 2010; Ghaemi, 2009; Herman, 2005; Kontos, 2011; McLaren, 1998; Sadler and Hulgus, 1990; Schwartz and Wiggins, 1985). In this article, I assert that the BPS model can be fully scientific when we recognize the patient-centered interviewing (PCI) method that produces BPS information about the individual patient (RC Smith et al., 2013). To help clarify the situation, I'll also introduce a new way to think about the BPS model in terms of general and specific models. These topics should interest clinicians, researchers, educators, and others seeking a medicine that is more scientific.

2. The biopsychosocial model

First, let's review the criticisms that the BPS model is not fully scientific (Bolton and Gillett, 2019; Creed, 2005; Foss and Rothenberg, 1987; Freudenreich et al., 2010; Ghaemi, 2009; Herman, 2005; Kontos, 2011; McLaren, 1998; Sadler and Hulgus, 1990; Schwartz and Wiggins, 1985). I agree with them—on the surface. The BPS model, as described by George Engel in 1977 (Engel, 1977), was vague, not scientifically testable, and not specific to the individual patient. The underlying factor responsible for these concerns was that it lacked a method to operationalize it. Engel's inchoate model described only "what'' the description of the patient should contain: psychological and social features integrated with disease information. There was no method telling us "how'' to obtain these BPS data.

Often unrecognized, however, Engel's 1977 BPS model was of fundamental importance even without the method because it articulated the theoretical concepts (multidimensional, interacting BPS variables) needed to extricate our clinical care, research, and teaching from the long-entrenched biomedical or disease-only model of Descartes (Bolton and Gillett, 2019; Sullivan, 2017). And, beyond theory, it was the impetus for considerable later population-based research that further established its scientific credibility (Karunamuni et al., 2020).

Nevertheless, while such a **general BPS model** had research and

E-mail address: smithrr@msu.edu.

https://doi.org/10.1016/j.socscimed.2020.113568
Received in revised form 26 October 2020; Accepted 26 November 2020
Available online 2 December 2020

theoretical value, it did not answer the method question: How do we obtain BPS information from the individual patient? Here is where I propose we also think in terms of a **specific BPS model** to clarify what has been called "level confusion" by Watzlawick et al., trying to solve problems at one level in terms of another level (Watzlawick et al., 1974). A specific model describes BPS data on an individual patient basis in contrast to the general model that applies only broadly as an overarching guideline in caring for all patients. Therefore, I propose two levels of the BPS model. First, the general model guides medicine itself (Bolton and Gillett, 2019; Sullivan, 2017) and is well supported by research at the macro or population level (Karunamuni et al., 2020). Second, the less well-recognized specific BPS model applies to the individual patient at the micro-level and has been far less understood. This paper addresses the latter to show an additional way in which the BPS model can be considered scientific. It answers critics' concerns about an absent method.

3. The patient-centered interview

The patient-centered interviewing method is the lamented missing method. It produces the specific BPS model by showing how to obtain a unique BPS portrait of each individual patient. Derived from the PCI, an example of a specific BPS description of one patient can be seen in Table 1. Note the multiplicity of interacting BPS influences, some immediate and others more remote. All are relevant, albeit to varying degrees. As described in detail elsewhere (Fortin VI et al., 2019), multiple specific PCI skills are required to elicit the BPS story, for example, open-ended questions, eliciting emotions, and expressing empathy.

Engel himself recognized his general model lacked a method for eliciting BPS information for the individual patient (Engel, 1996), and that a method was vitally necessary to establish the model as scientific, as others also noted (Engel, 1987; Foss and Rothenberg, 1987; Freudenreich et al., 2010; Ghaemi, 2009; Herman, 2005; McLaren, 1998; Sadler and Hulgus, 1990; Schwartz and Wiggins, 1985). Indeed, Engel believed the next task for the field was to discover the patient interviewing method that would produce an individualized, specific BPS model for each patient (personal communication). This proved to be no small task.

Table 1
Biopsychosocial profile derived from a patient-centered interview of a 55-year-old man.[a]

Biological Story
• Classic angina for four years but worsening and more frequent over the last 10 days.
• Type II diabetes of 15 years' duration with glycohemoglobin of 8.3 and BMI of 29.
• Mild chronic obstructive airways disease with a 35-year history of smoking.
Psychological Story
• Feels depressed with insomnia and anhedonia over the last few months—getting worse, never treated, not suicidal.
• Chronic stress from caring for a 25-year-old child with a disability. While he loves her very much, he becomes angry when she does not better care for herself, but he usually keeps it to himself.
• Worries about finances, especially caring for his daughter.
Social Story
• Coronavirus precautions led to being laid off from work two months ago.
• National postal policies have interrupted his receipt of medications for his diabetes and angina for the last month—and his daughter's seizure medications have not arrived.
• Neighborhood children say mean things to his daughter.
• His family has a strong spiritual life that has carried them through many problems in the past.

Note.
[a] The disease model would identify only the Biological Story using closed-ended, clinician-centered interviewing skills. The above BPS story stems from a PCI and demonstrates how understanding the interactions of the three stories provides a more complete understanding of the patient and how they dictate treatment beyond addressing just the biological or disease problem; for example, in addition to treating his acute coronary syndrome, diabetes, and COPD, one would also treat his depression, help obtain insurance coverage, arrange for different sources of his medications, and reinforce his spiritual life.

Eliciting BPS information from patients is not as simple as just talking to them, nor can we rely on, for example, the physical examination, talking to relatives, and diagnostic testing (although they sometimes do contribute a bit). Acquiring unique, relevant BPS data from interviewing the patient turns out to be very complex, not least because it's somewhat counterintuitive. We must learn to let the patient have some control of our interactions and learn to do more than ask questions.

At the time Engel articulated the BPS model in 1977, the usual way to interview the patient was the so-called *clinician-centered interview*. The disease-focused clinician took charge of the interaction and ignored the patient's personal and emotional concerns, only asking questions that would inform possible disease explanations for the patient's symptoms; some clinicians still do this. Well before articulating the BPS model, Engel sought to offset the isolated disease focus in his 1969 interviewing textbook (Morgan and Engel, 1969).

Here is the daunting task the field of medical communication then undertook, spearheaded by what now are known as the Academy of Communication in Healthcare (ACH) and the European Association for Communication in Healthcare (EACH). To make the BPS model scientific for each patient, the field needed to develop an interviewing method that answered critics' concerns (Engel, 1987; Foss and Rothenberg, 1987; Freudenreich et al., 2010; Ghaemi, 2009; Herman, 2005; McLaren, 1998; Sadler and Hulgus, 1990; Schwartz and Wiggins, 1985). The method would need to:

1) Identify psychological and social data in addition to biological (disease) information with the additional proviso that the data: a) are relevant to each individual patient and not just a laundry list of all BPS data; b) are consistent, reproducible, and efficient; and c) accurately reflect the individual patient's varying BPS content over time.
2) Be demonstrated in experimental studies (randomized controlled trials) that it was: a) readily learned and b) associated with improved health outcomes.

Levenstein, McWhinney, and colleagues at the University of Western Ontario identified the *patient-centered interview* in 1980 with the idea that, "The essence of the patient-centered interaction is that the physician tries to enter the patient's world, to see the illness through his or her eyes … " (McWhinney, 1989). This launched what was to prove a far more difficult task than articulating the BPS model, no small venture itself. Indeed, it has taken yeoman work by many medical communication scholars since that time to gradually and painstakingly develop an effective patient-centered method.

Patient-centered interviewing initially advised only that clinicians begin an interaction open-endedly and to follow the patient's lead to understand their interests and ideas and concerns, putting disease questions on the backburner. Interviewers avoided interruptions, allowed the patient to have control of the conversation, and encouraged them to express their personal concerns. Upon completion of the patient-centered phase, the clinician switched gears to ask routine questions that identify disease states—so disease information was not lost.

Remarkable progress followed. To cite only a few of many deserving examples, there was the seminal work that identified the numerous individual patient-centered skills (Lipkin et al., 1984) and the three functions of the interview (Bird and Cohen-Cole, 1991). Observational studies correlated the skills with various important patient outcomes (M. Stewart et al., 2000; M. A. Stewart, 1995), and many of the ever-increasing numbers of communication scholars participated in consensus conferences to update the most important skills and to categorize them (Duffy et al., 2004; Makoul, 2001; Simpson et al., 1991).

But progress sputtered. Many, including Engel (1996), worried about the lack of a specific definition of the patient-centered interview itself—and the related inability to give explicit directions for its conduct (Cegala and Broz, 2002; Engel, 1996; Headly, 2007; Levenstein et al.,

1989; Mead et al., 2002; M. Stewart and Roter, 1989). The field's communication experts observed highly variable patient-centered interviews from one interviewer to the next, indeed, interviewers sometimes performing in opposite ways, for example, some interrupting and others not interrupting (Headly, 2007; Mead et al., 2002). The result was that an inconsistently defined patient-centered interview obligated the field to depend on consensus conferences, observational research, and opinion pieces—none sufficiently definitive for scientific and teaching purposes, therefore, unable to establish the BPS model they sought to operationalize as scientific (Bensing et al., 2003; Inui and Carter, 1985; Lurie, 2003).

The patient-centered interview itself fell short because the large number of PCI skills the field had identified were not integrated into a complete model of the interview (McWhinney, 1989; M. Stewart and Roter, 1989). Rather, efforts often focused on individual skills or groups of skills. But a full model began to evolve in 1991 when numerous open-ended, emotion-seeking and empathic skills were joined strategically in a model that, for the first time, developed an integrated physical, personal, and emotional description of the patient, thus enabling a unique BPS story (R. C. Smith and Hoppe, 1991). In 1996, standing on the broad shoulders of the many other communication scholars, two investigators independently developed similar methods containing multiple skills related to all parts of the whole interview (Frankel and Stein, 1996; R. C. Smith, 1996). The numerous PCI skills were behaviorally-defined (meaning they could be observed as present or absent), sequenced, prioritized, and grouped into a multi-skilled model to guide the clinician through the interview from start to end. This produced the repeatable, consistent interview needed for teaching and research, at the same time not prescribing rote performances, as scholars also advised (Cegala and Broz, 2002; Headly, 2007; McHugh and Slavney, 1986; M. Stewart and Roter, 1989).

A reproducible PCI meant the method could, for the first time, be tested in controlled research. This enabled the investigators' conduct of two randomized controlled trials and one recent controlled trial that demonstrated the PCI was well learned by those who received training in comparison to an equivalent control group (Fossil Jensen et al., 2011; R. Smith et al., 2018; R. C. Smith et al., 1998). One research group subsequently demonstrated an association of the PCI method with improved mental and physical health outcomes in two randomized controlled trials (RC Smith et al., 2009; R. C. Smith et al., 2006; Lyles et al., 2003). Thus, the PCI method was easily learned and was associated with improved health outcomes. The field had developed for the first time an evidence-based patient-centered interviewing method; I use the term "evidence-based" in its true sense to refer only to patient-centered methods that, themselves, have been evaluated in randomized controlled trials (RCT) (Sackett et al., 1997).

Here's why this is important to the BPS model. If the PCI is evidence-based so, by definition, is the specific BPS model it operationalizes (defines). By medicine's current standard that RCTs are the most scientific research design (Sackett et al., 1997), it means the specific BPS model is scientific. That is, the PCI operationalizes a scientific BPS model in every individual patient by accurately and systematically producing relevant disease, personal, emotional, and relational information. Nevertheless, although the PCI method meets the criteria for "operationalism" found in Table 2 (McHugh and Slavney, 1986), researchers inevitably will improve on the method itself to provide a better description of the BPS model, neither ever final, always operational models (Popper, 1994).

A consistently defined PCI method is repeatable among different interviewers, teachers, and researchers. This is needed for successful teaching and, especially, for defining the BPS features of individual research subjects. To foster research, the researchers developed validated, reliable measures to evaluate the evidence-based PCI methods for teaching and research (K. Grayson-Sneed et al., 2016; K. A. Grayson-Sneed and Smith, 2018a, 2018b; K. A. Grayson-Sneed et al., 2017; Krupat et al., 2006).

Table 2
Criteria for operationalization of a scientific model.

1.	Logically consistent
2.	Specific in behavioral terms
3.	Empirically based
4.	Technically feasible
5.	Repeatable
6.	Aimed at creating a concept that will function as a theory or model of greater predictability

Although the PCI method already is prominently taught in medical, nursing, and other health care schools throughout the U.S. and abroad and has been translated into several languages (Fortin VI et al., 2019), many researchers and theorists remain unaware of the evidence-based PCI and its ability to operationalize a specific BPS model at the patient level (RC Smith et al., 2013). This blind spot creates the erroneous implication that the BPS model is not scientific, impeding the entire science of medicine by keeping its research anchored to diseases. For example, a recent study surveyed all 327,219 RCTs reported from 1975 to April 2010. There was mention of being patient-centered in only 1475 studies (0.5%), and only 13 studies reported a behaviorally-defined PCI in an intervention (RC Smith et al., 2010). Recognizing that the specific BPS model is scientific can change this practice—as so many educators already have done.

4. Conclusions

By appreciating both the specific and general models, we can better understand Engel's 1977 BPS model and how it has evolved since then to become fully scientific. The general model has been better understood and extensively supported by research at the population or macro level. Less well understood and previously detracting from the scientific credibility of the BPS model has been how it applies to the individual patient. Propitiously, because communication scholars have progressively established an evidence-based PCI, we now have strong scientific evidence for the specific BPS model to complement extant data supporting the general model. That is, we have one scientific BPS model that must be understood at micro and macro levels.

References

Bensing, J., van Dulmen, S., Tates, K., 2003. Communication in context: new directions in communication research. Patient Educ. Counsel. 50 (1), 27–32.
Bird, J., Cohen-Cole, S.A., 1991. The three-function model of the medical interview: an educational device. In: Hale, M. (Ed.), Models of Teaching Consultation-Liaison Psychiatry. Karger, Basel, pp. 65–88.
Bolton, D., Gillett, G., 2019. The Biopsychosocial Model of Health and Disease–New Philosophical and Scientific Developments. Palgrave-MacMillan, Switzerland.
Cegala, D.J., Broz, S.L., 2002. Physician communication skills training: a review of theoretical backgrounds, objectives and skills. Med. Educ. 36, 1004–1016.
Creed, F., 2005. Are the patient-centred and biopsychosocial approaches compatible? In: White, P. (Ed.), Biopsychosocial Medicine – an Integrated Approach to Understanding Illness. Oxford University Press, Oxford, pp. 187–199.
Duffy, F.D., Gordon, G.H., Whelan, G., Cole-Kelly, K., Frankel, R., Buffone, N., Langdon, L., 2004. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. Acad. Med. 79 (6), 495–507.
Engel, G.L., 1977. The need for a new medical model: a challenge for biomedicine. Science 196, 129–136.
Engel, G.L., 1987. Foreword. In: Foss, L., Rothenberg, K. (Eds.), The Second Medical Revolution. Shambhala, Boston vii-vix).
Engel, G.L., 1996. Foreword – being scientific in the human domain: from biomedical to biopsychosocial. In: Smith, R.C. (Ed.), The Patient's Story: Integrated Patient-Doctor Interviewing. Little, Brown and Co, Boston pp. ix–xxi.
Fortin VI, A.H., Dwamena, F., Frankel, R., Lepisto, B., Smith, R., 2019. In: Fielding, A. (Ed.), Smith's Patient-Centered Interviewing – an Evidence-Based Method, fourth ed. McGraw-Hill, New York (Lange Series).
Foss, L., Rothenberg, K., 1987. The Second Medical Revolution: from Biomedicine to Infomedicine. Shambhala, Boston.
Fossil Jensen, B., Gulbrandsen, P., Dahl, F.A., Krupat, E., Frankel, R.M., Finset, A., 2011. Effectiveness of a short course in clinical communication skills for hospital doctors: results of a crossover randomized controlled trial (ISRCTN22153332). Patient Educ. Counsel. 84 (2), 163–169.
Frankel, R.M., Stein, T.S., 1996. The Four Habits of Highly Effective Clinicians: A Practical Guide. Kaiser Permanente Northern California Region, Menlo Park, CA.

Freudenreich, O., Kontos, N., Querques, J., 2010. The muddles of medicine: a practical, clinical addendum to the biopsychosocial model. Psychosomatics 51 (5), 365–369.
Ghaemi, S.N., 2009. The rise and fall of the biopsychosocial model. Br. J. Psychiatry 195 (1), 3–4.
Grayson-Sneed, K., Dwamena, F., Smith, S., Laird-Fick, H., Freilich, L., Smith, R., 2016. A questionnaire identifying four key components of patient satisfaction with physician communication. Patient Educ. Counsel. 99, 1054–1061.
Grayson-Sneed, K.A., Smith, R.C., 2018a. A research coding method to evaluate a smoking cessation model for training residents-A preliminary report. Patient Educ. Counsel. 101 (3), 541–545. https://doi.org/10.1016/j.pec.2017.09.010.
Grayson-Sneed, K.A., Smith, R.C., 2018b. A research coding method to evaluate medical clinicians conduct of behavioral health care in patients with unexplained symptoms. Patient Educ. Counsel. 101 (4), 743–749. https://doi.org/10.1016/j.pec.2017.10.006.
Grayson-Sneed, K.A., Smith, S.W., Smith, R.C., 2017. A research coding method for the basic patient-centered interview. Patient Educ. Counsel. 100 (3), 518–525. https://doi.org/10.1016/j.pec.2016.10.003.
Headly, A., 2007. Communication skills: a call for teaching to the test. Am. J. Med. 120 (10), 912–915.
Herman, J., 2005. The need for a transitional model: a challenge for biopsychosocial medicine? Famlies Syst. Health 23 (4), 372–376.
Inui, T.S., Carter, W.B., 1985. Problems and prospects for health services research on provider-patient communication. Med. Care 23 (5), 521–538.
Karunamuni, N., Imayama, I., Goonetilleke, D., 2020. Pathways to well-being: untangling the causal relationships among biopsychosocial variables. Soc. Sci. Med. 112846. https://doi.org/10.1016/j.socscimed.2020.112846.
Kontos, N., 2011. Perspective: biomedicine-menace or straw man? Reexamining the biopsychosocial argument. Acad. Med. 86 (4), 509–515. https://doi.org/10.1097/ACM.0b013e31820e0d16.
Krupat, E., Frankel, R., Stein, T., Irish, J., 2006. The Four Habits Coding Scheme: validation of an instrument to assess clinicians' communication behavior. Patient Educ. Counsel. 62 (1), 38–45.
Levenstein, J.H., Brown, J.B., Weston, W.W., Stewart, M., McCracken, E.C., McWhinney, I., 1989. Patient centered clinical interviewing. In: Stewart, M., Roter, D. (Eds.), Communicating with Medical Patients. Sage Publications, London, pp. 107–120.
Lipkin Jr., M., Quill, T.E., Napodano, R.J., 1984. The medical interview: a core curriculum for residencies in internal medicine. Ann. Intern. Med. 100 (2), 277–284.
Lurie, S.J., 2003. Raising the passing grade for studies of medical education. J. Am. Med. Assoc. 290, 1210–1212.
Lyles, J.S., Hodges, A., Collins, C., Lein, C., Given, C.W., Given, B., Smith, R.C., 2003. Using nurse practitioners to implement an intervention in primary care for high utilizing patients with medically unexplained symptoms. Gen. Hosp. Psychiatry. 25, 63–73. PMCID: PMC1892768.
Makoul, G., 2001. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad. Med. 76 (4), 390–393.
McHugh, P.R., Slavney, P.R., 1986. The Perspectives of Psychiatry. The Johns Hopkins University Press, Baltimore, MD.
McLaren, N., 1998. A critical review of the biopsychosocial model. Aust. N. Z. J. Psychiatr. 32 (1), 86–92 discussion 93-96.
McWhinney, I., 1989. The need for a transformed clinical method. In: Stewart, M., Roter, D. (Eds.), Communicating with Medical Patients. Sage Publications, London, pp. 25–42.
Mead, N., Bower, P., Hann, M., 2002. The impact of general practitioners' patient-centeredness on patients' post-consultation satisfaction and enablement. Soc. Sci. Med. 55, 283–299.
Morgan, W.L., Engel, G.L., 1969. The Clinical Approach to the Patient. W.B. Saunders Co, Philadelphia.
Popper, K.R., 1994. The Myth of the Framework – in Defence of Science and Rationality. Routledge, New York.
Sackett, D.L., Richardson, W.S., Rosenberg, W., Haynes, R.B., 1997. Evidence-based Medicine–How to Practice and Teach EBM. Churchill Livinsgtone, New York.
Sadler, J.Z., Hulgus, Y.F., 1990. Knowing, valuing, acting: clues to revising the biopsychosocial model. Compr. Psychiatr. 31 (3), 185–195, 0010-440X(90)90001-9 [pii].
Schwartz, M.A., Wiggins, O., 1985. Science, humanism, and the nature of medical practice: a phenomenological view. Perspect. Biol. Med. 28, 331–361.
Simpson, M., Buckman, R., Stewart, M., Maguire, P., Lipkin, M., Novack, D., Till, J., 1991. Doctor-patient communication: the Toronto consensus statement. Br. Med. J. 303, 1385–1387.
Smith, R., Dwamena, F., Grover, M., Coffey, J., Frankel, R., 2010. Behaviorally-defined patient-centered communication – A narrative review of the literature. J. Gen. Intern. Med. 26, 185–191.
Smith, R., Fortin, A.H., , VI, Dwamena, F., Frankel, R., 2013. An evidence-based patient-centered method makes the biopsychosocial model scientific. Patient Educ. Counsel. 90, 265–270.
Smith, R., Gardiner, J., Luo, Z., Schooley, S., Lamerato, L., 2009. Primary care physicians treat somatization. J. Gen. Intern. Med. 24, 829–832.
Smith, R., Laird-Fick, H., Dwamena, F., Freilich, L., Mavis, B., Grayson-Sneed, K., …, Solomon, D., 2018. Teaching residents mental health care. Patient Educ. Counsel. 101, 2145–2155.
Smith, R.C., 1996. The Patient's Story: Integrated Patient-Doctor Interviewing. Little, Brown and Company (now Lippincott Williams & Wilkins, Boston.
Smith, R.C., Hoppe, R.B., 1991. The patient's story: integrating the patient- and physician-centered approaches to interviewing. Ann. Intern. Med. 115, 470–477.
Smith, R.C., Lyles, J.S., Gardiner, J.C., Sirbu, C., Hodges, A., Collins, C., …, Goddeeris, J., 2006. Primary care clinicians treat patients with medically unexplained symptoms – A randomized controlled trial. J. Gen. Intern. Med. 21, 671–677. PMCID: PMC1924714.
Smith, R.C., Lyles, J.S., Mettler, J., Stoffelmayr, B.E., Van Egeren, L.F., Marshall, A.M., …, Greenbaum, R.B., 1998. The effectiveness of intensive training for residents in interviewing. A randomized, controlled study. Ann. Intern. Med. 128, 118–126.
Stewart, M., Brown, J.B., Donner, A., McWhinney, I.R., Oates, J., Weston, W.W., Jordan, J., 2000. The impact of patient-centered care on outcomes. J. Fam. Pract. 49 (9), 796–804.
Stewart, M., Roter, D., 1989. Conclusions. In: Stewart, M., Roter, D. (Eds.), Communicating with Medical Patients. Sage Publications, London, pp. 252–255.
Stewart, M.A., 1995. Effective physician-patient communication and health outcomes: a review. Can. Med. Assoc. J. 152 (9), 1423–1433.
Sullivan, M., 2017. The Patient as Agent of Health and Health Care. Oxford University Press, Oxford.
Watzlawick, P., Weakland, J.H., Fisch, R., 1974. Change: Principles of Problem Formation and Problem Resolution. WW Norton & Company, Inc, New York.