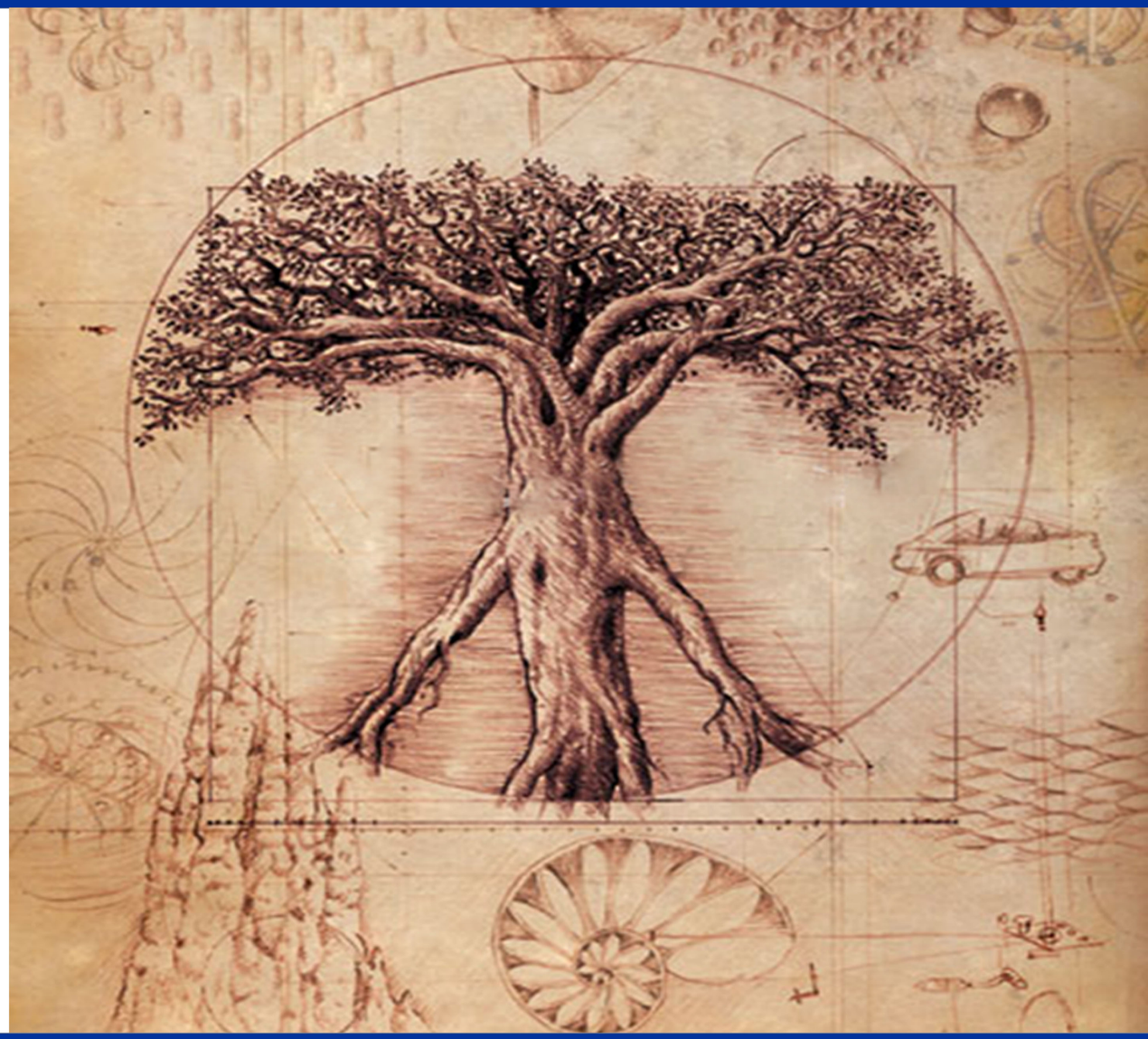
Cross-Cultural, Interdisciplinary Health Studies

International Journal of Body, Mind & Culture

eISSN: 2345-5802
http://ijbmc.org

Volume 3, Issue 2, 2016





International Journal of Body, Mind & Culture

Publishing House

Volume 3, Issue 2, 2016

http://ijbmc.org

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Cross-Cultural, Interdisciplinary Health Studies

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# Biopsychosocial Health System; Resources and Barriers

Hamid Afshar

[1] Associate Professor, Psychosomatic Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

**Editorial**

**Citation:** Afshar H. **Biopsychosocial Health System; Resources and Barriers.** Int J Body Mind Culture 2016; 3(2): 71-4.

Received: 8 May 2016
Accepted: 6 Jun 2016

The holistic and biopsychosocial (BPS) approach has been emphasized for years in psychiatry education syllabus for the recognition and management of psychiatric, psychological, and psychosomatic problems.

Physicians and psychiatrists are aware of the important role that psychosociocultural factors play in the formation and duration of various illnesses and diseases. Thus, they study the multifactorial etiology of many biomedical diseases in medical training. Moreover, they learn that there is a need for an integrative and community-based approach toward health promotion in order to achieve a balanced growth in psychophysical health of the society. In this educational process, "disease", as destruction in structure or function of different systems of the organism, has become the major focus of attention and the "patient", as a human being with "one pain", but "many sufferings", is underemphasized. During their medical career, physicians have to pay attention to an abundance of signs and clues which introduce the "patient" as an "ill person" and they have to see these signs as serious in their therapeutic and diagnosis program.

Unfortunately, there is not sufficient time during physicians' education and training period and treatment process for contemplation on systemic and holistic discussions. To practice in these domains, not only is there a need for the students to receive specific education and trainings, but the programs should be affordable and beneficial for both parties.

Clinical studies and experiences have shown that ignoring or underestimating this approach from the onset of anamnesis, diagnosis, treatment, and management, and even after the outset of the disease may influence patients' and physicians' psychobehavioral condition and ultimate salutogenesis and pathogenesis outcomes. Furthermore, burnout and unpleasant feelings in the therapeutic climate spread to all of the members of the therapeutic team and also to patients. In the following, an instance of a common therapeutic setting experienced by most therapists (general physicians, family physicians, specialists, and psychiatrists) will be discussed. Physicians (therapists) observe some signs in their encounter with their clients. These signs may

**Corresponding Author:**
*Hamid Afshar*
*Email: afshar@med.mui.ac.ir*

bring some questions to their mind, sometimes consciously and sometimes unconsciously. They may not pay attention to these signs, and consequently, not enter the domain of holistic interventions due to their lack of competence or skills in coping with and managing the situation.

**A. Situation:** It is 9.30 pm. The last client who refers to the therapist is a woman of 40 years. She has tightly covered her hair and is dressed elegantly, is calm, but seemingly tired, enters the office, and after common greetings, complains of her long (many years) history of headaches and migraines. In spite of trying various methods of treatment, she still has severe headaches twice a week.

**B. The first proposal:** The first treatment program that comes to the doctor's mind is a quick neurologic evaluation, medical history examination, medication commencement, and healthcare advice provision. The physician intends to ask questions about therapeutic history, examine tests and imaging, and write a prescription for the patient. Suddenly, the patient puts a long list of drugs she has used on the table and points out their side-effects, duration, and dose of use. She provides all her neurologic medical history including brain imaging, electroencephalogram (EEG), and even a referral note from a neurologist. In this state, therapists often view the client as a competitor in the treatment process; this may be the starting point of the patient-physician rapport damage.

**C. A transition in the interview process [considering psychological, social, and cultural factors]:** The client is a married woman with 3 children [a 16-year-old daughter and 2 twin boys, one of which has cerebral palsy (CP)]. Her husband is strict and serious, but caring. There is no history of migraine headaches in her maternal family. She herself has no history of psychiatric disease. Major psychosocial clues which may have caused persistent stress, and consequently, her migraine include chronic stress due to having a child with CP, and probably an unpleasant marital relationship with her husband.

**D. The second proposal:** It seems that psychosocial interventions, training of skills for coping with stress, family counseling, and complementary treatment methods are needed. In response to the physician's question, the client states that she has had some sessions with a psychologist. She has had Botox injection once or twice and she cannot afford to continue such costly treatments anymore. Moreover, the responsibility of caring for the children (especially the child with CP) is hers completely.

Clinical note: The therapist feels unequipped; while the therapist knows what services the client needs for an integrative management of the disease and care, limitation in his patient's financial resources and her situation restrict the choices.

**E) The third proposal:** The therapist thinks of the actions he can design to help the client. In such cases as this, there is seemingly a jigsaw puzzle with lost (or inaccessible) pieces. The client points out that she likes improving and reading books. She is a compliant patient.

The strong point [resources] at this stage is that these findings help the physician to give services other than medication. The therapist can provide complementary therapeutic interventions with the biopsychosocial approach and guide the client through the therapy process.

**F. Preparing-training-therapeutic agreement:** It seems that every physician should be able to prepare patients who suffer from long-term chronic problems, functional disorders, and psychosomatic problems which require care and must be managed. They should also be able to provide the necessary training for the client and come to an appropriate therapeutic agreement for the next stages. In the jigsaw puzzle of such patients, we have some pieces, but some other pieces are lost or not accessible. Here some questions arise: What are the main problems of the general medicine and

residency program education system in our country? Which theoretical or practical deficits give rise to weaknesses in integrative management function of the therapeutic system? What are the practice domains and job descriptions of general practitioners, family physicians, or psychiatrists in biopsychosocial approach and management? Which weaknesses exist in the system of medical education, treatment, and health care which deprive the patient of receiving integrated and multidimensional services? Which factors cause the therapist to have problems with presenting the right serious biopsychosocial services which are needed and make him feel unequipped in terms of resources?

Influential factors of weaknesses in medical/psychiatric education in the contemporary educational system:

## Educational aspects

1. Emphasis on education of the biological aspects of health and psychological health problems and limited emphasis on psychosocial and cultural aspects

2. Limited feasibilities for education of integrative interventions, limited and incoherent education during the training period of general medicine and psychiatry residency program

3. Focus on diagnosis of the "disease" versus "illness", and "pathogenesis" versus "salutogenesis"

4. The tendency for medicalization of all aspects of modern medicine and attempts to find clear causes for all medical disorders (not only in physical dimensions, but also in all psychosocial dimensions)

5. Shortage of skilled trainers and teachers to manage the psycho-pathologies embedded in family and society, and to employ integrative intervention modalities (Consequently, the systemic approach loses its right place.)

## Treatment aspects

1. Deficiencies in appropriate referral health systems and experienced family physicians in the treatment systems of Iran or some other countries, and thus, inappropriate distribution of patients in specialty or super-specialty centers in addition to hindrance of the provision of the right integrative specialty services due to limited time and financial resources

2. Shortage of or non-proportionate financial support or distribution in integrative and systemic community-based health procedures, especially in terms of insurance organizations

3. Shortage or loss of various groups which provide systemic services and also inappropriate social, financial, and spiritual coverage and support of these groups including family physicians, clinical psychologists, systemic psychotherapists, and experienced family therapists (It is worth noting that no significant relationship between the intervening components of the system is defined in health programs.)

4. Briefly, lack of a system including efficient family physicians, who can intervene in and treat the patient and the family simultaneously, and shortage of specialists (psychiatrists) who do not have enough time for or interest in multidimensional management is an important deficit.

## Health care system

1. Primary prevention is costly and yields in the long-term. Training for prevention is mainly emphasized at the second and third levels. For instance, there is much investment on treatment and rehabilitation of addicted patients, while the vicious circle of drug dependency at the community level is ignored. Healthy lifestyle, the raising, educating, and bringing up of children and adolescents, psychological health of youth, pathology of marriages and families, and etcetera are among factors which require investment to prevent social and clinical vulnerabilities. Thus, for instance, insurance companies never consider family care and

family therapy as a critical issue for preventing addiction in society, while in the long term it may be cost-effective for their own systems.

2. The role of physicians as the efficient managers and messengers of health in the community is underestimated in the health and education system.

3. The importance of training lateral skills such as problem-solving and stress management skills, familiarity with the basics of psychology within the society and community-based medical education has been underemphasized during the training period of physicians. As a consequence, physicians have serious difficulties in achieving these skills.

4. Considering the lack of above-mentioned skills, young physicians have a high stress and tension level when they enter the medical practice. This accelerates their early job burnout. Paradoxically, those who are to be protectors of health within the society, often encounter difficult conditions in medical practice.

5. In the conversion of health and medical education into a more specialty-based education, the tendency toward diagnosis and intervention tools, underestimation of community-based medical education and internal and general majors, and training of generalists limit the medical practice and activity within the biopsychosocial, spiritual, and cultural atmosphere.

## Conclusion

There are numerous factors which hinder the use of the biopsychosocial approach in health and medical care training and practice. Some of these factors are mentioned above, but a deep assessment and study in this regard is necessary. It is worth noting that historical and global experiences indicate that expert doctors in different health care levels can arrange holistic care settings in their medical practice. This is an obligation in industrialized and developing countries in which the patterns of "diseases" and "illnesses" must undergo substantial changes.

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# The Bodies We Are as Technological Artifact: The Case of 'Jasad'

Rosa Traversa[1]

[1] PhD, Department of Psychology, University of Bari, Bari, Italy

Qualitative Study

## Abstract

'Jasad' is a Lebanese cultural magazine that I consider as a precious example of Merleau-Ponty's 'flesh-ontology', whereby recovering the body does not only mean to juxtapose mind and body. Rather, it allows for a completely new reconfiguration of all those spheres we have been using to consider separately. Moreover, 'Jasad-flesh' remains always at the intersection of 'what is set, although flexible'. In sum, 'Jasad' is a breathing body, living in its heterogeneous unity. My main focus of analysis is the psychosemiotic implications of the consideration of the body as a technological artifact and cultural object.

**Keywords:** Magazine, Religion, Body, Culture, Jasad, Lebanon

**Citation:** Traversa R. **The Bodies We Are as Technological Artifact: The Case of 'Jasad'.** Int J Body Mind Culture 2016; 3(2): 75-85.

Received: 3 Mar 2016
Accepted: 29 May 2016

## Introduction

The present research contribution proposes an exploration of the ongoing transformations between the public and private spheres by focusing on the embodied human experience. In particular, this research contribution suggests how psychology might improve knowledge on the multiple tensions of the globalizing world by recovering a focus on the *carnal knowing*.

For such a purpose, I have drawn on the growing interest in philosophy (Lakoff & Johnson, 1999; Gilbert & Lennon, 2005) as well as in psychology (Wilson, 1998; Cresswell & Teucher, 2011; Cromby, 2004) for a *situated and embodied* concept of mind and culture.

**Corresponding Author:**
*Rosa Traversa*
*Email: rossella82traversa@gmail.com*

Since the beginning, psychology has been characterized by profound contradictions related to the contrast between naturalistic reductionism and interpretative exercise. The current debate deals with the comparison between mainstream general psychology inspired by neurosciences and new perspectives resulting from cultural and discoursive psychology inspired by socio-constructionism. By the end of the 20th century, re-focusing on the study of processes, rather than outcomes, was paved by neurosciences through dynamic systems theory and neural network models. Nonetheless, such models were already present in the late 19th century and this underlines the authentic debate at stake, that is, the paradigmatic dualism of 'hard science vs. soft science' together with the equation of 'hard' and 'real'. This last argument points to

the necessity of discussing the role of social sciences in the hard sciences, that is, providing a set of meanings for 'real', 'hard', and 'soft' in the study of physical, chemical, and biological functions themselves. Such a set of meanings has led me to reflect on *scientific* and *anecdotal* ways to produce knowledge, and how that which is conceived as out-of-average, redundant, and 'single case' is informative about our ways of knowing. In particular, this point led me to think how both qualitative and quantitative perspectives discuss what is shared, common, distributed, and 'general'.

In fact, the historical turn toward interpretative epistemologies and qualitative methodologies in social sciences, in particular in psychology, has triggered the struggle over the formulation of new criteria for adjudicating knowledge claims in qualitative research.

The aim of the present argument is to show how the movement between interpretation and empiricism is primarily based on a common reductionism of the body and flesh.

By departing from Cromby's challenge to outline an embodied subjectivity 'that is neither individualist, essentialist nor disembodied' (2004, p. 5), I will follow his argument that social constructionism without an appropriate conceptualization of subjectivity runs the risk to reify the 'social', by creating a depopulated psychology (Billig, 1998). In this sense, the mere focus on the discoursive observable features of human interaction might actually deprive psychology of what is significantly human.

Moreover, the constant omission of the embodied materiality from any psychological account could reinforce, rather than question, the Cartesian dualism of body vs. mind. By following this argument, I will attempt to show a twofold implication; on the one hand, language itself can be conceived as an embodied action (Bakhtin, Emerson, & McGee, 1986; Cresswell & Teucher, 2011), on the other hand, the embodied materiality does not provide the basis for any 'fixed, locatable and originary' (Wilson, 1998, p. 95) psychological explanation. In my view, 'location' provides a different approach to the psychological concept of 'positioning' in terms of 'stabil-flexibility', according to which both material and cultural realities express social constraints and agency.

In so doing, I will draw on the feminist perspective of Donna Haraway and Goodeve (2000) in order to show how metaphors do not strictly imply representations of reality, cognitive maps. Rather, they are profoundly *physical/semiotic* processes that enhance novelty, by "finding regularities into chaos of sensations and discovering coherencies in what is unpredictable" (Mininni, Ligorio, & Traversa, 2012).

By following this point, I will argue that both empiricism in mainstream psychology (Danziger, 1997) and social constructionism (Tolman, 1994) rely upon a *common* reductionism that brings to a *common* homogenizing human experience.

In this vein, I will propose to focus on the body at the intersection of social structure, culture, and subjectivity. With respect to this, I will point out Foucault's concept of biopolitics (1998) to make sense of the processes of reification of bodies and his latest (1988) arguments about how agentic bodies could inhabit the social arena (only mentioned, not yet fully theorized). Then, I will further Merleau-Ponty's (2002) proposal of *carnal knowing* to explain the body not as mere *extension* (Husserl, 1970) but as *flesh*, which recovers a more mature concept of embodied subjectivity.

My arguments will be interrelated with the discussion of sexuality, pornography, and politics in order to explore the ongoing transformations of intimacy and public relations as very much embodied processes.

For this purpose, I have analyzed a quarterly cultural magazine in Lebanon, 'Jasad' (Body in Arabic), specialized in the Body's arts, sciences, and literatures.

As I will try to suggest, the body question in this context shows, simultaneously, the

agency and the social structure, the embodied subjectivity, as well as the embodied reification. In this line, by working *with* these contradictions and tensions, rather than by transcending them, there is the possibility of transformation.

## Embodying subjectivity

The current attempt to recover a personal/social unity in psychology has been focused on recovering the concept of *subjectivity* (Stengers, 2008; Layton, 2008). The renewed attention to this concept has also emerged from discoursive psychologists, such as Margaret Wetherell (2008). In her article published in the first number of the journal of 'Subjectivity', she noted that the re-call to 'subjectivity' could be a trap, in the sense of re-confining the self in the public vs. inner essence, like psychoanalytic frameworks have been doing. She suggested the use of 'psychodiscoursive practices' in order to highlight a concept of subjectivity not depicted as 'identity', that is as something pre-established and fixed, but as the peculiar, unique, personal ways to appropriate some socially-constructed definitions, such as gender, race, class, sexual orientation, religiosity, and so on and so forth. This would imply, in my opinion, to stress the specificity of individual practices/existences as inscribed in a societal level *at the same time*.

In this vein, Cromby (2004, p. 3) outlines how, even when theorized, subjectivity is somewhat disembodied; the concreteness of human experience is devoid of embodied particularities or juxtaposed to other mental/linguistic processes. Thus, social constructionism has been either neglecting the body or conceptualizing it 'as surface of inscription, metaphor or text, rather than as a fleshy organ bearing both enablements and constraints.' By downplaying the embodied materiality of existence, constructionism has been conflating discoursivity and materiality. In so doing, it has treated all bodies as if they are equally *available* to the discoursive construction and it has failed to account for 'real persons in real contexts' (Salvatore & Valsiner, 2008). As a matter of fact, the human experience has been reduced to how we talk and write *about* it, rather than to its actual dynamicity.

Furthermore, the lack of theorization of a concept of embodied subjectivity *conceals*, rather than *addresses*, the Cartesian dualism of mind vs. body as well as the individual-society binary.

In fact, social constructionism has been replacing the same *up-to-down* paradigm in framing the mere discoursive aspects as whole determinants of situated interaction. On the one hand, mainstream psychology has reduced human sociality to variables within the individual (motivation, personality, and etc.), and on the other hand, constructionist psychology has failed to theorize embodied subjectivity, since it would recall the specters of essentialism and biological reductionism. In so doing, it has also reduced human experience.

I think that such an impasse could be addressed by re-articulating materiality, language, and metaphors as a re-articulation of location, meaning, and power-relations.

In this vein, Cresswell and Baerveldt's (2009) re-interpretation of Bakhtin provides an insight into the inseparability of corporeality and sociality of life. In fact, Bakhtin (1981, p. 171, emphasis added) argued: "[Rabelais] wants to return both a language and a meaning to the body […] and *simultaneously* return a reality, materiality, to language and meaning". Following this point, Bakhtin (1984b) conceives the body as a social entity and not a personal entity, and thus, he stated that '[the individual] *feels* that he is an indissoluble part of the collectivity, a member of the people's mass body" (1984b, p. 255, emphasis added). The concept of collectivity is here deployed by Bakhtin to address his well-known concept of "speech genre" (Holquist, 1990). Cresswell and Baerveldt (2009, p. 4) may interpret speech genre as Bakhtin's core idea that embraces body and sociality. Ultimately, they argue that for Bakhtin our *inner* emotional-

volitional tone comes from the sedimentation of collective practices. In other words, "to participate in a speech genre is to participate in a *reality* lived in common in a collectivity that is *personally experienced* as an ontological given". Newness in this respect comes from the very possibility to inhabit a speech genre while simultaneously opening to new self-understandings through exposing *life as framed* to a specific socio-cultural background, and thus, making life *less-given*. In this sense, "a work of art, in its creative genius, extends beyond a speech genre because it exposes life's *tacit livedness*" (Cresswell & Baerveldt, 2009, p. 5).

Selfhood, thus, arises from the *dialogical penetration* that takes place between different speech genres. People are part of different speech genres, so that individual uniqueness is the *self-stylization* in expressing the tensions among different speech genres. Among different speech genres means substantively among other people, not in one's head. As a matter of fact, one could be close enough to a community to be recognized as a part of it, while being different enough to satisfy his/her *outsideness* to be part of another collectivity.

In this line, Bakhtin (1984a) treated language as intimately bound to emotional-volitional tone and he theorized languages "as philosophies, not abstract but concrete, social philosophies, penetrated by systems of value and inseparable from living practice" (p. 471). Ultimately, the complex intersection of languages is the heterogeneity of speech genre that comes "in close connection" with society.

This point brings us to outline how metaphors foster knowledge not only in terms of a conflation between different domains of reality (Lakoff & Johnson, 1980), but also in terms of 'embodied semiosis'. In this vein, metaphors are practices of connection enhancing both vagueness and vividness of sense-making related to the emergence of novelty. Moreover, metaphors operate through diffraction, shifting trajectories and oblique narration by disclosing different limits and new openness. Indeed, metaphors cannot exist out of the materiality of bodies and place/time.

As argued elsewhere (Traversa, 2010), opening the meaning is opening the body, insofar as metaphors are not only representational figures, but are also exceeding places with expressive functions. In this regard, I disagree with Cromby (2004) on metaphors as only a 'surface of inscription', since the functioning of metaphors appears to extend towards the *exterior*, yet just remaining *under the skin*. This double-fold nature of metaphors fosters a peculiar way to the openness of the meaning; by constraining this process to the openness, unpredictability, and intensity of the *sentient body*. This last point highlights how a disembodied conceptualization of metaphors suggests a de-located and masculine conceptualization of knowledge and novelty (Bordo, 1990); that is, the lack of materiality would prompt a universal, neutral, and ubiquitous 'power-to-know'.

Donna Haraway (1988; 1996; 2000) offers a conceptualization of metaphor as a *generative* process, as she emphasizes *both* the literal nature of metaphor *and* the physical quality of symbolization.

As a matter of fact, as a feminist biologist/philosopher, she does not strictly separate biochemistry and language, and she conceives biology itself as 'twofold, as something about the functioning of the world from a biological point of view, as well as about the functioning of the world from a metaphorical point of view' (Haraway, 2000, p. 38). In this sense, metaphor exceeds its components and it is exactly the point of conjunction between the figurate and real domains, where the author feels she should live herself and not only to work with. Haraway proposes the way in which signs and flesh are profoundly interrelated, and 'naturculture' is a-one-word, meaning, and metaphors are able to connect *through* partialities (Haraway, 1988).

The partial perspective she referred to was not accounted for its own sake, but rather for

its possibility to keep room for unpredictable connections. In so doing, she has argued how the generative heterogeneity of metaphors is able to keep what exceeds all binary logic; ultimately, how they enhance novelty *while being* recognizable in a certain culture. In this way, she argued about the 'metaphors we live in' insofar as we are ourselves metaphorical structures, by relying upon splicing practices, rather than on isolation, and by interacting *with* the world in a complex way.

Haraway's metaphors like *cyborg, FemaleMan, Oncomouse,* tend to shed light on the permeability of the body and the inseparability of biology from the 'external world', as has been shown in bio-technologies. By drawing on technological bodies and embodied technologies, Haraway has been stressing how different *forms of life* have been transformed into *maps of life,* and then, have become *maps of reality*.

Another feminist cognitive psychologist, Elizabeth Wilson (1998), has indicated how the naturalized antibiologism in the current critical analysis has tended to look only 'outside the science' (for instance, toward environment and culture) to obtain sites of malleability, difference, and politics. Thus, such a critical habit has overlooked the potential of internally criticizing the scientific constructs themselves, which ground their neurological reductionism on the apparent surety of biological matter. Wilson's main concern is to show which *metaphysics* are revealed and which theories are enabled and foreclosed by the 'morphology of mind' in contemporary theories. For instance, her critique of the re-inscription of the Cartesian mind vs. body in the current identification of mind with brain is depicted through the metaphor of *decapitation* that is the dis-identification of the brain with the body in neuropsychology and cognitive science.

Thus, metaphor creates a space for possibility and temporal shifting *while* existing in the materiality of bodies and time. In this sense, it both *enables* and *constraints*, by suggesting also a knowledge positioning in relation with the world, which is an active reality.

## Between 'biopolitics' and the 'technologies of the self'

Foucault uses the term 'biopolitics' as synonymous to the power to regulate human worlds by the means of scientific disciplines and techniques; 'One might say that we shifted from the old right to *make* someone dye and *let* someone live, to the power of *making* someone live and *forbidding* someone to dye' (Foucault, 1998, p. 122). The French philosopher argues that the heterosexual norm operated for regulating reproduction by the means of various bio-powers concerns birth-rate, longevity, and public health. Hence, only compliant-malleable bodies can survive, while all the others are excluded, condemned to death or stigmatized as 'abnormal', that is, out of legal norm as well as out of human normality itself.

The important point here is how Foucault specified that this bio-power was a necessity for the regulation of bodies, in line with the economic processes of capitalistic societies. *Nonetheless*, his focus was on *how* these norms are produced and how the sexual device operates *in order to find crisis in its procedures of exclusion.* Therefore, he was not interested in class-struggle and in the Marxist revolutionary ideology (Simone, 2010). Furthermore, Foucault argued that 'a normalizing society is the historical effect of a life-based power technology' (p. 128). With respect to this, I interpret this 'life-based power' as a power for imposing and taking for granted a *one-only-way-concept of life*, rather than Foucault's rejection of life itself, in light of his next theorizing.

I will explain our point from this central opening by Foucault about technology in order to show how he started to focus on 'the care of the self' and 'the use of pleasure' (1988-90) as the possibilities of subjectivity (unfortunately, he did not fully theorize this point because of his sudden death).

Based on sexuality, Foucault argued on 'an aesthetics of individual existence' (based on what he called 'technologies of the self') aimed at the self-construction of the subject. In so doing, he seemed to re-articulate that exact humanistic dimension he has always been denying. In this sense, Foucault recovered an ethical perspective (absent from his previous works) that constitutes a fundamental philosophical turn.

The Foucaultian subject is always shown in light of social constructions, rather than as a one-and-for-all substrate. *Nevertheless*, he depicted subjectivity in terms of 'self-care', that is, a constant self-constitution practice Foucault had drawn from Socrates' physical and spiritual *paideia*. In this vein, after the exploration of subjugated-subjects since the XVIII century, he began to focus on entirely new forms of subjectivity by the means of *critical* reflections on self and historical present. These new subjectivities would enable different freedoms and creativities.

The concept of 'technologies of the self' introduced by Foucault is meant as practices *enabling* «[...] individuals to act - by themselves or by the means of others - on their bodies and their spirituality. By starting from their thinking, action, attitude, in order to produce self-transformation» (p. 13). Individuals, thus, recognize themselves as *subjects through the use* of these technologies, that is, they become aware of their active presence in the world and with other individuals.

This notion of technology also recalls Marcel Mauss' (1973) 'techniques of the body'. This concept emphasized the un-natural and learned characteristic of all gestures and behaviors concerning primary needs, such as feeding, rest, sexuality, and etc. that have been so long considered innate human behaviors. In this line, Mauss pointed out how corporeality and social life are inseparable and (as I will also argue following Merleau-Ponty) they are two moments of the same experience. Thus, the concept of *technique* becomes suitable with respect to how human beings *perform* their bodies.

Now, by departing from the relevance of these *techniques of the body* in defining subjects in different cultural contexts, it could be heuristically fruitful to analyze how different societies have been regulating bodies, and not only them, through the construction of these techniques themselves. In this sense, this analysis might improve a historical/evolutionary perspective on how different cultures have been defining individuals as *social subjects*.

The most important point here in my view is the *tension due to* overcoming the Cartesian dualism of mind vs. body. In fact, techniques of the body are practices where the body is not only the expression, a sort of mouthpiece, but rather, the body gets a social ontology *through* them. Ultimately, it is *called into being* (technology of the self) along a complex intersection between *habitus*, *maschera* (mask), and *persona* (person).

In sum, psychology as an 'embodied science' might be founded on the constant interrelation between mind and body by inquiring the multiplicity of such interrelation itself. The focus of psychological analysis, furthermore, might be the plural and differentiated subjects in order to keep multiplicity as the starting-point for approaching how society shapes, produces, and dominates them.

My point is that we should disregard the ambiguity, rather than still question how to explain it, in order to ask different questions. That is, by reframing our problem. Simultaneously, psychological investigation could also account for different techniques of resistance to power, by starting from bodies, subjects, and their practices. In so doing, the subject lives as place of *struggle*, and *thus,* also of *transformation*.

## Why Jasad?

The selection of Jasad (Quarterly cultural magazine specialized in the body's arts, sciences, and literature) was due to its *distinctiveness*. As visible in the homepage of

the website, it is "unprecedented in the Arabic region and language". We focused on the first three issues, available online at the website (http://www.jasadmag.com/) in order to analyze Jasad's cultural and political specificities.

In particular, our point is that the main pictures on the cover-pages and the whole rhetorical structure proposed in the Editorials by the founder and editor-in-chief of the magazine, the Lebanese poet and journalist Joumana Haddad, embody the core of Jasad's mission. Thus, they allowed us to breathe the atmosphere, to walk on the field, to follow the native point of view of Jasad's initiators.

Two images at the top of the webpage suggest a clear invitation addressed to the reader and the first is a *keyhole*, through which readers can partially see a flow of artworks representing female seminude bodies. The second image is the *broken handcuff* in its logo. These images recall two essential taboos; that which is intimate and private, and social rules and scripts. Hence, a first glance at the homepage seems to arouse an inquiring attitude, and a longing for a proactive discovering of what is behind/under and infringing on what is confidential. As such, the website is introduced as an *interlocutionary interface*.

This attitude is re-proposed in the text that clarifies the mission of the magazine. Moreover, the definition of the magazine as "unprecedented in the Arabic region and language" is strengthen by the more explicit aim "to contribute in breaking the obscurantist taboos […] and in providing writers, researchers and artists with the freedom that they rightfully deserve". Rhetorically, the oppositions between "until now" and "from now on", and between "darkness" and the "light/right" make the magazine both space-time and socio-cultural turn-points.

Therefore, the native point of view proposes a communicative contract, a "call for discovering" that turns the accepting intralocutor in an interactive interlocutor.

***The first issue:*** The first issue of Jasad (http://www.jasadmag.com/en/prev1.asp) is a real tribute to the body; both the cover image and the Editorial seem to celebrate the Body's birth. Alongside the images, we immediately perceive the contrast between a well-bordered red spot and a black background. A more accurate look at the red spot shows a stretched body, shaped under a red sheet. It seems like a static body, even if certain dynamism is portrayed by the folds of the sheet. It is not clear if it is a male or a female body; it seems like a neutral body that is coming to the light from the darkness, a life-spot, a heart beating without any contextual connotation.

The sense of the image is made explicit in the *similitude* proposed in the Editorial (http://www.jasadmag.com/en/editorialp.asp); "Just like an embryo which creates its own light when it is seen by the light, the first issue of Body (JASAD) is born today".

More specifically, the aim of this first issue is threefold. The first is to "give voice" to the body and this aim represents the "field" of the whole editorial and is enacted by several discursive cues. First, "body" is the subject of most of the verbs in the editorial, presenting both a positive-active (e.g., "A body which is constantly growing, continuously evolving") and a negative-passive (e.g., "this body of ours is stolen away from our Arabic life") value. Such an emphasized *agentivity* stresses the body's awareness and moral responsibility; the body itself is presented as a living human being. As such, it carries out all the activities that any human being has to improve in order to survive and to grow up:

a) *Physical-physiological activities*: "A living body, which eats and drinks and breathes, which researches, questions and grows";

b) *Developmental activities*: "which researches, questions, and grows; which transforms, reproduces, learns, and reflects"

c) *Cognitive activities*: "the body's thinking is done through meditation, rumination, elucidation, enquiry, delving deep, experimenting, challenging, and rebelling";

d) *Perceptive-sensorial activities*: "it is done through being awake, sleeping, dreaming, having visions, hallucinating, writing, sculpting, drawing, and dancing";

e) *Higher moral and social activities*: the "body is, therefore, truly and gratefully indebted".

The second aim deals with the "tenor" of the Editorial. In particular, the discursive construction is clearly oriented toward a high commitment of the reader; if s/he accepts the communicative contract proposed by the editor and shifts from a spectator to a co-constructive attitude. In relation to this, the author makes use of including markers several times, by the means of pronouns ("we" and "us") and adjectives ("our"), ranging from a more limited belonging to a wider one. In the first case, the reference is to "we-Arabians", showing a strong *embrayage* attitude; the reference to the Arabic world presupposes a "here-and-now" inclusion (for example, "They, in turn, can liberate our Arab body from its restricted and prohibited state").

In the second case, the inclusive strategy goes beyond the geo-socio-political references and refers to "all the world"; it seems to propose a more widespread *embrayage*, in which everyone, even if non-Arabic, can meet and agree with each other (for example, "the body is the truth of us all: our individual truth, and our collective truth").

The conjunction between "individual" and "collective" fights is made against any possible feeling to be "outside" the inclusion. In the next excerpt, the same theme is enacted by the connection between "us" and "all you", by creating a link between a narrower and a wider inclusion (Example: "A body which has just been born to us, and to you all. Born of us, and of you all. Born from us, and from you all").

The last excerpt also offers an example of discursive tools that are widely spread across the text; the *repetition* and the *tripartite list*. Both these rhetoric strategies represent a source for strengthening the power and the certainty of what is said by showing a well-structured argumentation and by enabling the interlocutor to follow and to trust the text content.

A further rhetoric strategy is to approach readers by the means of a direct talk. Sentences, such as "In the first issue you're holding in your hands", "But don't rush yourselves", "Like I told you", act to transform the editorial, a written intralocutory diatext (Mininni, 2003), into an interlocutory diatext. The reader is mostly addressed by metadiscursive index, the function of which is both to unfold the author's intentions and to help the addressee to understand the enunciator's perspective. In this way, the author tries to "take care" of the reader, so that the addressee can feel followed step-by-step.

The feeling of continuity, both in the themes of inclusion and in the construction of the relationship with the readers, is also discursively created through the "polisindeto". The repetition of the conjunction "and" works as a real linking point of different experiences with the same focus, that is, the "body" (Example: "And it's our identity, and our distinguishing feature, and our language, and our compass, and the path which leads to each and every one of us").

The third aim is related to the "mode" of the discourse. The argumentative-rhetoric strategies of this first editorial co-exist in the real frame in which the body can take voice, that is, the magazine's launch. As expected, the core metaphor used to represent the hopeful starting point is "travel" (Example: "The magazine sets off on its journey […] passes through […] stopping off […] along the way […] keeping its antennae tuned […] takes a set route […]").

The several verbs and expressions used to support such a metaphor contribute to the construction of the interpretative repertoires of the journal as an "adventure". As any adventure, it starts with a current unsatisfactory situation that is connoted by negative adjectives (Example: "[…] creative writers and experiments. So that they, in turn, can liberate our Arab body from its restricted and prohibited state, and turn its

languages, its explorations and its manifestations into a doorway, opening out into freedom.").

Thus, thanks to someone endowed with positive features, the negative situation can be overcome and new higher values can be embraced.

***The second issue:*** Once born, the body (and the journal) has a new object; it has to survive (http://www.jasadmag.com/en/prev2.asp). In order to endure, each human being will try to solve two main functions, to defend and to go on/to construct. Within this new perspective, the editorial (http://www.jasadmag.com/en/editorialp2.asp) is clearly divided into two parts.

In the first part, the author tries to restart the trip just begun through the journal's launch, but seems to be willing to "adjust" the aim. Through some common rhetoric and discursive strategies, it explicitly advertises the topic of the second issue; the celebration of the male body.

This topic is justified and legitimated by both discursive and ideological matters. For the discursive, several strategies are employed in order to strengthen the enunciator's positions:

a) The *tripartite list*, as in the example of "A body born in those creative births of yesterday, today and all times". In this case, this tool has an additional function, that is, to present a timeless and a long-time perspective. It seems essential as an anticipation of one of the main criticisms (imagined or acted) by others to the journal (this will be well explain below).

b) The value of *affective markers*, both the numerous adjectives and the verbs show a noticeable positioning and emphasize a clear polarization between positive (appealing, ingenious, conquering, grandeur, exhilarating, and outshines) and negative connotation (subjugated, blanked, out extolled, and absent)

c) Additional rhetoric figures, such as the *similitude* (Example: "like a cunning man killed by his slyness" and "just like the Matryoshka Russian dolls") and the *oxymora* are used, as in the example of "absent in its presence". These figures try to explain the variety, the complexity, and the paradoxical side of reality.

As for the ideological matters, the mission of the journal is expressed by rhetoric strategies that work to present their position as "natural"; the imperative verbs (Example: "Let us, this time, be the voyeur and give…") and the questioning.

In the excerpt, "Doesn't a man have his vagina and tunnels, just as a woman has her penis and erections? It's mandatory that we realize this duality, if we stop denying our mental and spiritual androgynity, to say the least.", the question is accompanied by some expressions, such as "just as", "mandatory", and "the least", aimed to naturalize the contents and to softly involve the reader to share the positions.

Furthermore, in the following lines, the editorial gains a pronounced dialogical structure. Both the use of the first person plural and the explication of some choices (example: "We've also added […] we've made some alterations") seem to construct the image of the enunciator as clear and transparent, making the addressees aware of the editorial mission.

At the end of the first part, a direct addressing of the readers (Example: "We would appreciate if you, dear readers…") represents the high point of the climax in which the editor tries to co-construct the vision and the mission of the journal. Although the first part is aimed to construct contents and methods, the second part of the editorial, entitled "On the margin", has a more "defensive" attitude. It is constructed using ten imaginary "adjacent couples" (???) (question-answer, observation-response, and etc.); it starts from the positions of an unspecified "someone" ("They said […] asked […] retorted […] responded […]) and is continued by the more assertive "I said […] replied […] answered". The second assertive part can also be constructed with questions, but they take a

rhetoric function. Most often, the second part of the couple has a provocative attitude, constructed using the syntactic construction (question, imperative) as well as informal lexicon. This construction seems to present the opposition between common sense, which sometimes appears as hypocritical and ridicule, and the attitude of the editorial, motivated by freedom and sincerity.

## Conclusion

The *transparency* of representation and the *opacity* of feeling are crossed by the complexity of meaning-making that enhances the intelligibility of *nature(-)culture* and the heuristic value of its distinction.

The philosophical notion of *naturality*, rather than 'innaturality' or 'naturalism', detects the necessity to-be-immersed in the complex context of nature.

Thus, the body imposes the subject-immersed-in-the-world and it is *other* both from (a certain) phenomenological reductionism and from reductionism in the philosophy of mind.

The usual assumption is that the world is a given, solid object. On the contrary, the peculiarity of what is 'perceived' is ambiguity, being blurred, and context-sensitive. Nonetheless, it is not correct to consider feeling as *de-structured* and *un-shaped* per se, since it would imply that it cannot be meaningful without any theoretical system.

According to Merleau-Ponty, the 'perceived' is not constrained to any signifying operation since it is already structured in its own terms that are fluidity and ambiguity oriented.

Phenomenological and categorical aspects are distinguishable only in terms of *different* intentions of the *same* experience. Thus, Merleau-Ponty (2002) emphasizes the priority of the *un-determined* over the always new *determined*. In so doing, he compelled us to change our concept of experience itself, not as a *state*, but rather as *in-becoming*. Furthermore, he interrogated us about our concept of *constitution* itself.

Here is an epistemological radical re-configuration; the subject matter is not simply the 'body', it is also 'flesh'. Moreover, 'feeling' is not only 'perceived qualities', but is also vital need. In this way, it does not consist of passive qualities, but rather of active, dynamic properties, only because it is functional to life itself.

Hence, this point introduces Merleau-Ponty's proposal of 'flesh ontology'. In this sense, the embodied mind is the result of a circular (neither vertical nor horizontal-linear) concept of experience and its related knowledge.

This is a notion not fully embraced either by the Husserlian *plena* or by the philosophy of mind's *qualia*.

Most importantly is that the subject (and/as the scientist) is neither a *transcendent* thinker taking notes of qualitative experience, nor a *passive* domain which is deterministically modified by experience. Rather, the subject is *co-born* with a certain context of existence and is constantly synchronizing with it.

As a matter of fact, *sensation* is literally a *communion*.

## Conflict of Interests

Authors have no conflict of interests.

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Evaluation of Treatment-Seeking Behavior among the Patients with Irritable Bowel Syndrome Based on Their Psychological Profile

Maryam Babaeian[1], Hamid Afshar[2], Hamed Daghaghzadeh[3], Awat Feizi[4], Ali Mohammad Sabzghabaee[5], Hamidreza Roohafza[6], Peyman Adibi[7], Victoria Omranifard[2]

[1] Resident, Department of Psychiatry, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[2] Associate Professor, Psychosomatic Research Center AND Department of Psychiatry, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[3] Associate Professor, Integrative Functional Gastroenterology Research Center AND Department of Gastroenterology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[4] Associate Professor, Department of Biostatistics, School of Public Health, Isfahan University of Medical Sciences, Isfahan, Iran
[5] Associate Professor, Department of Clinical Pharmacy and Pharmacy Practice, Isfahan Clinical Toxicology Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[6] Assistant Professor, Isfahan Cardiovascular Research Center, Isfahan Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
[7] Professor, Integrative Functional Gastroenterology Research Center AND Department of Gastroenterology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

**Quantitative Study**

## Abstract

**Background:** Irritable bowel syndrome (IBS) is a functional gastrointestinal (GI) disorder associated with adverse mental status, impaired health-related quality of life (QOL), and high medical expenses. So, the impact of psychological factors on treatment-seeking behaviors in patients with IBS is not clearly defined. The aim of our study was to investigate the potential relationship between psychological factors and treatment-seeking behavior in patients with IBS.

**Methods:** This cross-sectional study was a part of the SEPAHAN research project and was conducted on 4763 non-academic staff of 50 different academic centers in Isfahan Province, Iran. From among the study population, 1024 individuals with irritable bowel syndrome (IBS) were evaluated. This process was repeated 15 days and a week before the distribution of the questionnaires. The demographic questionnaire, Rome III questionnaire, Hospital Anxiety and Depression Scale (HADS), General Health Questionnaire-12 (GHQ-12), and treatment-seeking behavior checklist were completed for each participant and the results were compared between participants with and without IBS.

**Results:** The participants with and without IBS were significantly different in terms of frequency of insurance coverage, visiting the doctor [general physician (GP) or specialist], leaving work because of somatic problems, leaving work because of gastrointestinal (GI) problems, visiting the GP, visiting the GP because of GI problems, visiting a specialist because of GI problems, and using medications ($P < 0.001$). Prescription of imaging and visiting a specialist were not significantly different between the two groups ($P = 0.014$).

**Conclusion:** It was found that treatment-seeking behavior had a relation with socioeconomic status and comorbid psychiatric disorders. Moreover, patients with IBS who presented more treatment-seeking behavior experienced more anxiety and depression.

**Keywords:** Rome III, Hospital Anxiety and Depression Scale (HADS), General Health Questionnaire-12 (GHQ-12), Treatment-seeking behavior, Irritable bowel syndrome (IBS)

**Citation:** Babaeian M, Afshar H, Daghaghzadeh H, Feizi A, Sabzghabaee AM, Roohafza H, et al. **Evaluation of Treatment-Seeking Behavior among the Patients with Irritable Bowel Syndrome Based on Their Psychological Profile.** Int J Body Mind Culture 2016; 3(2): 86-95.

Received: 17 Jun 2016
Accepted: 24 Sep 2016

**Corresponding Author:**
*Victoria Omranifard*
*Email: v_omranifard@med.mui.ac.ir*

## Introduction

Irritable bowel syndrome (IBS) is characterized by chronic abdominal pain, discomfort, bloating, and alteration of bowel habits (Drossman, Camilleri, Mayer, & Whitehead, 2002). IBS is a functional gastrointestinal (GI) disorder caused due to dysfunction of the gut–brain axis; however, excessive mast cell activation has a central pathophysiological role in the disorder (Stark, van Marriott, Ellis, & Harkness, 2007). Onset of IBS is more likely to occur after a stressful life event (Chang, 2011), but abnormalities in the gut flora result in inflammation and altered bowel function (Khanna, & Tosh, 2014).

The prevalence of IBS varies by country and by age, but the global prevalence is 10-15% (Drossman et al., 2002). Characteristic symptoms of IBS in normal population-based samples are common. However, only 25% to 50% of individuals with these symptoms, especially those with severe and recurrent abdominal pain, seek treatment (Sandler et al. 2002). IBS is associated with adverse mental status, impaired health-related quality of life (QOL), and high medical expenses (Thompson et al., 1999). Previous studies showed that psychiatric problems are prevalent in 40% to 60% of patients with IBS that it is significantly more than normal population (Talley, Howell, & Poulton, 2001; Levy et al., 2006; Whitehead, Palsson, & Jones, 2002; Locke, Weaver, Melton, & Talley, 2004).

In the face of malaise or illness and to resolve the problem, individuals choose different ways that are termed treatment-seeking behavior. These behaviors are lack of attention to the disease, treatment by medical service providers, and self-medication (MacKian, 2003).

Treatment-seeking behavior is influenced by various factors including the patient's expression of the need for treatment of disease, sensitivity and vulnerability to a specific disease, the patient's understanding of his/her disease, its causes and ways of dealing with it, access to services, and financial costs and acceptability of provided services (Pourreza et al., 2011). On the other hand, one of the issues that may not be controllable is the low status of women in some areas that can be a barrier to treatment. In these cases, what is important is not the patient or consumer perspective, but the perspective of the dominant members of the family (Pourreza, 2004).

For example, a community survey with 6183 individuals in rural Bangladesh found a clear gender difference in treatment-seeking behavior, with women less likely to seek treatment compared to men (Bhuiy, 2008). Various studies indicate that factors and associated symptoms such as simultaneous presence of other gastrointestinal diseases, severity of symptoms, psychological factors, and reduced QOL affect the treatment-seeking behavior of patients with IBS (Koloski, Talley, Huskic, & Boyce, 2003; Wilson, Roberts, Roalfe, Bridge, & Singh, 2004; Williams et al., 2006). A study conducted in Greece showed that female gender and mixed type IBS (diarrhea and constipation) affected the treatment-seeking behavior of these patients (Katsinelos et al., 2009). A study conducted on Chinese patients showed that IBS and dyspepsia with significant anxiety and depression, and social disability were related with seeking health care and work days lost (Hu et al., 2002). Moreover, anxiety was an independent factor in determining the use of health care in individuals with IBS and dyspepsia (Huet al., 2002). To the best of our knowledge, no study has been performed on the impact of psychological factors on treatment-seeking behaviors in patients with IBS in Iran. As mentioned above, this study attempted to investigate the potential relationship between psychological factors and treatment-seeking behavior in patients with IBS.

## Methods

This cross-sectional study was a part of the SEPAHAN research project (Adibi et al., 2012) that was conducted in 2010-2012 on the

non-academic staff of Isfahan University of Medical Sciences, Iran. The SEPAHAN research project was conducted through multiple sessions held between experts from different departments of Isfahan University of Medical Sciences and the main aims of SEPAHAN one year before beginning the study. Ethical approval to conduct the study was provided by the Medical Research Ethics Committee of Isfahan University of Medical Sciences (#189069, #189082, and #189086).

The project was designed to be a cross-sectional study and we decided to gather all information through self-administered questionnaires. After 7 months, the final list of questionnaires was compiled. Most questionnaires selected were standard questionnaires that were previously validated in Iranian settings. However, we had to design some new assessment tools or translate some questionnaires into Persian using the forward-backward translation procedure. Two health professionals performed the forward translation independently. The back-translation was done by a third person who was a professional English translator. The translators and principal investigator of the project (PA) held several sessions in order to evaluate and edit the translations. The translations were then sent to a group of faculty members (one gastroenterologist, three psychiatrists, and one nutritionist) for content validity and distributed among 100 apparently healthy adults for face validity. Considering the feedback from the faculty members and the participants who tested the translations, the final Persian version of each questionnaire was developed (Adibi et al., 2012).

To increase the participation rate and the accuracy of collected data, we decided to distribute the questionnaires in two "waves" with a short period between them (3-4 weeks). To save time and decrease errors in the data extraction phase, we developed an optical mark recognition (OMR) system that could distinguish the selected answer for each question in the scanned pictures of questionnaires. All data management was performed according to the principles of confidentiality (Adibi et al., 2012).

Isfahan University of Medical Sciences has over 20 thousand non-faculty employees and this study population consisted of 4763 individuals in 50 different centers in Isfahan Province. Cluster sampling was performed on 50 random sites including hospitals, campuses, and centers. The data used in this study is extracted from the database of the SEPAHAN project. The inclusion criteria consisted of being the non-academic staff of Isfahan University of Medical Sciences and 20 to 65 years of age, having IBS, and providing an informed consent to participate in the study. The exclusion criterion was the lack of complete information on individuals with IBS. From among the study population, 1024 indidviduals with IBS were evaluated. At baseline, all directors of various academic centers in different cities informed about the protocol of the study. The centers' personnel were informed of the study through brochures and posters distributed among the public relations staff 45 days prior to the distribution of the questionnaires. This process was repeated 15 days and a week before the distribution of the questionnaires.

After providing information about the content and objectives of the study, the questionnaires were distributed among employees in various centers in different cities of the province and public relations unit staff. Each participant was provided with a packet to send the questionnaire to the central office of Isfahan University of Medical Sciences.

## Questionnaires

***Demographic questionnaire:*** A demographic questionnaire including age, gender, marital status, education, history of medical diseases, smoking, pregnancy, weight, height, and physical activity variables was used in the present study.

***Rome III questionnaire:*** In the Rome III classification, functional GI disorders (FGIDs) are classified into the six major esophageal (category a), gastroduodenal (category b),

bowel (category c), functional abdominal pain syndrome (category d), biliary (category e), anorectal (category F) domains for adults.

The functional bowel disorders (category C) include irritable bowel syndrome (C1), functional bloating (C2), functional constipation (C3), and functional diarrhea (C4).

Irritable bowel syndrome (C1) is more specifically defined as pain associated with change in bowel habit, which is different from functional diarrhea (Longstreth et al., 2006).

***Hospital Anxiety and Depression Scale:*** The Hospital Anxiety and Depression Scale (HADS) was originally developed by Zigmond and Snaith (1983) and is commonly used by doctors to determine the levels of anxiety and depression that a patient is experiencing. The HADS is a fourteen-item scale that generates ordinal data; seven of the items are related to anxiety and seven to depression. Zigmond and Snaith created this outcome measure specifically to avoid reliance on aspects of these conditions that are also common somatic symptoms of illness, for example, fatigue and insomnia or hypersomnia. This, they hoped, would create a tool for the detection of anxiety and depression in individuals with physical health problems. There are a large number of studies that have explored the underlying factor structure of the HADS. Many support the two-factor structure, but there are others that suggest a three or four factor structure. Some argue that the tool is best used as a unidimensional measure of psychological distress (Zigmond, & Snaith, 1983; Bjelland, Dahl, Haug, & Neckelmann, 2002).

***General Health Questionnaire-12:*** The 12-item General Health Questionnaire (GHQ-12) is a screening device for identifying minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients. It is suitable for all ages, adolescent and older adults, but not children, and it assesses the respondent's current state and whether that differs from his or her usual state. This self-administered questionnaire focuses on two major areas; the inability to carry out normal functions, and the appearance of new and distressing phenomena. The GHQ-12 is a quick, reliable, and sensitive short form, ideal for research studies. Its reliability coefficients have ranged from 0.78 to 0.95 in various studies (Feyer et al., 2000).

***Treatment-seeking behavior checklist:*** The treatment-seeking behavior checklist was a measurement tool designed for assessment of treatment behaviors through 10 items on the basis of reliability and validity of the SEPAHAN study. The items included type of visit (private or public), number of referrals to general practitioners, number of referrals to a doctor only because of GI problems, number of referrals to a specialist, number of referrals to a specialist only because of GI problems, the cost of doctors' visits, the type of imaging performed, payments for imaging, payments for lab tests, and medications prescribed in the past month for GI disorders.

### Statistical analysis

The study was conducted on 1024 patients with IBS. The abovementioned questionnaires were completed and collected for statistical analysis using SSPS software (version 18, SPSS Inc., Chicago, IL, USA) in the form of descriptive statistics, including the reporting and summarizing of data using summary measures of numerical tables, graphs, and analysis. Independent sample t-test was used for quantitative variables, chi-square test for qualitative variables, and logistic regression for trend analysis and multivariate analysis (or multivariate covariance analysis).

## Results

As shown in table 1, participants with and without IBS were significantly different in terms of frequency of insurance coverage, visiting the doctor (GP or specialist), leaving work because of somatic problems, leaving work because of GI problems, visiting the GP, visiting the GP because of GI problems,

**Table 1.** Comparison of patients with and without irritable bowel syndrome in terms of treatment-seeking behavior factors

| Variables | | IBS [n (%)] | | P-value | OR | CI | |
|---|---|---|---|---|---|---|---|
| | | No | Yes | | | Lower | Upper |
| Having insurance | No | 3414 (91.3) | 858(83.8) | < 0.001 | 2.032 | 1.00 | 2.00 |
| | Yes | 325 (8.7) | 166 (16.2) | | | | |
| Visiting the doctor (GP or specialist) | No | 3338 (89.3) | 791 (77.2) | < 0.001 | 2.050 | 2.00 | 2.050 |
| | Yes | 401 (10.7) | 233 (22.8) | | | | |
| Leaving work because of somatic problems | No | 3581 (95.8) | 900 (87.9) | < 0.001 | 3.00 | 2.00 | 3.00 |
| | Yes | 158 (4.2) | 124 (12.1) | | | | |
| Leaving work because of GI problems | No | 3597 (96.2) | 919 (89.7) | < 0.001 | 2.00 | 2.00 | 3.00 |
| | Yes | 142 (3.8) | 105 (10.3) | | | | |
| Visiting the GP | No | 3603 (96.4) | 930 (90.8) | < 0.001 | 2.00 | 2.039 | 3.00 |
| | Yes | 136 (3.6) | 94 (9.2) | | | | |
| Visiting the GP because of GI problems | No | 3691 (98.7) | 999 (97.6) | 0.014 | 1.00 | 1.00 | 3.00 |
| | Yes | 48 (1.3) | 25 (2.4) | | | | |
| Visiting a specialist | No | 3703 (99.0) | 1003 (97.9) | 0.008 | 2.00 | 1.00 | 3.00 |
| | Yes | 36 (1.0) | 21 (2.1) | | | | |
| Visiting a specialist because of GI problems | No | 3656 (97.8) | 974 (95.1) | < 0.001 | 2.00 | 1.00 | 3.00 |
| | Yes | 83 (2.2) | 50 (4.9) | | | | |
| Imaging prescription | No | 3633 (97.2) | 976 (95.3) | 0.005 | 1.00 | 1.00 | 2.00 |
| | Yes | 106 (2.8) | 48 (4.7) | | | | |
| Using medications | No | 3704 (99.1) | 993 (97.0) | < 0.001 | 3.00 | 2.027 | 5.00 |
| | Yes | 35 (0.9) | 31 (3.0) | | | | |

GP: General practitioner; GI: Gastrointestinal; OR: Odds ratio; CI: Confidence interval; IBS: Irritable bowel syndrome

visiting a specialist because of GI problems,and using medications. Nevertheless, prescription of imaging and visiting a specialist were not significantly different between the two groups.

The results showed that treatment-seeking behavior had a significant relationship with IBS, depression, female gender, marriage, BMI, and physical activity. However, it did not have significant relationships with anxiety and educational level (Table 2).

There was not any significant relationship between GHQ score and number of referrals to the doctor. Nevertheless, the relationships between anxiety and depression scores, and referrals to the doctor were significant, too (Table 3).

**Table 2.** Results of regression analysis

| Predictor variables | Coefficients (B) | Wald | P-value | 95% Confidence interval for B | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| IBS* | 0.00 | 22.00 | 0.00 | 1.00 | 1.00 |
| Anxiety* | 0.00 | 4.00 | 0.27 | 1.067 | 2.00 |
| Depression* | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Age | -0.36 | 6.00 | 0.10 | 0.00 | 0.00 |
| Sex | -1.076 | 28.00 | 0.00 | 0.00 | 0.00 |
| Marital status** | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| Educational group* | 0.00 | 4.00 | 0.36 | 0.00 | 0.00 |
| BMI | 0.017 | 1.00 | 0.00 | 0.00 | 1.042 |
| Physical activity | -0.085 | 0.00 | 0.00 | 0.00 | 1.00 |

IBS: Irritable bowel syndrome; BMI: Body mass index
** 1: Single; 0: married
* 1: Yes; 0: No

**Table 3.** Relationship between psychiatric symptoms and visiting the doctor

| Variables | | Visiting the doctor | | P-value ANOVA | F |
|---|---|---|---|---|---|
| | | No | Yes | | |
| GHQ score | Mean | 2.00 | 3.00 | 0.006 | 7.00 |
| | SD | 2.00 | 3.00 | | |
| Anxiety score | Mean | 4.00 | 6.05 | < 0.001 | 16.00 |
| | SD | 3.00 | 4.00 | | |
| Depression score | Mean | 7.00 | 8.01 | 0.002 | 9.00 |
| | SD | 3.00 | 3.00 | | |

ANOVA: Analysis of variance; GHQ: General Health Questionnaire-12; SD: Standard deviation

## Discussion

Health-seeking behavior, as a multi-dimensional concept, relies on time and context (Poortaghi et al., 2015). Dressler has noted that health-seeking behavior is influenced by such matters as availability of services, transportation, and wealth of the patient or his immediate group (Dressler, 2001). Leininger is also of the opinion that people who frequently use the popular or folk sector choose this system as it is easily accessible and less expensive than the professional sector (Leininger, 1988). Slikkerveer opines that the economic status of the patients is the decisive factor in the choice of therapy (Slikkerveer, 1990).

Mainuddin, Ara, Rawal, Islam, and Shariful Islam conducted a cross-sectional study on 200 rural married women in Bangladesh using multistage sampling technique and face-to-face interviews to investigate the socio-economic characteristics, and proxy indicators for women empowerment in mobility and health-seeking behavior-related decision making. The results showed that only 12% of women were empowered to decide on their own about seeking healthcare and 8.5% in healthcare seeking for their children. In multivariate analysis, women empowerment in health-seeking behavior was higher among the age group of 25-34 years (OR = 1.76, CI = 0.82-3.21). Moreover, it had a significant relationship with [OR = 6.38, (CI = 0.98-4.21)], and women's working status [OR = 16.44, (CI = 0.79-2.71)] (Mainuddin, Ara, Rawal, Islam, & Shariful Islam, 2015).

Several reports have revealed that the need for reassurance is a key factor in seeking medical consultation among patients with functional GI disorders (Spiegel et al., 2005; Delaney, 1998; Howell, & Talley, 1999) and that such patients expect diagnostic tests beyond what is usually recommended by physicians (Lacy et al., 2007; Casiday, Hungin, Cornford, de Wit, & Blell, 2009; Bijkerk et al., 2003). As a result, both patients and doctors frequently experience frustration, dissatisfaction, and feelings of stigmatization (Dhaliwal, & Hunt, 2004). However, Spiegel et al. reported that a negative colonoscopy finding was not associated with reassurance or improved health-related QOL in patients with IBS. In a literature review, Koloski, Talley, and Boyce, (2001) even suggested that abnormal attitudes and beliefs about the illness are more important than symptom severity or knowledge about the illness in terms of patients' tendency to seek health care.

Chuma, Gilson, and Molyneux investigated the effects of socioeconomic factors on self-reported illnesses, treatment-seeking behavior, cost burdens, and coping strategies in 294 rural and 576 urban households along the Kenyan coast. Their study showed significant differences in treatment-seeking patterns in terms of socio-economic status and regressive cost burdens. The results of their study suggested that the elimination of user fees at least in targeted hardship areas of economics, developing more flexible charging systems, and improving quality of care in all facilities can promote micro-finance schemes that enable small amounts of credit to be accessed with minimal interest rates (Chuma, Gilson, & Molyneux, 2007).

According to the results of this study, it can be said that socioeconomic factors and having access to health insurance, as influential factors in health-seeking behavior, are improving. The results of the current study showed a significant difference between participants with and without IBS in

terms of insurance coverage.

Results of previous studies showed that the levels of self-reported illness have generally been higher for chronic conditions in comparison with acute illnesses (Ceesay, Morgan, Kamanda, Willoughby, & Lisk, 1997; Thompson, Miller, & Witter, 2003; Gupta, & Datta, 2003). Considering the chronicity of IBS, more visits to the doctor by these patients were expected in comparison with the healthy population. The results of this study showed that treatment-seeking behavior had a significant relationship with IBS which confirmed the results of previous studies.

However, other studies have reported that the differences in cost are likely to relate more to the type and timing of the actions taken in response to an illness (Onwujekwe, & Uzochukwu, 2005; Filmer, 2005; Worrall, Basu, & Hanson, 2005).

Previous studies have shown that comorbidity with anxiety disorder in patients can be a reason for seeking treatment. For example, in an Australian study, individuals with alcohol dependence did not perceive themselves as disabled and did not seek treatment (Proudfoot, & Teesson, 2002). However, having a comorbid affective disorder, like anxiety, directly attributable to alcohol use increases the likelihood that such individuals will seek treatment (Proudfoot, & Teesson, 2002).

The results of the present study showed there was no significant relationship between GHQ score and referrals to the doctor, but the relationship between anxiety and depression scores, and referrals to the doctor were significant.

In a study on 210 patients with back pain admitted to an orthopedic emergency unit, the Oswestry Disability Index and HADS were used to investigate the relation of anxiety and depression with seeking treatment among these patients (Gotfryd et al., 2015). The results showed that the number of medical visits in the previous 6 months ($P = 0.04$) and the scores of anxiety and depression ($P = 0.05$) were independently correlated with physical disability. Most patients (77%) would agree to participate in a hypothetical program of physical rehabilitation for prevention of back pain (Gotfryd et al., 2015).

In the study by Balasundaram, Sarkar, Hamide, and Lakshminarayanan (2014) in patients with HIV, and comorbidity with depression, there was a delay in starting treatment in one-fifth of the subjects due to depression, fear of stigma, disclosure to family, and side-effects (Balasundaram, Sarkar, Hamide, & Lakshminarayanan, 2014).

The results of the current study showed that prescription of imaging and going to a specialist were not significantly different between the two groups. This could be because visiting a specialist and prescription of imaging easily takes place in our country and many patients are treated by specialists in primary care without visiting a general practitioner. Therefore, the majority of the patients and healthy individuals have at least visited a specialist and undergone one imaging test.

In conclusion, the results of this study showed that treatment-seeking behavior had a relation with socioeconomic status and comorbid psychiatric disorders. Furthermore, patients with IBS who presented more treatment-seeking behavior experienced more anxiety and depression. On the other hand, the rate of behaviors like visiting the doctor (GP or specialist) and using medications were higher among patients with IBS. It is recommended that future studies explore the relationship between treatment-seeking behavior and illness factors of IBS and also intervention methods to reduce the economic losses caused by the repeated visits to the doctor by patients with IBS.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

The information of this article was extracted from the thesis of Dr. Maryam Babaeian

which was funded by the Psychosomatic Research Center of Isfahan University of Medical Sciences (Grant No: 393555).

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Pathology of Visual Memory in Patients with Epilepsy

Reza Pourhosein[1], Roghaye Moazaz[2]

[1] Associate Professor, Department of Psychology, School of Psychology and Education, University of Tehran, Tehran, Iran
[2] Lecturer, Department of General Psychology, Payame Noor University, Meshkinshahr, Iran

**Quantitative Study**

## Abstract

**Background:** Epileptic seizures have destructive effects on the brain, because they intervene in healthy and normal brain processes, and create interference at different stages of memory and cause malfunction in its performance and function, especially in the early years of life. The purpose of this study was to investigate memory as one of the important areas of cognition in patients with epilepsy.
**Methods:** In this causal-comparative study, the subjects consisted of 52 children of 8 to 14 years of age with epilepsy. Among them, 15, 16, and 15 patients had parietal lobe epilepsy, temporal lobe epilepsy, and frontal lobe epilepsy, respectively. The participants were selected among the patients referring to the clinic of a neurologist. Rey-Osterrieth complex figure (ROCF) test was used to assess visual memory.
**Results:** The visual memory scores in the epilepsy group were lower than the healthy group and the difference between the two groups was significant ($t = 33.76$, $df = 103$, $P < 0.001$). No significant difference was obtained between the three epilepsy groups in terms of visual memory scores ($f = 1.6$, $df = 2$, $P < 0.212$). In the present research, no significant difference was observed in visual memory between the three epilepsy groups.
**Conclusion:** It can be concluded that patients with epilepsy have impaired visual memory.
**Keywords:** Epilepsy, Visual memory, Rey–Osterrieth complex figure test

**Citation:** Pourhosein R, Moazaz R. **Pathology of Visual Memory in Patients with Epilepsy.** Int J Body Mind Culture 2016; 3(2): 96-100.

Received: 20 Mar 2016
Accepted: 6 Jun 2016

## Introduction

Epilepsy is a complex organic process that occurs in the brain; it is a comprehensive and progressive symptom of neural damage. In this state, the firing of neurons in certain areas of the brain is excessive, unpredictable, and disorderly. Extensive researches in the field of brain function disorder have shown that, in addition to the physical effects of convulsion, and its psychological, social, and economic effects, the main complaint of these patients is cognitive damage particularly to memory (Cornaggia, Beghi, Provenzi, & Beghi, 2006). Therefore, epilepsy and cognition have a complex and reciprocal relationship and the pathology is largely a result of psycho-pathology of epilepsy. There are many difficulties to studying memory in patients with epilepsy. The most important difficulty is to control the factors that are effective in the cognitive process of these patients; these factors include age at onset of

**Corresponding Author:**
*Reza Pourhosein*
*Email: prhosein@ut.ac.ir*

epilepsy, convulsion, convulsion intensity, type of epilepsy, and consumable drugs (Desai, 2008). In the present research, visual memory and the effects of the two factors of type of epilepsy and age at its onset on the amount of cognitive vulnerability were investigated in these patients.

Visual memory is a system that encodes the stream of stimuli, retains the codes related to previous stimuli, compares the codes for two stimuli, and operates based on the result of the comparison. Neuropsychologists believe that by providing images for patients with epilepsy and refreshing their memory through those images, they can embark on the analysis of differences in the damaged area of the brain. The results of these researches have shown the differences in the cognitive problems of children with different types of epilepsy. In a comparison of the tasks related to attention and memory between three groups of patients with frontal lobe epilepsy, temporal lobe epilepsy, and absence epilepsy, and the control group, the three groups of patients received scores lower than the control group (Hernandez et al., 2003). Among the patient groups, children with frontal lobe epilepsy earned lower scores than the other two groups, and children with temporal lobe epilepsy, compared to patients with absence epilepsy, obtained lower scores (Hernandez et al., 2003). In another research on visual memory, children with frontal lobe epilepsy, in comparison with children with temporal lobe epilepsy, obtained lower scores (Petty, Gross, Brewer, & Davis, 2008). In terms of cognition, patients with frontal lobe epilepsy have shown more vulnerability than patients with temporal lobe epilepsy (Helmstaedter, 2002).

Epileptic seizures have destructive effects on the brain, because they intervene in healthy and normal brain processes, and create interference at different stages of memory and cause malfunction in its performance and function, especially in the early years of life. The importance of early years of life in the development of mental processes has caused researchers to consider the age of onset of epilepsy as an important factor in the intensity and vulnerability of memory in patients with epilepsy. Moreover, it seems that patients with lower age of onset of seizures show more cognitive deficits in neurological tests (Pavone et al., 2001).

Memory, among the mental forces, is more delicate and more fragile and the importance of understanding the impact of memory defect in everyday activities on individuals' quality of life (QOL) has been clearly determined in researches. Furthermore, epilepsy is a multifaceted disorder that has an unspecified, complex, and sensitive border between neurology and psychology. With the consideration of these facts and that memory defect can cause essential psychological symptoms, such as depression, anxiety, and psychosis, we can comprehend the importance of investigating memory in patients with epilepsy and move in this direction.

## Methods

**A) Participants and research design:** In this causal-comparative study, the subjects consisted of 52 children of 8 to 14 years of age with epilepsy. Among them, 15, 16, and 15 patients, respectively, had parietal lobe epilepsy, temporal lobe epilepsy, and frontal lobe epilepsy. The participants were selected from among patients referring to the clinic of a neurologist. The study inclusion criteria included diagnosis of epilepsy based on the results of electroencephalogram (EEG), lack of psychiatric disorders including learning disorders and attention deficit hyperactivity disorder (ADHD), and attendance of ordinary schools. The control group consisted of 52 individuals (28 girls and 24 boys); after randomly selecting areas and schools in Tehran, sampling was continued until reaching the desired number of subjects (equivalent to the patient group). The inclusion criterion of the control group was lack of epilepsy and other psychiatric disorders based on clinical interview. This group was matched with the patients group

in terms of gender, age, socio-economic class, and educational level of parents.

**B) Tests:** One of the most famous tests on perceptual and visual memory is the Rey–Osterrieth complex figure (ROCF) test that was proposed for the first time in 1942 by Rey and was investigated by Osterrieth (Figure 1). The ROCF test entails the copying and recreation of a cumulative figure from memory. This test consists of two cards (A and B); in this research, card A was used. Card A consists of 18 cognitive parts and is executed in two stages (copying and reminding). The results of factor analysis indicate that this test covers 5 sets of psycho-neurological functioning; memory of the visual-spatial reminder, memory of visual-spatial recognition, response orientation, processing speed, and the ability of visual-spatial structuration. In addition, this test can distinguish patients with brain damage and mental disorders from healthy individuals. Each copy is scored for the accurate reproduction and placement of 18 specific design elements. The validity of this test was reported as 77% in the copy stage, 51% in the representation stage, and 62% in the narrative stage (Yar Ahmadian, 2007).

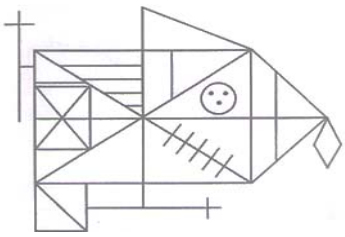

**Figure 1.** Recreation of a cumulative figure

**C) Stages of experiment performance:** The shape of card A of the ROCF test does not have a specific meaning and its graphical realization is also simple. The complexity of the shape structure is in the analyzing and organizing of cognitive activity required for drawing it. The test is performed individually and in two stages. In the first stage, the card is placed on an appropriate side in front of the participant and he/she is asked to draw it on a white paper without lines. This stage shows the participant's perceptual and organizing activity. In the second stage, the card is removed, and after 3 minutes has elapsed, the participant is asked to accurately draw the mnemonic of the previously observed image from memory. The scores resulting from the second stage represent the amount of visual memory of the participants. There is no time limit in these stages.

## Results

Based on the results of the ROCF test, the visual memory scores in the epilepsy group (18.55 ± 4.35) were higher than the healthy group (11.22 ± 6.56) and this difference between the two groups was significant ($t = 33.76$, $df = 103$, $P < 0.001$).

In patients with epilepsy, the average and standard deviation of age of onset of epilepsy was 8.27 ± 2.971. A significant correlation was observed between age of onset of epilepsy and visual memory scores; visual memory score was lower in patients with lower age of onset of epilepsy than patients with higher age of onset of epilepsy ($r = 0.75$, $P < 0.01$).

The results of the ROCF test in patients with epilepsy in the 3 groups of parietal (16.64 ± 6.07), frontal (20.30 ± 6.19), and temporal (6.80 ± 19.43) epilepsy did not show any significant difference between the visual memory scores in the 3 epilepsy groups ($f = 1.6$, $df = 2$, $P < 0.212$).

## Discussion

The main objective of this study was to investigate visual memory as one of the important cognitive fields in patients with epilepsy. The results showed that visual memory in patients with epilepsy was weaker than healthy individuals; these results correspond with the findings of previous researches (Frank, & Landeira-Fernandez, 2008; Cornaggia et al., 2006). Due to the importance of memory as a cognitive ability and the high probability of its vulnerability in brain damage and various clinical conditions, it has become an

important field of investigation for neuropsychologists. The confirmation of this hypothesis can approve the efficiency of the ROCF test in the diagnosis of brain damages and their distinction from healthy individuals. Researchers suggest that cognitive defect is influenced by different factors, of which in this research the effect of age of onset of epilepsy and kind of epilepsy were investigated. Luria (1969) has gone beyond the traditional neuropsychological model that is proposed in the framework of investigating brain dysfunction or damaged brain function and has considered growth-oriented subjects. The same point is also important for brain damages; deeper qualitative changes caused by brain damage occur at younger ages. According to this view, injuries in early childhood usually have more serious effects (Ghasemzadeh, 2006). Studies in the field of cognitive problems consider the age of onset of epilepsy as one of the most important and influential factors affecting cognitive functions (van Rijckevorsel, 2006). This issue was also confirmed in the present research.

The prevalence and frequency of occipital and parietal lobe epilepsy are lower. Thus, there are an insufficient number of neuropsychological studies and comparison of these patients. Nevertheless, numerous neuropsychological researches have been carried out on patients with temporal and forehead lobe epilepsy. The findings have shown some difficulties in the memory of these patients. However, it is contradictory results. The findings of Delaney, Rosen, Mattson, & Novelly (1980) have shown that patients with temporal lobe epilepsy have some difficulties in the sub-sections related to visual and verbal memory, while patients with frontal lobe epilepsy illustrate a more ordinary performance in these tasks. However, Kemper, Helmstaedter & Elger (1992) did not find any differences between the two studied groups in terms of memory defect. In the present research, no significant difference was observed in visual memory between the 3 epilepsy groups.

Some of the limitations of this research were the lack of control of the effect of factors like the type and dose of drugs, and frequency and intensity of convulsions on the amount of cognitive vulnerability. Therefore, it is recommended that future researches investigate the probability of the effectiveness of these factors. Furthermore, the investigation of the other cognitive fields in patients with epilepsy seems necessary. It is evident that many studies should be performed in order to illustrate the neuropsychological defects occurring in patients with epilepsy. It is hoped that this will result in acquiring further information in the field of cognitive performance of patients and providing appropriate assistance for assessing the education, improvement of QOL and social issues of patients, especially epileptic children.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

We would like to thank all participants who took part in this study.

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Cross-Cultural Adaptation of a Farsi Version of the Impulsive Behavior Scale-Short Form in Iran

Omid Shokri[1], Mohammad Hossein Sanaeepour[2]

[1] Assistant Professor, Department of Psychology, School of Education and Psychology, Shahid Beheshti University, Tehran, Iran
[2] MSc Student, Department of Psychology, School of Education and Psychology, Shahid Beheshti University, Tehran, Iran

**Quantitative Study**

## Abstract

**Background:** The aim of the present study was to investigate psychometric properties of the Impulsive Behavior Scale-Short Form (IBS-SF) among undergraduate Farsi-speaking Iranian students. In this study, 201 individuals (95 men, 106 women) answered to the IBS-SF and the Problematic and Risky Internet Use Screening Scale (PRIUSS).
**Methods:** The confirmatory factor analysis and internal consistency methods were used to compute the factorial validity and reliability of the IBS-SF, respectively. In order to examine the construct validity of the IBS-SF, the correlation of different dimensions of IBS-SF with PRIUSS was determined.
**Results:** The results of confirmatory factor analysis showed that a 5-factor structure of the negative urgency, lack of perseverance, lack of premeditation, sensation seeking, and positive urgency was replicated in the Iranian sample. The IBS-SF convergent validity was confirmed by a correlation between different features of impulsivity trait and problematic and risky internet use behavior. The internal consistency of the different subscales of impulsivity trait ranged from 0.67 to 0.80.
**Conclusion:** The present study revealed that the IBS-SF is a valid and reliable scale for measuring impulsivity trait among undergraduate Farsi-speaking Iranian students.
**Keywords:** Confirmatory factor analysis, Impulsive Behavior Scale-Short Form (IBS-SF), Problematic and risky internet use behavior, Validity, reliability, Iranian students

**Citation:** Shokri O, Sanaeepour MH. **Cross-Cultural Adaptation of a Farsi Version of the Impulsive Behavior Scale-Short Form in Iran.** Int J Body Mind Culture 2016; 3(2): 101-12.

Received: 10 Mar 2016
Accepted: 25 May 2016

## Introduction

The undeniable explanatory power of impulsivity construct, as a personality trait, in different conceptual domains has attracted the attention of researchers in educational, clinical, and health studies (An et al., 2012). The correct predictions of the impulsivity construct have made it important in a wide range of individual/social harms. These harms include aggressive behaviors (Gagnon, McDuff, Daelman, & Fournier, 2015; Heinz, Makin-Byrd, Blonigen, Reilly, & Timko, 2015; Piko & Pinczes, 2014), risky online behaviors (Dalbudak et al., 2013; Floros et al., 2015; Li, Dang, Zhang, Zhang, & Guo, 2014), risky sexual behaviors (Birthrong & Latzman, 2014;

**Corresponding Author:**
*Mohammad Hossein Sanaeepour*
*Email: mh.sanaeepour@gmail.com*

Dir, Coskunpinar, & Cyders, 2014; Fulton, Marcus, & Payne, 2010), risky driving (Pearson, Murphy, & Doane, 2013), problematic use of mobile phones (Billieux, Van der Linden, & Rochat, 2008), tendency toward substance abuse (Mokri, Ekhtiari, Edalati, Ganjgahi, & Naderi, 2008), risk of violence toward intimate partner (Derefinko, DeWall, Metze, Walsh, & Lynam, 2011), cognitive functional deficit (Nejati & Maleki, 2012), and even suicidal and self-damaging behavior (Ammerman, Kleiman, Uyeji, Knorr, & McCloskey, 2015; Dvorak, Lamis, & Malone, 2013). Moreover, the important role of impulsivity in clinical psychology is undeniable. It provides realistic interpretations for some disorders like borderline personality disorder (BPD) (Diagnostic and Statistical Manual of Mental Disorders (DSM-5®), 2013), antisocial personality (Lijffijt et al., 2012; Sargeant, Bornovalova, Trotman, Fishman, & Lejuez, 2012), substance abuse (Kaynak et al., 2013), alcohol abuse (*DSM-5*®, 2013; Jones, Chryssanthakis, & Groom, 2014; Rubenking & Lang, 2015), pathologic gambling (*DSM-5*®, 2013; Pascucci et al., 2015), and attention-deficit/hyperactivity disorder (ADHD) (*DSM-5*®, 2013; Fossati et al., 2015; Lopez, Dauvilliers, Jaussent, Billieux, & Bayard, 2015). Therefore, it is essential to develop a reliable and validated scale in order to measure the impulsivity. In this regard, different instruments have been recently developed. First, for self-report measurements, the two methods of organized interview and questionnaire have been used. A clinician mainly applies organized interviews to analyze behavioral history and expression capacity of individuals in terms of impulsive behaviors. In the organized interview, it is essential to use checklists like the Psychopathy Checklist-Revised (PCL-R) (Hare, Hart, & Harpur, 1991) and Impulsivity Rating Scale (IRS) (Lecrubier, Braconnier, Said, & Payan, 1995) to reduce interviewer error. The interviewer can also use a questionnaire. Some of the most famous pen and paper measurement instruments for measuring impulsivity trait are the Eysenck Personality Questionnaire (EPQ) (Eysenck & Eysenck, 1985) (was developed according to the evolved theory of personality traits and measures the 3 factors of risk taking, impulsivity, and sympathy by 54 items), Zukerman's Sensation Seeking Scale (SSS) (Zuckerman, 2007) (includes 40 items and measures the 4 factors of adventure seeking, boredom susceptibility, disinhibition, and experience seeking), Barratt Impulsiveness Scale (BIS-11) (Barratt, Stanford, Kent, & Felthous, 1997) (includes 30 items and measures cognitive impulsivity, motor impulsivity, and non-planning), Dickman Functional and Dysfunctional Impulsivity Instrument (Dickman, 1990) (includes 24 items and measures the 2 factors of dysfunctional impulsivity and functional impulsivity), State Impulsivity Scale (Iribarren, Jimenez-Gimenez, Garcia-de Cecilia, & Rubio-Valladolid, 2011), Richmond Compulsive Buying Scale (Ridgway, Kukar-Kinney, & Monroe, 2008), and Impulsive Behavior Scale-Short Form (IBS-SF) (Lynam, 2013). Second, experimental behavioral scales are used for impulsivity measurements. These scales include Roger's Decision Making Task (Ekhtiari, Rezvanfard, & Mokri, 2008a), Gehring's Task (Ekhtiari et al., 2008b), the Iawa Gambling Task (Ekhtiari & Behzadi, 2001), Delay Discounting Task (Ekhtiari, Behzadi, Jannati, & Moghimi, 2003a; Ekhtiari, Behzadi, & Mokri, 2005), Time Perception Task (Ekhtiari, Jannati, Parhizgar, Behzadi, & Mokri, 2004), and Balloon Analogue Risk Task (BART) (Ekhtiari, Jannati, Moghimi, & Behzadi, 2003b). These tasks were developed with the goal of reducing the dependency of measurements on language factors, placing a person in actual situation of risk-taking decision making, and independency to Reduction of self-awareness. Third, the evoked potential method is applied to measure impulsivity. This method records individuals' brain electrical activity during a task which a researcher has asked them to

perform. Fourth, functional and structural brain imaging are used to analyze activities of brain areas that are important in impulsive decision making.

The psychometric properties of different instruments which measure impulsivity have been studied and analyzed by many researchers (Candidoa, Ordunaa, Peralesa, Verdejo-Garciab, & Billieux, 2012; Cyders, Littlefield, Coffey, & Karyadi, 2014; D'Orta et al., 2015; Ekhtiari et al., 2008b; Gao, Zhang, & Jia, 2011; Javid, Mohammadi, & Rahimi, 2012). Javid et al. (2012) performed psychometric analysis on the BIS-11. They analyzed the main components of BIS-11 through a varimax rotation and showed that the factor structure of the impulsivity scale consists of the 3 factors of non-planning, motor impulsivity, and cognitive impulsivity. In this study, the internal consistency coefficient of BIS-11 universal factor was 0.81. Moreover, the reliability of the Farsi version of BIS-11 was obtained as 0.77 using test-retest method. Ekhtiari et al. (2008b) studied the validity and reliability of the Farsi versions of the EPQ, BIS-11, Dickman Functional and Dysfunctional Impulsivity Instrument, and SSS in two groups of healthy individuals and opiates users. The qualitative pattern of joint variance between different subscales of the inventories empirically supported their validity. In addition, internal consistency coefficient of different subscales of the inventories confirmed their reliability. Cyders et al. (2014) analyzed the psychometric characteristics of IBS-SF-English version (EV) among a group of students. The confirmatory factor analysis of the IBS-SF-EV showed that the factor structure of the IBS-SF-EV consists of the 5 factors of negative urgency, positive urgency, lack of perseverance, lack of premeditation, and sensation seeking. In the English version, the internal consistency coefficient of multiple factors ranged from 0.74 to 0.85. Moreover, the same variance between IBS-SF-EV subscales and wide ranges of self-damaging behaviors, like alcohol abuse, substance abuse, gambling, and risky sexual behaviors, empirically supported the construct validity of the IBS-SF. D'Orta et al. (2015) analyzed the psychometric characteristics of the IBS-SF-Italian version (IV). The confirmatory factor analysis of the IBS-SF-IV provided the same results as the IBS-SF-EV. The internal consistency coefficients of the IBS-SF-IV ranged from 0.73 to 0.84. A correlation between subscales of the IBS-SF-IV and addictive behaviors and depression symptoms empirically supported the construct validity of the IBS-SF. Candidoa et al. (2012) analyzed the psychometric characteristics of the IBS-SF-Spanish version (SV). The confirmatory factor analysis of the IBS-SF-SV also provided the same results as the IBS-SF-EV. The internal consistency coefficients of the IBS-SF-SV ranged from 0.61 to 0.81. In this study, correlation between subscales of IBS-SF-SV and emotion regulation strategies empirically supported construct validity of the IBS-SF.

Considering the above explanations, the inaccessibility of necessary information about psychometric properties of the Farsi version of the IBS-SF can be observed. Thus, the aim of the present study was to develop a Farsi version of the IBS-SF. For the first time, the factor structure of the IBS was investigated among a group of 18-25-year-old, undergraduate Farsi-speaking, Iranian students. The confirmatory factor analysis method and internal consistency were used to compute the factorial validity and reliability of the IBS-SF, respectively. In order to examine the construct validity of the IBS-SF, the correlation between different dimensions of IBS-SF and problematic and risky internet use behavior was determined.

## Methods

### Participants and procedure

In this study, 201 undergraduate, Farsi-speaking, Iranian students (95 men, mean age: 22.71 ± 2.96, age range: 18-30;

106 women, mean age: 21.22 ± 2.29, age range: 18-28) were chosen through available sampling method. Among the students, 42 (21.4%), 48 (23.9%), 52 (25.9%), and 59 (29.4%), respectively, studied at the School of Educational Sciences and Psychology, the School of Chemistry, School of Electrical and Computer Engineering, and School of Literature and Humanistic Sciences of Shahid Beheshti University, Tehran, Iran.

In this study, back translation method was used to prepare the IBS-SF-Iranian version (IBS-SF-IrV). The IBS-SF-EV was translated into Farsi, and then, back-translated into English by a bilingual person, aiming for comprehensive and linguistic equivalence. Subsequently, the differences between the original English and back-translated versions were decreased to an acceptable minimum through iterative review process by two translators. Finally, some faculty members evaluated and confirmed the content validity and cultural equivalence of this inventory.

### Measurement instruments

***Impulsive Behavior Scale-Short Form:*** In this scale, the 5 factors of positive urgency (including items 3, 10, 17, and 20), negative urgency (including items 6, 8, 13, and 15), lack of perseverance (including items 1, 4, 7, and 11), lack of premeditation (including items 2, 5, 12, and 19), and sensation seeking (including items 9, 14, 16, and 18) were measured by 20 items. In the IBS-SF (Lynam, 2013), participants score items on a 4-point scale ranging from 1 (completely agree) to 4 (completely disagree). Items 1, 4, 7, 5, 12, and 19 are reversely scored. The results of studies by Cyders et al. (2014), Billieux et al. (2012), and Candidoa et al. (2012) have empirically supported the technical characteristics of the English, French, and Spanish versions, respectively.

***Problematic and Risky Internet Use Screening Scale:*** Jelenchick et al. (2014) developed the Problematic and Risky Internet Use Screening Scale (PRIUSS) to prevent and screen problematic and risky use of internet among American teenagers and youth aged between 18 to 25 years. Based on the findings of Jelenchick et al. (2014), the PRIUSS consists of the 3 factors of social harms (including items 1-6), sensation harms (including items 7-11), and impulsive internet use (including items 12-18). Participants score each item on a 5-point scale ranging from 0 to 4; never = 0, rarely = 1, sometimes = 2, often = 3, and always = 4. The respondents are asked to record their internet use in last 6 months. In the PRIUSS, the problematic and risky internet use score increases as the general score increases. Shokri (2015) conducted a study on a group of students in order to investigate the factor validation of the Farsi version of the PRIUSS. The results of the confirmatory factor analysis of the PRIUSS showed good agreement between multiple structures of the PRIUSS (including emotional damage, social harm, and impulsive internet use) and the data. In the study by Shokri (2015), the internal consistency coefficient of emotional damage, social harm, and impulsive internet use was 0.85, 0.83, and 0.81, respectively. In the present study, these values were, respectively, 0.84, 0.85, and 0.86.

### Rationale for data analysis

In this study, data analysis was based on Classical Test Theory (CTT). The items of the IBS-SF were retained or eliminated based on the statistical characteristics of factor analysis. In this study, in order to use confirmatory factor analysis, maximum likelihood for estimating model method was used. Moreover, based on the Hu and Bentler model (1999), the $\chi^2$ index (a non-significant value corresponds to an acceptable fit), $\chi^2$ to degrees of freedom (df), the comparative fit index (CFI), the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), and the root mean square error of approximation (RMSEA) were used to present a comprehensive evaluation of model regression.

## Results

### Descriptive statistics

Table 1 shows descriptive statistics of mean

(M), standard deviation (SD), correlation of every item with total score, and internal consistency (Cronbach's alphas) with the assumption of deleting every item. In this study, Cronbach's alphas were used in order to estimate the reliability of the IBS-SF-IrV. The Cronbach's alphas for negative urgency, positive urgency, lack of perseverance, lack of premeditation, and sensation seeking subscales were 0.80, 0.74, 0.73, 0.67, and 0.76, respectively. The correlation coefficient between total score and each item ranged between 0.34 (item 2) and 0.64 (item 6) (Table 1).

In the present study, before data analysis and through the confirmatory factor analysis statistical method, the univariate normality assumptions and the multivariate normality and desultory measures were tested, respectively, by estimating skew and kurtosis levels, and through Mahalanobis distance and missing data methods (Kline, 2005; Meyers, Gamst, & Guarino, 2006). In addition, questionnaires with missing data were not taken into account (based on the expectation maximization method). The 5-factor model of IBS-SF was tested by AMOS (version 18) and confirmatory factor analysis (Cyders et al., 2014; D'Orta, et al., 2015; Candidoa et al., 2012; Lynam, 2013).

**Table 1.** Mean, standard deviation, correlation of every item with total score, and Cronbach's alphas with the assumption of deleting every item

| Items | Mean ± SD | Corrected item-total r | Cronbach's α if item deleted |
|---|---|---|---|
| Negative urgency (α = 0.80) | | | |
| 6. When I feel bad, I often do things I later regret in order to make myself feel better now. | 2.78 ± 1.06 | 0.64 | 0.72 |
| 8. Sometimes when I feel bad, I cannot seem to stop what I am doing even though it is making me feel worse. | 3.06 ± 1.15 | 0.63 | 0.71 |
| 13. When I am upset, I often act without thinking. | 3.10 ± 1.11 | 0.59 | 0.74 |
| 15. When I feel rejected, I often say things that I later regret. | 2.88 ± 1.23 | 0.53 | 0.77 |
| Lack of perseverance (α = 0.73) | | | |
| 1. I generally like to see things through to the end. | 4.24 ± 0.70 | 0.52 | 0.67 |
| 4. Unfinished tasks really bother me. | 4.01 ± 0.94 | 0.56 | 0.64 |
| 7. Once I get going on something, I hate to stop. | 4.06 ± 0.82 | 0.57 | 0.63 |
| 11. I finish what I start. | 3.85 ± 0.86 | 0.44 | 0.71 |
| Lack of premeditation (α = 0.67) | | | |
| 2. My thinking is usually careful and purposeful. | 3.92 ± 0.85 | 0.34 | 0.67 |
| 5. I like to stop and think things over before I do them. | 4.06 ± 0.87 | 0.55 | 0.53 |
| 12. I tend to value and follow a rational, "sensible" approach to things. | 4.15 ± 0.78 | 0.39 | 0.64 |
| 19. I usually think carefully before doing anything. | 3.84 ± 0.90 | 0.53 | 0.55 |
| Sensation seeking (α = 0.76) | | | |
| 9. I quite enjoy taking risks. | 3.07 ± 1.13 | 0.54 | 0.71 |
| 14. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional. | 3.50 ± 1.06 | 0.62 | 0.67 |
| 16. I would like to learn to fly an airplane. | 3.25 ± 1.26 | 0.54 | 0.71 |
| 18. I would enjoy the sensation of skiing very fast down a high mountain slope. | 3.07 ± 1.25 | 0.52 | 0.72 |
| Positive urgency (α = 0.74) | | | |
| 3. When I am in a great mood, I tend to get into situations that could cause me problems. | 2.90 ± 1.18 | 0.36 | 0.71 |
| 10. I tend to lose control when I am in a great mood. | 3.17 ± 1.07 | 0.62 | 0.57 |
| 17. Others are shocked or worried about the things I do when I am feeling very excited. | 3.15 ± 1.05 | 0.56 | 0.61 |
| 20. I tend to act without thinking when I am really excited. | 2.98 ± 1.08 | 0.47 | 0.67 |

SD: Standard deviation

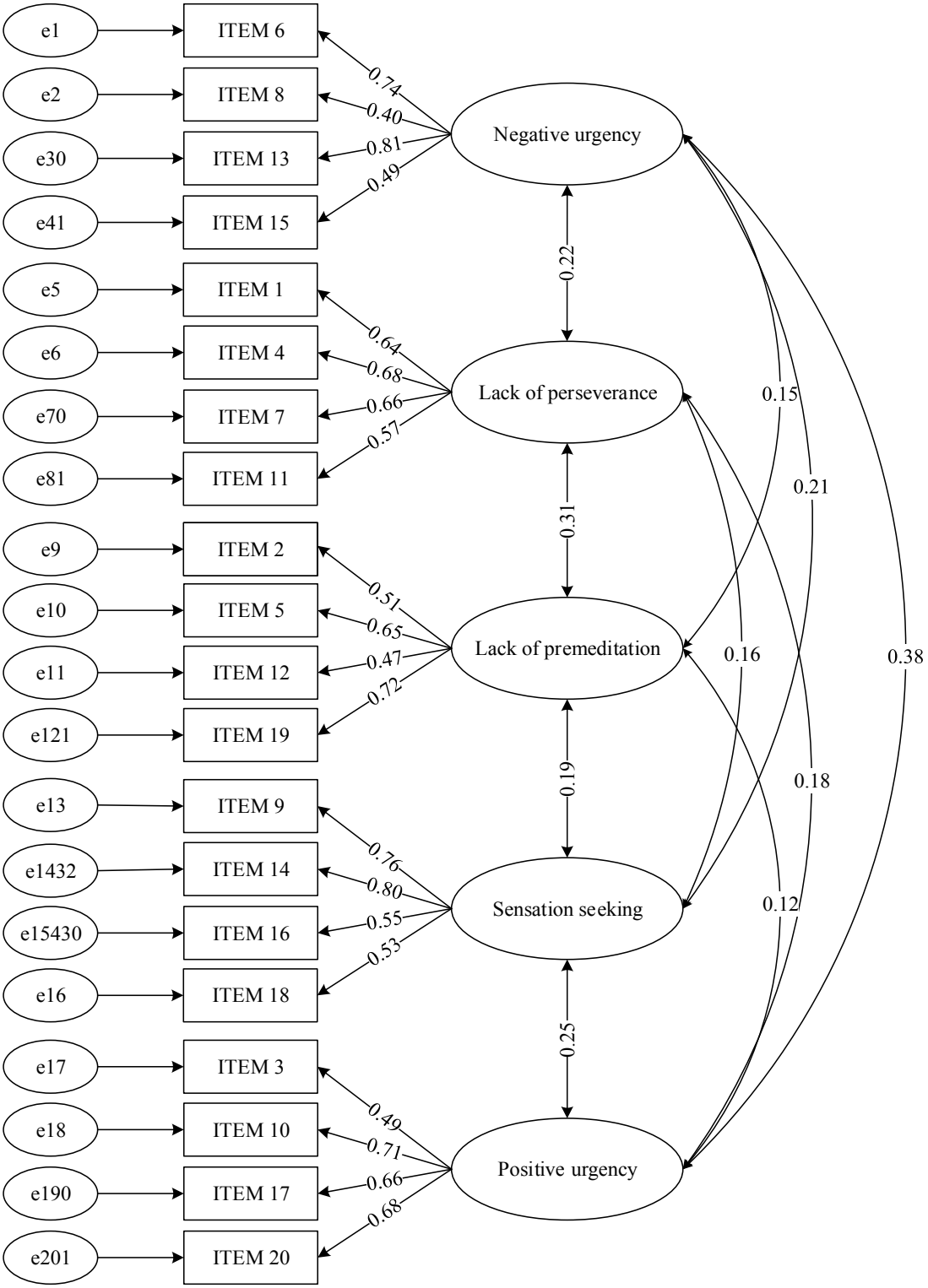


**Figure 1.** The results of regression indices for the 5-factor structure of Impulsive Behavior Scale-Short Form (IBS-SF) among Iranian students

In figure 1, the results of regression indices for the 5-factor structure of IBS-SF of Hu and Bentler (1999) among Iranian students were presented as $\chi^2$ = 425.36, df = 160, $\chi^2$/df = 2.66, CFI = 0.84, GFI = 0.81, AGFI = 0.79, and RMSEA = 0.09.

Numerical values of $\chi^2$/df > 2, RMSEA > 0.06, and the indices of AGFI, GFI,

and CFI < 0.90 are essential to the evaluation of the regression of the Hu and Bentler model (, 1999) with the present data. As can be observed in figure 1, these conditions were not appropriately satisfied and made the correction of the model essential. Evaluating the regression of the Hu and Bentler model (1999) with the present data by choosing the proposed corrections shows that with decreasing 10 units in df of the corrected model, the value of $\chi^2$ showed a 173.621 units decrease. This was carried out by creating covariance between the remaining levels of item errors in items 13 and 6, and 15 and 8 in positive urgency, 4 and 1, and 11 and 4 in lack of perseverance latent factor, 19 and 5 in lack of premeditation latent factor, 16 and 9 in sensation seeking latent factor, and 10 and 3, and 20 and 10 in positive urgency latent factor. Then, covariance was created between the remaining levels of item errors for item 9 in lack of premeditation latent factor and item 9 in sensation seeking factor. Eventually, covariance was created between the remaining levels of item errors for item 16 in sensation seeking latent factor and item 3 in positive urgency latent factor.

Figure 2 shows latent factor of IBS-SF for students after creating covariance between levels of item errors in different factors. For this model, the values of goodness of fit indices were acquired as $\chi^2$ = 251.74, $\chi^2$/df = 1.67, CFI = 0.94, GFI = 0.91, AGFI = 0.90, and RMSEA = 0.058.

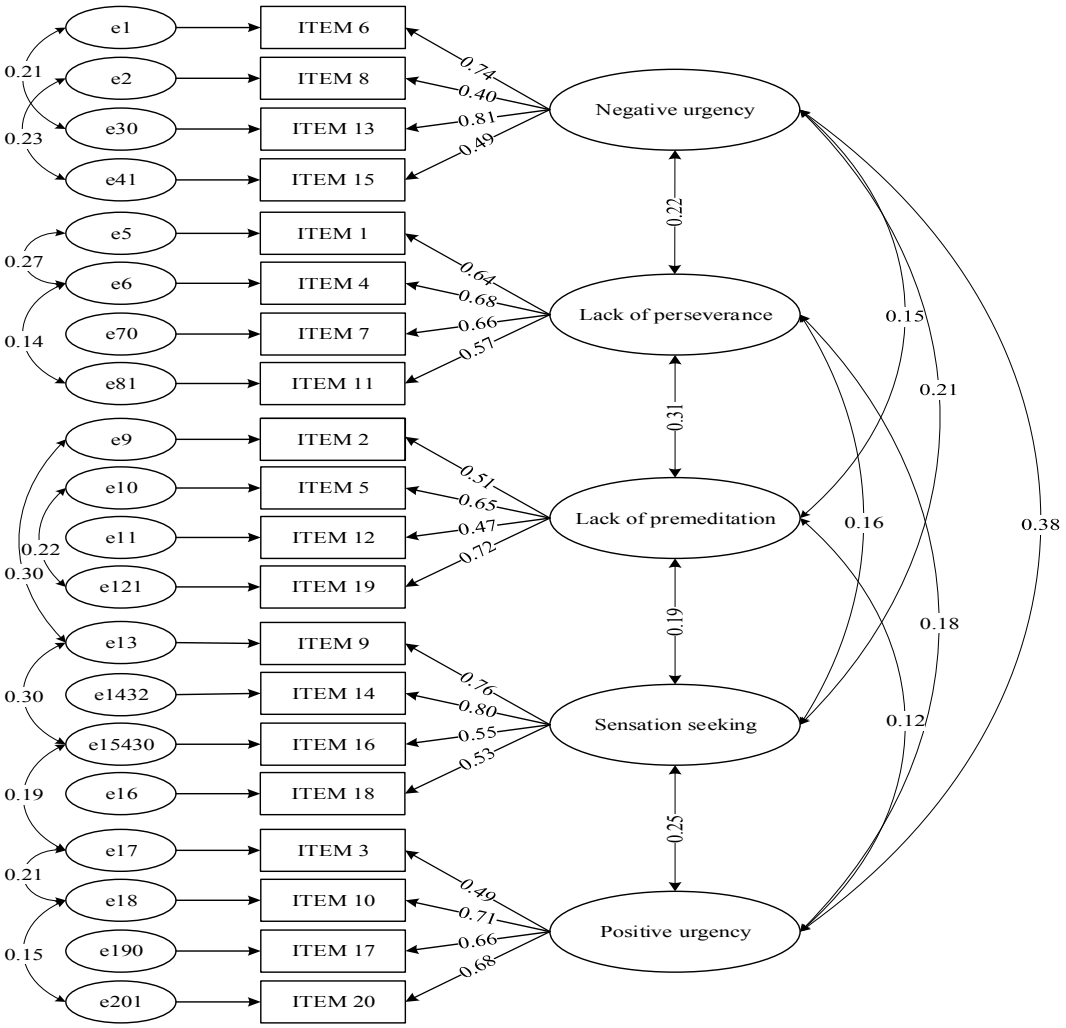


**Figure 2.** Latent factor of Impulsive Behavior Scale-Short Form (IBS-SF) for students after creation of covariance between levels of item errors in different factors

**Table 2.** Correlation matrix between subscales of Problematic and Risky Internet Use Screening Scale (PRIUSS) and Impulsive Behavior Scale-Short Form (IBS-SF)

| | Social harm | Emotional harm | Impulsive use of internet |
|---|---|---|---|
| Positive urgency | 0.22 | 0.20 | 0.42 |
| Lack of perseverance | 0.21 | 0.18 | 0.24 |
| Lack of premeditation | 0.36 | 0.18 | 0.23 |
| Sensation seeking | 0.31 | 0.20 | 0.51 |
| Positive urgency | 0.19 | 0.21 | 0.42 |

$P < 0.01$

The numerical values of goodness of fit indices for the corrected measuring model show good regression between the assumed 5-factor IBS-SF and data.

### Construct validity of IBS-SF

In this study, in order to investigate the construct validity of IBS-SF, the correlation between different subscales of IBS-SF (including positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking) and different subscales of PRIUSS (including social harm, emotion harm, and impulsive use of internet) was evaluated. As can be observed in table 2, the significant positive correlation between different subscales of IBS-SF and PRIUSS subscales empirically support the construct validity of IBS-SF.

## Discussion

The present study was conducted to investigate psychometric properties of the IBS-SF among undergraduate Farsi-speaking Iranian students. The confirmatory factor analysis of the IBS-SF-IrV showed that the 5-factor structure of IBS-SF (including positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking) has an acceptable fit with the data. This finding was in line with that of the studies by Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). The construct validity of IBS-SF was empirically supported by shared variance between multiple impulsivity traits and different types of self-damaging behaviors, like risky sexual behaviors, substance abuse, alcohol abuse, pathologic gambling, and domestic violence. This finding was in line with the findings of Dir et al. (2014), Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). Eventually, internal consistency values of subscales of the IBS-SF-IrV showed that this version has adequate reliability. In addition, numerical values acquired for internal consistency coefficients of the IBS-SF-IrV are comparable with those of short and long versions in other existing languages; French (Billieux et al., 2012), English (Cyders et al., 2014), Spanish (Candidoa et al., 2012) and Italian (D'Orta et al., 2015).

Moreover, the present results empirically supported the meta-context explanatory power of the theoretical IBS-SF model. This result was in line with that of the studies by Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). On the one hand, prediction of different types of impulsive behaviors through personality traits and the trait nature of these behaviors cause the theoretical IBS-SF model to become independent from context factors. This finding was in line with the findings of Thomson and Carlson (2014), Mueller et al. (2010), Miller et al. (2013), James and Taylor (2007), and Whiteside and Lynam (2003). However, in impulsivity and self-damaging behavior researches, emotion regulation strategies (Ammerman et al., 2015; Pivarunas & Conner, 2015; van Zutphen, Siep, Jacob, Goebel, & Arntz, 2015; Velotti & Garofalo, 2015), coping strategies of activating experiences (Keough, Badawi, Nitka, O'Connor, & Stewart, 2016), self-control (Choi et al., 2014; Ludwig et al., 2013), negative emotionality (James & Taylor, 2007), and goal regulation (Fulford, Eisner, & Johnson, 2015) were presented as the most

important conceptual explanation for the explaining power of impulsive traits in different types of risky behaviors.

It should be noted that the present study had some limitations. First, the study sample only consisted of undergraduate university students. Therefore, further researches on other samples are required in order to generalize the issue. Second, the present study was conducted through only one measurement. Accordingly, it is not possible to evaluate the consistency of IBS-SF scores. Third, the technical specifications of the IBS-SF-IrV were determined by both factor validity and convergent validity. Thus, the evaluation of technical specifications of the IBS-SF-IrV by other methods, like predictive validity and divergent validity, is suggested. Forth, although the present IBS-SF data were acquired from both men and women, a sexual equivalence analysis of the factor structure of IBS-SF was not considered.

Finally, the results of the present study show that the IBS-SF-IrV is an exact and authentic, multidimensional self-reporting scale in impulsivity behavior researches for measuring different dimensions of impulsivity traits among undergraduate, Farsi-speaking, Iranian students.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

The authors wish to thank Dr. Hamidreza Sanaeepour who assisted in editing the manuscript grammatically.

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Anxiety Sensitivity and Metacognition in Iranian Patients with Functional Gastrointestinal Disorders and Healthy Individuals

Fatemeh Zargar[1], Mina Kavoosi[2], Mitra Molaeinezhad[3]

[1] Assistant Professor, Department of Psychiatry, School of Medicine AND Behavioral Sciences Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[2] MSc Student, Department of Clinical Psychology, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran
[3] Postdoc Student in Psychosomatic Disorders AND Assistant Professor, Behavioral Sciences Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

**Quantitative Study**

## Abstract

**Background:** Psychosomatic disorders are a group of psychiatric disorders in which psychological factors play an important role in the development, maintenance, and exacerbation of medical conditions. The most important category of psychosomatic disorders is functional gastrointestinal disorders (FGID). The present study aimed to compare anxiety sensitivity (AS) and metacognitions between patients with FGID and healthy individuals in Isfahan, Iran.

**Methods:** This case-control study was conducted on 50 patients (13 men and 37 women) with FGID who were diagnosed by a gastroenterologist and had the study inclusion criteria and 50 matched healthy individuals (15 men and 35 women). The subjects were randomly selected. The data collection tools consisted of the Anxiety Sensitivity Index-Revised (ASI-R) and Metacognitive Beliefs Questionnaire (MCQ-30). The data were analyzed in SPSS software.

**Results:** The results showed that there were significant differences in all subscales of ASI-R and MCQ-30, except the fear of publicly observable symptoms subscale in the ASI-R and negative beliefs about the uncontrollability of thoughts and corresponding danger (UD) subscale in MCQ-30 between patients with FGID and healthy individuals.

**Conclusion:** The results showed that AS and metacognitive beliefs about worry play a crucial role in psychosomatic disorders such as FGID. Anxiety has appeared as the common component between FGID. Hence, the management of anxiety in FGID by clinicians in the treatment of these disorders is recommended.

**Keywords:** Psychosomatic disorder, Anxiety sensitivity (AS), Metacognitive beliefs, Functional gastrointestinal disorders

**Citation:** Zargar F, Kavoosi M, Molaeinezhad M. **Anxiety Sensitivity and Metacognition in Iranian Patients with Functional Gastrointestinal Disorders and Healthy Individuals.** Int J Body Mind Culture 2016; 3(2): 113-20.

Received: 15 Mar 2016
Accepted: 26 May 2016

**Corresponding Author:**
*Mitra Molaeinezhad*

*Email: m_molaei@bsrc.mui.ac.ir*

## Introduction

Functional gastrointestinal disorders (FGID) is a category of psychosomatic disorders with the first rank among medical disorders associated with psychiatric consultation (Sadock & Sadock, 2007). FGID accounts for about 50% of patients referred to gastrointestinal diseases service centers in Iran (Mazaheri, Afshar, Weinland, Mohammadi, & Adibi, 2012).

These functional disorders are often associated with affective disorders (depression and anxiety), which indicates a relationship between the pathophysiologic mechanisms of affective disorders and the digestive system (Mayer, Craske, & Naliboff, 2001; Naliboff et al., 2012).

In recent years, the concept of anxiety sensitivity (AS) has attracted much attention as a mediator in a significant number of emotional disorders, anxiety disorders, somatic symptom disorders, and psychosomatic disorders (Stewart, Watt, & Taylor, 2009; Sabourin, Stewart, Watt, & Krigolson, 2015). AS has been defined as excessive fear of anxiety-related sensations (e.g., blushing, tachycardia, dizziness) and the individual's belief about the potential physical, psychological, and social traumatic consequences of these symptoms (Olatunji & Wolitzky-Taylor, 2009; Taylor et al., 2007).

AS induces fear of the emotions related to anxiety and its gastrointestinal symptoms. Negative cognitive appraisal plays a role in the establishment and maintenance of anxiety and stress which, in turn, exacerbate psychosomatic symptoms including FGID. Research has shown significant difference in AS between patients with FGID and healthy subjects (Lackner & Gurtman, 2005).

AS causes individuals to fear the physical symptoms of anxiety and to consider these symptoms as the beginning of a disaster. This concept of worry about worry (meta-worry) is based on metacognitive theories (metacognition) (Wells, 2011). AS and metacognitive beliefs are correlated with each other (Vujanovic, Zvolensky, Bernstein, Feldner, & McLeish, 2007). Metacognition includes beliefs and strategies that appraise, monitor, or control the cognition. Metacognitive beliefs include positive and negative beliefs regarding worry. Positive beliefs refer to the advantages and benefits of engaging in anxiety (i.e., worry about the future helps me better plan for the future) (Wells, 2011). By activation of negative meta-cognitive beliefs, worry or rumination itself becomes the focus of negative appraisal, which causes meta-worry (Cook, Salmon, Dunn, & Fisher, 2014). Negative beliefs are related to beliefs about uncontrollability and dangerousness of thoughts and cognitive experiences (Wells, 2011). Negative beliefs about the need to control thinking might typically have a paradoxical effect; attempts to suppress unwanted thoughts or worries lead to increase in their salience and emotional distress (Cook et al., 2014).

The metacognitive variable is considered as the base of many psychological disorders, including generalized anxiety disorder (GAD), social phobia, panic disorder, obsessive-compulsive disorders (OCD), anorexia, and schizophrenia (Morrison et al., 2015; Fisher & Wells, 2005). Nevertheless, dysfunctional metacognitive beliefs can be important in psychosomatic disorders such as FGID in which stress plays a significant role. A recent study showed more dysfunctional metacognitive beliefs among patients with organic and functional gastrointestinal diseases (Quattropani, Lenzo, Mucciardi, & Toffle, 2015).

One of the subjects which has attracted the most attention in recent studies is evaluation of factors associated with anxiety which play a role in psychosomatic diseases as a mediator variable (i.e., AS and dysfunctional metacognitive beliefs) (Cook et al., 2014; Lenzo et al., 2013; Quattropani et al., 2015; Yilmaz, Gencoz, & Wells, 2011). Although extensive researches have been carried out on these variables in some groups of gastrointestinal diseases, no single study has adequately compared AS and dysfunctional metacognitive

beliefs in patients with FGID and healthy controls, simultaneously. If metacognitive beliefs or AS are important in FGID, they require particular psychotherapies. Moreover, psychological prevention methods of FGID have been specified.

AS and metacognitive beliefs have an important role in the development and maintenance of psychosomatic disorders related to anxiety, such as FGID. Thus, the aim of this study was to determine whether there are significant differences in metacognitive beliefs and AS between patients with FGID and healthy individuals in Isfahan, Iran.

## Methods

The present case-control study was conducted on 50 patients with FGID who were diagnosed by a gastroenterologist and referred to health centers, private medical offices, and public medical centers in Isfahan from May to July 2015. The subjects were randomly selected. Their healthy matched individuals, who did not have an established diagnosis, were selected based on demographic characteristics from among attendants of patients with FGID. The participants' age ranged from 20 to 65 years and the 50 healthy subjects were in the same age range. After signing informed consent forms, the participants in both groups completed the Anxiety Sensitivity Index-Revised (ASI-R) and the 30-item Metacognition Questionnaire (MCQ-30).

### Questionnaires

***Anxiety Sensitivity Index-Revised:*** The initial version of this scale was developed in 1986 (Reiss & McNally, 1985). This questionnaire consists of 16 items rated on a 5-point Likert type scale ranging from 0 to 4 (0: very low-4: very high) and 3 subscales.

The basic subscales of ASI-R include fear of physical symptoms, fear of cognitive symptoms, and fear of publicly observable symptoms (Taylor et al., 2007). The fear of physical symptoms refers to fear of somatic anxiety symptoms, which are believed to lead to a catastrophic physical issue. The fear of cognitive symptoms refers to the fear of the mental correlates of anxiety symptoms, considered as signals of a mental disorder. The fear of publicly observable symptoms refers to the belief that a public exhibition of anxiety symptoms will result in public ridicule and rejection (Taylor et al., 2007).

In the study by Kavoosi (2014), the internal consistency of the Persian version of ASI was obtained at 0.89. Furthermore, the reliability of the 3 subscales of fear of physical symptoms, fear of cognitive symptoms, and fear of publicly observable symptoms was 0.86, 0.84, and 0.85, respectively.

***The 30-item Metacognition Questionnaire:*** This measure assesses individual differences in metacognitive beliefs, judgments, and monitoring tendencies. It consists of 5 subscales which are assessed by 30 items. These subscales are labeled positive beliefs about worry (POS), uncontrollability and danger (UD), cognitive confidence (CC), need to control (NC), and cognitive self-consciousness (CSC). POS measures the extent to which a person thinks that perseverative thinking is useful. The UD subscale assesses the negative beliefs about worry concerning uncontrollability and danger, which refers to the extent to which a person believes perseverative thinking to be uncontrollable and dangerous. The CC subscale measures confidence in attention and memory. NC assesses the extent to which a person believes that certain types of thoughts need to be suppressed (e.g., ''I should be in control of my thoughts all of the time''). CSC measures the tendency to monitor one's own thoughts and focus attention inward (Wells & Cartwright-Hatton, 2004). In the MCQ-30, each item is scored based on a 4-point Likert scale ranging from 1-4 (do not agree-very much agree). The original MCQ (Wells & Cartwright-Hatton, 2004) and its Persian version (Shirinzadeh Dastgiri, Goudarzi, Rahimi, & Naziri, 2009) possess good internal consistency and convergent validity, as well as acceptable test-retest reliability. The Persian version of the

MCQ-30 (Shirinzadeh Dastgiri et al., 2009) was used in this study.

### Ethical Considerations

This study was approved by the Behavioral Sciences Research Center of Isfahan University of Medical Sciences (Grant no: 294270). In addition, before the beginning of the study, informed consent was obtained from all participants, and they were assured of the confidentiality of all their personal information.

### Statistical analysis

All analyses were performed in SPSS software (version 18, SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to present the demographic data. Two-sample t-test and chi-square test were, respectively, used for the comparison of continuous variables, and categorical variables.

## Results

Table 1 shows the analysis of demographic data in patients with FGID and healthy subjects. The results of t-test in the variable of age and chi-square test in other variables showed that there was no significant difference between demographic variables in the group of patients with FGID and the control group.

For comparison of the two groups in terms of metacognitive beliefs and AS, multivariate analysis of variance (MANOVA) was used. MANOVA assumptions were made. Regarding equality of covariance matrices, Box's test showed that the observed covariance matrices of the dependent variables were equal across groups (F = 1.31, P = 0.38). Levene test results showed equality of variances between FGID and control groups in AS and metacognitive beliefs (F = 0.31, P = 0.39). Wilks' Lambda test results regarding mean differences in the two groups showed a significant difference between FGID and control groups in terms of AS and metacognitive beliefs generally (F = 2.62, P = 0.01). Table 2 provides the mean scores and standard deviations of the dependent variables (AS and metacognitive beliefs) and comparison of the measures in FGID and control groups. These results have been separately presented in table 2.

Table 2 shows the two groups have significant differences in all subscales of ASI-R and MCQ-30 except the subscales of fear of publicly observable symptoms and UD.

**Table 1.** Demographic characteristics of the subjects

| Variable | Patients with FGID | Control group | P-value |
|---|---|---|---|
| Age [mean (SD)] | 35.36 (12.3) | 34.51 (11.72) | 0.72 |
| Gender [N (%)] | | | |
| Male | 37 (74.0) | 33 (73.3) | 0.56 |
| Female | 13 (26.7) | 12 (26.0) | |
| Education level [N (%)] | | | |
| < High school | 29 (59.2) | 23 (50.0) | 0.61 |
| Bachelor degree | 15 (30.6) | 16 (34.8) | |
| > Bachelor degree | 5 (10.2) | 7 (15.2) | |
| Marital status [N (%)] | | | |
| Single | 11 (22.9) | 16 (35.6) | 0.133 |
| Married | 37 (77.1) | 29 (64.4) | |
| Occupation [N (%)] | | | |
| Housewife | 18 (41.9) | 7 (17.9) | |
| Self-employed | 7 (16.3) | 8 (20.5) | 0.91 |
| Salaried Employee | 11 (25.6) | 6 (15.4) | |
| Student | 4 (9.3) | 2 (5.1) | |
| Unemployed | 3 (7.0) | 7 (17.9) | |

**Table 2.** Means, standard deviations, and comparison of anxiety sensitivity and metacognitive beliefs in the functional gastrointestinal disorders and control groups

| | | Mean ± SD | Mean square | df | F | P-value |
|---|---|---|---|---|---|---|
| Fear of physical symptoms | FGID | 13.02 ± 8.45 | 13665.61 | 1 | 248.71 | 0.01 |
| | Control | 10.36 ± 8.59 | 2570.49 | 1 | 172.34 | |
| Fear of cognitive symptoms | FGID | 6.74 ± 4.22 | 7482.25 | 1 | 781.17 | 0.01 |
| | Control | 4.40 ± 3.45 | 29790.76 | 1 | 152.24 | |
| Fear of publicly observable symptoms | FGID | 8.62 ± 3.08 | 21550.24 | 1 | 115.42 | 0.48 |
| | Control | 8.68 ± 3.09 | 26536.41 | 1 | 113.65 | |
| POS | FGID | 18.56 ± 4.86 | 19432.36 | 1 | 140.25 | 0.01 |
| | Control | 15.96 ± 4.91 | 16002.25 | 1 | 114.87 | |
| UD | FGID | 14.88 ± 4.39 | 13665.61 | 1 | 248.71 | 0.3 |
| | Control | 14.48 ± 4.24 | 2570.49 | 1 | 172.34 | |
| CC | FGID | 16.78 ± 4.63 | 7482.25 | 1 | 781.17 | 0.01 |
| | Control | 13.80 ± 5.01 | 29790.76 | 1 | 152.24 | |
| NC | FGID | 14.40 ± 3.74 | 21550.24 | 1 | 115.42 | 0.01 |
| | Control | 12.48 ± 3.71 | 26536.41 | 1 | 113.65 | |
| CSC | FGID | 13.06 ± 3.56 | 19432.36 | 1 | 140.25 | 0.01 |
| | Control | 12.24 ± 3.89 | 16002.25 | 1 | 114.87 | |

POS: Positive beliefs about worry; UD: Uncontrollability and danger; CC: Cognitive confidence; NC: Need to control; CSC: Cognitive self-consciousness; FGID: Functional gastrointestinal disorders; SD: Standard deviation; df: Degrees of freedom

## Discussion

AS and dysfunctional metacognitive beliefs play a significant role in FGID. Despite the role of these constructs in psychopathology, no studies have compared them between patients with FGID and healthy individuals. This study indicated significant differences between FGID and control groups in subscales of MCQ-30 (i.e., POS, CC, NC, and CSC); FGID patients obtained higher scores in these subscales compared with the healthy controls.

These results are consistent with the findings of Quattropani et al., (2015) which showed significant correlations between diagnosis of gastrointestinal disorder (functional and organic) and metacognitive dysfunctional beliefs. Other studies showed a relationship between POS and anxiety in psychosomatic disorders such as cancer (Cook et al., 2014; Quattropani et al., 2015). Patients' belief that preservative thinking is useful can increase anxiety symptoms and AS. On the other hand, NC was negatively related to anxiety. It may be due to this that participants, with higher conviction about the need to control their thinking, experience greater anxiety. This finding is in agreement with the findings of a study that showed that cancer patients have higher scores in the NC subscale of MCQ-30 which predicts higher anxiety in them (Cook et al., 2014).

In the present study, there were significant differences between FGID and control groups in the subscales of fear of physical symptoms and fear of cognitive symptoms of ASI-R. AS in gastrointestinal diseases has been described as gastrointestinal (GI) symptom-specific anxiety (GSA). GSA has 5 dimensions, which include worry, fear, vigilance, sensitivity, and avoidance (Saigo et al., 2014).

Hypervigilance is defined as an increased awareness and attention and might increase perceived relevance of GI-specific sensations leading to a decreased ability to notice other internal or external stimuli. Sensitivity, as heightened perception, might raise GI-specific sensations and symptoms under a variety of conditions including eating and stress (Labus et al., 2004). Hypervigilance and sensitivity as two dimensions of GSA are synonymous with the fear of physical symptoms subscale of ASI-R.

Dysfunctional metacognitive beliefs are correlated with AS in patients with gastrointestinal disorders (or GSA). For example, worry, vigilance, and sensitivity dimensions are related to the POS subscale of

MCQ-30. Moreover, avoidance (especially seeking reassurance) and vigilance dimensions are related to CSC and CC subscales of MCQ-30. The tendency to monitor one's own thoughts and focus attention inwards has a marginal role in the metacognitive model of psychopathology. This finding was consistently with previous studies on metacognition.

Individuals with high AS search the environment for any symptom of a potential disaster and react to any internal or external stimulant with hypervigilance and high sensitivity (Dowden & Allen, 1997).

Therefore, individuals with emotion vulnerabilities such as AS catastrophize and react to even normal events with enhanced anxiety (Kashdan, Zvolensky, & McLeish, 2008). Individuals with higher AS frequently have concerns about bodily anxiety symptoms and react to them negatively. Negative evaluation and catastrophizing of a bodily sense can lead to exacerbation of anxiety which, in turn, enhances anxiety symptoms (Schmidt et al., 2010).

In the current study, there were significant differences between FGID and control groups in the POS, CC, NC, and CSC subscales of MCQ-30; the FGID group had higher scores in these subscales. These results are consistent with the findings of a study that showed there were significant correlations between the diagnosis of gastrointestinal disorders (functional and organic) and metacognitive dysfunctional beliefs (Quattropani, Lenzo, Fries, & Belvedere, 2014). Other studies showed a relationship between POS and anxiety in psychosomatic disorders such as cancer (Quattropani et al., 2015, Cook et al., 2014). A patient's belief that preservative thinking is useful can increase anxiety symptoms and AS. On the other hand, NC was negatively related to anxiety. This suggests that participants with higher conviction about the need to control their thinking experience greater anxiety. This finding is consistent with the findings of Cook et al. (2014) who showed that cancer patients have higher scores in the NC subscale of MCQ-30 and this predicts higher anxiety in them.

The present study showed that patients with FGID and healthy individuals did not have significant differences in the UD subscale. This finding was not consistent with previous studies on students and the public, which have indicated that greater negative beliefs about worry (such as UD) predict higher levels of anxiety (Wells, & Cartwright-Hatton, 2004; Spada, Mohiyeddini, & Wells, 2008; Yilmaz, Gencoz, & Wells, 2011; Allott, Wells, Morrison, Walker, 2005). This result may indicate a difference in negative beliefs about worry between FGID patients and the general population. However, further research is required to establish whether this is a true population difference or an artifact of the present data.

In summary, the current study provides initial evidence that patients with FGID have more dysfunctional metacognitive beliefs and AS compare to healthy populations.

## Conclusion

Due to the importance of AS and dysfunctional beliefs as components in FGID, their roles in this respect and that of other psychological factors should be studied. A deeper understanding of these components is necessary for the development of better preventive and therapeutic methods. However, with a small sample size of heterogeneous patients with FGID, caution must be applied, as the findings might not be transferable to all patients with FGID. Hence, further researches with greater sample size are recommended in specific FGIDs.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

The authors would like to thank the staff of the Psychosomatic Research Center for their assistance in data gathering.

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Sleep Quality and its Associated Factors in Iranian Patients with Breast Cancer

Farzaneh Habibi[1], Marsa Hashemi[2], Simin Hemati[3], Ali Gholamrezaei[4]

[1] Student of Medicine, Medical Students' Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[2] General Practitioner, Medical Students' Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[3] Associate Professor, Department of Radiotherapy Oncology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[4] General Practitioner, Poursina Hakim Research Institute, Isfahan, Iran

**Quantitative Study**

## Abstract

**Background:** Sleep disturbances are common, but widely underdiagnosed in cancer patients. Thus, the aim of the present study was to evaluate sleep quality and its associated factors among women with breast cancer.

**Methods:** This cross-sectional study was conducted on women with breast cancer referring to 2 outpatient clinics in Isfahan, Iran. Sleep quality [Pittsburgh Sleep Quality Index (PSQI)], severity of anxiety and depression [Hospital Anxiety and Depression Scale (HADS)], cancer symptoms [M.D. Anderson Symptom Inventory (MDASI)], and quality of life (QOL) [European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30)] were assessed in the present study.

**Results:** The study population consisted of 101 patients with mean age of 49.7 years and mean cancer duration of 2.3 years. The mean global PSQI score of patients was 8.5 and 80.2% had poor sleep quality. Factors associated with global PSQI score in univariate analyses were body mass index (BMI) (r = 0.445), severity of cancer symptoms (r = 0.580), anxiety (r = 0.363), and depression (r = 0.332). BMI and symptom severity were independently associated with poor sleep quality (standardized coefficient = 0.388 and 0.480, respectively). With regards to QOL, patients with poor sleep quality had lower physical and psychosocial functioning than good sleepers.

**Conclusion:** Sleep disturbances are highly common in women with breast cancer in our society and significantly affect their QOL. Obesity, cancer symptoms, and psychological symptoms are important factors associated with and contributing to sleep problems in these patients. Cancer care programs must have a comprehensive approach, including sleep assessment and management, in the treatment of these patients.

**Keywords:** Breast cancer, Sleep, Insomnia, Obesity, Anxiety, Depression, Psychosocial, Quality of life

**Citation:** Habibi F, Hashemi M, Hemati S, Gholamrezaei A. **Sleep Quality and its Associated Factors in Iranian Patients with Breast Cancer.** Int J Body Mind Culture 2016; 3(2): 121-31.

Received: 15 Mar 2016
Accepted: 28 May 2016

## Introduction

Sleep disturbances are common, but widely underdiagnosed in cancer patients. Using objective and subjective sleep measures, studies have found sleep disorders in more than half of the patients with cancer (Howell et al., 2014; Sateia & Lang, 2008). Some factors which contribute to sleep disorders in this population include female gender, older age, psychological distress, cancer-related

**Corresponding Author:**
*Ali Gholamrezaei*
*Email: ali.gholamrezaei@ymail.com*

symptoms, and treatment side effects (Howell et al., 2014; Costa et al. 2014; Roscoe et al., 2007). Sleep disturbance is not only an important problem per se, but is also associated with other complaints such as fatigue (Nishiura, Tamura, Nagai, & Matsushima, 2015), anxiety and depression (Die, 2013; Irwin, Olmstead, Ganz, & Haque, 2013), and more frequent physical complaints (Sanford et al., 2013; Fortner, Stepanski, Wang, Kasprowicz, & Durrence, 2002). In general, sleep quality can play an important role in cancer patients' quality of life (QOL) (Liu et al., 2013; Alfano et al., 2011). Breast cancer is the most prevalent type of cancer among Iranian women (Mousavi et al., 2009). The mean age of onset for breast cancer is approximately 15 years younger in Iran in comparison to western countries (Vostakolaei et al., 2012). However, there is a lack of data regarding the prevalence of sleep disorders and their associated factors in Iranian breast cancer patients. Such knowledge is essential for designing comprehensive and supportive care programs for cancer patients in order to improve their QOL (Howell et al., 2014; Redeker, Pigeon, & Boudreau, 2015). Therefore, this study was conducted to assess sleep quality and its associated factors in Iranian patients with breast cancer.

## Methods

### Patients and Setting

This cross-sectional study was conducted on women with breast cancer referring to two outpatient cancer care clinics in Isfahan (Iran) in 2015. Patients were invited to participate in the study while they were in waiting rooms prior to regular physician appointments. The inclusion criteria consisted of confirmed pathological diagnosis of breast cancer, lack of diagnosis of any other cancer, willingness to participate in the study, and capability of completing the questionnaires either through writing or answering the questions read by the interviewer. Patients who had recently undergone surgery or been hospitalized were not included in the study. Data on the sleep quality of the female population from a general population-based study in Iran were used for comparison (Asghari, Farhadi, Kamrava, Ghalehbaghi, & Nojomi 2012). The study was ethically approved by the board of directors of the Cancer Care Centers and consent to participation was obtained from all patients.

### Measures

Demographic data were gathered using a questionnaire and cancer related data were gathered through reviewing the patients' medical records. Other information was collected using the Pittsburgh Sleep Quality Index (PSQI), Hospital Anxiety and Depression Scale (HADS), M.D. Anderson Symptom Inventory (MDASI), and European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30).

### Pittsburgh Sleep Quality Index

The PSQI was used for the assessment of sleep quality. The PSQI consists of 19 items in the 7 scales of overall sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, need meds to sleep, and daytime dysfunction due to sleepiness. The total score of each scale ranges from 0 to 3. The global PSQI score ranges from 0 to 21 with a score of higher than 5 indicating poor sleep quality (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) and insomnia with high sensitivity and specificity (above 85%) (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002).

### Hospital Anxiety and Depression Scale

The HADS was used for the assessment of anxiety and depression. The HADS examines depression and anxiety symptoms with 14 items in 2 subscales each containing 7 items. The total score of each subscale ranges from 0 to 21. The respondents can be categorized as normal (0-7), borderline (8-10), and abnormal cases (11-21) based on their score. With score of 8 and above for each subscale, the HADS has a sensitivity and specificity of approximately 80% in screening anxiety disorders and depression (Bjelland,

Dahl, Haug, & Neckelmann, 2002).

### M.D. Anderson Symptom Inventory

The MDASI was used to assess common symptoms in breast cancer patients. The MDASI is an international questionnaire consisting of 13 items which evaluate common core symptoms in patients with various types of cancer (Cleeland et al., 2000). Each item is rated from 0 (not present) to 10 (as bad as you can imagine) and the mean symptom severity is the average of the 13 items.

### European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30

The EORTC QLQ-C30 was used in the present study to evaluate QOL. This questionnaire comprises 30 items in 5 functional scales, 9 symptom scales, and a global health status/QOL scale (Aaronson et al., 1993). Because of considerable overlap between symptom scales of the EORTC QLQ-C30 and that of the MDASI, only functional scales were included in the analyses. Each functional scale score ranges from 0 to 100, with high scores representing a high/healthy level of functioning (Aaronson et al., 1993).

The validated Persian versions of all the above-mentioned questionnaires were used in this study (Farrahi Moghaddam, Nakhaee, Sheibani, Garrusi, & Amirkafi, 2012; Montazeri, Vahdaninia, Ebrahimi, & Jarvandi, 2003; Saadatpour et al., 2015; Safaee & Moghim, 2007). A trained interviewer helped the illiterate patients in completing the questionnaires.

### Statistical Analysis

The SPSS software (version 16.0, SPSS Inc., Chicago, IL, USA) was used for data analysis. Descriptive data are presented as mean and standard deviation (SD) or number and percentage. Chi-square test was used to compare qualitative variables and independent sample t-test (or Mann-Whitney U test for non-parametric data) was used to compare quantitative variables. The Pearson correlation coefficient (or Spearman's correlation coefficient for non-parametric data) was used to investigate the association between quantitative variables. Linear regression analysis was conducted for the assessment of independent association between various factors and sleep quality. P values of less than 0.05 were considered statistically significant in all analyses.

## Results

### Patients and cancer characteristics

During the study period, a total of 113 eligible patients were invited to participate. Among them, 5 patients were not willing to participate in the study and data on 7 other patients were not complete, and thus, could not be included in the analyses. Finally, data on 101 patients were included in the analyses. The mean age of the participants was 49.7 ± 11.8 years and 78.4% of the subjects were married. The patients' Education level ranged from primary school (26.7%) to university education level (13.0%), and 12.9% of subjects were illiterate. Only 28.7% had regular physical activity. Their mean body mass index (BMI) was 27.5 ± 4.4 kg/m$^2$; 24.6% were obese and 50.9% were overweight. The subjects' mean cancer duration was 2.3 years (median = 1 year; ranged from less than 1 year to 19 years). Tumor grades of I, II, and III were present in 12.3%, 54.8%, and 32.9% of the patients, respectively, and 24.2% had metastasis in their cancer history. Regarding cancer treatment history, 31.5% had undergone surgery, 80% had a history of radiotherapy, 86.4% had a history of chemotherapy, and 82.1% were undergoing cancer treatment while participating in the study.

### Sleep Quality in cancer patients compared with controls

The mean global PSQI score of the cancer patients was 8.5 ± 4.4, and 80.2% of the patients had poor sleep quality (global score ≥ 5). Based on cancer duration, poor sleep quality was present in 71%, 91.4%, and 77.4% of patients with cancer duration of less than or equal to 1 year, between 1 and 2 years, and 2 years or

more, respectively (P = 0.099). The PSQI dimension scores are presented in figure 1.

Compared to the general female population, cancer patients had higher global PSQI score and higher scores (worse state) in dimensions of duration of sleep, sleep disturbance, sleep efficiency, and the overall sleep quality, particularly in younger age groups (Table 1). Higher score in the need meds to sleep dimension in cancer patients, compared to controls, was only significant in the age group of 50-59 years.

## Factors associated with sleep quality in women with breast cancer

***Demographic characteristics*:** Only BMI was correlated with the global PSQI score (r = 0.445, P = 0.001). Regarding the PSQI dimensions, daytime dysfunction due to sleepiness was correlated with age (r = -0.305, P = 0.006), BMI (r = 0.295, P = 0.036), and physical activity (r = -0.245, P = 0.024).

In addition, BMI was correlated with sleep disturbance subscale score (r = 0.390, P = 0.004) and physical activity was correlated with the overall sleep quality subscale score (r = -0.240, P = 0.025).

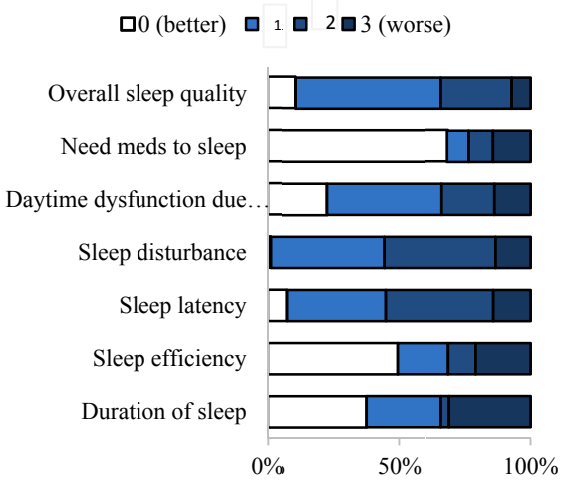


**Figure 1.** Sleep quality dimensions scores in cancer patients
PSQI: Pittsburgh Sleep Quality Index

**Table 1.** Pittsburgh Sleep Quality Index global and dimension scores in breast cancer patients compared with general female population categorized by age

| | Age (year) | | | |
|---|---|---|---|---|
| | 30-39 | 40-49 | 50-59 | 60-69 |
| Global PSQI score | | | | |
| Patients | 9.05 ± 5.26* | 8.54 ± 4.45† | 8.42 ± 4.24† | 7.28 ± 4.88 |
| Controls | 5.75 ± 3.60 | 6.27 ± 3.70 | 6.64 ± 3.93 | 7.97 ± 4.31 |
| PSQI dimensions | | | | |
| Duration of sleep | | | | |
| Patients | 1.22 ± 1.47† | 1.45 ± 1.26† | 1.11 ± 1.18 | 0.66 ± 1.21 |
| Controls | 0.78 ± 0.90 | 0.92 ± 0.97 | 1.05 ± 0.97 | 1.26 ± 1.09 |
| Sleep disturbance | | | | |
| Patients | 1.78 ± 0.85* | 1.70 ± 0.65* | 1.70 ± 0.77* | 1.57 ± 0.53 |
| Controls | 1.05 ± 0.48 | 1.13 ± 0.51 | 1.23 ± 0.56 | 1.31 ± 0.59 |
| Sleep latency | | | | |
| Patients | 1.68 ± 0.82 | 1.68 ± 0.73 | 1.55 ± 0.93 | 1.57 ± 1.13 |
| Controls | 1.37 ± 1.10 | 1.49 ± 1.12 | 1.48 ± 1.10 | 1.82 ± 1.07 |
| Daytime dysfunction due to sleepiness | | | | |
| Patients | 1.73 ± 1.04† | 1.27 ± 0.92 | 1.23 ± 0.86 | 1.00 ± 1.15 |
| Controls | 1.21 ± 1.05 | 1.12 ± 1.04 | 1.07 ± 1.04 | 1.13 ± 1.06 |
| Sleep efficiency | | | | |
| Patients | 1.00 ± 1.37 | 1.06 ± 1.12* | 1.00 ± 1.24† | 1.00 ± 1.26 |
| Controls | 0.50 ± 0.94 | 0.46 ± 0.89 | 0.60 ± 0.94 | 0.79 ± 1.11 |
| Overall sleep quality | | | | |
| Patients | 1.42 ± 0.76† | 1.36 ± 0.80† | 1.22 ± 0.69 | 0.83 ± 0.75 |
| Controls | 0.92 ± 0.76 | 1.01 ± 0.80 | 1.03 ± 0.79 | 1.19 ± 0.86 |
| Need meds to sleep | | | | |
| Patients | 0.31 ± 0.82 | 0.70 ± 1.20 | 0.96 ± 1.22† | 1.00 ± 1.41 |
| Controls | 0.23 ± 0.71 | 0.45 ± 0.99 | 0.48 ± 1.04 | 0.82 ± 1.22 |

Data are presented as mean ± SD; PSQI: Pittsburgh Sleep Quality Index
* compared with age-matched controls; P < 0.001; † compared with age-matched controls; P < 0.050

**Table 2.** Association of cancer symptoms and psychological symptoms' severity with sleep quality scores

| | MDASI Severity | Anxiety | Depression |
|---|---|---|---|
| Global PSQI score | 0.580* | 0.363* | 0.332* |
| PSQI dimensions | | | |
| Duration of sleep | 0.269* | 0.145 | 0.247† |
| Sleep disturbance | 0.563* | 0.392* | 0.223† |
| Sleep latency | 0.281* | 0.101 | 0.121 |
| Daytime dysfunction due to sleepiness | 0.579* | 0.379* | 0.268* |
| Sleep efficiency | 0.306* | 0.137 | 0.169 |
| Overall sleep quality | 0.464* | 0.248† | 0.296* |
| Need meds to sleep | 0.222† | 0.234† | 0.214† |

Data are presented as Pearson or Spearman's correlation coefficients; PSQI: Pittsburgh Sleep Quality Index; MDASI: MD Anderson Symptom Inventory
* P < 0.001; † P < 0.050

***Cancer-related factors*:** No association was found between cancer duration, tumor grade, or treatment history and any of the sleep quality scores. Those with metastasis had unexpectedly lower global PSQI scores (5.8 ± 3.5 vs. 9.4 ± 4.3, P < 0.001). However, after controlling for BMI, having metastasis was no longer associated with the global PSQI score (P = 0.199). Mean symptoms' severity score (4.1 ± 2.0) was correlated with the global PSQI score (Figure 2) and all of its dimensions (r = 0.222-0.580) (Table 2).

***Psychological factors:*** Mean scores of anxiety and depression subscales and the total HADS score were 10.5 ± 3.8, 8.0 ± 3.8, and 18.7 ± 6.9, respectively. This corresponded to abnormal anxiety and depression levels in 48.1% and 21.9% of the patients, respectively. Both anxiety and depression scores were significantly correlated with the global PSQI score (Figure 3) and many of the PSQI dimensions (r = 0.214-0.392) (Table 2).

***Independent predictors of sleep quality:*** Factors associated with the global PSQI score or its dimensions in univariate analyses were inserted into a linear regression model (Table 3). There was a non-significant association between age and the global PSQI score (β = -0.260, P = 0.062). Higher BMI was associated with poor sleep quality (β = 0.388, P = 0.006). Although symptom severity was associated with poor sleep quality (β = 0.480, P = 0.001), psychological factors were no longer associated with the global PSQI score in this regression model (Table 3).

## Association of sleep quality with quality of life

Comparison of QOL between patients with good sleep quality and those with poor sleep quality is presented in table 4. Patients with poor sleep quality had lower global health and lower scores in all functional dimensions of QOL.

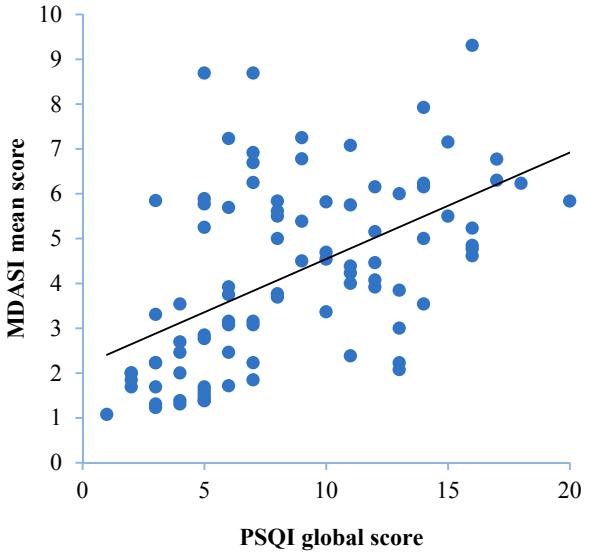


**Figure 2.** Correlation between symptoms severity and global sleep quality (r = 0.580, P < 0.001).
PSQI: Pittsburgh Sleep Quality Index; MDASI: MD Anderson Symptom Inventory

**Table 3.** Independent predictors of global sleep quality

| | Unstandardized Coefficients | Standardized Coefficients (β) | P-value |
|---|---|---|---|
| Age* | -1.080 | -0.260 | 0.062 |
| BMI* | 2.145 | 0.388 | 0.006 |
| Physical activity | 0.071 | 0.012 | 0.932 |
| MDASI severity | 0.988 | 0.480 | 0.001 |
| Anxiety* | -0.052 | -0.010 | 0.944 |
| Depression* | -0.303 | -0.059 | 0.723 |

BMI: Body mass index; MDASI: MD Anderson Symptom Inventory; Linear regression model Dependent variable: Pittsburgh Sleep Quality Index global score ; R square = 0.393; * To prevent multicollinearity and for better clinical interpretation, anxiety and depression scores are categorized as normal (0-7), borderline (8-10), and abnormal (11-21), BMI (kg/m$^2$) is categorized as underweight (< 18.5), normal (18.5-24.9), overweight (25-29.9), and obese (≥ 30), and age is categorized as 30-39, 40-49, 50-59, and 60-69 years.

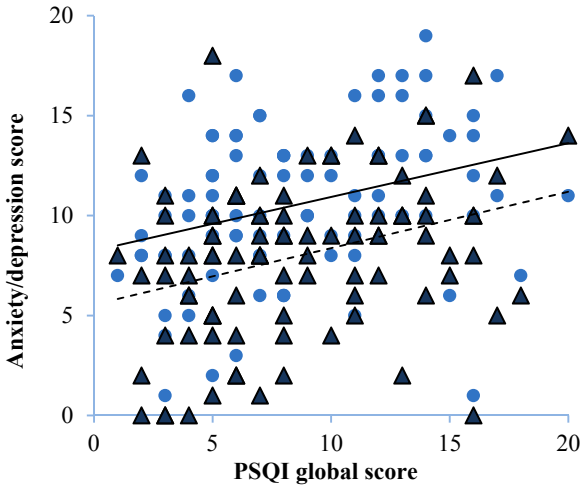


**Figure 3.** Correlation of anxiety (circle, continuous line) and depression (triangle, dashed line) with global sleep quality (r = 0.363 and 0.332, respectively) (P < 0.001)
PSQI: Pittsburgh Sleep Quality Index

## Discussion

Poor sleep quality was found in 80% of the Iranian women with breast cancer which is considerably higher than that in the age-matched general population and significantly associated with impaired physical and psychosocial functioning of the patients. Some similar studies in Iran also showed high frequency of sleep disturbance in these patients (up to 90%) (Khoramirad, Mousavi, Dadkhahtehrani, & Pourmarzi, 2015). Studies in other populations using the same subjective sleep measure (the PSQI) also reported poor sleep quality in 46% to 66% of women with breast cancer (Khoramirad et al., 2015; Sanford et al., 2013; Liu et al., 2013; Ho & Fong, 2014; Chen et al., 2014; Vargas et al., 2010; Colagiuri et al., 2011; Otte, Carpenter, Russell, Bigatti, & Champion, 2010; Beck et al., 2010).

Differences in the frequency of sleep disturbances among various studies may be attributed to differences in demographic characteristics of the studied populations (e.g., age, BMI, and socioeconomic status), cancer-related factors (e.g., cancer duration, symptoms, and treatments), and cut-off scores in the PSQI for defining sleep disturbance. Regardless of these factors, sleep disturbances are common in women with breast cancer throughout their disease course, though contributing factors may be different in various stages.

**Table 4.** Comparison of quality of life in patients with good and poor sleep quality

| Subscales of EORTC QOL-C30 | Good sleep quality | Poor sleep quality | P-value |
|---|---|---|---|
| Global health status | 70.4 ± 25.5 | 51.1 ± 21.4 | 0.002 |
| Physical functioning | 70.5 ± 22.6 | 56.1 ± 24.8 | 0.015 |
| Role functioning | 87.7 ± 24.7 | 62.0 ± 28.6 | < 0.001 |
| Emotional functioning | 81.8 ± 14.1 | 47.3 ± 30.1 | < 0.001 |
| Cognitive functioning | 91.2 ± 12.8 | 66.8 ± 27.8 | < 0.001 |
| Social functioning | 82.4 ± 23.2 | 66.2 ± 26.3 | 0.009 |

EORTC QOL-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30

Differences were observed between cancer patients and controls in some of the sleep quality dimensions which were more evident in younger age groups; younger patients had more daytime dysfunction due to sleepiness. Similarly, Klyushnenkova, Sorkin, and Gallicchio (2015) found independent association between younger age and excessive daytime sleepiness in a large sample of breast cancer patients. In contrast, Colagiuri et al. (2011) found independent association between older age and poor sleep quality in a large sample of Danish women with breast cancer. The role of age in the association between cancer and sleep disorders is complex. As both breast cancer and sleep disorders are common in middle-aged women (Vostakolaei et al., 2012; Asghari et al., 2012), some patients may already have sleep problems when they are diagnosed with cancer. Although still controversial, there is evidence that sleep disorders may increase the risk of cancer development (Palamaner Subash, Kumar, Cheskin, & Pancholy, 2015). On the other hand, age of onset for breast cancer in Iran is lower than that in western countries (Vostakolaei et al., 2012). Diagnosis of cancer at a younger age and subsequent treatments can have a major impact on patient's daily life, and contribute to poor psychological health and sleep disturbance. A more comprehensive evaluation of age-related factors that can also affect sleep quality (e.g., physical and psychosocial health) in a larger sample of cancer patients as well as longitudinal studies are required in this regard.

Weight gain is a common problem in women with breast cancer early after diagnosis, is unlikely to return to pre-diagnosis state (Makari-Judson, Braun, Jerry, & Mertens, 2014), and is associated with increased mortality (Playdon et al., 2015). The underlying factors are not clear yet, but chemotherapy, menopausal changes, and lifestyle changes (physical inactivity and over eating) may be involved (Goodwin, 2001). In the present study, 75% of the patients had a BMI of above normal range and there was an independent association between BMI and poor sleep quality. In the study by Dhruva et al. (2012), higher BMI was associated with more objective sleep disturbance. Obesity can disturb circadian rhythms in breast cancer patients, leading to poor sleep (Berger, Hertzog, Geary, Fischer, & Farr, 2012). In the general population, obesity is a well-known risk factor for sleep disorders particularly obstructive sleep apnea (Tuomilehto, Seppa, & Uusitupa 2013). The association between obesity and sleep disorders is not however unidirectional. Sleep disturbance can also contribute to obesity and other metabolic problems by affecting neuroendocrine function and glucose metabolism (Beccuti, & Pannain, 2011). In cancer patients, fatigue and psychological distress should also be considered as mediating/moderating factors in the association between obesity and sleep disturbance (Berger et al., 2012; Gerber et al., 2011). Only a small subset of our patients had regular physical activity. Exercise may improve sleep quality not only by decreasing weight, but also by improving other contributing factors such as cancer-related symptoms and psychosocial functioning of the patients (Rogers et al., 2015; Payne, Held, Thorpe, & Shaw, 2008; Tang, Liou, & Lin, 2010; Cheville et al., 2013).

Patients with cancer experience various and debilitating symptoms throughout their disease course such as pain, fatigue, nausea-vomiting, loss of appetite, and dyspnea which may be due to the cancer or treatments (Trajkovic-Vidakovic, de Grae, Voest, & Teunissen, 2012). Pain, fatigue, and sleep disturbance is a common symptom cluster in cancer patients with each symptom aggravating the others (Beck, Dudley, & Barsevick, 2005). Strong and independent association was observed between symptoms and sleep quality. This finding was in agreement with that of Nishiura et al. (2015), Ho and Fong (2014), Yennurajalingam et al. (2015), Ma, Chang, and Lin (2014), and Delgado-Guay, Yennurajalingam, Parsons,

Palmer, and Bruera (2011). There is also interaction between physical and psychological symptoms contributing to sleep disturbance in cancer patients (Ho & Fong, 2014; Colagiuri et al., 2011; Delgado-Guay et al., 2011). Accordingly, sleep problems management in cancer patients requires adequate evaluation, and management of both physical and psychological symptoms. This may be achieved through mind-body interventions and with a biopsychosocial approach for which efficacy studies are needed (Kwekkeboom, Cherwin, Lee, & Wanta, 2010).

The current study had a number of limitations. The study had a cross-sectional design and could not provide information on cause-and-effect relationships. The study sample size was small and included patients were not representative of breast cancer patients in Iran. Other aspects of sleep such as sleep hygiene and beliefs which may have roles in sleep problems in cancer patients were not evaluated (Redeker et al., 2015). Furthermore, a self-report measure of sleep quality was used which could not provide information on the specific underlying sleep disorders. Accordingly, multi-center studies with larger sample of patients in various cancer stages, longitudinal studies, and studies using more objective measures such as polysomnography are required to better understand sleep problems and their underlying factors in cancer patients.

## Conclusion

Sleep problems are highly common in women with breast cancer in our society and significantly affect their QOL in various dimensions of physical and psychosocial functioning. Obesity, cancer-related symptoms, and psychological symptoms are important associated/contributing factors in sleep problems among these patients. The present findings may help to inform physicians about sleep disturbance and its associated problems and the need for investigation and management of sleep disturbance. Such management methods in cancer patients require a biopsychosocial approach. Multi-center and longitudinal studies using more objective sleep measures for more accurate investigation of sleep disorders in cancer patients are recommended.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

This study had no external funding support. We are thankful to the board of directors of Omid University Hospitals for their cooperation in conducting the study.

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International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

# Biosemiotic Medicine: Healing in the World of Meaning

Farzad Goli[1]

[1] Professor, Faculty Instructor, Energy Medicine University, California, USA AND Danesh-e Tandorosti Institute, Isfahan, Iran

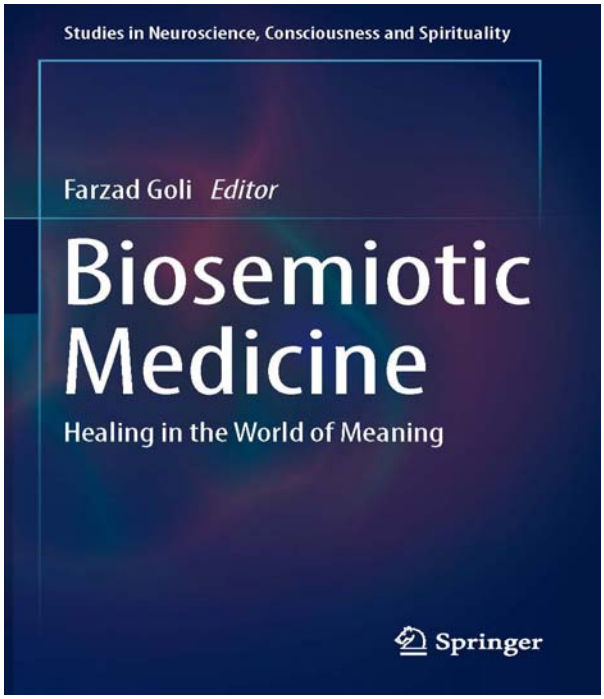
**Book Review**

**Citation:** Goli F. **Biosemiotic Medicine: Healing in the World of Meaning.** Int J Body Mind Culture 2016; 3(2): 132-7.

Received: 15 May 2016
Accepted: 25 Jun 2016

## From the back cover

This book presents an interpretation of pharmaceutical, surgical, and psychotherapeutic interventions based on a univalent metalanguage: biosemiotics. It proposes that a metalanguage for the physical, mental, social, and cultural aspects of health and medicine could bring all parts and aspects of human life together, and thus, shape a picture of the human being as a whole, made up of the heterogeneous images of the vast variety of sciences and technologies in medicine discourse. The book adopts a biosemiotics clinical model of thinking, because, similar to the ancient principle of alchemy, *tam ethice quam physice*, everything in this model is as much physical as it is mental. Signs, in the forms of vibrations, molecules, cells, words, images, reflections, and rites, conform to cultural, mental, physical, and social phenomena. The book decodes healing, dealing with health, illness, and therapy by emphasizing the first-person experience as well as objective events. It allows readers to follow the energy information flows through and between embodied minds and to see how they form physiological functions such as our emotions and narratives.




**Corresponding Author:**
***Farzad Goli***
*Email: dr.fgoli@yahoo.com*

## Life is nothing but infonnation in practice

***The more informed, the more alive one is (Rumi):*** Numerous studies in the recent decades have revealed that we are experiencing a shift from the biological paradigm to systemic paradigm in medicine. However, this is not an omnipresent transformation; it is rather the average of diverse and, at times, opposite processes. On the one hand, the accomplishments of genetic engineering in cloning, stem cells, or screening, and genetic manipulations confirm the mechanical model of biomedicine that has provided the grounds for the selection and promotion of genetic programs or even mass production and change of the organs. On the other hand, multiple studies in other fields of science such as psychoneuroimmunology and epigenetics have deeply challenged the approach of biomedicine. It seems that reductionism still proves itself to be pragmatic for non-chronic conditions.

In emergency and acute conditions, the agency of the patient and coping strategies are less important and mechanical approaches are more efficient to a great extent. However, in chronic conditions and planning of macro health programs, the inefficiencies and insufficiencies of the mechanical approach reveal themselves more dramatically and the need for a systemic model becomes obvious. In order to establish such a systematic model, we need to develop interdisciplinary knowledge and the necessary methods.

Systematic clinical studies and the developing fields of medical anthropology, health psychology, and psychosomatic medicine make evident the interference of symbolic and physical worlds more and more. They uncover how our health and illnesses are formed in a multifaceted heterogeneous matrix of biological, emotional, social, cultural, and spiritual factors.

Tolerating this multilingual and interdisciplinary medium, after several centuries of attempts at establishing a single pure chemophysical language, is tremendously difficult for medical discourse. It seems that for explanation, clinical reasoning, and management in the systemic approach, we should prepare ourselves for a more complicated chaotic system with increasing uncertainty. This way we might be able to substitute human and societies' health with the diseases and their potential causes as the subject of medicine and move towards the development of sustainable happiness. It seems that we need transdisciplinary groundwork to integrate such a vast anisotropic field of knowledge and practice.

Contemporary theorist scholars no longer believe in a single metanarration that explains all levels of organization and all life worlds. Moreover, they no longer believe people, similar to early Wittgenstein, should be silent about things that cannot be described with experimental and observable language. These scholars concur more with the late Wittgenstein's acceptance of the interaction and coexistence of language games. From this vantage point, love is neither reduced to biochemical fluctuations, nor to a conditioned social pattern that people imitate in certain situations; not even a psychodynamic regression, and not necessarily a pure experience of selflessness and devotion. To understand these phenomena, we must first go beyond the objective and categorical level and explore the phenomenon itself; who actually experiences love. We should also be open to all subjective and objective dimensions to be able to reframe these experiences in the bio-psycho-social framework. We should be aware that we are now part of that context and its result is an interpersonal interpretation that might lead us to the prescription of a remedial package including medicine therapy, psychotherapy, meditation, family therapy, and even environmental and social modifications. In order to integrate such a health service system that entails all of the intra/inter/transpersonal fields, we need

something beyond a multidisciplinary approach that can trace the flow of signs in the body, mind, society, and culture and is also able to devise management plans.

Some psychosomatic medical theorists such as Thure von Üexkull have considered biosemiotics as an approach that can explain the mental and the physical in a single ground called semiosis, away from being limited in the Cartesian dualism boundaries. To speak of the mind from this perspective is in fact to talk of a self-organizing order, from a phenomenal world that perceives the world in a particular way and acts the same way; a differential system that differentiates stimulations in a systemic way. In other words, a mind is a specific way of being in the world. Now, if we return to the definition of life, we recognize that it has a similar domain with the mind as per the above definitions, and that all of the descriptions also apply to the living body. In the systemic approach, mind is not only embodied in the form of the elemental body, but it is also embodied in the discourses and institutions.

The four different physical, emotional, cognitive, and social phenomena are indeed emergent recreations of mind in different levels of organization that has its own specific language and rules at each level. In Luhmann's opinion, each of these levels has its functional closure. At the same time, levels are structurally open to each other; this is why the sign systems interact with each other, and the semiosis freely moves through and between the systems.

The inclusive phenomena of meaning response, that is traditionally called the placebo effect, is a distinguished example of relations between the levels of organization and one of the biomedicine anomalies that made us think about the function of interpretation from symbolic components to physical components. To think about a language that can transform an idea or image into a chain of physiological changes. This phenomenon accompanies all remedial interventions like a shadow and is responsible for a large part of effectiveness of all psychological, chemical, and physical interventions. It is not a fixed coefficient and not a non-specific effect, but rather a specific biosemiotic formula that acts in a special way and to a special amount in any psychosocial context.

Biosemiotic interpretation of the placebo response is our point of departure in this book. We have attempted to show how the process of meaning making and interpreting can play a role not only in symptom formation and psychoneuroimmunologic responses, but also in health/illness behavior, epigenetic patterns, and of course, in psychosomatic treatments. In addition, through biosemiotic lenses, we observe that direct mechanical or chemical agents do not result in healing symptoms, but in reality, it is the organism's interpretation of the chemical and physical signs that can lead to healing.

In the first chapter of this book, my colleagues, Dr. Rafieian and Dr. Atarodi, and I have initially aimed at addressing the complexities of the phenomena of placebo and stated that the explanation and conscious application of these phenomena with a pure biological behavioral approach would be an arduous task which would ultimately be inefficient. For this reason, we have addressed the methodological (noise vs. signal), the pragmatic (meaning-specific vs. non-specific), and the ethical (beneficence vs. autonomy) dilemmas. Later in the chapter, we explore some solutions in the systemic model for the dilemmas to convene these so-called heterogeneous dimensions. Finally, we proceed with the semiotic approach to understand how it can explain and solve the psychosomatic phenomena.

In the second chapter of this book, Professor Brier, a science philosopher and a theorist of cybersemiotics, elaborates this transdisciplinary pattern rather extensively and explicates how this pattern can provide a common groundwork for social sciences, psychology, biology, chemistry, and physics; a context that seems to be essential for an

interdisciplinary field like medicine.

With the combination of the two metalanguages –the cybernetic-informational approach focusing on the bottom-up organization, and the semiotic-hermeneutic approach explicating the top-down organization– Professor Brier has created this inspiring model that can illuminate psychosomatic phenomena such as placebo responses convincingly.

In the third chapter of this book, psychoanalyst and psychosomatic specialist, Professor Scheidt has focused on how biology and biography intersect. Furthermore, he has clarified how hermeneutic procedures can lead symptom formation, therapeutic relationship, and even bodily responses. He has gone further in illustrating the non-substance-bound healing effects in the narrative medicine framework in a quite elucidating and inspiring way. In this chapter, Professor Scheidt has demonstrated how we narrate the self and the world with our body and language, and how we construct our world in this way. When we experience a powerful, unpleasant event, and our previous narration loses its cohesion and consistency, we should reconstruct it more consistently with the other components. Each therapy, regardless of its verum effects, could be considered as a promising change in patients' narrations.

The truth is that we do not solely enter the patient's body with chemical and physical interventions. We intervene directly with inductions and interventions, and also indirectly, by entering the patient's narration and web of beliefs. It is evident that when therapeutic narrations are more compatible with patients' narrations, there is a more profound impact, and therefore, a greater motivation for the patient to change his/her narration. Entering the web of beliefs of an individual and a society, in order to create a more congenial, salutogenic, and positive narration, is undoubtedly a delicate, complicated, and time-consuming task.

Dr. Johari Fard, clinical psychologist, and I have attempted to present an outlook of intertwined webs of beliefs in the fourth chapter. We have displayed how the webs of belief of a person, a culture, and also a healing system interact with each other and their interventions could resonate or destroy a placebo effect. Globalized statistics alone will not suffice for optimizing the meaning effect; we must also consider the compliance, the individual's anticipations, and the culture or the sub-culture of the individual. This might be the solution for the resistances and chaotic phenomena in response to various treatments. Through the use of this model, more suitable, more effective, and more democratic clinical settings may be within reach.

Dr. Farzanegan, psychosomatic medicine practitioner, and I decided to devote the fifth chapter of this book to the ritual effect and the structuralistic-anthropologic analysis of the treatment patterns and methods. We have presented how the form of each medical model and clinical setting, along with direct inductions (doctrines, prognoses, and instructions) and indirect inductions (treatment metaphors, traditions, rituals, and psalms), can systemically moderate individuals' beliefs, behaviors, and psychoneuroimmune responses.

An important point that is frequently ignored in health training and medical advertisements, due to different reasons, is that information, similar to drugs, should be formulized and prescribed at certain measured doses; otherwise, it could lead to side effects or even worse, without any positive effect, produce a nocebo effect. Increasing the risk of avoiding danger can cause increased health anxiety and, paradoxically, lead to the reduction of immune system functionality and the rise in susceptibility to illnesses which ultimately causes symptoms and even illnesses.

The discussion about the performance and metaphoric aspect of healing is continued in chapter six. Dr. Rafieian and Professor Davis, social theorist, address the role of performance and interpersonal interaction between health-

care professionals and patients using examples of hypnosis and placebo research. They illustrate the health-care system from a sociocognitive view and show the importance of performance in medical practice.

The sociocognitive theorists of hypnosis believe that trance is not necessary for the experience of hypnotic phenomena. In their view, suggestions, belief, and expectancy are the key components for the development of hypnotic experiences. Consequently, they have described hypnosis as "believed-in imaginings" and defined it as a kind of role-taking. Placebos have also been used for a long time in medicine and are still used widely in medical practice. As the placebo itself is inert, it has been proposed that the mind-body mechanisms surrounding the prescription of placebo are instrumental in healing formation. As with hypnosis, suggestion, expectancy, and belief are also the main components here. These findings cement the importance of performance practices and the verbal and non-verbal communication between the health-care professional and the care seeker in the clinical setting.

In the seventh chapter, Dr. Monajemi, practitioner and cognitive psychologist, Dr. Malekian, psychiatrist with a fellowship in psychosomatics, Dr. Ahmad Zadeh, psychiatrist, and I have addressed different dimensions of medicalization and their context, personal impacts, and social effects. We have illuminated the iatrogenic disorders of informational interventions. At the end of this chapter, we have tried to present practical solutions for optimizing the effects of informational drugs and minimizing their side effects.

In the eighth chapter, Professor Schmidt, clinical psychologist, and Professor Wallach, clinical psychologist and science philosopher, who have conducted several valuable studies in the placebo responses and parapsychology fields, address this topic from the mind-matter interactions perspective. Structural analysis of the previous chapter can be followed here to explore how a treatment process can systemically correlate a group of symbols with specific psychosomatic changes. Casual and mechanical patterns cannot explain such phenomena; hence, a correlational-semiotic pattern seems essential.

The concept of pseudomachine that authors have borrowed from von Lucadou is fully innovative and illuminative in the structural and semiotic explanation of the placebo response. From this point of view, any treatment process can be considered a pseudomachine that can condition the expectation of psychophysical changes to behaviors (referring to the healer, drug consumption, therapeutic procedures, and regimes), objects (doctor, drug, and devices), locations (clinic, operation room, and ashram), and of course, specific beliefs. Numerous studies have revealed that even in effective treatments, active agents commonly constitute a smaller portion of the treatment effects, and the larger part of the treatment is due to semiotic factors.

In the final chapter, I have aimed at presenting a bigger picture of life and medicine from the biosemiotic perspective; a picture that can demonstrate a more profound and efficient meaning for life, health, illness, and medical practice. The human organism is a self-organizing and self-narrating stream of signs that lives in/with an infinite ocean of semiospheres. Throughout the history of evolution, unlimited semiosis has inclined towards progressive coherence of signs and has gradually created more complicated and emergent characteristics. The omnipresent process, called Agapism by Peirce, entails the universal love that is present beyond Darwinian wars between organic systems and expands the meaning of the signs by creating more complex systems and higher levels of organizations. The evolutionary love is the tendency of life to form new and more complex forms and habits.

Medicine in such a world, where even the hard realities are nothing except natural habits, should be a more fluid, more creative,

and more humane art. Semiotics not only interprets the psychological effects, but also the effects of the chemical and physical factors which depend on its interpretations. Ethics, psychology, and sociology in this view are as bodily and medical as drugs and surgeries, and all of them are semiotic agents. The healing responses are formed via interpretation of these meaningful agents by the whole organism. The formula of a patient-doctor relationship or a public health training program needs a great deal of precise semiotic accuracy, like the synthesis of a drug. The difference is that the relationship formula is formed not only on the basis of predetermined instructions, but is also constructed in live processes of relationship.

Thus, attuning to the developing cohesion of the signs towards the sustainable development of health –in addition to meticulous psychological, sociological, anthropological, and semiotic studies– requires consideration of the qualitative, improvisational, and chaotic dimensions of therapeutic relations. As such, we need something more than medical science and technology; we need a hermeneutic participatory art of healing. "Doctor is medicine", as Michael Balint stated, and this medicine can heal well when the healing system, healer, and client are attached to the evolutionary love.