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Editorial **Clinical neuroscience and mental health: filling the gap**

Orestis Giotakos

(MD. MSc, PhD), Founder of Obrela (info@obrela.gr)

Abstract

Recent developments in neuroscience can help inform clinicians³ understanding of cognition, emotion, behavior, and social interactions—all critical aspects of peoples lives that are dramatically affected in psychiatric disorders. Psychiatry is informed by a broad range of basic biological and social sciences and has at its disposal many tools, like brain imaging, genetics, neuropsychopharmacology, neurophysiology, epidemiological models, and neuropsychology, for developing new assessment and treatment approaches, grounded in understanding of etiology and pathophysiology. However, psychiatry as clinical neuroscience must strengthen its partnerships with the disciplines of public health, community and behavioral health science, and health economics. The WPA Action Plan 2017-2020 supports psychiatrists to promote mental health and improve care capacity, like service development, awareness raising and advocacy, education, research and publications. Establishing new approaches in publishing innovative research findings, I suggest that the creation of the new journal, *Dialogues in Clinical Neuroscience & Mental Health*, will contribute to guiding this interdisciplinary field in new directions.

Human brain is probably the most complex object on Earth. In fact, the brain has an estimated 10¹¹ neurons, each with an average 10⁴ connections with other neurons. Zooming in and out of this dense jumble of cells and cables reveals non-random structural patterns at different levels. Better understanding of brain functioning and brain plasticity has allowed neuroscientists to transfer findings from research to education, therapy and rehabilitation programs. However, advancements in some areas which have dominated the literature, like "reward" and "fear" circuits, have gradually paved the way for a more nuanced conceptualization of valuation in the brain and the mesocorticolimbic system can no longer be categorized as a "reward" or a "dopaminergic" circuit, nor can the amygdala be deemed the "fear center." Based on this concept, Haye (2015) [1] suggested that "our goal is to help generate new hypotheses about how to better apprehend affective circuits". Recently, Boyle et al (2017) [2] found that disease risk is driven mostly by genes with no direct relevance to disease, but which act as modifiers of more fundamental biologic processes, perhaps related to individual genetic backgrounds and environmental experience. Based on these findings, Weinberger (2017) [3] suggested: "This proposal echoes the question of whether psychiatric disorders are really "diseases" rather than varying states of brain development that have a particular way of expressing difficulties in particular environmental contexts, based on genomic background, development and experience".

Understanding the brain represents one of the most profound and pressing scientific challenges of the 21st century. Recent developments in neuroscience can help inform clinicians> understanding of cognition, emotion, behavior, and social interactions—all critical aspects of peoples lives that are dramatically affected in psychiatric disorders. Some areas of neuroscience, like the emotion regulation, are of particular relevance to clinicians because they help further the understanding of patients and can lead to the development of novel therapeutics. For many decades, scientists have thought of cognition and emotion as two largely separate systems in the brain, but even as researchers began to find evidence of the interdependence of the two, this interaction was often seen in the light of emotions interfering with the higher level of cognitive processes. Despite the affective neuroscience developments, scientists get still confused about what is meant by 'emotion', since there are distinctions between the functional emotion state ('the emotion state'), its conscious experience ('the experience of the emotion'), our ability to attribute emotions to others ('emotion perception'), our ability to think and talk about emotion ('conceptualizing emotion'), and the behaviors caused by an emotion state ('the expression of emotions', 'emotional reactions') [4]. Although much still remains to be discovered, current

findings in affective neuroscience have already influenced our understanding of drug use and abuse, psychological disorders such as panic disorder, and complex human emotions such as desire and enjoyment, grief and love.

During the last decade Neuroscience research has made also a step forward in virtual reality and big data analysis. The advent of plug-and-play technologies has simplified the connection between Skinner boxes and computers. At the present time, sophisticated software can provide user-friendly and intuitive panels for facilitating the creation of user-defined protocols, as well as direct access to analysis reports, providing straight-to-the-point integrated data, statistics and graphs. We know now that understanding how the brain works, needs to have three types of maps: first, 'cell type map, i.e. to identify the diverse types of cells and their distributions in all brain regions, and the molecular expression pattern in each cell type. Using molecules specifically expressed in different cell types as markers, we can then draw the second type of map—'connectivity map', the so-called 'connectome', which is the wiring diagram of nerve connections among all neurons in the brain. Mapping the 'connectome' is often compared to mapping the 'genome', the complete sequence of all nucleotides and genes they encode along the entire DNA of an organism. The third type, 'activity map', refers to mapping of the firing or spiking pattern of all neurons in the brain associated with a particular state of the brain [5].

Psychiatry is grounded in clinical neuroscience. The components of psychiatry and the components of neurology are often arbitrary and historical rather than rational. Whereas neurology has traditionally focused on discrete anatomical lesions, psychiatry or modern clinical neuroscience addresses dysfunction in anatomical circuits and connectivity. Psychiatry, like neurology, rests on a foundation of clinical neuroscience. It also encompasses and is informed by a broad range of basic biological and social sciences and has at its disposal many tools, like brain imaging, genetics, neuropsychopharmacology, neurophysiology, epidemiological models, and neuropsychology, for developing new assessment and treatment approaches, grounded in understanding of etiology and pathophysiology. Brain-imaging methods such as CT, MRI and PET are now serving useful diagnostic functions, but further advance in the use of MRI requires more fundamental understanding of the meaning of MRI signals and how they relate to the structure and activity of neural circuits. Psychiatry as clinical neuroscience must strengthen its partnerships with the disciplines of public health, community and behavioral health science, and health economics. Psychiatry needs to pay attention to the inequalities in the delivery of mental health services to vulnerable populations, as well as to the integration of mental health services into other areas of medicine, from pediatrics to geriatrics. Also, to the unmet mental health needs of medical students and physicians generally, whose rates of suicide are two to three times greater than in the general population. Moreover, several diagnostic concepts in psychiatry have changed to some extent through the years and that some of them have disappeared along this way. Several diagnostic categories have been split or lumped in a way that is questionable. The project launched in the early 1980s to validate DSM-III categories by elucidating their "specific" etiopathogenetic underpinnings seems to have failed **[6].** A dialogue should be kept between the neurosciences and other anthropological, psychological and social sciences. Psychiatry can improve both assessment and treatment strategies via deeper understanding of genetics, pathophysiology, functional neuroanatomy, and neuropsychopharmacology, allowing for the development of more personalized interventions.

On the other hand, mental health issues are found across the world and in every population. According to the World Health Organization, around a third of the adult population worldwide suffers from a mental disorder such as depression, anxiety and schizophrenia. However, treatments for depression and methods for preventing suicide, for example, are not evenly spread. There is clearly a gap between neuroscience research and mental health services. So it is important to find treatments for mental health disorders that can be delivered in culturally diverse low and middle-income countries, where there are challenges of poverty, stigma and a lack of clinicians with specialist training in mental health. Among all the conditions in the world of health, mental health occupies a unique and paradoxical place. There is an over-treatment and over-medicalization of mental health issues, often fueled by a pharmaceutical industry interested in the broadening of the boundaries of "illness" and in the creation of more and wider diagnostic categories and thus markets for "selling sickness." On the other hand, exists profound under-recognition of the suffering and breadth of mental health issues affecting millions of people across geographies, which is a global problem. The WPA Action Plan 2017-2020 sets out a strategy for expanding the contribution of psychiatry to improved mental health for people across the globe [7]. Three characteristics frame the strategic intent of the Action Plan. First, strengthening the contribution of psychiatrists to reducing distress, illness and suicidal behaviour among vulnerable populations, like women and girls, people under extreme stress, including those affected by conflict and emergencies, and people living with longstanding mental illnesses and their caregivers. Second, supporting psychiatrists to promote mental health and improve care capacity, like service development, awareness raising and advocacy, education, publications and research. Third,

expanding the reach and effectiveness of partnerships and collaboration with service providers, service beneficiaries and policy makers. In addition, WPA proposes working with journals and other publications in low- and middle-income countries, re-establishing a task force on peer support for editors of psychiatric journals in low and middle-income countries.

Finally, it should be noted that many talented young scientists, especially in biological sciences, are under the "curse" of 'high-impact' journals. In most cases these scientists need to conform to not only rigorous standards of data collection, analysis and interpretation, but also to the generally accepted peers' paradigm and thinking, as well as to the financial burden. Innovative science may needs to break the existing paradigm of the field. We can try to establish new approaches to publishing innovative research findings that are not necessarily acceptable by high-impact journals and new review criteria that stress the innovative aspects of the research. In parallel, we can strengthen the dialog, in order to fill the gap between the neuroscience knowledge and the mental health needs. I suggest that the creation of the new journal Dialogues in Clinical Neuroscience & Mental Health, will contribute to guiding this interdisciplinary field in new directions. I hope that in the future, our journal will become more than a repository of articles in an interesting area of science. I hope that the Journal Dialogues in Clinical Neuroscience & Mental Health will take an active role in shaping the field, by helping create a new community of researchers with common interests in this very different disciplinary background. I am deeply grateful to the founding members of the editorial board for their support, and to our publisher, obrela, for providing essential resources to this endeavor. I am confident that together we will make important contributions to the future of the emerging field of clinical neuroscience and mental health.

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Review

Unconscious and brain plasticity: neuroscience meets psychoanalysis

Elias D. Kouvelas

Department of Physiology, Faculty of Medicine, University of Patras, Greece. kouvelas_elias@hotmail.com

Abstract

I present some thoughts, hopefully useful for the progress of the dialogue between psychoanalysis and neuroscience. When Sigmund Freud first explored the implications of the unconscious mental processes to behaviour, he tried to adopt a neural model of behaviour in an attempt to develop a scientific psychology. About hundred years later, Eric Kandel suggested a part of unconscious ego, the procedural unconscious, while Mauro Mancia suggested that the establishment of inter-subjectivity between the mother and the infant during the pre-verbal stages of life depends on the mechanisms of implicit memory. Francois Ansermet and Pierre Magistretti, in agreement with Eric Kandel and the results of recent neurobiological research, support the notion that through the mechanisms of synaptic plasticity experience leaves a trace in the neuronal network, although some traces are not conscious. From trace to trace, from inscription to re-inscription and to the re-association of traces, the link and connection between the initial experience and the traces is somehow lost, even though the initial traces maintain a direct link with experience. Thus one could say that, as far as the establishment of the unconscious is concerned, inscription of experience separates from experiences in successful emotion regulation. These results are very compatible with the Freudian notions on the regulation of "id" by the "ego" and with his suggestion that specific neurons of the " ψ " system, related with the "ego" functions, are located in the frontal cortex.

In this article I will present some thoughts, hopefully useful for the progress of the dialogue between psychoanalysis and neuroscience, a dialogue that was established since long time ago by Sigmund Freud himself. In 1914 in his work "on Narcissism" he writes: "We must recollect that all of our provisional ideas in psychology will presumably one day be based on an organic substructure" Few years later, in his work "Beyond the Pleasure Principle" (Freud 1920) **[1]** states again: " The deficiencies in our description would probably vanish if we were already in a position to replace the psychological terms with physiological or chemical ones...We may expect (physiology and chemistry) to give the most surprising information and we cannot guess what answers it will return in a few dozen years of questions we have put to it. They may be of a kind that will blow away the whole of our artificial structure of hypothesis".

We can see here how Freud, being an excellent neuroanatomist and a genuine son of the Enlightenment, questions his psychoanalytic theory. When Sigmund Freud first explored the implications of the unconscious mental processes to behaviour, he tried to adopt a neural model of behaviour in an attempt to develop a scientific psychology. I am talking about the "Project for a scientific psychology" (Freud: 1895/1966) [2]. This book was written in 1895 few years after his magnificent publication on the structure of the neuronal cells. Freud was the first to show the fibrous morphology of the cytoplasm of the neuronal cells (Freud:1882) [3]. Before I proceed to a discussion of the "Project ..." let me add the extremely interesting information for what I discuss in this article: in the same year, 1895, the founder of modern Neurobiology, Ramon Y. Cajal, published a book under the title "Algunas conjeturas sobre el mecanismo anatomico de la ideacion, association y attencion" (Conjections on the anatomical mechanisms of ideation, association and attention). In this book Cajal, who, for some years was practising hypnosis for the treatment of hysteria suggests an anatomical model for the creation of ideas, of the association mechanisms and of the intentional actions. Similarly, Freud in his "Project..." suggests that brain functions are based on 3 systems: φ , ψ , and ω . The system ϕ consists of perception neurons which receive external stimuli through the form of energy that in order to reach the system is filtered by a specific filter. The system ψ is mainly psychic, it receives inputs from the sensory periphery (ϕ system of neurons) and from internal stimuli which originate from instincts as it is sex and famine. . Tonic inhibition of this interoceptive division of ψ was accordingly

assumed to be the physiological basis of executive control (the "ego").

Consciousness, which was attributed to a separate neuronal system (" ω "), was located at the motor end of the apparatus. The distinctive function of the ω system was to monitor the accumulation of drive energies within ψ . Increased drive tension generated feelings of unpleasure in ω ; motor discharge, by contrast, generated pleasure. This affective-homeostatic function was, according to Freud, the primary purpose of consciousness. He therefore always insisted that affects were conscious by definition. Affect was the raison d'être of consciousness (Solms and Panksepp 2012) [4]. Later on, in his book "The Ego and the Id" (1913) [5], Freud incorporated the inhibited part of « ψ ». The "id" is the part of the personality that contains all human's basic instinctual drives. Id is the only component of personality that is present by birth. It is the source of our bodily needs, desires and impulses. The id" acts according to the "pleasure principle". It is defined as seeking to avoid pain or "unpleasure". According to Freud the "id" is unconscious by definition. In the "eqo" Freud incorporated " ϕ ", " ω " and part of " ψ ". The "ego" acts according to the "reality principle". It seeks to please the id's drive in realistic ways that will benefit in the long term. The ego mediates between the desires of the "id" and the "superego". The "ego" is the organized part of the personality that includes defensive, perceptual, cognitive and executive functions. Conscious resides in the "ego", although not all of the operations of the "ego" are conscious.

In the "Project for a Scientific Psychology" Freud adopts the individual neurons theory connected to each other with synapses (contact barriers according to the terminology used by Freud). In other words he adopted a reductionist, monistic theory for behaviour. The individual neuron theory was advocated at that time by Ramon Y Cajal but until 1950ies it was not the predominant theory. Until 1950ies the predominant theory was "the network theory", advocated by Golgi. The "Project for a Scientific Psychology" was published several years after Freud's death by Maria Bonaparte and his daughter Anne Freud. Freud abandoned this model for a pure mentalistic one based on verbal reports of subjective experiences, because of the immaturity of brain science at the time. Initially, as Eric Kandel [6, 7] has pointed out, this separation may have been as healthy for psychiatry as it was for psychology. It permitted the development of systematic definitions of behaviour and

disease that were not contingent on still-vague correlations with neural mechanisms. Moreover, by incorporating the deep concern of psychoanalysis for the integrity of an individual's personal history, psychoanalytic psychiatry helped to develop direct and respectful ways for physicians to interact with mentally ill patients, and it led to a less stigmatized social perspective on mental illness. However, the initial separation of psychoanalysis from neural science advocated by Freud, was stimulated by the realization that a merger was premature. But as psychoanalysis evolved after Freud, rather than being seen as premature, the merger of psychoanalysis and neuroscience was seen as unnecessary, because neural science was increasingly considered irrelevant (Kandel:1999) [7]. The majority of psychoanalysts, , adopted the dualistic mindbody theory of Descarte. However, as Marilia Aisenstain (2014) [8] pointed up: Freud and the discovery of psychoanalysis could not have happened if Spinoza (17th century) had not posited the unity of substance and defended the notion of "materialist and substantial monism. Psychoanalysis, in fact, could only be inscribed within this current. The description of hysterical conversion is a good illustration of how intrapsychic conflicts are expressed in the body. Many years have passed since Freud introduced psychoanalysis, and brain science today is in the cusp of a revolution similar to the unravelling of the human genome in 1990's. Terms like 'consciousness' or the 'unconscious' can be discussed not only on a psychological or psychoanalytic basis but also on a neurobiological basis. This provides a possibility for a dialogue between psychoanalysis and neuroscience and as the title of my presentation suggests, this dialogue can be founded on the unconscious and brain plasticity. Although Aristotle in the ancient times and Leibnitz, Immanuel Kant, Herbart or von Helmholtz referred to the unconscious processes, it was Sigmund Freud who really pointed up and established the role of the unconscious in our behaviour and feelings.

About hundred years later, at the end of the 20th century, Eric Kandel **[6, 7]** suggested (Kandel: 1998, 1999) that part of our unconscious ego, what he names *procedural unconscious*, has not been repressed and is concerned with unconscious habits, and perceptual and motor skills that are mapped into procedural (implicit) memory. Many changes that have taken place during psychoanalysis concern precisely this very part of the unconscious. This progress does not depend on conscious awareness of the repressed unconsciousness as Sigmund Freud suggested. It does not, in other words, require the unconscious to be transported into the realm of the conscious. It, rather, consists of changes in behaviour that increase the range of the subject's procedural strategies for *doing and being*. In support of his hypothesis Eric Kandel presents the work of Louis Sanders, Daniel Stern and their colleagues in Boston who developed the idea that during the analysis there are moments of meaning - moments in the interaction between patient and therapist - which represent the achievement of a new set of implicit memories that permit the therapeutic relationship to progress to a new level. This progression does not depend on conscious insights; it does not require, so to speak, the unconscious becoming conscious (Kandel:1999). In my opinion these ideas, expressed almost twenty years ago, were a very good start for the dialogue between psychoanalysis and neuroscience and are in agreement with ideas expressed by psychoanalysts. Otto Kernberg [9] Professor of Psychiatry and Psychoanalysis at the Universities Cornell and Columbia suggests:" One other implication of these formulations is that the deepest layers of psychic experience that will organize the psychic apparatus are represented by peak affect states of a positive or negative quality, in the context of which the deepest aspects of the relationships between self and others are internalized, presumably at first into procedural memory, and only later on in the form of declarative or preconscious memory" (Kernberg:2006). Similarly the late Mauro Mancia [10], Professor of Neurophysiology and Psychoanalyst at the University of Milan, referring to the early experiences indicates that: "these experiences, with the fantasies and defenses they induce, cannot be repressed because the structures of the explicit memory needed for repression take two or three years to mature._Therefore, in these preverbal and pre-symbolic stages of life, when the child and its mother identify with one another, with proto-linguistic forms of communication shared affective states and a relation in which intersubjectivity implies "inter-fantasy", the infant will be able to create affective representations and store them in the implicit memory. These will form the unconscious, unrepressed structure of his mind" Therefore "a critical part of the psychoanalysts work today involves transforming symbolically and rendering verbalizable __the implicit structures in the patient's mind that mark the unrepressed unconscious"_(Mancia:2010). Thus, according to Mauro Mancia [10], the establishment of inter-subjectivity between the mother and the infant during the pre-verbal stages of life depends on the mechanisms of implicit memory. However,

mirror neurons (Gallese et al, 1996) **[11]** may, also, play a key role in the establishment of inter-subjectivity between the mother and the infant during the pre-linguistic stages of life.

The dialogue between psychoanalysis and neuroscience is impressively advanced with the work of the psychoanalyst Francois Ansermet [12] and the neuroscientist Pierre Magistretti [13]. Francois Ansermet and Pierre Magistretti, in agreement with Eric Kandel and the results of recent neurobiological research, support the notion that through the mechanisms of synaptic plasticity experience leaves a trace in the neuronal network. This network, made up of series of facilitated synapses acting in concert, represent the neuronal substrate of our memories in the explicit or the implicit or procedural memories, in other words, what makes us unique. However, Francois Ansermet and Pierre Magistretti indicate that there are traces which are not conscious. Through the same mechanisms of plasticity, through synaptic re-arrangements and re-associations with new traces that have been inscribed, an unconscious internal reality can be formed, which of course plays a key-role in the determination of the subject. Thus from trace to trace, from inscription to re-inscription to the re-association of traces, the link and connection between the initial experience and the traces is somehow lost, even though the initial traces maintain a direct link with experience. Thus one could say that as far as the establishment of the unconscious is concerned, inscription of experience separates from experience. Thus, the unconscious is not a memory system. The unconscious can therefore be seen as a discontinuity from which the subject emerges in its uniqueness. Thus Pierre Magistretti and Francois Ansermet introduce the discontinuity as a characteristic of the unconscious and continue by saying." Through the unique interplay mediated by the re-association of traces, the universal mechanisms of plasticity result in the production of a unique subject, each time different.

One could say that in this way and paradoxically plasticity implies a determination of the unpredictable....One never uses the same brain twice....Thus we would be biologically determined not to be biologically determined, we would be genetically determined to be free". Consequently, within the framework of their extremely comprehensive theory on the unconscious, Pierre Magistretti and Francois Ansermet bring together a very daring idea on the determinism of human behavior, with which I absolutely agree. Few years ago in an international psychiatric meeting I concluded my presentation under the title" Experience: A major determinant of brain architecture" as follows: "Brain architecture can be modified by experience and such modifications of brain map may contribute to the biological expression of individuality. The structure of human brain, although limited by the general framework of the genetic material, is continuously under reform by the experience and the activity of the brain itself. It can be identified as a paradox that one of the characteristics of the evolution of the human species is the selection of genes that permit to escape from them, in the sense that they give the possibility of considerable plastic changes of brain architecture and presumably human behavior. Therefore the structure of our brain is a result of our personal history and our mind is not confined in the form of inflexible networks. On the contrary our mind is a historical, cultural and social phenomenon". Within the concept that I described above, considering the trace, another dimension has to be taken into account, namely the emotional connotation of such traces (Magistretti and Ansermet: 2008) [12, 13]. Perception does not only originate from the external world through exteroceptive pathways but also through interoceptive pathways which inform the brain about the state of our body which is essential for our feelings of pleasure and displeasure. As a result traces are linked to somatic states which are carried out along the chain of the trace re-associations in the unconscious level. Thus the body is in play in the establishment of individuality. One cannot think the mental without the somatic. About 2500 years ago Hippocrates indicated that from the brain and from the brain only, arise our pleasures, joys, laughter and jests, as well sorrows, pains, grief's and tears...Today he would add: pleasures, joys, laughter and jests, as well sorrows, pains, grief's and tears also produce the brain itself.

I regard that amygdala can be a good example in order visualize some of the mechanisms that make possible the association of an external stimulus with a somatic state. Several experimental data indicated that in amygdala an external stimulus, for example an acoustic specific stimulus, can be associated with the somatic state of fear (Pascoe and Kapp, 1985) **[14].** This association is established through the facilitation of specific synapses in the basolateral nuclei of amygdala. After the establishment of such an association, the associated stimulus can induce fear and anxiety reactions through the activation of facilitated neuronal networks of amygdala. Afferents from the amygdala project to the hypothalamus, which can alter the state of the Autonomic Nervous System and through the hypophysis the secretion of hormones , and to the periaqueductal gray matter in the brain stem, which can evoke behavioral reactions via the somatic motor system (Pare et al: 2004) **[15]**. Amygdala also projects to cortical areas and this pathway is important for the perception of the emotional experience a component of consciousness. However, this experience has to be distinguished from what is happening inside the amygdala. The associations that are established there, the cause of autonomic, motor and conscious reactions, remain in the unconscious level and brain imaging studies indicate that under certain conditions can induce post-traumatic stress reactions.

Hundred years ago, Freud recognized that consciousness also entailed an interoceptive affective aspect and he suggested that this aspect defined the original "purpose of consciousness" and therefore he supported the notion that "the brain knows more than it admits" (Freud 1911) [5]. That is why Antonio Damasio was moved to say that "Freud isights on the nature of affect are constant with the most advanced contemporary neuroscience views (Damasio 1999) [16]. Similarly Josef Le Doux (1999) [17], in the laboratory of whom was realized most of the pioneering research on the function of amygdala, emphasized, few years ago: "when electrical stimuli applied to the amygdala of humans elicit feelings of fear, this is not because amygdala "feels" fear, but, instead, because the various networks that the amygdala activates ultimately provide working memory with inputs that are labeled as fear. This is all compatible with the Freudian notion that conscious emotion is the awareness of something that is basically unconscious.

As I mentioned above, amygdala projects to several regions of cerebellar cortex. One of the major projections is to the ventral medial prefrontal cortex (vmPFC). Recent studies suggest the involvement of different regions of the prefrontal cortex in the modulation of amygdala reactivity and the mediation of effective emotion regulation. The strength of amygdala coupling with orbitofrontal cortex and dorsal medial prefrontal cortex predicts the extent of attenuation of negative affect following reappraisal. Effective amygdala-prefrontal connectivity predicts individual differences in successful emotion regulation (Banks et al. 2007 **[18]**, Etkin et al. 2011 **[19]**, Moravetz et al. 2017 **[20]**, Townsend et al 2013 **[21]**). These results are very compatible with the Freudian notions on the regulation of "id" by the "ego" and with his suggestion that specific neurons of the " ψ " system, related with the "ego" functions, are located in the frontal cortex.

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Review Poor insight in psychosis and meta-representation models

Orestis Giotakos

Psychiatrist (MD, MSc, PhD)

Abstract

Historically, poor insight and self-awareness deficits in schizophrenia have typically been understood as stemming from psychological defenses or adaptive coping strategies. Perhaps both psychological process and neuropsychological deficit account for the phenomenon of poor insight. Different models of insight exist for different broad categories of mental disorders, like psychotic, neurotic, and neurological, but investigators have increasingly turned their attention to poor insight, as an important feature in schizophrenia. A variety of phenomena might be considered as reflecting impaired insight in psychosis, like failure to recognize signs, symptoms or disease, failure to derive appropriate cognitive representations, despite recognition of the disease, and misattribution of the source or cause of the disease. The unawareness of tardive dyskinesia symptoms in schizophrenic patients points that self-awareness deficits in schizophrenia may be domain specific. Poor insight is an independent phenomenological and a prevalent feature in psychotic disorders in general, and in schizophrenia in particular, but we don't know yet if delusions in schizophrenia are the result of an entirely normal attempt to account for abnormal perceptual experiences or a product of abnormal experience but of normal reasoning. The theoretical approaches regarding impaired insight include the disturbed perceptual input, the impaired linkage between thought and emotion and the breakdown of the process of self-monitoring and error checking. The inability to distinguish between internally and externally generated mental events has been described by the meta-representation theory. This theory includes the awareness of ones' goals, which leads to disorders of willed action, the awareness of intention, which leads to movement disorders, and the awareness of intentions of others, which leads to paranoid delusions. The theory of metarepresentation involves mainly output mechanisms, like the frontal cortex, while the input mechanism involves posterior brain systems, including the parietal lobe. There are many similarities between the disturbances of awareness seen in schizophrenia and those seen as a result of known neurological impairment. This is more apparent for the many disturbances of body awareness and delusional disorders resulting from right parietal lobe dysfunction. Neurological models may provide a means for classifying various disorders of awareness. Classic anosognosia describes the denial of motor impairment in hemiplegia, anosodiaphoria the indifference to the hemiplegia, and a number of disorders are characterized by a specific tendency to confuse identities, like misidentification symptoms, reproductive phenomena, and confabulation. Neuropsychological models of impaired insight typically attribute the disturbance to any of a variety of core deficits in the processing of information. In this respect, lack of insight is on conceptual par with alogia, apraxia or aphasia in reflecting disturbed cognitive processing. In this direction, research have implicated the role of self-monitoring in disorders of awareness and many of the core symptoms of schizophrenia, and has been suggested that these symptoms are the result of a disturbance of a medial frontal system involving anterior hippocampus, cingulated gyrus, supplementary motor area, and dorsolateral prefrontal cortex. Poor insight seems to be something more than a symptom or an epiphenomenon and its mechanism may constitute a core factor into the psychosis process. Also, poor insight could arise as a common mechanism for many other mental disorders or even it would be an independent and trans-diagnostic factor into the human personality, probably like the dimension of psychotism.

Key words: psychosis, insight, schizophrenia, psychotism, metacognition, meta-representation, self-awareness, self-monitor-ing, anosognosia, neuropsychiatry

The notion of insight in psychiatry

Insight is defined as a person's ability to view oneself, including his psychological functioning, as if from the perspective of an external observer [1]. In neuropsychiatry, the terms "anosognosia" and "lack of awareness" are synonyms, relating to an individual's pathology. The term "anosognosia" is used primarily to describe the lack of awareness of specific functions following brain damage, an example found in hemiplegia. The term "insight" is positioned more closely to the concept of "denial" and is used mainly in psychiatric disturbances, such as schizophrenia and bipolar disorder or even personality disorders, Alzheimer Disease or conditions related with judgment impairment. David (1990) [2] suggested three dimensions of insight: (a) the acknowledgment of the existence of a psychiatric disorder, (b) therapeutic compliance, (c) the ability to name unusual internal experiences, such as hallucinations. Amador & David (1998) [3], suggested five dimensions of insight: (a) the lack of awareness of their mental disorder, (b) the lack of awareness of the effects of medication, (c) the lack of awareness of the consequences of their pathology, (d) the lack of awareness of specific symptoms, and (e) the lack of awareness regarding the contribution of symptomatology to their pathology. The most renown scales developed for the measurement of insight are the Schedule for the Assessment of Insight [2], the Schedule for the Assessment of Insight – Expanded Version (SAI-E) [4] and the Scale to Assess Unawareness of Mental Disorder (SUMD) [5]. In relation to clinical insight [6], research points out that patients with schizophrenia present lower levels of insight, compared to patients with depression or bipolar disorder [7]. Similarly, low levels of insight have been found in individuals with schizo-affective disorder or mood disorders, with or without psychotic symptoms [8,9], although some researches failed to establish significant differences between the different groups of patients [10].

One of the most consistent and reliable literature findings concerns the positive relationship between *metacognitive capacity*, which leads to the recognition of the pathology, and low mood or depression. Similarly, an association has been established between pathologically elevated mood and the respective lack of awareness in multiple diagnostic groups [3, 11]. Increased symptoms of depression in schizophrenia tend to be associated with increased levels of insight [12].

Similar results were found in a meta-analysis by Mintz et al (2003) **[13]**, analyzing 40 studies that explored the effect size between insight and symptoms domain in schizophrenia. Negative relationships of small effect size were established between insight and the total constellation of symptoms, but also individually between insight and positive and negative symptoms. In addition, a positive relationship was found between insight and depressive symptoms in schizophrenia, although the effect size remained small. The negative relationship between insight and positive symptoms was stronger in the most acute phase of schizophrenia, but decreased as patients reached stabilization. Guided by the hypothesis that depression is developed when patients are more aware of the presence and consequences of their psychosis, the authors described a cognitive model of insight, according to which the lack of insight reflects a form of self-denial in an attempt to target depressed feelings. Indeed, poor insight can often be interpreted as a form of denial, with the aim of maintaining an intact self-esteem. Conversely, good insight can be viewed as an example of "depressive realism". The exception that proves the rule is found in the case of psychotic depression, where the common link between low mood and good insight is eliminated, and psychosis ends up being the core symptomatology [14]. A relationship was also supported regarding cognitive abilities (IQ) and insight in patients with schizophrenia [15]. A related study of 500 patients with psychosis showed that the lack of insight primarily reflects general cognitive ability, rather than a specific cognitive function [16]. Similarly, low insight was associated with low performance on the WCST, and in particular, performance on the WCST revealed a greater association with awareness compared to other cognitive features, such as IQ or memory [17]. Beck & Warman [18] distinguished *cognitive insight* from *clinical* insight, as the latter is characterized by the recognition and acceptance of one's pathology. Cognitive insight is associated with the ability of attributive metacognition; the flexibility of a person to navigate between his beliefs, experiences and judgment. Within this context, the self-report Beck Cognitive Insight Scale [19] was developed.

The most prominent theoretical perspectives that attempt to account for the development of lack of insight are summarized as follows: (1) The *perceptual input* is impaired, as occurs with the loss of hearing or vision, which may in turn lead to paranoid ideation or other abnormal perceptual experiences, such as hallucinations. (2) There is a disruption in the *inferential process*, where the patient fails to recognize the consequences or the results of actions. (3). The *process of self-monitoring* is disturbed, and the experience of consciousness altered, disturbing the distinction in the perception of internally and externally produced phenomena. For instance, a patient with auditory hallucinations may be engaged with inner speech, but he may not be aware of the fact that this speech is self-produced. (4). The processes of error checking may be disturbed, resulting in the disruption of the ability to doubt and discriminate what is indisputable from what may be possible or impossible. (5). The linkage between thought and affect is disrupted, leading to out of proportion affective reactions. (6) There are weaknesses in certain capacities, such as the capacity to hold on to a memory representation, organize a task and maintain the effort until successful completion [3]. Reviewing cases of schizophrenia, Carpenter [20] identified four subtypes of schizophrenia: (1) typical schizophrenia, with poor insight, paranoid and passivity delusions, auditory hallucinations and restricted affect, (2) flagrant schizophrenia, with irritable or bizarre behavior, incongruent affect and absence of anxiety or depression, (3) insightful schizophrenia, that appears similar to typical schizophrenia, but the person presents good insight, and (4) hypocondriacal schizophrenia, characterized by moderate insight and multiple somatic concerns and visual hallucinations.

Extending the boundaries of insight, we find notions related to other self-awareness phenomena. The concept of self-deception is defined as the eclectic and self-motivated absence of understanding of material that is psychologically comprehensible [21, 22]. It has been theorized as a defiant expansion of self-awareness, which concerns the lack of awareness regarding the presence of the pathology. In the case of self-deception, the lack of awareness tends to be global and incorporates large chunks of psychological material. Moreover, it is often associated with an individual's motivational components, something not evaluated in the cases of insight in schizophrenia. Sackeim & Gur (1978) [23] suggested the following criteria to describe the phenomenon of *self-deception*: (1). the person has two mental contents, that are conflicting when expressed as propositions, (2). these two mental contents occur simultaneously, (3). The individual is not aware of one of the two mental contents, (4). The process that defines which mental content is subject to awareness depends on the individual's motivation. The aforementioned researchers distinguished self- from other-deception, and created a related guestionnaire, the Self-Deception Questionnaire. This scale comprises of 20 items, such as "have you ever felt hatred toward either of your parents?, "Do you ever feel attracted to people of the same sex?", "Do you have sexual fantasies?". The application in college students showed that levels of self-deception were negatively associated with self-reported depression, but also with overall presence of psychopathology [24]. Higher levels of self-deception were consistently associated with less or less severe symptoms of depression. It was supported that people with high levels of self-deception simply deny or minimize their perception of symptoms, negating the presence of symptoms primarily to themselves. It could be hypothesized that self-deception may have a protective role against depression. Conversely, depression on its own may reduce mechanisms of self-deception. Research has shown that a denial component remains consistent during emotionally heightened situations, both in the duration of the disorder but also following rehabilitation [24]. It is therefore likely that during depression the phenomenon of self-deception is maintained, and adopts the function of a trait, as much as a state, characteristic. Possibly, the absence of denial reflects a trait characteristic of depressed individuals. The absence of denial could be conceptualized as a form of depressive realism. Research has shown that at least one component of depressive realism is independent from the affective part of depressed patients. No particular association has been found between insight and psychosis in depressed patients, nor between levels of self-deception and psychosis. However, it was established that depressed patients with low levels of insight reported less depressive symptoms and it was hypothesized that a link between poor insight, high use of self-deception and less depressive symptoms exists in affective disorders. [25]. The phenomenon of self-awareness in affective disorders can be viewed on a continuum, with severe depression occupying one end, followed by mildly depressed patients with low levels of self-deception (the so-called *depressive realism*), and in the other end of the spectrum a group of healthy individuals with high levels of self-deception. This continuum appears to be independent of the psychotic process [25].

Insight and neurological disorders

Clinicians working in neuropsychiatric contexts often notice that some patients develop a range of unusual disorders of *awareness* and *insight*. The quality of symptoms is so peculiar that they are classified as psychotic patients, until a potential brain damage is detected by a neurological examination. In 1914, Joseph Francois Felix Babinski **[26]** introduced the term *anosognosia*, in an effort to describe the denial of awareness of motor disorders. Today, the term is synonymous with "unawareness", "lack of insight" and "imperceptions of disease". Babinski had observed that these individual's lack of insight was not complemented by an overall loss of cognitive ability, and in 1939 Lhermitte [27] distinguished the traditional "anosognosia", such as denial of hemigplegia, from "anosodiaphoria", such as indifference to hemiplegia. There are multiple accounts of cases with lack of awareness of auditory or visual limitations [28], while in some of these cases a parallel development of delusions and hallucinations is noted [29]. In 1985, Fredericks [30] differentiated "verbal anosognosia", in which the patient expresses a denial of symptoms during the medical examination and complementary questions, from "anosognosic behaviour disorder", where patients display unusual reactions regarding their suffering parts. Some patients may deny a pathology's existence, other's may indicate they were suffering in the past but not now, and others may even give a nickname for their body parts presenting a disorder. Other disorders may encompass "body schema disorders", which usually involve amputated body parts for which the patient complains of heat or burning, while another case is that of the "alien hand syndrome", whose description involves capacity of the hand to act on its own (e.g. touching the buttons of a shirt). Most syndromes that involve a deficit in awareness of a pathology are associated with damage in the right hemisphere. Deficits caused by Anton Syndrome are due to damage of the primary visual cortex. The "phantom limb" syndrome usually results from an amputation, more often in left amputated limbs, but also due parietal damage [31].

A constellation of redublicative phenomena, characterized by confusion regarding the identity of bodily parts, have been given different terms with the passage of time, such as misidentification symptoms, redublicative phenomena, or confabulation and include delusional beliefs involving people, places or body parts [32]. A disorder characterized by delusional beliefs relating to place is known as reduplicating paramnesia, during which a delusional belief that a given place has moved to another place exists. In 1923, Capgras and Reboul-Lachaux [33] described a 53 year old woman who exhibited the delusional belief that her family and friends had been replaced by an identical impostor. Although a diagnosis of Capgras Syndrome today refers to psychiatric deficits, in approximately half of these cases some form of brain damage is discovered. Many of these disorders have been attributed to right thalamoparietal damage. Delusional beliefs may concern limbs, as in the case of somatoparaphrenia, an example of which is manifested in the delusion that someone's hand belongs to somebody else's who might be on the bed [35]. Delusions may also result from temporal epilepsy and hallucinations of faces or animals, along with lilliputian hallucinations, due to

lesions in the secondary cortical zones **[36]**. Damage in the prefrontal cortex, both in the dorsolateral and orbitofrontal cortex, are known to cause a wide range of cognitive deficits, in which the patient may experience apathy and decreased awareness **[37]**.

Most neurological research supports the association of awareness syndromes with impairment in the right parietal lobe or/and its connectivity with the thalamus and frontal lobe. Many authors have described these syndromes as disorders of an internal representation of the body, and especially of these of body image or body schema [38]. It should be noted that disorders upsetting the awareness of primary visual and acoustic functions are more likely the consequence wide-spread brain damage. It has been suggested that damage in the right parietal lobe disrupts this representation in consciousness [39], through a failed reception of sensory information regarding the opposite side of the body [40], or due to damage in the completion of the internal or external stimulation in the parietal lobe [41]. Damage in the right parietal cortex may disrupt an individual's ability to evaluate the importance of a stimulus or to notice changes in the internal or external environment. Deficits in attentional ability are more likely to derive from damage in the right hemisphere, as the right hemisphere includes a greater area of the association cortex [42].

Insight and Psychosis

It is agreed that patients with schizophrenia often exhibit poor insight or lack of awareness of their pathology. David [2] supported that insight associated with schizophrenia involves three characteristics: the recognition that someone has a disorder, the compliance with therapy and the ability to acknowledge the unusual mental events as pathological. German neurologist Carl Wernicke distinguished disorders of awareness of stimuli generated from the body, which he termed somatopsychosis, from disorders involving awareness of externally generated stimuli, which he termed allopsychosis. Although patients with schizophrenia do not exhibit obvious neurological deficits, they exhibit many unusual symptoms in their motor movement that resemble the characteristics previously described somatopsychosis. Research also shows that individuals with schizophrenia do not display awareness of tardive dyskinesia, a syndrome appearing in 20% of individuals receiving antipsychotic medication, with symptoms such as involuntary chorioathetosis, tics, grimaces and dystonia. These patients rarely complain of their symptoms, and they seem to

have greater lack of awareness about dystonia in their mouth compared to other parts of their body, while the lack of awareness also seems to be more prevalent when cognitive deficits or negative symptomatology coexists [43, 44]. Patients with schizophrenia present multiple unusual bodily experiences and lose the sense of their body image [45], while these bodily experiences may be influenced by "external agents", a symptom belonging to Schneiders first-rank symptoms of schizophrenia. Body-image disturbances and somatic delusions are reported in 15-30% of psychotic patients, and involve disorders in the perception of body shape, size or position [46]. Patients with psychosis, compared to those without the disorder, present a greater occurrence of body-image distortion symptoms [47]. Delusions and hallucinations prevail in individuals with schizophrenia, while at least 90% report abnormal beliefs [48]. The inability to recognize the irrational nature of delusional beliefs is the key feature of the diagnosis of schizophrenia. However, similar to frontal lobe syndrome, patients with schizophrenia are able to recognize this irrational nature in others, even if they are unaware of it in themselves [49]. Most theoretical etiological perspectives refer to primary deficits in perception, attention or consciousness [48]. On the one hand, it is supported that delusions are the result of an expected and normal interpretation of an abnormal sensory experience [50], while opposite views posit that an anomalous logic is used to interpret a normal perceptual experience [51]. The rather complex Capgras Syndrome, also observed in individuals suffering from Schizophrenia, often presents neurological changes and deficits. Multiple psychological mechanisms may co-exist, such as depersonalization, wish fulfillment, an inability to face ambivalent feelings, incestuous wishes and homoeroticism [52]. A typical characteristics of misidentification syndromes is that patients accept and maintain a double orientation to the "truth" of their delusions. A similar situation has also been described for recovering individuals with schizophrenia and has been termed double awareness phase [53]. Primary research has shown that hallucinations exist in at least 50% of patients with schizophrenia, and approximately one out of three report auditory hallucinations, while one out of five report visual hallucinations. In most cases these involve human voices talking in the third person [48]. Furthermore, hallucinations seem to be more detailed and complex in patients with schizophrenia compared to those with neurological disorders. A research investigating the "source" of hallucinations, using a questionnaire directed at schizophrenic patients, found that 40% of patients failed to answer questions on this topic [5].

Representation of information and insight in Psychosis

Most researchers support that similar to delusions, hallucinations result from the combination of a faulty perceptual process and faulty interpretive process. They also highlight their similarity with damage in the dorsolateral and orbitofrontal cortex, indicating that the level of the absence of awareness resembles the deficits in the process of error monitoring evident in patients with frontal disorders [54]. Echolalia, the automatic repetition of other's speech, and echopraxia, the automatic repetition of other's movements, are rate yet characteristic elements of both schizophrenic and frontal syndrome patients [55]. Consequently, from these findings it can be supported that at least some symptoms of unawareness in schizophrenic patients may be related with frontal lobe dysfunction [56]. It can also be suggested that the majority of awareness disorders in neurological patients are the result of right hemispheral damage, while findings regarding the lateralization of damage in schizophrenia suggest deficits in the left hemisphere. The initial hypothesis was related to the schizophreniform symptoms presented in patients with left temporal lobe epilepsy [57]. This finding was later reinforced both by postmortem studies [58] and neuroimaging research [59]. Nevertheless, in 1985 Cutting [48] suggested the presence of a right hemispheral anomaly, supporting the presence of a hemispheric imbalance in which the mechanisms of a malfunctioning right hemisphere lead to left hemisphere hyperfunction. This right hemispheral disorder is responsible for the deficits in body image perception we encounter in schizophrenic patients, but also in the difficulties of affect processing and expression. In the same year, Cummings [60] additionally postulated that posterior right injuries result in a disruption of the passage of information into the limbic system, which in turn leads to delusions and hallucinations. These two researchers hypothesized that symptom development follows the extent of brain damage. For instance, the perceptual symptoms of body image perception may reflect right posterior brain damage, while paranoid ideations and thought deficits may be linked to disordered mechanisms in the left hemisphere. Additionally, several neurobehavioral theories of awareness and body image disorders indicate the role of the right inferior parietal lobe in attentional impairment, despite the parietal lobe not being particularly considered accountable for schizophrenia [41].

Multiple neuropsychological theories of awareness emphasize the role of an *error-monitoring system* **[54]**, which consists of three parts: (a) An internal representation of the desired outcome, (b) a feedback related to the outcome and (c) a comparison between the desired and final outcome. *Anosognosia* or the overall lack of insight may result from fault in the mechanisms determining the desired outcome, or disturbances in the process of comparison. Similarly, in 1989 McGlynn & Schacter [61] suggested the presence of a conscious awareness system located in the inferio-parietal lobe, while in 1988 Shallice [62] presented the case of the supervisory attentional system. In 1992, Frith's [63], proposal of a cybernetic model put emphasis on intention and on the monitoring system. Frith supported that schizophrenia can be seen as a disorder of meta-representation, which plays an important role in awareness processes. This model involves (a) the awareness of one's goals, (b) the awareness of one's intentions, and (c) the awareness of the intentions of others. Frith hypothesized that the lack of awareness of one's goals leads to disorders of willed action characterized by negative symptoms, such as apathy. Lack of awareness of intentions leads to self-monitoring disorders and anomalies in the experience of action, such as motor movement deficits. In addition, limitations in social interaction leads to delusions of persecution and reference. Hallucinations are the result of a person's failure to recognize the self-generated nature of some actions or of inner speech, attributing it to an external source. Most positive symptoms can, according to Frith, be explained as a deficit in the capacity to distinguish between changes resulting from actions of the individual himself and those resulting from external events. Although these views emphasize output mechanisms, most neurobehavioral theories on delusions and hallucinations attribute them to deficits in perceptual input mechanisms. Input mechanisms are mostly associated with posterior brain areas, such as the parietal lobe, while output mechanisms are mostly associated with frontal areas, including the frontal cortex (Barr, 1998). Finally, Frith [63] suggested that brain areas involved in the disorders of willed action, such as the dorsolateral prefrontal cortex, the supplementary motor area and the anterior cingulate gyrus are responsible for the positive symptoms in schizophrenia, while the monitoring system seems to be primarily linked with the hippocampal system.

Disturbances of the self and insight in psychosis

The term *"self"* is defined as a constellation of characteristics, such as the body, emotions, thoughts and senses, which makes up an individual's *identity* and which differentiates him from others (Keefe, 1998, Keefe et al, 1995). Kraepelin, Bleuler, Schneider and numerous other researchers characterized schizophrenia as a *disorder of the self*. Patients appear to have a cognitive deficit in their capacity to maintain the distinction between the internal, mental phenomena generated within the boundaries of their nervous system and those occurring outside of their bod-

ies, which are perceived through their senses. In 1993, Keefe [64, 65] termed these manifestations as autonoetic agnosia, referring to the "deficit in the ability to recognize self-generated mental phenomena". These involve delusions, hallucinations, ideas of thought broadcasting or thought insertion, etc. Hallucinations are considered the result of a misinterpretation of an internally generated mental phenomenon as something that has been generated in the externally perceived environment. All people may experience intense, and often quite lively visual or auditory memories or fantasies on an everyday basis, but they do not attribute them to some external agent. This type of misinterpretation has been found to take place in approximately 70% of patients with schizophrenia [66]. Moreover, many of the delusions of schizophrenic patients seem to involve a misunderstanding of the self. The most important delusional belief according to Schneider [67] is that of thought insertion, where external thoughts are inserted into these of the patient, thought withdrawal, where an external source withdraws thoughts from those of a patient, thought broadcasting, where thoughts are being shared to the environment and are thus available to others, and *delusional control*, where there is a sense that one's motor movements are determined by an external source. As previously mentioned, insight is defined as the ability of a person to view oneself, including his psychological functions, as if from the perspective of an external observer [1]. Schizophrenic patients thus exhibit autonoetic agnosia [64, 65], since they do not only experience a limited capacity for insight in relation to their symptomatology, but they also have limited capacity for self-observation, resulting in a difficulty shifting between internal and external observation. This difficulty in the normal development of the capacity to separate self and other was a rather primary observation and was believed to originate from the early interaction between parent and child [68, 69, 70]. These theories discussing the schizophrenogenic parent were rejected due to limited empirical evidence [71], but views on the early establishment of a difficulty to separate an internal-external mental world remain, since it is evident that this discriminative ability is possible from infancy [72]. Still, individuals of normal development exhibiting hemiplegia often develop characteristics of anosognosia, followed by a denial regarding the obvious bodily deficits. Thus, a continuing question of the scientific community is the extent to which individuals with schizophrenia, who exhibit a profound inability to determine the source of their symptoms, are similar to individuals with anosognosia.

One of the most important brain functions is to recognize what element belongs to the self and what does not. In basic survival terms, we need to discriminate between elements belonging to our body and elements belonging to the external environment, since the latter may endanger our health through viruses, internal iniuries etc. This requirement emerges in numerous everyday tasks, and our nervous system, as our immune system, expends large amounts of energy to maintain this distinction between internal and external. Imagine for example the problem that will occur if our nervous system fails to establish these boundaries of the self in periods of hunger. Furthermore, it is not enough to merely distinguish between internal and external events, but also between our own emotional reactions and other's emotional experiences [64, 65]. We are aware that individuals with brain damage or lesions present deficits in their mental imagery capacity, which are in line with deficits in perception, pointing to the presence of parallel neural pathways during imagery and visual perception [73,74]. In addition, brain areas encompassed in the realm of vision are also involved in visual mental imagery, while neural connections between the anterior inferior temporal lobe and the primary visual area of the occipital lobe indicate that visual images are shaped with the use of information stored in memory. Research employing PET scans has shown that the brain areas involved in visual mental imagery encompass, apart from the primary visual cortex in the occipital lobe, the superior parietal regions for the capacity to differentiate one image from another, the inferior parietal regions for the topographical coding of visual fragments during the assembly of an image, the temporal lobe for the recollection of material from our visual memory, and the prefrontal cortex, for the production of an image, extending it and potentially complementing it with older memory fragments. The question arising in relation to the case of autonoetic agnosia in schizophrenic patients concerns the point in this process where the internally generated image is confused with the externally perceived object. It is likely that top-down processes play an important role, since even the compartmentalized or fragmented visual information tends to be complemented by internal mechanisms of mental imagery [73,74].

Neuroanatomy of poor insight in psychosis

Some patients with temporal epilepsy develop symptoms similar to *Snaiderian* and symptoms of *autonoetic agnosia* **[75]**, while cases of malfunction of the temporal lobe or hippocaempal structures in patients with schizophrenia have also been reported **[76]**. The hippocampus is central for the comparison between sensory information and expected perceptual input, through an internally generated world constructed by memories. Schizophrenics clearly present with a weakness in maintaining an intact memory representation of the external world, something that deters the comparison between internal and externally generated phenomena. The temporal lobe has been considered the centre of auditory hallucinations. Electrical stimulation of the temporal lobe may generate auditory hallucinations, and the left temporal cortex is the most common brain area involved in epilepsy with auditory hallucinations **[77]**.

The anterior cingulate plays a key role in distinguishing between imagery and perception. Individuals with anterior cigulatomy have reported an automatic generation of imagery with perceptual content [78]. The fact that increased activation of the anterior cingulate occurs in cases when a response to external events is required [79], but not during the examination of internal spiritual or mental processes [80], indicates that this structure supports the identification of external events as deriving from outside the self. Based on these findings, it was suggested that intentions are involved in the monitoring system from the prefrontal cortex, through the hippocampal-entorhinal cortex and the cingulate, and are completed in the basal ganglia and supplementary motor area [81]. Decreased neural density in the anterior cingulate has been documented in psychotic patients, which indicates a developmental deficit in neural differentiation or migration. This may be encompassed in the etiology of schizophrenia symptoms: the abnormal connectivity of the anterior cingulate with the hippocampus may denote an abnormal myelination during late puberty, thus directing to the neurodevelopmental perspective on schizophrenia development [82].

The functions of the prefrontal cortex are not fully understood, but we are aware that this brain area is involved in guiding behavior, including monitoring, action, decision making, planning and creativity, with the support of the working memory and through knowledge categorization [83]. The supervisory attentional system postulated by Shallice (1988) [62] incorporates the prefrontal cortex as a core structure. Indeed, the prefrontal cortex seems to play a role in this system in various ways. For example, both the visual perceptual process and visual mental imagery seem to stimulate similar neural networks, such as the primary visual cortex, the posterior parietal cortex, temporal areas and the dorsolateral prefrontal cortex. Yet, an important distinction arises in the fact that neural networks involved in imagery result to the triggering of top-down processes, whereas neural networks in perception are associated with bottom-up processes [84].

Movement behavior begins with projections from the prefrontal cortex to the striatum, followed by the globus palidus and from there to the anteroventral and ventrolateral thalamic nuclei, which in turn project to the premotor area and the supplementary motor area and to the anterior cingulate **[80, 81]**. Malfunction in any of these areas may lead to disorders such as Parkinson's disease, while the positive symptoms of schizophrenia have also been associated with a failure in monitoring movements, accounted for by deficits between premotor areas and the striatum. This is supported by the symptom of a sense of movement, as if controlled by external forces, in patients with *Metachromatic Leukodystrophy*, where the white matter connectivity of several cortical areas, and in particular the frontal cortex is upset **[85]**.

The neuroanatomical model of autonoetic agnosia [64, 65] in schizophrenia suggests that the cognitive deficit in insight may be caused by a disrupted connectivity between specific brain areas. Computer generated models on information processing attempted to describe mechanisms through which the development of some symptoms takes place. The isolation of some computer parts led to several consequences, such as leading to conclusions irrelevant to the incoming data or the independent uncontrolled functioning of some parts. Applying these observations to cognitive contexts, the pioneers Hoffman & McGlashan [86] in 1993 hypothesized that if for instance some brain areas responsible for speech were isolated from the network of movement initiation, such as the supplementary motor area during the period of cortical pruning, the development of some form of subvocal speech would be possible perceived by the patient as independent of other intellectual processes and thus interpreted as a hallucination or as some thought deficit. A similar proposal was made by David in 1994 [87], who supported that the excessive neural activity between two brain areas, known as dysmodularity, provides a more accurate explanation for the pattern of cognitive deficits and neuroanatomical findings in patients with schizophrenia. This presupposes the burdening of the cognitive system and reduced brain hemispheric asymmetry, as suggested by Crow (1990) [88], as well as reduced gray compared to white matter, which is associated with greater connectivity between brain areas [89].

The type of connectivity between brain areas in schizophrenic patients remains a central area of research in the field of neuroscience. Initial SPECT research had shown increased blood flow in the Broca's area in patients with auditory hallucinations **[90]**, a finding that denotes that auditory hallucinations are part of an inner speech which is not under the control of the self-monitoring system. However, other research using PET showed that in schizophrenic patients with auditory hallucinations there was reduced metabolism in the Broca and Wernicke's areas of the audiroty cortex, compared to patients without auditory hallucinations. Nevertheless, the hypothesis that the strongest connection in schizophrenia occurs between insight and the right frontal, parietal and temporal lobes, along with the striatum, remains, further reinforced by findings on patient's performance on the Wisconsin Card Test [91]. Neuroimaging findings suggest a relationship between poor insight and the global reduction of brain volume [92], reduced volume of the frontal lobe [93], and reduced volume of the cingulate gyrus and temporal lobe [94], despite the existence of research supporting opposite findings [95]. Different method of imaging, analysis and measurement, but also the use of psychometric scales, are undoubtedly associated with the arising conflicting findings. Recent research has found an association between insight and the cortical thickness in patients during their first episode of psychosis [96], the homogeneity of the white matter [97] and the cingulate gyurs of patients during their first episode of psychosis [98]. In addition, there seems to be an involvement of the cortical midline system, especially of the medial frontal (ventro-medial, BA 10, 11 and dorso-medial, BA 9) and of the cingulate gyrus. A meta-analysis by van der Meer et al (2010) emphasizes the involvement of the frontal segments in the activity of self-observation, compared to observation of others. Also, there was an activation of the right superior frontal gyrus (BA 9), close to the median line, when normal individuals were asked to replace themselves with a significant other figure, e.g. the prime minister Tony Blair [99], whereas in schizophrenic patients no such activation occurred. The authors interpreted this finding as the patients' weakness to distinguish themselves during a meta-cognitive process. This finding is similar to the research by Holt et al [100], in 2011, according to which patients with schizophrenia in a similar task displayed less activation in the medial prefrontal areas and slightly more in the medial posterior cingulate, which suggests «an anterior-to-posterior shift in medline cortical activity in schizophrenia». These findings are in line with those established in the long term studies by Michael Petrides [101, 102, 103] in humans and monkeys, according to which cortical lesions and damage in the medial part of the mid-dorsolateral prefrontal cortex (BA 46 & 9/46) lead to deficits in tasks of the monitoring of information in working memory, where the capacity for an epoptic processing of information is evaluated, while the

architectonic areas 46 & 9/46 of the prefrontal cortex appear to be linked with specific segments of the inferior parietal lobe through the superior longitudinal fasciculus. The inferior part of the posterior parietal cortex seems to be a crucial area for the updating of information in the working memory and the BA 46 & 9/46 encode it into an "abstract/symbolic form", in order to achieve the controlled monitoring in the active mnemonic process. According to Petrides [103] (2013), this system has the capacity to hold symbolically coded information in an active state, in order to supervise the between them relation and their relation with the intended programmed behavior. Adding to this topographical theory, Devinsky [104] (2009) mentioned characteristically: «Delusions result from right hemisphere lesions. But it is the left hemisphere that is deluded». It should also be noted that theories of self-monitoring and error-checking agree with the theory concerning the use of a salience network. According to Corlett et al (2010) [105], there are two types of error prediction associated with schizophrenia and the development of delusional beliefs, playing opposite roles: one that overweights the prediction versus one that underweights the prediction. The over-weighting of the prediction may be prioritized due to its pathogenetic nature, occurring first, and is followed by the under-weighting of the prediction, which bears as a result a state of fatigue and withdrawal. Neurobiologically, the hyperactivation of the salience network is likely followed by the hyper-activation of the default mode network (DMN) and subsequently by the suppression of the salience and attention network. This initial hyperactivation seems to be normalized by antipsychotics, since as stated by Kapur (2003) [106], "Antipsychotics dampen the salience of these abnormal experiences and by doing so permit the resolution of symptoms... they do not erase the symptoms but provide the platform for a process of psychological resolution... if treatment is stopped, the dysregulated neurochemistry returns, the dormant ideas and experiences become reinvested with aberrant salience, and a relapse occurs".

Insight and Metacognitive processes

The field of *metacognition* has enriched what is known as cognitive neuropsychiatry, an area promoting the research of cognitive processes that account for psychological and behavioral abnormalities. Saxe & Ofen **[107]**, in 2010, suggested the area of «attributive metacognition», which involves the capacity of a person to determine his beliefs and desires functioning as a part of his capacity for self-awareness, and

the area of strategic metacognition, which refers to a person's capacity to monitor and control his mental acitivities. Their differences are found both in the objects of the thoughts (beliefs and desires vs mental activities and planning), and in the action that follows (attribution as interpretation vs strategy as control). The notion of meta-memory was created within this context, and its investigation through a psychometric guestionnaire employed the question "how many words does a person predict that he will remember from a given list of words". David et al [6], in 2012, found that bipolar patients and patients with Alzheimer's disease, but not patients with schizophrenia, overestimated their memory capacity. The term metacognitive thought was initially introduced in the literature of education as the "capacity of thinking about thinking" during learning [108], but throughout the years has gained a broad range of meanings which reflect the general ability of thinking about thought both in terms of content, but also in terms of its underlying processes. Therefore, while originally the term primarily described a person's ability to observe his own thought processes and to detect in them potential errors, it later included incorporated the ability of "awareness of cognitive distortions" [109], as well as "thinking about emotions" [110], while the importance of metacognitive thought in the triggering of reactions deriving from thoughts and emotions has been repeatedly highlighted. It should be noted that the use of the term "metacognitive thought" is often parallel to the use of other terms, such as theory of mind (TOM) and mentalization. The term theory of mind refers to «thinking about the thoughts of others during the process of relating to them" [111] and constitutes a major component of metacognitive thought as an element of a broader system that permits the capacity of thinking about thinking. The term mentalization refers predominantly to the understanding of internal states within the context of an attachment bond". Consequently, the term "metacognitive thought" can be conceptualized as a range of activities, from thinking about specific psychological phenomena to compiling perceptions into complete and coherent representations of oneself and others [112, 113, 114]. This constructive metacognitive acitivity involves: (1) the capacity for the construction of complex representation of internal states of the self and the ability to reflect upon these states, which is described with the term self-reflectivity (2) the capacity for the construction of complex mental representations of the internal states of others and the capacity for reflection upon them, which is referred to as the understanding of the mind of others, (3) the

ability to place these representations in a world where the self is not the center, which is labeled with the term *decentration*, (4) the ability to use knowledge to deal with and resolve psychological and social challenges, which is attributed as mastery [**115**, **116**].

The theory of emotion regulation seems to hold an important place in the interpretation, but also in the consequences of lack of insight. Recently, Massons et al [117] (2017) studied 143 patients with psychosis using the Scale of Unawareness of Mental Disorder (SUMD), the Markova and Berrios Insight Scale and the 8th item of the Calgary Depression Scale for Schizophrenia (CDSS), and found that the awareness of the mental disorder was associated with higher scores on suicidality, especially in the following two items of awareness «disturbed thinking and loss of control over the situation» and «having a vague feeling that something is wrong». It is known that different emotions produce different behaviors, and that the same feeling under different circumstances may produce a different behavior. Emotions inform us on whether we are safe or not, without providing clear directions on the achievement of a goal. The theory of meta-emotion was developed within this context, exploring the relationship between affective reactions to primary emotions and the motivation for their change, along with the reactions directed at the "emotional self"; all of which formed the base for the development of the Meta-Emotion Scale (with items concerning anger, compassion, interest, embarrassment, cognitive control and thought suppression) [118]. Thereof, we have arrived at a point where we are talking about the "cognition about emotion", but also about secondary emotions that attempt to determine the primary (emotions about emotions), based on which Dina Mendoca (2013) [119] suggested specific metaemotional strategies for the support of

psychotic patients, such as predictions about future emotions (anxiety for future anxiety), identification of current emotions, monitoring of changes in one's affective state, organization of a future plan of action, and regulation of future emotions that are diverted, as well as evaluation of the result.

Conclusively, symptoms of schizophrenia could be explained as additional deficits in a sequence of developments, during the process of representation and interpretation of information (meta-representation process), but also during the cognitive enrichment and subsequent processing (meta-cognitive process). It should be noted that the lack of insight is not only documented in psychosis (in schizophrenia or affective disorders), but also in diagnoses of "neuroses", such as body dysmorphic disorder [120], hoarding disorder [121] and anorexia nervosa [122]. Surprisingly, the DSM 5 [123] mentions only about the lack of insight in three disorders, obsessive-compulsive disorder (OCD), body dysmorphic disorder and hoarding disorder, requiring the clinician to determine whether the patient has good insight, poor insight or the abstract term absent/delusional beliefs to account for lack of insight. Since the deficit in insight, at least in schizophrenic patients, appears to be less than an epiphenomenon of the disorder, the place, and potentially even the manner through which insight is developed may be a key element in the development of psychotic disorders. The mechanism that leads to the development of poor insight deserves to be further studied in the future, and not just as a pathogenetic mechanism of the development of psychosis, but also as an etiological component of multiple other psychological disorders [124]. Also, the lack of insight may constitutes a trans-diagnostic factor underlying the human condition, independent of diagnosis, in a manner similar or parallel to the manner in which psychotism operates, as described by Van Os & Reinighaus (2016) [125].

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Research A Cognitive Rehabilitation Program for Psychoses: Origins, Development and Perspectives

Dimitrios Kontis^{1, 2}, Eirini Theochari^{1, 2}, Angeliki Andreopoulou¹, Spyridoula Vassilouli¹, Dimitra Giannakopoulou¹, Eleni Siettou¹, Maria Kouloumbi¹, Antonios Tsichlakis¹, Eleftheria Tsaltas² ¹Coanitive Rehabilitation Unit, Psychiatric Hospital of Attica

²Experimental Psychology Laboratory, 1st Department of Psychiatry, Athens University Medical School

Abstract

Background: Cognitive Remediation or Rehabilitation Treatment (CRT) is a psychosocial treatment method against cognitive deficits and their functional consequences. CRT is implemented in various disorders ranging from brain injury to neurological and mental disorders and is associated with positive results in terms of cognitive and social functioning. Similarly, the investigation of the effects of CRT in schizophrenia has shown that it could improve cognition and everyday functioning and that it might also be beneficial for the other clusters of symptoms of the disorder (positive and negative symptoms). Objective: To present the origins, process of development and characteristics of a CRT program for individuals with psychoses (schizophrenia and other psychotic disorders, bipolar disorder with psychotic features and bipolar depression, etc.), along with the experience of its pilot implementation and its perspectives under limited financial and human resources. Methods: The article will discuss the theoretical basis of a CRT program for patients with psychosis. It will also present the consecutive steps of its development, its structure and its pilot implementation. Finally, it will discuss its future perspectives. Results: The program is based on the experience from animal and human studies and on principles including interdisciplinary therapeutic team work, individualization of therapy, frequent practice of cognitive tasks, use of strategies and psychological support. It aims at the improvement of everyday functioning of individuals with psychoses through the enhancement of their cognition. It is preceded and followed by sessions assessing cognitive performance, symptoms and functioning and comprises 40 individual training sessions with a frequency of at least two sessions per week. The training sessions are divided into two parts including a) a cognitive exercises module and b) a social cognition module. Cognitive exercises include a program designed for elderly suffering from mild cognitive impairment and additional cognitive tasks involving the main cognitive domains of impaired performance in schizophrenia. The social cognition module has been arisen from a program administered to patients hospitalized in an acute psychiatric ward with the aim to facilitate and accelerate their discharge. The perspectives of the CRT program include the development of group training sessions and public awareness activities and the creation of similar CRT Units in Mental Health Centres and other Health Settings. Given that both the cognitive impairments and the methods used for their treatment have common features across different mental or neurological disorders (e.g. non-psychotic depression, dementia, brain injury, substance use disorders), they also include the implementation of the program on individuals presenting with cognitive impairments beyond psychoses. Conclusions: The development of CRT programs in the context of a National Health Service and under conditions of limited

Conclusions: The development of CRT programs in the context of a National Health Service and under conditions of limited funding is feasible and could satisfy the unmet needs of patients having cognitive difficulties regardless of their aetiology.

Key words: Cognitive remediation, cognitive rehabilitation, CRT, cognitive training, psychosis, schizophrenia

Introduction

Rehabilitation has been defined as "the planned attempt under skilled direction by the use of all available measures to restore or improve the health, usefulness and happiness of those who have suffered an injury, or are recovering from a disease". It has an additional aim to "return those individuals to the service of the community in the shortest time" ¹. Rehabilitation can be implemented in every disease, either mental or non-mental, which is associated with treatment-resistant symptoms impeding everyday functioning.

Cognitive deficits accompany several disorders which, directly or indirectly, impact on brain functioning, including mental, neurological or general medical disorders ²⁻¹². Cognitive deficits refer to, albeit not being limited to, deficits in general cognition and specific cognitive impairments in the areas of speed of processing, memory, attention, reasoning and social cognition. The management of these cognitive deficits involves, whenever feasible, the treatment or the prevention of the progression of the underlying disorder and the use of supplementary psychosocial therapeutic methods which are generally referred to as "cognitive remediation" or "cognitive rehabilitation" treatments (CRTs).

CRTs have been clinically employed and have been found to improve both cognition and everyday functioning of individuals suffering from cognitive deficits across different disorders. In a recent review of CRT programs, Cicerone and colleagues suggested that they are the best available forms of treatment for people who exhibit neurocognitive impairment and functional limitations after traumatic brain injury or stroke. Interestingly, Cicerone and colleagues also suggested that different cognitive domains could respond differentially to treatments¹³.

Besides brain injury or neurological disorders, CRT programs have also been used in the management of psychiatric disorders. The earliest programs have been historically developed for patients with schizophrenia and have been associated with positive effects. Meta-analyses have confirmed that CRT is an effective treatment against cognitive deficits in schizophrenia^{14, 15} and have generated calls asking for its adoption as a best practice in the treatment of the disorder¹⁶. Recent evidence suggests that CRT in schizophrenia appears limited in older patients, but that it could be beneficial even for individuals at ultra-high risk for psychosis^{17, 18}. Although there is not yet convincing evidence supporting the use of CRT in the prodromal psychotic state, psychological interventions incorporating CRT tasks are found promising with respect to the delay of the first psychotic episode¹⁹. Preliminary evidence also indicates that CRT is associated with an increase in time to relapse in schizophrenia ²⁰. Similar CRT programs have been administered to mental health disorders other than schizophrenia and had a comparable efficacy on cognitive symptoms^{21, 22}. Interestingly, CRT programs not only enhance cognition, but they also appear to improve the primary symptoms of the underlying disorders^{23, 24} and they could modify the use of psychiatric services ^{14, 21, 25-29}.

CRT programs in schizophrenia share certain key practice methods such as the use of strategies to optimize performance, the repetition of the same exercises over many sessions until performance is improved and the linking of exercises to real world behaviours^{30, 31}. The current CRT programs in schizophrenia can be classified into three groups: a) cognition enhancement programs, b) compensatory rehabilitation programs and c) computer-based programs ³². The programs aiming at cognitive enhancement focus on the correction of the underlying deficit. The compensatory rehabilitation programs are designed to overcome or circumvent cognitive deficits in order to improve broader aspects of functioning. These programs take advantage of the unimpaired cognitive processes and of the context of the behaviours through environmental supports such as signs, checklists, or alarmed drug packaging. Similarly to their applications in non-mental disorders, the use of computers in CRT in schizophrenia has been employed to increase its efficacy. Computerized CRT programs could have both advantages (improved control of the level of difficulty, immediate feedback, better monitoring, familiarization of patients with advances in technology) and disadvantages (limited social interaction, difficulties of older patients with using computers). It should be noted here that current evidence in schizophrenia suggests that computer and non-computer-based CRT programs have similar efficacy ¹⁴.

CRT has been mainly used in research rather than clinical practice in patients with schizophrenia. Its pilot implementation beyond research and in the context of mental health services in several countries shows that it is a feasible treatment strategy against cognitive deficits associated with mental and neurological disorders³³⁻³⁸.

Stimulated by the literature on the close association between cognition and everyday functioning in patients suffering from mental disorders³⁹⁻⁴¹, we founded a specialized Unit (named as Cognitive Rehabilitation Unit) in the Psychiatric Hospital of Attica (PHA)⁴². PHA is the largest provider of mental health services in Greece. Our aim was to improve the social functioning of individuals with mental disorders through the enhancement of their cognition. In this paper we present the historical and theoretical background, the development, the implementation and the perspectives of a CRT program for individuals with psychotic disorders.

Methods

The article will discuss the history and the theoretical basis of a CRT program for patients suffering from psychotic disorders. It will also present the consecutive steps of its development, its structure and its implementation. Finally, it will discuss its future perspectives.

Results

A brief history of CRT

The history of CRT is closely linked to the history of neuropsychology. Publications, dated as early as the 17th century, describe methods of rehabilitation in patients with aphasia. Broca, after having proposed his theory on the lateralization of language in 1861⁴³, he also investigated methods for the rehabilitation of language functions following brain injury. Interestingly, similar rehabilitation tools as those used during these early efforts (such as wooden geometric forms) were also employed in the creation of intelligence tests, supporting the strong and mutual relationship between cognitive assessment and cognitive training ⁴⁴. The American psychologist Shepherd Franz who was a prominent figure in the neuropsychological rehabilitation⁴⁵. He identified rehabilitation with re-education and favoured the re-education of specialized capacities or the re-education of the personality as a whole for individuals presenting with cognitive impairments and psychotic disorders⁴⁶.

The First World War which led to severe brain injuries to thousands of soldiers fuelled the efforts to create brain injury rehabilitation centres in several countries including Germany and Austria. Kurt Goldstein, Max Isserlin and Walther Poppel-reuter were neuropsychiatrists who have left written documents of their work in Germany⁴⁷⁻⁴⁹ and used techniques involving the strengthening of preserved skills rather than the

recovery of lost skills. After the end of the First World War the interest in neurosychological rehabilitation was diminished, but it was eventually restored after the Second World War by the Russian psychologist Alexander Luria^{50, 51}.

A group of brain injury treatment centres was created in the UK which focused mainly on aphasia and provided both medical and rehabilitation services. The prominent centres were those of Oxford and Edinburgh. At the Oxford centre, the neurologist W. R. Russell confirmed the role of post-traumatic amnesia duration in predicting functional outcome from traumatic brain injury⁵², a role which had been identified long before⁵³. At the Edinburgh centre, in 1946, Edna Butfield and the psychologist Oliver Zangwill published the results of a case series of aphasia therapy⁵⁴. Zangwill divided the strategies used in neuropsychological rehabilitation into three categories, compensation, substitution and direct retraining⁵⁵ (table 1).

Figure 1



Table 1: Cognitive rehabilitation strategies proposed by Zangwill (Zangwill 1947)

Strategy	Description	Example
Compensation	Reorganization of psychological function so as to minimize or circumvent a particular disability. During com-	In serious disabilities of the right hand, an individual
	pensation training, the patient is being helped to get round his disability along ways that he has already found.	could be trained in the use of the left hand.
Substitution	The building-up of a new method of response to replace one damaged irreparably by a cerebral lesion.	Lip reading in the deaf.
Direct Retraining	Re-learning during which the patient regains lost functions. It is opposed to substitute learning, since it	Correction of errors in simple multiplication by revising and
	does not refer to replacement of a lost function by a new one, but to the reappearance of this same function.	re-learning the multiplication tables.

Similar initiatives to create rehabilitation centres for brain injuries have been undertaken in the US in order to treat injured war veterans. Interestingly, the cognitive assessments used in these centres, such as the Wechsler intelligence scales have been incorporated in neuropsychological batteries which are currently being used worldwide⁵⁶.

After the Second World War, the brain rehabilitation efforts continued in many countries. The target population of these centres eventually moved from war veterans to road accident victims with brain injuries and stroke patients⁵⁷. During the 1960s and early 1970 there was a new surge of interest in the systematic rehabilitation of patients with traumatic brain injury. The interest in CRT was also triggered by advances in cognitive psychology and has been continuing until today worldwide⁵⁸⁻⁶². The CRT programs differed with respect to their structure and the rehabilitation settings in which they were administered. Day treatment programs or residential rehabilitation programs were developed to address the multiple and complex needs of patients. These latter programs aimed to directly improve the individual's functioning in a particular residence, community or occupation and therefore provided the rehabilitation services at these sites⁶³. More recent CRT programs were influenced by the revolution in information technology and begun to take advantage of computer technology⁶⁴⁻⁶⁷.

CRT in Psychiatry

CRT in Psychiatry has a shorter history in which schizophrenia plays a pivotal role. Schizophrenia has long been recognized as a cognitive disorder⁶⁸. In the early 1900s Emil Kraepelin differentiated "dementia praecox" from manic depressive illness on the basis of cognitive symptoms⁶⁹. He also described the frequent attentional disturbances which accompanied dementia praecox such as distractibility, disturbances of vigilance and inability to shift attention⁶⁹. Eugen Bleuler was the first to use the term "schizophrenia" instead of "dementia praecox", since he had noticed that the syndrome does not always progress into dementia and that it does not always appear during puberty or shortly after. He also noticed that patients with schizophrenia demonstrate variable attentional deficits. In contrast to the attentional deficits, Bleuler believed that memory impairments in schizophrenia are secondary to distractibility or delusions⁷⁰.

However, the discovery of antipsychotics has led psychiatrists and other mental health professionals to ignore cognitive deficits. The focus was set primarily on the positive and secondarily on the negative symptoms of the disorder.

During the 1970s and 1980s, it was found that in contrast to

patients with other psychiatric diagnoses, patients with schizophrenia cannot be distinguished from brain injured patients on the basis of cognitive impairments revealed by neuropsychological tests⁷¹. Despite this early finding, the relationship of schizophrenia with cognitive impairments was not systematically investigated until the 1990s. More recent studies started to shed light onto the link between cognition and social functioning ^{39,40} and to examine whether cognitive impairments could be improved with the administration of antipsychotics^{72,73}. It was found that antipsychotics could indeed improve but, unfortunately, they could not reverse these cognitive impairments and, therefore, psychological treatments such as CRT were tried with the aim to further improve residual deficits in cognition and functioning.

CRT studies in the field of schizophrenia, conducted during the 1980s and 1990s, investigated the effect of programs with either focused (specific task training) or broader rehabilitation objectives including social cognition ⁷⁴⁻⁷⁸. The results of the earlier programs focusing on attentional training and set-shifting were promising, but contradictory ⁷⁹⁻⁸³. They used paper-and-pencil, computerized, or a combination of both types of exercises and employed two main methodologies, namely drill and practice (systematic repetition of concepts, examples, and practice exercises) and strategy coaching (education and use of cognitive strategies to compensate for difficulties).

What could be the aim of CRT?

Based on the literature presented above, the aim of CRT could be summed into combining compensation and substitution of cognitive impairments with direct cognitive retraining and efforts to improve community functioning.

The origins of CRT at the PHA

As mentioned above, the unmet needs of individuals suffering from severe mental disorders and the evidence revealing the relationship of cognitive deficits with everyday functioning stimulated the development of a specialized service inside the PHA. The study of the relevant literature, along with the experience of conducting human an animal research work in the interface of cognition and mental disorders both fuelled this development ⁸⁴⁻⁸⁹ which followed three steps. The first step was the establishment of a Cognitive Rehabilitation Unit (Unit) and the recruitment of a research and therapeutic team comprising mental health professionals from different disciplines. Unfortunately, the establishment of the Unit coincided with the emergence of a severe financial crisis in Greece.

Due to resulting financial and human resources constraints, the PHA approved the establishment of the Unit provided that it would not be associated with high economic costs. The second step was the investigation of the correlates of cognition in patients with schizophrenia receiving care from the same hospital though several cross sectional studies ⁹⁰⁻⁹². Having had a better understanding of the role of cognition in schizophrenia and of its relationship with functioning, the third step focused on methods to remediate cognitive deficits. Following a sabbatical at the Institute of Psychiatry, King's College, London, the staff of the Unit was familiarized with CRT methodology and participated in research on the predictors and efficacy of CRT in schizophrenia^{17, 93, 94}. The above experience resulted in the development of a CRT program for individuals with schizophrenia which was named "Meleti", after the Greek word "study", and was elaborated over certain key principles.

Principles of the "Meleti" program

The "Meleti" program is based on certain principles. The first principle is that there are similarities in terms of cognitive deficits and their rehabilitation among mental and non-mental disorders. Interestingly, neuropsychological tests cannot distinguish cognitive deficits in schizophrenia from those observed after head injury^{71, 95}. The appearance of similar cognitive deficits in the context of different diagnoses 96-98 suggests that cognition could actually be a common treatment target in different neuropsychiatric disorders. Consequently, it should come as no surprise that CRT programs implemented against the cognitive deficits of seemingly diverse disorders share common characteristics^{3, 13, 26, 32, 99, 100}. A second principle arising from randomized trials is that CRT could improve both cognition and social functioning in schizophrenia^{14,} ¹⁰¹. As mentioned above, these trials also showed that the addition of CRT programs on other rehabilitation programs could boost functioning^{14, 15}. A third principle is that CRT is more effective in clinically stable patients¹⁴. A fourth principle is that cognitive strategies should be incorporated in CRT, since they facilitate the "bridging" of cognitive outcomes with everyday functioning¹⁴. Two other principles are that CRT in schizophrenia should be individualized based on the cognitive and functional profiles of patients¹⁰² and that it should recruit an interdisciplinary therapeutic team. Notably, the interdisciplinary approach is recommended for CRT programs in other brain disorders, such as acquired brain injury¹⁰³. Finally, a last principle is that higher education of trainers is associated with better results in terms of both attendance and cognitive improvements following CRT in schizophrenia¹⁰⁴.

The characteristics of the "Meleti" CRT Program Population

The population of the CRT program was determined using several inclusion and exclusion criteria shown in table 2.

Table	2: Inc	lusion	and	excl	lusion	criteria

Inclusion criteria	Exclusion criteria
Psychosis	Other organic brain disorder or history of serious brain injury affecting brain functioning
Age18-65 years	Dementia
Good knowledge of Greek	History of mental retardation
Stable psychopathology	Dyslexia or other learning difficulties
Stable pharmacological treatment	Current alcohol or substance use
Cognitive dysfunction and patient's request	Serious vision problems

Assessments

The neuropsychological assessment battery was mainly based on the domains of cognitive dysfunction which the Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) identified in schizophrenia ¹⁰⁵. In addition to these cognitive domains we also included judgement, vocabulary, spatial visualization ability and motor skill, visual learning and memory and cognitive flexibility and calculated an equivalent of full-scale IQ using the Block Design and Vocabulary subtests¹⁰⁶. The cognitive assessment battery of the "Meleti" comprised subtests from the Weschler Adult Intelligence Scale (WAIS)-IV¹⁰⁷, the Montreal Cognitive Assessment (MOCA)¹⁰⁸, the Hopkins Verbal Learning Test-Revised¹⁰⁹, the Benton Visual Retention Test-Revised¹¹⁰, the Intra-and Extra-Dimensional Set Shifting and the Stockings of Cambridge Task from the Cambridge Neuropsychological Test Automated Battery (CANTAB)¹¹¹ and the Point-Light movies from Harvard University assessing social cognition through movies of whole-body emotional cues¹¹².

In addition to the neuropsychological assessment, the assessments of the "Meleti" program also included clinical symptom scales (Positive and Negative Syndrome Scale-PANSS for schizophrenia¹¹³ and the Clinical Global Impression Scale¹¹⁴), a self-esteem scale (Rosenberg Self-Esteem Scale¹¹⁵), a Subjective Scale to Investigate Cognition in Schizophrenia¹¹⁶ and functioning rating scales, such as the DSM-IV-TR¹¹⁷ GAF Scale, the Strauss-Carpenter Scale¹¹⁸ and the Camberwell Assessment of Need Scale¹¹⁹.

The assessment battery is shown in table 3.

Table 3: Assessment battery

A. Objective Cognitive Assessment	Cognitive or Clinical Domain
1. Animal naming	Psychomotor speed
2. Digit symbol WAIS-IV	Psychomotor speed
3. Comprehension WAIS-IV	Judgment
4. Vocabulary WAIS-IV	Vocabulary
5. Block design WAIS-IV	Spatial visualization ability and Motor Skill
6. Montreal Cognitive Assessment (MOCA), Attention subscale	Attention
7. Digit span subscale WAIS-IV	Immediate and working memory
8. Hopkins Verbal Learning Test (HVLT) – Revised	Verbal learning and memory
9. Benton Visual Retention Test-Revised	Visual learning and memory
10. Intra and Extra- Dimensional Set Shifting (IEDS) from Cambridge Neuropsychological Test Automated Battery (CANTAB)	Cognitive flexibility
11. Stockings of Cambridge (SOC) CANTAB	Cognitive planning
12. Montreal Cognitive Assessment (MOCA)	Brief cognitive screening tool
13. Point-light movies	Social cognition
B. Subjective cognitive function	Description
1. Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS)	A scale to measure cognitive complaints of patients with schizophrenia
C. Clinical Assessment	
1. Clinical Global Impression (CGI) Scale	Brief assessment of the patient's global symptoms by the clinician
2. Positive and Negative Syndrome Scale (PANSS)	A rating scale used for measuring symptom severity of patients with schizophrenia
D. Self-esteem	Description
1. Rosenberg self-esteem scale	A 10-item scale that measures self-worth
E. Functioning	Description
1. Global Assessment of Functioning (GAF) Scale	A rating scale used for measuring the social, occupational, and psychological functioning of an individual.
2. Strauss-Carpenter Scale	A four-item scale based on four areas of functional outcome in schizophrenia.
3. Camberwell Assessment of Need Scale	A scale assessing the needs of people with severe mental illness

Development procedure

The "Meleti" CRT program was developed in four phases.

Phase I: Data collection phase: Reviewing the existing CRT programs for severe mental disorders

DK and ET reviewed the existing CRT programs for severe mental disorders, starting from the first publications on CRT in schizophrenia¹²⁰ and continuing with the existing meta-analyses and the relevant individual papers^{15, 121-124}. They also reviewed the literature involving the CRTs in patients suffering from non-psychiatric disorders^{125, 126}.

Phase II: Practical CRT training phase

Before the development of the "Meleti" program, DK was trained at the Department of Psychology, Institute of Psychiatry, King's College London (2010-2011). This training involved theoretical and practical experience with one CRT paper-and-pencil program which had been previously developed in Australia. The program was based on executive processing, and consisted of three modules: cognitive flexibility, working memory, and planning. DK participated in the development and was also trained in the administration of a similar electronic CRT program (CIRCUITS) which was developed at the Institute of Psychiatry ^{127, 128}. Upon his return from London he trained the members of the therapeutic team of the Unit.

Phase III: Sessions design

Several meetings of the therapeutic team of the Unit were dedicated to determining the sessions of the CRT program. During these meetings the therapeutic team decided to integrate CRT sessions initially designed for individuals with mild cognitive impairment into the rehabilitation program for individuals with psychoses and to develop additional sessions targeting cognitive and social cognition impairments.

Phase IV: Pilot implementation phase

During this phase, the sessions were first administered to individuals suffering from schizophrenia at the Unit which was initially housed inside the PHA. The program was finalized following this initial administration. The Unit's therapeutic team conducted educational seminars to mental health professionals of the PHA working at hostels and boarding house who implemented the program to patients accommodated in these residential structures.

Frequency and duration of therapy

The frequency of CRT sessions is 2-5 sessions per week. The duration of treatment including the assessment sessions is approximately 6 months.

Referral and therapy

Individuals can be accepted by the Unit following a referral by their therapist or therapeutic team or by themselves. An initial evaluation of the individual is conducted by a Consultant Psychiatrist during a diagnostic interview. The Psychiatrist takes a history of the disorder, makes the diagnosis, evaluates the patient according to the inclusion and exclusion criteria and conducts the clinical assessments (see table 3). Clinical, neuropsychological, and social functioning evaluations are conducted before and after CRT sessions and the program ends with a report given to the participant and his/her therapeutic team. Figure 1 shows a summary of the "Meleti" program from the referral of a participant to the completion of the program.

Initial psychoeducation session

Before the start of the assessments and the therapeutic sessions of the program, the participant attends one psychoeducational session lasting 45 minutes. During this session, he/she has the chance to learn basic facts about the symptoms of psychotic disorders, about the role of cognition on these symptoms and, lastly, about the importance of cognitive symptoms for everyday functioning.

Assessment sessions

The assessments shown in table 3 are conducted during two groups of three separate sessions before and after the therapeutic sessions, respectively. They are conducted by the psychologists, the occupational therapist and the psychiatrists of the Unit. These assessments produce quantitative data which are useful for the individualization and evaluation of treatment.

Therapeutic sessions

Table 4 shows the 40 sessions of the CRT program and the cognitive domains targeted by each session. They comprise two modules, the Cognitive Exercises Module (first 35 sessions) and the Social Cognition Module, (last 5 sessions), respectively.

Goals

The whole program develops around specific goals jointly set by the participant and his/her therapeutic team. These goals have to be specific, measurable, realistic and achievable within a time-frame. Notably, the goals could change during the course of training, when the participant and his/her therapeutic team gain a better understanding of his/her strengths and weaknesses. At the end of the program, the participant rates the degree of achievement of his/her goals using a Likert scale. Finally, the participant and his therapeutic team are given a report from the Unit summarizing the treatment course, his/her strengths and capabilities and proposing practical interventions for the accomplishment of his/her goals in his/her everyday life.

Cognitive strategies

An important component of the CRT program is the teaching of cognitive strategies. Before each cognitive exercise the participant is shown a list of strategies and selects the most appropriate. Examples of strategies include visualization, verbalization, dividing larger tasks into smaller ones, checking, making comparisons etc. Strategies correspond to all three types suggested by Zangwil (see table 1)⁵⁵.

Meta-cognition

Cognitive strategies are closely linked to meta-cognition but they are not identical¹²⁹. Meta-cognition is the awareness of one's own cognition and meta-cognitive activities which could occur either before cognitive activities, or during activities or after their completion. It involves planning, monitoring and evaluation¹³⁰. The participant not only chooses between a set of suggested cognitive strategies, but he/she is also asked to follow any other helpful strategy. In addition, after having completed a task, he/she is asked to specify which strategy he/she chose, whether and why he/she followed an alternative strategy and to rate the usefulness of these strategies. These meta-cognitive tasks along with the rating of the achievement of the initial functional goals aim at facilitating the generalization of the cognitive benefits to real world tasks.

Sessions Number	Educational material	Cognitive domain involved
	Cognitive Exercises Module	
First 22 sessions	Cognitive exercises from leaflets for patients with Mild Cognitive Impairment or similar ex-	Verbal Learning, Verbal Comprehension, Working Memory,
	ercises by other books. Exercises involve specific cognitive domains and are individualized	Selective Attention, Vigilance, Reasoning and Problem Solving,
	(graded for difficulty) according to the cognitive performance of participants. st	Planning
Intercalated in 5 sessions	Name maximum number of words in one minute that belong to a certain category (e.g.	Verbal fluency
(sessions 3,4,7,8,12)	animals)	Processing speed
23 rd Session	Dual task and image symmetry exercises	Cognitive Flexibility, Selective Divided Attention, Vigilance
24 th session	Letter and form symmetry, completion of sentences and stories, synonyms	Selective Attention, Reasoning and Problem Solving, Verbal
		Comprehension
25 th session	Number and Letter coding exercises	Selective Attention, Speed of Processing, Working Memory
26 th session	Text comprehension and memory	Verbal memory, Verbal comprehension
27 th session	Wordsearches	Verbal fluency
28 th session	Image ordering	Reasoning and Problem Solving, Verbal Fluency
29 th session	Guess Who game and Tangram	Working Memory, Visual Memory
30 th session	Arithmetic calculations and games	Working Memory, Arithmetic Operations, Attention
31 st session	Images differences, left-right discrimination, metaphors	Working memory, Selective Attention, Visual Memory, Verbal
		Comprehension
32 nd session	Geography game	Verbal Memory and Learning, Visual Memory and Learning
33 rd session	Executive functioning game (BeeBot)	Reasoning and Problem Solving, Working Memory, Planning
34 th sessions	Auditory memory exercises	Auditory Memory, Working Memory, Verbal Comprehension,
		Reasoning and Problem Solving
35 th session	Memorizing and Copying forms	Visual Memory and Learning
	Social Cognition Module	
36 th session	Self-Knowledge exercises	Meta-cognition
37 th session	Emotion Recognition tasks	Emotion Perception, Meta-Cognition
38 th session	Emotion and Social Stimuli Recognition tasks	Emotion and Social Perception, Empathy, Meta-Cognition
39 th session	Emotion Recognition tasks	Emotion and Social Perception, Understanding Intentions,
		Meta-Cognition
1-40 ⁿ session	Storytelling	Meta-Cognition

Table 4: Rehabilitation Sessions and Cognitive Functions

*The main leaflets are given with the permission of the Athens Association of Alzheimer's Disease and Related Disorders.

Zangwill, O. L. (1947). «Psychological aspects of rehabilitation in cases of brain injury.» Br J Psychol Gen Sect 37(2): 60-69.

Additional evaluations

The evaluation of participant is not limited to the assessment battery administered by the Unit's team. It also includes evaluations conducted by their therapeutic team outside the Unit (outpatient clinics, hostels, mental health centres e.t.c.) assessing their needs, cognitive capabilities and goals and similar self-evaluations by the participant before following therapeutic sessions. Ratings of the needs of participant by family members and caregivers are also encouraged when feasible. Discrepancies in evaluations could reveal deficits in the participant's meta-cognition and insight, or systemic dysfunctions in the participant's environment.

Follow-up

The follow-up of participants includes 10 anamnestic sessions and group CRT sessions with cognitive and social cognition tasks. These sessions are offered as a continuation of core sessions.

Perspectives

The future perspectives of the Unit include the development of novel educational, clinical and organizational activities. Educational initiatives for mental health professionals and carers could contribute to early detection of cognitive impairments and could lead to the administration of the CRT program before the first psychotic episode. As mentioned above, there is promising evidence associating such an administration with a delay in the appearance of the first psychotic episode¹⁹. Dissemination activities including public awareness initiatives could also result in combating stigma. There is a need to inform the public, employers and those responsible for designing health policies about the importance of work opportunities for individuals with psychoses. These opportunities should take into account their cognitive difficulties and could result in their full integration into society. In addition, dissemination activities could have a preventive potential given that cognitive impairments manifested as a drop in school performance usually precede psychotic symptoms¹³¹. The creation of a network for CRT by following the paradigm of France³⁶ could facilitate the dissemination and success of cognitive rehabilitation efforts. Finally, the integration of CRT programs in the treatment of cognitive difficulties associated with other mental health disorders, medical disorders or with aging is another perspective. Interestingly, the administration of arithmetic and reading exercises in older people has been shown to have beneficial effects in non-targeted cognitive functions, suggesting a transfer of benefits¹³². In addition to individuals with psychosis, the Unit has already administered the "Meleti" program to patients with substance use disorders and brain injury with promising results.

Discussion

We described the stages of development, the aims and the structure of a CRT program which comprises cognitive exercises, training in social cognition and meta-cognition, includes strategy coaching and addresses the needs of individuals presenting with psychotic disorders and cognitive difficulties.

Similar programs are implemented in a clinical or research basis. The "Meleti" program shares common characteristics with the existing programs in schizophrenia, but it also has notable differences. The similarities between the "Meleti" program and the existing relevant programs include the population involved, the intensity of sessions (e.g. ^{76, 79, 133}), the use of strategies (e.g.^{76, 134-136}) or the use of paper and pencil tasks. Similarly, to several ex-

isting programs, the "Meleti" program also recognizes the importance of interdisciplinary work. However, "Meleti" differs with the current CRT programs in a number of issues. First, "Meleti" does not include computerized exercises. It should be noted here that, in general, although the use of computerized tasks could facilitate the control of the level of difficulty of exercises and the individualization of treatment, there is a dearth of data comparing the efficacy of computerized versus no computerized CRT programmes¹⁰⁴. As mentioned above, a recent meta-analysis in schizophrenia found that paper-and-pencil and computerized CRT programmes have similar efficacy¹⁴. In addition, "Meleti" is clinically oriented and it is implemented in clinical settings, whereas many programs are being used for research purposes in university settings. Another difference is that "Meleti" combines training in both cognition and social cognition, whereas several programs for individuals with schizophrenia do not address social cognitive impairments. In addition, as opposed to other programs, the core component of "Meleti" comprises personal (one-to-one) sessions, rather than group sessions. However, group sessions are now being used in a pilot continuation of the main program. Finally, the trainers of the Unit are experienced psychologists, as opposed to the faculty of other CRT programs which employ non-specialized staff.

There are a number of limitations of the "Meleti" program which need to be mentioned. We acknowledge that the absence of data from a randomized study investigating its efficacy is the most important of them. However, the safe implementation of the program to more than 150 participants supports the feasibility of the program. In addition, naturalistic pilot data published in conferences and unpublished data from a non-randomized comparative study with a control group receiving occupational therapy of the same duration found that "Meleti" group showed improvements in cognition and symptomatology which did not appear in the occupational therapy group. Undoubtedly there is a need for a randomized study examining the short- and long-term effects of the program for participants and their caregivers and its effects on variables beyond cognition, such as symptomatology, functioning and psychiatric services issues (relapses, hospitalizations, costs).

In conclusion, we briefly presented the history of CRT with a particular focus on schizophrenia and we also described the development of one CRT program for individuals with psychoses in the context of the Greek National Health Service. Our experience has shown that the implementation of CRT in psychosis is feasible and could satisfy several unmet needs of patients having cognitive difficulties. Preliminary evidence suggests that this program could be implemented in individuals presenting with cognitive difficulties which are suffering from other disorders beyond psychosis.

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Research

Investigating burnout/occupational stress in relation to emotional intelligence and coping strategies in Greek nurses

Paraskevi Koronaiou & Alexandros-Stamatios Antoniou

National and Kapodistrian University of Athens

Aim: The purpose of this study was to examine the relationship between burnout, emotional intelligence, occupational stress factors, coping strategies and demographic variables in a sample of Greek hospital nurses. Background: Nurses in general seem to experience intense occupational stress and high risk of burnout syndrome as well as absences and premature withdrawal from work due to the complex nature of their duties. Emotional intelligence is proven to have a protective role against both stressors and burnout.

Methods: A questionnaire survey was conducted in order to measure burnout, emotional intelligence, occupational stressors, coping strategies and demographic factors, in a sample of two hundred seventy one (N=271) nurses working in general and oncology hospitals in the Athens area.

Results: Analysis of the data demonstrated that married participants and those aged between 36 to 50 years, presented significantly higher levels of emotional exhaustion than other members of the nursing staff. The results also revealed a significant positive relationship between burnout and stressors at work, as well as a negative relationship between burnout and emotional intelligence, as expected.

Conclusion: According to simple linear regression, all occupational stress factors were identified as significant predictors of emotional exhaustion and depersonalization dimensions of burnout. Also, nurses demonstrating a better relationship quality with doctors and other colleagues seem to achieve lower burnout scores and higher emotional intelligence levels.

Keywords: burnout, occupational stress factors, coping strategies, emotional intelligence, Greek hospital nurses

Introduction and background

Stressors, coping mechanisms, burnout and emotional intelligence

Global financial crisis, current socio-economical conditions, increased unemployment and new forms of labor such as part time working have created a rising sense of uncertainty, insecurity and workplace stress across the world and particularly in Greece. Hart and Cooper (2001) claim that workplace stress is a global phenomenon which causes significant negative consequences to both workers and companies alike. Occupational stress is nowadays recognized as a global challenge (Dewe, O'Driscoll & Cooper, 2010 and is defined as a human reaction to overwhelming pressure and demands coming from the workplace environment (Health and Safety Executive, 2013).

Under those circumstances emotional intelligence becomes a necessary and very important skill. Goleman (1995. 1998) himself notes that during these unstable times emotional skills could secure an occupational position to an individual. Thus, the more complex the working conditions and the collaboration among colleagues, the more important the emotional intelligence skills acquisition.

Stressors

Occupational stress is considered as an escalating hazard especially within professions such as medicine, dentistry, nursing and other health care professions, where higher levels of alcohol or drug use as well as suicidal thoughts are sometimes evident (e.g. Arnold, Silvester, Patterson, Robertson, Cooper & Burnes, 2005. National Institute for Occupational Safety and Health, 2008). In particular, nurses and other health professionals may suffer from mental illnesses, and appear to utilise mental health facilities more frequently than in previous years (Arnold et al., 2005). Apart from the nature of the profession, other important stressors include workload, insufficient manpower, time pressure, exposure to contagious diseases, lack of sleep, treating difficult or terminal patients, etc. (National Institute for Occupational Safety and Health, 2008). An equally important workplace stressor is work-family conflict. As Brough and O' Driscoll (2005) note, interactions among work and family obligations and commitments may cause conflicts which may in turn negatively influence workers, both physically and psychologically. According to Montgomery, Panagopolou and Benos's survey (2006), in a sample of Greek doctors, heavy workload was found to interfere with family and social obligations as the burden of the participants' daily emotional demands was carried home with them.

Furthermore, long hours and workload have negative effects on professionals' health and according to Arnold et al. (2005) it is widely observed that more than 40 working hours per week are considered non-productive and hazardous. Likewise, work shifts appear to be an unhealthy form of work which can lead to low satisfaction and productivity, and to greater health risks such as cardiovascular diseases and gastrointestinal disorders (e.g. Coolican, 2008. Kantas, 1998). Such forms of work might also influence family and social conditions due to the disruption of the person's normal circadian circles; the periods of time in which a person is normally awake or asleep respectively. Circadian rhythm is the biological endogenous system which determines the human sleep and waking patterns and is related to the secretion of the hormone melatonin. This system can be disrupted by external stimuli such as artificial light (Kantas, 1998).

Coping mechanisms

The term coping strategies refers to a person's attempt to alter environmental conditions or to control his/her feelings through his/her behavior and thoughts in order to handle a stressful condition or environment and as such coping strategies are considered one of the most important organizational issues (Arnold et al., 2005. Montes-Berges & Augusto, 2007).

Burnout

Another phenomenon closely related to stress is burnout syndrome. This syndrome, which has been studied in depth over the last decades (e.g. Freudenberger, 1974. Maslach, Jackson, & Leiter, 1996), appears when occupational stress factors become long-term unresolved issues and have a negative affect on a person, both physically and psychologically. These negative consequences are not limited to a strictly occupational level affecting a person's productivity but also affect family and social environments (Leiter & Maslach, 2007). Health care professionals in particular face a higher risk of burnout syndrome, work absence and premature retirement, reduced work satisfaction, etc. (National Institute for Occupational Safety and Health, 2008).

Burnout syndrome is considered a serious organizational issue for health care professionals. Health care professionals are frequently exposed to human suffering and death which alone is considered an important causal factor of this syndrome (Antoniou, 2007). Burnout is more likely to appear among medical staff working at oncology clinics. Health care workers employed within oncology units face specific working conditions such as dealing with cancer patients and their relatives, extended bureaucracy, emotional issues concerning death, and intensive care (Truffelli, Bensi, Garcia, Narahara, Abrao, Diniz, Da Costa Mirada, Soares & Del Giglio, 2008).

As Attica-based surveys suggest (Antoniou & Polychroni, 2008. Issari & Antoniou, 2014) psychiatric nurses are equally vulnerable to stressors and thus to burnout syndrome, due to work factors such as failed initial expectations, work-family conflicts, interpersonal relationships, and work environment conditions (heavy workload, insufficient manpower, etc.).

Emotional intelligence

Emotional intelligence as a term has become increasingly popular in recent years among the scientific community and the public alike. Goleman (1995) suggested that Intelligence Quotient (IQ) and Emotional Quotient (EQ) are two different non-contradictive qualities and set the Socratic quote "gnothi seauton" ("know thyself") as the corner stone of emotional intelligence id. a persons' ability to realize and recognize his/ her emotions the moment they appear. Goleman (1995) also noted the importance of feelings in life and claimed that a medium-IQ but high-EQ person could be more successful in life than another with a higher IQ.

Emotional intelligence in general plays an important role in preserving successful human relations and feelings, which are especially important in creating a healing relationship and interaction between patients and healers (McQueen, 2004). Moreover since emotions can be helpful in dealing with stressors and burnout (Gorgens-Ekermans & Brand, 2012), and might have a positive impact at work, then EQ could explain the individual differences regarding coping with occupational stressors (Landa, Lopez-Zafra, Martos & Aguilar-Luzon, 2008).

According to previous surveys (Dusseldorp, Meijel & Derksen, 2010. Landa et al., 2008) emotional intelligence is noted to have a protective role against stress while positively influencing the health of nursing staff. Petrides and Sevdalis (2009) claimed that nurses' emotional coping, both personally and occupationally, and their ability to maintain a non-conflict communication and interaction inside a stressful workplace environment is a key issue to be scientifically as well as educationally examined further.

Current study

The aim of this study was to explore the relationships between burnout syndrome, occupational stressors, coping mechanisms and emotional intelligence in a sample of Greek hospital nurses in the greater area of Athens. In addition to these variables, the purpose of this study was also to investigate the demographic characteristics of the sample. Group differences among respondents working in general and oncology clinics and in the public and private sector were also investigated.

In line with previous research (e.g. Dusseldorp et al., 2010. Gorgens-Ekermans & Brand, 2012. Landa et al., 2008), the following assumptions were expected in the current study: Negative associations between emotional intelligence and emotional exhaustion and depersonalization as well as positive associations with personal accomplishment. Similarly, negative associations between emotional intelligence and vocational stressors among nursing staff were expected. Differences between nurses according to their demographic characteristics with respect to burnout syndrome might also be expected.

Method

Sample and data collection

The scales of the survey were self-reported, administered on paper, stapled together and handed-out individually for each participant during his/her work hours in the clinical units. Due to workload and the responsibilities of the nurses taking part in the research, and due to the nature of the profession (cyclic working hours / shifts), in most cases it took successive visits by the researcher to collect the completed forms. During the distribution of the forms, the researcher informed the participants about the importance of sincere and spontaneous answers. Instructions on completing the questionnaires were also provided.

Survey data were collected from 271 nurses including men and women, of differing educational levels and ages working in several hospitals in the greater area of Athens. The sample consisted of 184 nursing staff working in general/dermatological units and 87 nursing staff working in oncology clinics. 236 participants were employed in public hospitals and 35 were working in private hospitals. A total of 514 questionnaires were distributed and the final sample consisted of 271 volunteer respondents (valid response rate, 52,7%).

Measures

Data were collected using a self-reported questionnaire consisting of five (5) sections as follows: (1) Maslach Burnout Inventory (MBI), (2) Occupational Stressors Scale, (3) Occupational Stress Indicator (Coping Scale), (4) Trait Emotional Intelligence Questionnaire-Short Form and (5) Demographic Data.

(1) Burnout

The first scale was the Maslach Burnout Inventory (MBI) by Maslach and Jackson (1986), which consists of 22 items (Greek adaptation by A.-S. Antoniou). The MBI is a widely used instrument which measures the way in which care workers perceive their work and their patients (Antoniou, 2006). The items are divided into three dimensions: 1. Emotional exhaustion, 2. Depersonalization, 3. Personal accomplishment, ranked in a 7-point Likert scale (0=never to 6=every day). According to Antoniou (2007) this measure can also be used as a prognosis tool for the physical and psychological health of the participants and as a source of information used on intervention programs. The emotional exhaustion dimension is also considered the core element of this instrument (Shirom & Melamed, 2008).

(2) Occupational Stress Factors

The second instrument was the Occupational Stressors Scale aimed at investigating the perceived stress sources which take place in the occupational environment. This was developed by Antoniou (2002) and consists of 30 statements rated on a 5 point Likert scale ranging from 1 (*it does not causes me stress*) to 5 (*it causes much stress*).

Exploratory factor analysis was performed on this measurement in order to uncover its structure. According to the results, the scale consists of six factors which contributed to 60% of the total variance. These factors are as follows: workplace pressure, secondary tasks, emotional involvement, family responsibilities, workload, interpersonal relationships.

(3) Coping Strategies

The instrument used to investigate and measure nurses coping strategies was the Coping Scale Occupational Stress Indicator which is the final scale of the Occupational Stress Indicator (OSI) devised by Cooper, Sloan and Williams (1988) and adapted by Antoniou. This 28-item scale, measures the coping strategies which an individual uses to handle stressful situations. Participants rate the frequency of use of six different stress-coping strategies using a six-point Likert self-report scale ranging from 1 ("never used by me") to 6 ("extensively used by me"). The Coping Scale Occupational Stress Indicator's scale is broken down into the following six subscales: social support, task strategies, logic, home-work relationships, time, and involvement.

(4) Emotional Intelligence

The fourth instrument consisted of the Trait Emotional Intelligence Questionnaire - Short Form (TEIQUE-SF) which measures global trait emotional intelligence (trait El), it consists of 30 statements and is based on the long form of the TEIQue (Cooper & Petrides, 2010. Petrides & Furnham, 2001). Participants rate the responses to each statement ranging from 1 ("Completely Disagree") to 7 ("Completely Agree"). The respondents' answers were originally calculated as a whole and afterwards according to the TEIQue-SF scoring key (London Psychometric Laboratory, 1998-2014), were divided into four sub-scales: wellbeing, self-control, emotionality, sociability.

(5) Personal and occupational demographics

The final part of the questionnaire consisted of demographic and occupational information and included questions in relation to gender, age, marital status, educational level, years in nursing, afternoon-and-nightshifts per month, quality of relationships with doctors and other health professionals. These findings were to be examined in relation to the dependent variables of the study.

Data analysis

This study followed a cross-sectional descriptive method. Data collection was performed by the administration of printed scales whose treatment was based on application of quantitative statistics. The data were analyzed using the Statistical Package for Social Sciences software (SPSS, version 21.0, IBM Corp.).

Multivariate Factor Analysis was applied using orthogonal rotation, in order to investigate the measurements internal structure and parameters (Mylonas, 2012). Reliability analysis was performed for all four scales using Cronbach *a* internal consistency coefficient. For the simple linear regression analysis workplace stressors, family status and age of participants were entered as independent variables and emotional exhaustion and depersonalization were entered as dependent variables. Intercorrelations among measurement instruments was performed using pearson correlational analysis. Relations between demographic data (such as gender, age, type of hospital, etc.) and the measurement were investigated by using t-test, ANOVA and MANOVA statistical analysis.

Results

Demographic and occupational characteristics of participants

The main demographic, educational, and occupational characteristics of the participants are presented in Table 4. The sample consisted of 184 and 87 nursing staff working in general/dermatological and oncology clinics respectively. 236 participants were employed in public hospitals and 35 were working in private hospitals. The majority of participants (244) were women (90.04%), and 27 were men (9.96%). Approximately half of the sample was aged between 36 years and 50 years

(56,1%), 36.2% of the participants were aged between 20 years and 35 years, and 7.7% were aged 50 years or above.

Mean work experience in nursing was 15 (sd=9) years. The mean number of working night-afternoon-and weekend shifts was 3 (sd=4), 5 (sd=5) and 2 (sd=1) respectively. Most of the nurses were married (59.4%), 29.5% were single/unmarried, 5.9% were divorced and 4.7% were living with their partners.

Descriptive characteristics of the scales

Table 1 contains the descriptive characteristics and the Cronbach α internal reliability of the four measures of this research. According to Maslach and Jackson (1986) the three burnout dimensions are evaluated as follows: I. *emotional exhaustion:* high levels: more or equal than 27, moderate levels: 17-26, low levels: 0-16, II. *depersonalization:* high level: more or equal than 13, moderate levels: 7-12, low levels: 0-6, III. *personal accomplishment:* high levels: 0-31, moderate levels: 32-38, low levels: more or equal than 39. In the present study, the mean score of participants' emotional exhaustion was 25.9 (sd=12.2), indicating moderate to high levels of exhaustion and the mean scores of depersonalization and personal accomplishment subscales

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were moderate, scoring 8.6 (sd=6.7) and 36.1 (sd=7.5) respectively. Among all nursing participants (N=271), 48.3%, 32.8% and 24.7% scored high levels of emotional exhaustion, depersonalization and personal accomplishment respectively. High levels in all burnout dimensions were noted for 10% of the total sample.

Descriptive results of the occupational stressors, coping strategies and emotional intelligence are presented in Table 1. The mean scores of the stressors were presented in rank order. The ranked order of the most frequently perceived causes of work stress were as follows: 1. secondary tasks (M=29.3), 2. workplace pressure (M=23.8), 3. family responsibilities (M=13.8), 4. interpersonal relationships (M=13.0), 5. workload (M=12.0) and 6. emotional involvement (M=9.8). In order to identify the nurses' mechanisms of coping with stress in the workplace, these were presented by their mean scores in rank order as follows: task strategies (M=28.8), involvement (M=26.7), social support (M=18.4), home and work relationships (M=17.7), time (M=16.0), logic (M=13.2). Similarly, scores for global emotional intelligence and its subscales were ranked as follows: wellbeing (M=5.1), emotionality (M=4.9), emotional intelligence (total score (M=4.8), self-control (M=4.6) and sociability (M=4.4).

Variable	Cronbach a	М	SD
Emotional exhaustion	.87	25.98	12.28
Depersonalization	.76	8.69	6.78
Personal accomplishment	.75	36.15	7.57
secondary tasks	.86	29.34	7.74
workplace pressure	.86	23.81	7.49
family responsibilities	.73	13.86	4.60
interpersonal relationships	.78	13.01	4.52
Workload	.67	12.09	3.53
emotional involvement	.74	9.80	3.05
task strategies	.43	28.85	4.38
Involvement	.58	26.70	4.40
social support	.44	18.45	3.08
home and work relationships	.45	17.77	3.62
Time	.26	16.06	2.90
Logic	.50	13.25	2.81
Wellbeing	.73	5.16	1.00
Emotionality	.42	4.91	.71
emotional intelligence (total score)	.83	4.86	.63
self-control	.50	4.62	.82
Sociability	.50	4.47	.80

Pearson intercorrelations among all study scales

Table 2 presents the intercorrelations between all four dependent variables. The findings suggest several significant correlations between the study scales. Positive correlations between occupational stress factors and the two dimensions of burnout syndrome, emotional exhaustion and depersonalization, and negative associations between occupational stress factors and personal accomplishment emerged as expected.

A negative relationship between burnout dimensions and emotional intelligence and a negative correlation between work stressors and emotional intelligence was demonstrated for the participants, also as expected. The first two burnout sub-scales were negatively correlated with the involvement strategy, which in turn was positively related with personal accomplishment. Finally, emotional intelligence (both as a total score as well as its dimensions separately) appears to present low but positive correlations with the coping strategies (statistically significant Pearson r values vary between 0.121 and 0.274). The above results indicate that the higher the emotional intelligence score, the more frequent the use of coping mechanisms or vice versa.

Means of measures and demographic characteristics of the sample

Presented below are the main findings of the study's instruments in relation to the demographic characteristics of the participants.

	1.emotional exhaustion	2.depersonalization	3.personal accomplishment	4.workplace pressure	5.secondary tasks	6.emotional involvement	7.family responsibilities	8.workload	9.interpersonal relationships	10.social support	11.task strategies	12.logic	13.home and work relationships	14.time	15.involvement	16.Emotional intelligence-total	17.wellbeing	18.self-control	19.emotionality	20.Sociability
1.emotional exhaustion	1																			
2.depersonal- ization	.496**	1																		
3.personal accomplishment	186**	332**	1																	
4.workplace pressure	.521**	.317**	071	1																
5.secondary tasks	.627**	.304**	046	.711**	1															
6.emotional involvement	.325**	.120*	.002	.549**	.622**	1														
7.family responsibilities	.500**	.301**	029	.624**	.596**	.414**	1													
8.workload	.480**	.169**	122*	.609**	.634**	.531**	.554**	1												
9.interpersonal relationships	.455**	.382**	317**	.755**	.559**	.476**	.511**	.547**	1											
10.social support	127*	120*	.071	030	061	011	.035	056	011	1										
11.task strategies	096	103	.099	073	053	121*	002	051	065	.494**	1									
12.logic	043	.009	.089	122*	055	094	003	162**	159**	.349**	.511**	1								
13.home and work relationships	150*	091	.053	119	152*	157**	124*	-200**	183**	.389**	.448**	.304**	1							
14.time	096	046	.016	093	085	040	024	093	083	.368**	.565**	.443**	.308**	1						
15.involvement	237**	190**	.277**	181**	169**	071	040	125*	215**	.445**	.565**	.413**	.419**	.428**	1					
16.Emotional intelligence-total	378**	328**	.420**	320**	227**	170**	274**	378**	449**	.183**	.149*	.177**	.256**	.102	.274**	1				
17.Wellbeing	281**	214**	.348**	137*	093	048	166**	196**	257**	.112	.121*	.056	.253**	.071	.221**	.801**	1			
18.self-control	230**	254**	.294**	321**	207**	157**	283**	311**	414**	022	.027	.231**	.097	.043	.139*	.690**	.418**	1		
19.emotionality	243**	270**	.307**	208**	148*	030	150*	242**	294**	.259**	.114	.066	.172**	.044	.246**	.749**	.462**	.338**	1	
20.sociability	354**	227**	.293**	338**	240**	286**	272**	366**	438**	.156**	.152*	.190**	.193**	.126*	.194**	.761**	.462**	.452**	.486**	1
** Correlation is sig * Correlation is sign	nificant at iificant at tl	the 0.01 le	evel (2-tail vel (2-taile	ed). d).																

Table 2. Correlations among all study scales

Burnout syndrome

Depersonalization levels were significantly higher for participants working in the private sector compared with their colleagues who were employed in the public sector (p=0.00) (Table 3). No statistically significant differences were identified with regard to gender (p=0.69) or among nurses working in oncology units or dermatological/general units (p=0.94). Data analysis demonstrated that married (M=27.9, p=0.01) and older participants aged 36 to 50 years (p=0.00), presented significantly higher levels of emotional exhaustion as compared to other nursing staff. Furthermore, having children provided higher scores in the emotional exhaustion dimension (M=27.4), while not having children provided higher scores in the depersonalization dimension (M=9.6). With regard to years of experience as a nurse, respondents with 11-20 years of experience scored higher on levels of emotional exhaustion (M=28.2) and personal accomplishments (M=34,4) than participants with more or less years of vocational experience.

Regarding hospital shifts, statistically significant relationships were observed between nightshifts and the depersonalization dimension (r = 0.148, P=0.015<0.05) as well as with afternoon shifts and depersonalization (r = 0.124, P=0.042<0.05).

In addition, better quality of professional relations at the workplace was related to lower the levels of burnout. Hence higher scores in emotional intelligence were noted by nurses who reported very good relations with doctors and other health professionals (Table 5.).

Variable		I. E	motional ex	naustion		II.D	epersonalizati	ion	III. Personal accomplishment		
	N	%	м	SD	Sig. (2-tailed)	м	SD	Sig. (2-tailed)	М	SD	Sig. (2-tailed)
Gender											
Males	27	10,0%	25,81	11,42		11,14	7,63		34,55	8,64	
Females	244	90,0%	26,00	12,39	,94	8,42	6,64	,21	36,32	7,44	,24
Туре											
Oncology	87	32,1%	25,55	11,17		8,67	6,76		34,89	6,87	
General/dermatological	184	67,9%	26,18	12,79	,69	8,70	6,81	,97	36,74	7,82	,06
Category											
Public	236	87,1%	26,08	12,41		8,09	6,58		36,41	7,40	
Private	35	12,9%	25,28	11,46	,72	12,71	6,82	,00	34,34	8,55	,13
Age											
20-25	26	9,6%	17,88	9,09		8,69	6,61		38,88	6,62	
26-30	30	11,1%	21,23	11,38		9,56	6,85		36,40	8,04	
31-35	42	15,5%	25,21	11,70		9,69	7,36		34,50	6,71	
36-40	44	16,2%	30,02	11,20		9,90	6,60		35,38	7,92	
41-45	50	18,5%	28,12	13,61		8,06	7,20		35,42	8,29	
46-50	58	21,4%	27,96	12,08		7,62	6,45		36,36	7,34	
50=< years old	21	7,7%	25,28	11,98	,00	7,38	5,96	,48	38,47	7,21	,21
Marital status											
Married	161	59,4%	27,96	12,64		8,08	6,77		36,30	7,24	
Single	80	29,5%	23,11	10,85		9,40	6,46		36,33	7,93	
Divorced	16	5,9%	20,31	11,93		8,43	6,72		35,81	9,75	
Living together	13	4,8%	26,92	12,15		12,76	7,77		32,92	6,30	
Widower/widow	1	,4%	15,00	•	,01	1,00	•	,08	44,00	•	,46
Kids											
Not having kids	117	43,2%	23,99	11,89		9,68	6,81		35,62	7,58	
Having kids	154	56,8%	27,49	12,39	,02	7,94	6,68	,03	36,55	7,56	,31
years of nursing experience											
(M=15, sd=9)											
less than or equal to 10 years	94	34,7%	22,17	11,02		9,87	6,90		36,68	7,02	

 Table 3. Demographic characteristics and burnout levels of participants

11-20	83	30,6%	28,28	12,94		8,77	6,66		34,46	8,12	
21-30	85	31,4%	27,75	12,04		7,38	6,57		36,74	7,51	
greater than or equal to 31 years	9	3,3%	27,77	13,16	0,00	8,00	7,38	0,10	40,55	5,98	0,04
	I. Emoti	onal exhaus	tion			II. Depers	onalization	III. Personal accomplishment			
Number of shifts	Mean	Sd	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed	Sig. (2-tailed)			Sig. (2-tailed)	
Mean nightshifts per month	3,21	3,84	,01	,81	,14	,01			-,01	,85	
						,04			,59		

Results significant at the 0.05 level (2-tailed) are presented in bold.

Occupational stressors and coping strategies

Female nurses reported significantly higher scores in stressors such as family responsibilities (p=0.04), workload (p=0.03) and emotional involvement (p=0.01). With regard to type of clinic, it was found that the participants in the general/dermatological clinics perceived more workplace pressure (p=0.02) and emotional involvement (p=0.03) than their colleagues working in oncology clinics. Concerning coping mechanisms, an interaction between age and marital status was identified, with single participants reporting higher levels of social support during their work life as a coping strategy, compared to their married colleagues (Table 4). Furthermore, nurses reporting good or very good relations with doctors had significantly higher scores in specific coping strategies such as the involvement strategy, coping with occupational stress by recognizing their limitations and making their work more interesting (Table 5).

Emotional intelligence

According to the results of the Two-Way MANOVA analysis (using gender and type of clinic as independent variables, and emotional intelligence factors as dependent variables) no statistically significant differences were found regarding the type of clinic factor, as oncology and general/dermatological staff scored similarly. Although there were no gender differences in the total emotional intelligence score, female nurses scored significantly higher on the emotionality subscale (P=0.010<0.05) and male on the self-control (P=0.003<0.05) (Table 4).

Descriptive characteristics demonstrate that male nurses score statistically higher levels (M=4.9) in the self-control dimension compared to female nurses (M=4.5), whilst the latter score statistically higher levels for the emotionality dimension (M=4.9) compared to the former (M=4.9) (Table 4).

With respect to the variable of the nurses' professional relationships, it was found that the better the quality of the relationships with the doctors and other health professionals the higher the mean scores in emotional intelligence (for both the total score I and all four dimensions) (Table 5).

	**										
				Gender					Туре		
		Men		Woi	men	Cim	Onco	ology	Ger	Ci.a.	
	Variable	М	Sd	М	Sd	Sig.	М	Sd	м	Sd	5lg.
Stroscore	workplace pressure	22,96	7,89	23,91	7,45	,23	22,25	7,01	24,55	7,61	,02
	emotional involvement	8,74	3,07	9,92	3,03	,01	9,27	3,10	10,05	3,00	,03
Stressors	family responsibilities	12,29	4,78	14,04	4,56	,04	13.18	4,99	14,19	4,38	,12
	Workload	10,74	3,77	12,24	3,48	,03	11,79	3,59	12,23	3,50	,32
Emotional	Self-control	4,98	,90	4,58	,80	,00	5,42	,91	4,82	,86	,19
Intelligence	Emotionality	4,61	,85	4,94	,68	,01	4,28	,78	4,73	,87	,09

Table 4. Occupational stressors, coping mechanisms and emotional intelligence scores in regard with the participants' sex and the hospital's type

		A	Marital status	М	Sd	
		Age	Single	18.52	2.33	
		20-25	Living together	17.00	3.60	
			Married	19.18	2.56	
		26-30	26-30 Single 1	19.43	3.07	
			Living together	18.66	1.52	
			Married	19.00	2.58	
		21.25	Single	18.56	2.82	
		51-55	Divorced	20.00		
			Living together	18.50	3.08	
		36-40	Married	17.58	2.97	
Stress coping	Social support		Single	19.63	1.91	0,03
			Divorced	12.33	5.85	
			Living together	18.00		
			Married	18.86	2.90	
		41-45	Single	19.33	2.54	
			Divorced	15.50	2.64	
			Married	17.88	3.28	
		46 50	Single	20.75	2.36	
		40-30	Divorced	20.12	2.41	
			Widower/widow	21.00		
		50- < voars old	Married	17.65	4.31	
			Single	20.00		

Results significant at the 0.05 level (2-tailed) are presented in bold.

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	Relations with doctors						Relations with other health professionals							
	Very go 4	ood (N=134, 9,4%)	Good (N	l=114, 42,1%)	indiffere 8,	ent (N=23, 5%)	Sig. (2-tailed)	Very good (N=149, 55%)		Good (N=112, 41,3%)		indifferent (N=9, 3,3%)		Sig.
	М	Std.	М	Std.	м	Std.		М	Std.	м	Std.	М	Std.	(z-talleu)
Emotional exhaustion	23,39	11,14	28,28	12,62	29,60	14,07	0,00	24,01	11,88	27,64	11,89	35,11	15,24	,00
Depersonalization	8,02	6,35	8,45	6,69	13,73	7,82	0,00	8,44	6,84	8,80	6,64	10,44	7,58	,44
Personal accomplishment	37,41	6,73	35,76	7,47	30,73	10,06	0,00	36,81	7,64	35,74	7,40	31,22	6,61	,07
family responsibilities	13,14	4,62	14,34	4,60	15,69	3,77	0,01	13,40	4,68	14,13	4,44	17,33	3,04	,01
interpersonal relationships	12,27	4,41	13,44	4,49	15,13	4,50	0,00	12,34	4,49	13,86	4,40	12,33	3,87	,00
emotional involvement	27,52	4,05	26,27	4,46	24,04	4,85	0,00	27,06	4,37	26,41	4,40	24,11	4,45	,17
Emotional intelligence (total	5,02	,63	4,73	,59	4,59	,64	0,00	4,97	,64	4,75	,59	4,48	,59	,00
Wellbeing	5.36	.97	4.96	.99	4.98	1.01	0.00	5.31	.98	5.02	.98	4.72	1,19	.01
Self-control	4,82	,80	4,43	,78	4,38	,85	0,00	4,74	,78	4,52	,82	3,88	,83	,00
Emotionality	5,01	,74	4,85	,65	4,57	,70	0,01	4,98	,75	4,83	,65	4,83	,50	,25
Sociability	4,62	,80	4,35	,80	4,28	,69	0,01	4,57	,83	4,38	,74	4,27	,82	,05

Results significant at the 0.05 level (2-tailed) are presented in bold.

Regression analysis

The six occupational stressors of this survey and the demographic variables of age and marital status were used as independent predictors of the dependent variant of the emotional exhaustion and the depersonalization in the simple linear regression analysis.

The results revealed significant positive relationships between burnout and stressors at work and all occupational stress factors were found to be significant predictors of emotional exhaustion and depersonalization dimensions of burnout.

Table 6 Linear regression analysis for predicting emotional exhaustio	on and depersonalization of the Greek nursing staff
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Emotional exhaustion						Depo	ersonalization		
	β	Std. Error	Beta	Sig		β	Std. Error	Beta	Sig
Variable	5,63	2,13		,00	Variable	1,84	1,30		,16
workplace pressure	,85	,08	,52	,00	workplace pressure	,28	,05	,31	,00
Variable	-3,18	2,28		,16	Variable	,87	1,54		,57
secondary tasks	,99	,07	,62	,00	secondary tasks	,26	,05	,30	,00
Variable	13,14	2,38		,00	Variable	6,07	1,38		,00
emotional involvement	1,30	,23	,32	,00	emotional involvement	,26	,13	,12	,048
Variable	7,49	2,05		,00	Variable	2,55	1,25		,042
family responsibilities	1,33	,14	,50	,00	family responsibilities	,44	,08	,30	,00
Variable	5,80	2,34		,01	Variable	4,78	1,45		,00
Workload	1,66	,18	,48	,00	workload	,32	,11	,16	,00
Variable	9,90	2,03		,00	Variable	1,24	1,16		,28
interpersonal relationships	1,23	,14	,45	,00	interpersonal relationships	,57	,08	,38	,00
Variable	19,93	1,86		,00	Variable	10,31	1,04		,00
Age	1,44	,41	,21	,00	Age	-,38	,23	-,10	,09
Variable	29,47	1,57		,00	Variable	7,22	,87		,00
Marital status	-2,22	,88	-,15	,01	Marital status	,93	,49	,11	,05

Results significant at the 0.05 level (2-tailed) are presented in bold.

Discussion

Nursing, as is the case with other health-care professions, is a an interesting field of study, since these professionals appear to be prone to burnout syndrome due to the unique stressors and conditions that they face on an everyday basis such as non-standard shifts, heavy workload, interpersonal relationships, facing human pain, disease and death etc. The aim of the current study was to investigate the relationship between burnout syndrome, the occupational stress factors, stress mechanisms and the emotional intelligence of a sample of Greek nurses in the greater area of Athens. Associations between those factors and demographic characteristics were also examined. A total of 514 questionnaires were distributed to hospital nurses and the response rate of the survey was 52.7% (271 volunteer respondents).

According to the main findings of the present research using the Maslach Burnout Inventory (MBI), the highest levels of the subscales emotional exhaustion, depersonalization and personal accomplishment were 48%, 32% and 25% respectively. A noteworthy 10% of the participants scored high levels in all the three subscales of the measurement.

Gender

Gender did not significantly affect burnout dimensions, a fact that verifies Maslach's (2003) assumptions, according to which both men and women experience burnout in roughly the same way. On the other hand these findings indicate that women present statistically significant higher mean scores in occupational stressors such as emotional involvement, family responsibilities and workload.

Concerning Petridis and Furnham's (2001) TEIQ-SF questionnaire, gender was not found to affect the emotional intelligence total scores; a finding that confirms the hypothesis that men and women have "strong" and "weak" traits but both are characterized by similar levels of that type of intelligence (Goleman, 1998). Although gender differences did not affect the total emotional intelligence score among participants, female nurses scored significantly higher on the emotionality subscale and men on the self-control one respectively. Similar findings arose in a 1997 Bar-On research, where men were found to be more confident and adjustable in stressful conditions in comparison with women (Bar-On, 2006).

Type of hospital

Nurses working in general/dermatological clinics seem to score higher than oncology nurses with regard to occupational stressors such as workplace pressure and emotional involvement. According to Antoniou (2007) oncology nurses treating cancer patients experience human pain and death on a daily basis. Under such circumstances the appearance of burnout syndrome seems to be more likely. On the other hand research in Greece by Papadatou, Anagnostopoulos and Monos (1994) some 20 years ago, showed that general clinic nurses had higher emotional exhaustion levels than those working in oncology clinics. The researchers attributed these findings to the resilience and more effective coping mechanisms which the oncology staff had developed. However, in the present study no significant differences on the burnout dimension was identified between the two types of clinic.

Category (private/public)

Regarding the category of the clinics, nurses employed in private clinics scored significantly higher depersonalization levels than their colleagues working in public clinics as expected. Shirom (Shirom, 2009. Shirom & Melamed, 2008) suggests that depersonalization is not a burnout dimension but a coping strategy against workplace stressors, which precedes the burnout syndrome. Thus, one can assume that due to increased depersonalization levels, private clinic nurses are at greater risk of presenting burnout syndrome than their public clinic colleagues.

Age

According to Maslach (2003) senior workers present lower levels of burnout syndrome than younger workers due to maturity and the coping mechanisms acquired over time. This assumption is partly confirmed in the current study, as nurses aged 50 years and above achieved average scores for emotional exhaustion levels, whilst their younger colleagues indicated high levels of emotional exhaustion. Younger nurses (20-35 years old) also score average levels for the above dimension.

Similar findings were observed in a sample of Greek doctors (Alexias, Anagnostopoulos, & Pilatis, 2010, where participants aged between 31-40 years and 41-50 years scored higher levels of emotional exhaustion than their older colleagues. Alexias et al. (2010) attribute these results to probable work and family fulfilled obligations of the senior doctors which contribute to less stress.

Years of experience

Statistically significant results were identified between years of nursing experience and burnout syndrome. More specifically, nurses with less than or equal to 10 years of experience scored the lowest emotional exhaustion levels (M=22.1) whilst their colleagues with 11-20 years of experience presented higher scores for this dimension. Furthermore the latter participants present lower levels of personal accomplishment (M=34.4) than their colleagues with 31 or more years of nursing experience (M=40.5).

Children

According to Maslach (2003) marital status is closely connected to burnout syndrome. Single people tend to experience higher degrees of burnout than married people and although having children is considered an additional sentimental burden which reinforces burnout, people who are married with children are less prone to the above syndrome. This fact is attributed to the assumption that married individuals are older and more mature and thus more experienced at dealing with interpersonal problems and emotional conflicts in their family environment.

However, the current study revealed higher levels of emotional exhaustion in married nurses followed by participants living together (upper medium to high levels), whilst single and divorced nurses scored medium levels for this factor. With regard to having children the findings indicate that nurses with children demonstrated statistically higher levels of emotional exhaustion, whilst childless nurses presented higher levels of depersonalization. The above findings lead to the assumption that participants aged 36 to 50 years, who are likely to be married with children are more at risk of emotional exhaustion. However simple linear regression analysis showed that marital status independent factor does not affect depersonalization at all while it hardly affects participants' emotional exhaustion (Table 6).

Other factors such as increased family obligations and higher financial demands rather than the family itself are probable stressors which emotionally exhaust individuals. Furthermore, other stressors should be taken into account; work and family conflict in health professionals (e.g. Montgomery et al., 2006), as well as important personal events e.g. child birth combined with workplace demands (Issari & Antoniou, 2014).

For nurses in particular, according to the literature there are various stress factors related to their special workplace conditions such as shift-work. Results from the current study revealed a significant positive relationship between the depersonalization dimension and evening/night shifts. These findings indicate that changing shifts is indeed a stress factor for nurses which increases depersonalization.

Relations

For the burnout scale, nurses reporting very good relations with doctors scored medium levels for all three of the burnout syndrome dimensions. On the contrary those reporting good relations have higher burnout scores while those with indifferent relations score high levels for all three dimensions. Similarly nurses reporting very good relations with other health professionals present medium levels of emotional exhaustion in contrast with the higher scores of their colleagues reporting good, indifferent or even bad relations.

Thus, according to the above, higher quality interpersonal relations in the workplace seem to provide a supporting network other than family and friends which offers cooperation and understanding leading to more efficient coping mechanisms and burnout prevention. The current findings confirm previous research (e.g. Locke, 2005. Rice, 2005. Tyler & Cushway, 1992. 1995) according to which social support and relationships, especially workplace relationships, has a beneficial effect on facing and coping with stress through factors like understanding, trust, being informed and increased self-efficacy (Bandura, 2001).

Relationships have similar effects regarding involvement coping mechanism. Specifically nurses reporting good or very good relationships with doctors presented higher means of involvement strategy than those reporting indifferent ones. According to these findings the former nurses seem to deal with stressors by staying busy and identifying their personal boundaries in comparison to their colleagues. The above applies to findings concerning emotional intelligence results as well; nurses having very good relationships with doctors and other health professionals score higher on emotional intelligence, in total and for all four subscales, compared with nurses reporting good or indifferent relations.

According to Goleman (1995. 1998) emotional intelligence is basically related to identifying and controlling the individual's emotions as well as recognizing others' emotional condition. This is achieved not only through personal skills (such as self-awareness and self-control) but also through social skills such as empathy. Particularly for health professionals, Dusseldorp et al. (2010) have stressed the importance of emotional intelligence in the development of key skills such as sensitivity, empathy, creativity, self-awareness, self-control and self-esteem.

All four scales intercorrelations

Through correlations between workplace stress factors and burnout scales it was revealed that all six stressors are positively related to both emotional exhaustion and depersonalization. The above intercorrelations indicate that the more the perceived stress the higher the emotional exhaustion and depersonalization and vise versa. These findings provide evidence of the importance of stress factors in the workplace which if constant and not dealt with effectively may lead to deterioration effects both personally and organizationally.

The findings indicate also that the higher the participants' emotional exhaustion and depersonalization the less the use of involvement strategy (through looking for ways to make the work more interesting, recognizing their own limits, etc.) as stress coping strategy and vice versa; the less the use of involvement the higher the exhaustion and depersonalization scores. On the other hand, higher scores in personal accomplishment increase the use of this strategy of the study sample.

Intercorrelations between burnout syndrome and emotional intelligence support the current study's assumptions regarding factors measured by those scales. Results confirm the negative relation between emotional intelligence (both as a total score and in the four subscales) and the two burnout dimensions; emotional exhaustion and depersonalization. In a similar way the positive relation between emotional intelligence (total and subscales) and personal accomplishment, was confirmed. The above results are similar to other surveys involving nurses, where higher emotional intelligence was linked to lower levels of burnout syndrome and stress (e.g. Gorgens-Ekermans & Brand, 2012. Landa et al., 2008. Montes-Berges & Augusto, 2007).

Regression analysis results

Simple linear regression analysis revealed that all stress factors and especially secondary tasks were significant predictors of the participants' emotional exhaustion. This means that the appearance of each of the above stressors is expected to raise the emotional exhaustion levels of the sample of Greek nurses. In the same way all stressors and interpersonal relations in particular predict participants' depersonalization. Those results confirm the assumption that workplace stressors being long term and unresolved may lead to burnout syndrome.

Conclusion

Leiter and Maslach (2007) consider burnout syndrome to be the greatest organizational hazard of the 21st century. Health care workers in particular seem prone to burnout syndrome due to the specific conditions and the stressful situations which they have to face on a daily basis. Workplace stressors such as heavy workload, family-work conflict and relations in the workplace have a significant effect on the appearance of burnout especially if they are not dealt with sufficiently. The above is confirmed by the current study's findings with Greek nurses, as stress factors such as secondary tasks, workplace pressure, family obligations and interpersonal relations positively affect burnout and could significantly attribute to the appearance of emotional exhaustion and depersonalization.

Furthermore, with regard to relationships, the quality of interpersonal relationships is twofold, meaning that relationships could represent either a stress factor or a stress coping mechanism in the work environment. The current results support the above assumptions, since among Greek nurses the better the quality of workplace relations with doctors and other health care professionals, the lower the burnout levels and also the higher the emotional intelligence. Emotional intelligence according to both this study's hypothesis and references through its traits such as empathy, adaptability, self-awareness and self-control of one's emotions lead an individual to creating and preserving healthy relationships while increasing the possibility of insuring his/her job.

Thus, reinforcing emotional intelligence in nursing staff may lead to improved interpersonal relations and more effective coping with the many stressors which may result from the current global as well as Greek socio-financial crisis and the constantly changing labor market. As a consequence dealing with those workplace stressors, the hazard of burnout syndrome appearance could be prevented.

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Research

Differences in Burnout Proneness depend on Time Perspective – Evidence from an Occupational Sample of Industrial Employees and MBA-Students

Julie Papastamatelou & Alexander Unger

University of Applied Sciences Ludwigshafen, Germany

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Abstract

We examined the effect of time perspectives on the burnout-tendencies of a German sample (N = 151). We used the German version of the Maslach-Burnout-Inventory (MBI-GS-D) to measure burnout on the three dimensions (Emotional Exhaustion, Cynicism and Personal Accomplishment) and the Zimbardo Time Perspective Inventory (ZTPI) to capture the individual time perspectives (Past Negative, Past Positive, Present Fatalistic, Present Hedonistic and Future). We tested the relationship in a sample consisting of employees of an international company located in Germany (n = 72) with a low level of working-autonomy and of MBA students (n = 79) with a high level of working-autonomy. The Past Negative and Present Fatalistic orientations were identified as significant factors which enhance Emotional Exhaustion, whereas the Present Hedonistic orientation reduced Emotional Exhaustion. Present Hedonism decreased burnout tendencies by enhancing Personal Accomplishment. Contrary to our initial hypothesis the Future dimension did not show a significant effect on Emotional Exhaustion, but had a nearby significant reducing effect on Cynicism and a significant enhancing (and thus burnout-reducing) effect on Personal Accomplishment. Therefore, the Future dimension seems to inhibit burnout. Moreover, it was shown that high deviations from a Balanced Time Perspective (DBTP) caused an increase of all three burnout-dimensions as predicted. We additionally tested a mediator-model using the Present Fatalistic perspective as a mediator. The results indicated that the influence of the factor subsample is mediated by the Present Fatalistic dimension on Emotional Exhaustion and Personal Accomplishment (indirect effects). We observed direct and mediated indirect effects of the factor subsample on Cynicism. The findings of the current study are comparable with results of previous studies from the health care sector on time perspectives and burnout and indicated that there is an influence of time perspectives across very different occupational sectors.

Keywords: burnout; emotional exhaustion; cynicism; personal accomplishment; time perspectives; Zimbardo Time Perspective Inventory (ZTPI)

1. Introduction

Burnout has been discussed as a serious and highly relevant problem in various societies and in different occupational settings [1, 2, 3]. Studies have shown that it poses a problem even outside the occupational context as e.g. for students [4] or parents [5]. A recent study by Unger, Papastamatelou, Vowinckel, Klamut and Heger (2017) [6], investigated the influence of time perspectives on burnout-proneness in the health care sector. The results showed that the Deviance from a Balanced Time Perspective (DBTP) is essential for burnout proneness and that this influence is mediated by perceived stress and self-efficacy. The purpose of the current study is twofold: First, to test if there is an influence of time perspectives outside the health care sector. Second, to examine if differences between the subsamples can be explained by differences in time perspectives. Although the single time perspectives are of relevance for burnout, in this study we focus on the possible relevance of the overall-configuration as operationalized by the Deviance from a Balanced Time Perspective. The DBTP is based on the assumption of optimal scoring on each time dimension. To calculate the individual DBTP-score the observed values are subtracted from the optimum values, squared and summed. The square root of the resulting sum is calculated into the DBTP-score (cf. Stolarski, Wiberg & Osin, 2015, pp. 59-61).

The Zimbardo Time Perspective Inventory (ZTPI) was established and cross validated by Zimbardo & Boyd (1999) [7] and it has explained a wide range of human thinking and behavior. The core concept consists of five time perspectives: Past Positive, Past Negative, Present Fatalistic, Present Hedonistic and Future. The Present Negative orientation is associated with aversive experiences in the past which are still relevant for the present. The Past Positive perspective is related to positive past memories and nostalgia. Present Hedonism refers to a strong need for immediate gratification, whereas Present Fatalism is relevant to feelings of helplessness and the belief that one cannot influence his own life. The Future perspective implies a wide time horizon and hard work in the presence, in order to reach high-standard goals in the future. For a more detailed description cf. Zimbardo and Boyd, 1999 and Zimbardo and Boyd, 2008. These function as a learned system of reference, which has a significant impact on: well-being [8], academic achievement [9] or dysfunctional behaviors such as a problematic consumption of alcohol, drugs and cigarettes [10].

It is possible that the concept of time-perspectives provides new explanations with respect to burnout. A change of time perspective by the affected individual could attenuate the level of severity of burnout, or perhaps support the prevention of burnout development. Relevant is the concept of the Balanced Time Perspective which is assumed to be favorable for human functioning and well-being, as well as the deviations from this optimum [11].

A strong link between time perspectives and a vulnerability to burnout may arise from the observed relationship between time perspectives and well-being [12, 13].

Derivation of the Hypotheses

The Past Negative orientation can be assumed to reduce motivation and optimism, thus it will enhance the negative perception of the working-situation. Studies have linked the Past Negative dimension to neuroticism [14] and to an increased negative mood [15]. In contrast, it can be assumed that the Past Positive orientation will prevent from burnout, because of its influence on the stability of the individual [16].

Although Present Hedonism is linked to many problematic aspects as drug abuse [17], unprotected sex [18], risky driving [19] and low health awareness in general [20], it has on the other hand many advantages [21], such as its positive effect on social connectivity and on the ability to fade out future consequences which could be helpful in preventing burnout. In contrast, the Present Fatalistic perspective can be very critical for burnout proneness and has been described as a highly problematic time perspective [22]. It is associated with being at risk for mental illness and dysfunctional behavior [23]. Moreover, it could have a reducing effect on self-efficacy and active problem-coping strategies which are relevant for burnout. Finally, regarding the Future perspective Boniwell and Zimbardo (2004) [24] argue that beside its wide range of advantages, such as high achievement motivation or goal-striving, a pronounced Future perspective can be associated with being unable to enjoy the present. This could contribute to a higher burnout risk. The overall configuration of the time perspectives is of significant relevance for burnout tendencies. This overall configuration is developed as a Balanced Time Perspective (BTP) and deviations from it as the Deviation from Balanced Time Perspective (DBTP) [25].

In summary our hypotheses about the influence of time perspectives on burnout are the following: The Past Negative, the Present Fatalism and the Future orientations will enhance burnout tendencies, whereas the Past Positive and the Present Hedonistic orientations will reduce burnout tendencies. The DBTP will enhance burnout. We tested these hypotheses for all three burnout-dimensions (Emotional Exhaustion, Cynicism and Personal Accomplishment-reverse coded) as measured by the Maslach-Burnout-Inventory (MBI). Further we investigated differences between the two subsamples and examined, if these differences can be explained by time perspectives.

Methods

1.2.1. Participants

The sample consists of employees of a logistic and distribution center of an international company which is located, in Germany and of German MBA-students. The purpose of this sample composition was to test if the factor *responsibility* shows (a) differences in burnout tendencies and (b) if these differences can be explained by the different time perspectives of these subsamples. The MBA-students have a higher responsibility competence in their working place (72.9% hold a managerial position, the remaining 27.1% are accounting clerks with at least some working autonomy), whereas the employees have no substantial responsibility or very low levels of responsibility. In the overall sample 49.37% were females (50.63% males) with a mean age of $M_{age} = 31.17$ years; SD = 8.21 years.

1.2.2. Measures

The German ZTPI [26] and the German version of the MBI-GS-D [27] were used. The data-collection in the logistic center was conducted in small groups and the anonymity of the data was ensured through the use of ballot boxes. The data-collection in the MBA-courses of the University of Applied Sciences Ludwigshafen was conducted in the same way.

1.2.3. Statistical analysis

We tested the influence of the five ZTPI-dimensions in a linear regression analysis on each of the three burnout-dimensions. In a second linear regression analysis we included only DBTP as predictor of the three burnout-dimensions. In addition, we conducted t-tests, in order to examine the differences between the subsamples. Furthermore, we have calculated the DBTP for both subsamples, in order to investigate differences between them. Finally, we applied the Hayes-Process-Macro for SPSS to test if these differences were mediated by the Present Fatalism orientation, which was observed to be higher for the employees. We conducted the mediator-analysis for all three burnout factors.

1.2.4. Results

As shown in Table 1 the following ZTPI-dimensions reached significance in the predicted direction: The Past Negative and Present Fatalistic dimensions enhanced *Emotional Exhaustion* as predicted and the inhibiting effect of the Present Hedonistic perspective on *Emotional Exhaustion* was also confirmed. Furthermore, the Present Hedonistic orientation reduced *Personal Accomplishment*. The Future dimension did not have any significant effect on *Emotional Exhaustion* and did instead have an effect in the opposite direction: Thus, the Future perspective showed a nearby significant reducing effect on *Cynicism* and enhanced *Personal Accomplishment* and had therefore a reducing effect on burnout tendencies.

It is worthwhile to mention that additional ZTPI-dimensions showed nearby significant effects in the predicted direction (*p*-values between .05 and .10), such as the Past Positive and the Past Negative orientations on *Cynicism* and the Past Positive and the Present Fatalistic orientations on *Personal Accomplishment*. The DBTP (cf. Table 2) enhanced the proneness of all three burnout-dimensions significantly.

Table 1: Linear Regression Analysis with the effect of the five						
ZTPI-dimensions	on	Emotional	Exhaustion,	Cynicism	and	
Personal Accomp	lishı	ment				

	В	SE	β	t	р
Emotional Exhaustion:					
Past Positive	-0.04	0.18	02	-0.23	.410
Past Negative	0.36	0.14	.24	2.54	.007
Present Fatalistic	0.37	0.18	.22	2.07	.021
Present Hedonistic	-0.24	0.19	12	-1.24	.046
Future	-0.06	0.16	04	-0.37	.108
Cynicism:					
Past Positive	-0.29	0.19	14	-1.54	.063
Past Negative	0.22	0.15	.14	1.49	.069
Present Fatalistic	0.30	0.19	.17	1.57	.060
Present Hedonistic	0.11	0.21	.05	0.53	.301
Future	-0.28	0.17	16	- 0.16	.056
Personal Accomplishment:					
Past Positive	0.12	0.10	.11	1.22	.112
Past Negative	-0.05	0.08	06	-0.62	.268
Present Fatalistic	-0.13	0.10	13	-1.23	.110
Present Hedonistic	0.20	0.11	.17	1.77	.039
Future	0.37	0.09	.38	4.01	< .001
					,

Note. All *p*-values are reported for one-tailed tests. Significant *p*-values are presented in bold; Emotional Exhaustion: R2 = .17; Cynicism R2 = .25; personal Accomplishment R2 = .23.

Table 2: Linear Regression Analysis with the effect of Deviation from Balanced Time Perspective on Emotional Exhaustion, Cynicism and Personal Accomplishment

	В	SE	β	t	р	
Emotional Exhaustion	0.40	0.12	.27	3.21	.001	
Cynicism	0.50	0.13	.32	3.88	< .001	
Personal Accomplishment	-0.28	0.07	33	-4.00	< .001	
Note All n-values are reported for one-tailed tests. Significant n-values are presented in hold:						

Note. All p-values are reported for one-tailed tests. Significant p-values are presented in bold; Emotional Exhaustion: R2 = .07; Cynicism R2 = .10; Personal Accomplishment R2 = .11. In a next step, we examined if the differences between the sample of the employees and the one of the MBA-students could be explained by differences in the time perspectives. Therefore we used a time perspective as a mediator. We reported the observed differences, between the two subsamples, for burnout tendencies and time perspectives, and subsequently we tested a mediator-model.

1.2.4.1. Differences in burnout tendencies

The conducted t-tests revealed that the subsamples differ as hypothesized: The employees showed significantly more *Emotional Exhaustion* ($M_{empl.} = 3.19$ vs. $M_{MBA} = 2.88$; p = .037; one-tailed) and more *Cynicism* ($M_{empl.} = 2.96$ vs. $M_{MBA} = 2.38$; p < .001; one-tailed) compared to their MBA-counterparts. However, we observed no differences with respect to *Personal Accomplishment* ($M_{empl.} = 5.02$ vs. $M_{MBA} = 4.93$; p = .192; one-tailed).

1.2.4.2. Differences in Time Perspectives

We tested for differences in time perspectives between the employees and the MBA-students: The *t*-tests revealed that, three out of the five time dimensions showed differences: The employees were less Future oriented compared to the MBA-students ($M_{empl.} = 3.60$ vs. $M_{MBA} = 3.78$; p = .044; one-tailed) and showed a higher Present Hedonistic orientation ($M_{empl.} = 3.33$ vs. $M_{MBA} = 3.17$; p = .011; one-tailed). The employees scored higher on the Present Fatalistic dimension ($M_{empl.} = 2.72$ vs. $M_{MBA} = 2.42$; p = .001; one-tailed).

1.2.4.3. Test of the Mediator Model

The DBTP showed no differences between both subsamples. Instead one outstanding main difference in time perspectives was the higher Present Fatalistic orientation of the employees (cf. above). We can assume that the higher burnout proneness of the employees is due to their lower working-autonomy. We hypothesized that working-autonomy and fatalism are closely related to each other. Consequently, we examined if this difference will mediate the influence of the factor *subsample*. We conducted mediator analyses for all three burnout factors by using the Hayed-Process Macro for SPSS. Table 3. Regression Coefficients, Standard errors, and Model Summary Information for the Subsample Influence Mediator Model with the Mediator Present Fatalistic on Emotional Exhaustion

Consequent								
			M1 (Present Fata	listic)		,	Y (Emotional Exha	austion)
Antecedent		Coeff.	SE	р		Coeff.	SE	р
X (Subsample)	al	0.281	0.100	.006	c1	0.163	0.169	.336
M1 (Present Fatalistic)		-	-	-	b1	0.504	0.136	<.001
Constant	iM1	2.125	0.154 R ² =0.052	<.001	iy	1.507	0.385 R ² =0.106	<.001
F(1,145)=7.943, p=.006 F(2,144)=8.554, p<.001								
p-values are fo	r two-tai	led tests.						

We observed a significant indirect effect of the subsample on Emotional Exhaustion via the Present Fatalistic orientation; a,b, = 0.142 (BootLLCI = .0529; ULCI = .2764), whereas the subsample showed no significant direct effect; c' = 0.163; p =.336. (cf. Table 3 and Figure 1). The results indicated a significant indirect effect of the subsample on Cynicism via the Present Fatalistic dimension; a₁b₁ = 0.149 (BootLLCI = .0533; ULCI = .3053) and there was also a significant direct effect of the subsample on Cynicism; c' = 0.417; p = .021 (cf. Table 4 and Figure 2). Additionally, the subsample had an indirect effect on Personal Accomplishment via the Present Fatalistic dimension; a,b, = -0.077 (BootLLCI = -.1611; ULCI = -.0236) and no significant direct effect; c' = 0.001; p = .997 (cf. Table 5 and Figure 3). In all mediator analyses we observed the same significant enhancing effect of the subsample on the Present Fatalistic perspective (the employees showed a higher Fatalistic orientation). The influence of the two subsamples on Emotional Exhaustion and Personal Accomplishment was mediated by Present Fatalism. In the case of Cynicism, we observed a direct and an indirect effect. Consequently, we can summarize that differences in Present Fatalism were shown to be a mediator of this influence.

Figure 1. Mediation model for the influence of the subsample on Emotional Exhaustion with the Present Fatalistic orientation as mediator



subsample MBA-students = coded with 1 subsample employees = coded with 2

Figure 2. Mediation model for the influence of subsample on Cynicism with the Present Fatalistic orientation as mediator



subsample MBA-students = coded with 1 subsample employees = coded with 2

Figure 3. Mediation model for the influence of subsample on Personal Accomplishments with the Present Fatalistic orientation as mediator



subsample MBA-students = coded with 1 subsample employees = coded with 2

Discussion

The assumption of an influence of time perspectives on burnout was confirmed. The effects were in the predicted direction (except for the Future orientation). In addition, we could show that the Present Fatalistic dimension, as a mediator, could explain the differences between the two subsamples in the cases of *Emotional Exhaustion* and *Cynicism*.

We can conclude that time perspectives influence all three burnout dimensions. In particular, the DBTP seems to be of outstanding importance. The relevance of time perspectives was shown for an occupational sample outside the health care sector. A study by Unger et al. (2017) [28] has recently shown this relevance for a professional health care sample and has identified perceived stress and self-efficacy as mediators of the time perspective influence on burnout. Thus, a general mechanism of influence seems to exist which is not restricted to specific working domains.

We did not conclude that the current findings imply that the importance of organizational factors as issued in the burnout-literature [29, 30] has to be re-evaluated. Instead, further research is needed to shed light on how time perspectives interact with organizational factors.

Our current study has several limitations. Our sample sizes were quite small and we refer to specific populations. Furthermore, the subsamples with high and low working-autonomy might also differ in other aspects, e.g. the MBA-students are presumably more motivated in general, since they are studying on their own initiative. These aspects limit the generalizability of our results.

Nonetheless our results are of importance for burnout-screening, burnout-prevention and the development of new therapeutic approaches. A pronounced DBTP can be evaluated as an indicator for being at risk for burnout tendencies. Interventions for altering individual time perspectives might be an effective additional approach to existing therapies. This requires that the understanding of the role of time perspectives and their interaction with organizational factors have to be further broadened. The findings of the current study suggest that a high Past Negative orientation and a high Present Fatalistic orientation are problematic and should be weakened in the context of therapeutic interventions, whereas the Past Positive and the Present Hedonistic dimensions as inhibiting factors should be strengthened. The role of the Future dimension needs further examination, but at the moment we can conclude that the maintenance of a high Future perspective seems to be at least in some respects helpful in inhibiting burnout tendencies. These results could be attributed to the positive bias of the Future dimension of the ZTPI. In a similar way the findings of Papastamatelou et al. (2015) [31] indicated that the Future orientation correlated negatively with generalized anxiety disorder. Therefore, the positive bias could lead to the prevention of burnout tendencies in individuals with a pronounced Future perspective.

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Research

Implementation and Evaluation of a Greek, manualised, CBT parenting intervention for children aged 3-8 with Attention Deficit and/or Disruptive Behaviour Disorders. A single group outcome study.

Apostolos Vourdas¹, Kalliopi Triantafyllou², Gerasimos Kolaitis²

1 "Thetikoi Goneis", Parent Guidance Program, Ethnikis Antistaseos 34, Chalandri, Athens, 15232, Greece. 2 Department of Child Psychiatry, Medical School, National & Kapodistrian University of Athens, «Agia Sofia» Children's Hospital, Thivon and Papadiamantopoulou, 11527.

Objective: To evaluate the effectiveness of a Greek parenting program, based on social learning theory, as a therapeutic intervention for children aged 3-8 with behaviour disorders.

Design: Single group pre-post outcome study.

Setting: Department of Child Psychiatry of the University Medical School, «Aghia Sophia» Children's Hospital, Athens, Greece.

Participants: Sixty-five parents with children aged 3-8 meeting DSM-IV criteria for Attention Deficit and/or Disruptive Behaviour Disorders were evaluated in the current study.

Intervention: Positive Parents Happy Kids. A manualised parenting program, of 12 weekly group sessions and two parent-child sessions, based on cognitive behaviour and social learning theory.

Outcome measures: Parents completed measures of child emotional and behavioural difficulties (SDQ) and parental stress (PSI short form), pre and two-week post intervention, as well as a client satisfaction questionnaire. **Results:** The SDQ showed that post treatment, a statistically significant proportion of children moved from the borderline-clinical range to non clinical range regarding: a) the Total Difficulties Score (24.6%), b) the hyperactivity subscale (26.2%), c) the conduct subscale (40%) and d) the peer relationship problems (20%). The impact of the problems was also significantly reduced. According to PSI, there was also a statistically significant improvement in all categories (Total Parental Stress, Parental Distress, Parent-Child Interaction and Difficult Child). The acceptance of the program was very satisfactory as shown by the high attendance rate and the completion of satisfaction questionnaire.

Conclusion: The study provides evidence that therapeutic improvement can be achieved by a manually based, parent Cognitive Behavioural Program designed for a Greek population. The question whether, in countries like Greece it is preferable to import well researched, but expensive foreign programs or design new culturally-sensitive programs, based on the common characteristics of the previous ones is discussed.

Keywords: Parenting program, conduct problems, ADHD, children, outcome

Introduction

Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) can affect up to 12.6% and 6.8% of children respectively¹, whereas the prevalence of ADHD in school-aged children is estimated to 5.2%². These conditions are the most common child psychiatric disorders and the most common reason for referral to a child psychiatry service ³. Although, these statistics come primarily from research conducted in US and UK, there is good evidence to suggest that (at least within the Western World Countries and thus in Greece) the above prevalence estimates should be about the same⁴.

The comorbidity of CD (or ODD) and ADHD is high⁵ and are put together, under the same category of DSM-IV as: Attention Deficit and Disruptive Behaviour Disorders⁶. The long-term psychiatric consequences of conduct disorder have been well documented in many studies and associated with depression⁷, drug abuse and suicidality⁸, delinquency and antisocial personality disorder⁹.

Without a timely, early and effective intervention, CD may result in significant financial burden both for the family and the society, whereas the long-term financial cost of a child with CD is about 10 times higher, than a child without behavioural problems^{10,11}. In addition, CD is a significant contributor to global YLDs (Years Lived with Disability), ranking as the 30th leading cause of nonfatal burden worldwide, despite its prevalence ceasing at the onset of adulthood as per diagnostic criteria¹².

Although behaviour problems have a multifactorial aetiology, parenting is a key determiner of child behaviour¹³, and conduct problems are unwittingly developed and sustained in the home by maladaptive parent-child interaction such as reinforcement of ineffective use of commands, harsh punishment, failure to attend to appropriate behaviour and coercive parent-child exchanges¹⁴. Parenting of ADHD or Conduct Disorder kids share similar ineffective characteristics¹⁵. When ineffective parenting is the problem, cognitive behaviourally based parenting programs, with principles derived from social learning theory can provide an effective solution and they are more effective with younger children¹⁶.

Parent training programs based on the above theoretical principles, such as the Incredible Years¹⁷, Triple P Positive Parenting Program¹⁸, the Parent-Child Interaction Therapy (PCIT)¹⁹, the Parent Management Training²⁰ have been widely studied and consist significantly effective psychotherapeutic

interventions for the prevention of CD²¹. Research findings indicate that some of the above programs reduce ADHD symptoms and can be applicable in ADHD diagnosis or in case of comorbidity^{15,22,23}.

Many governments and international bodies (e.g. World Health Organization) in order to prevent violence, promote the transportation and rollout of evidence-based existing parenting programs or they suggest that if new programs are to be designed, they should incorporate the common characteristics that they will be more likely to be effective²⁴.

A meta-analysis by Kaminski et al²⁵ showed that: a) helping parents how to develop emotional communication skills, b) how to interact positively with their child, c) how to respond consistently to their children, d) how to use correctly the time out, e) asking parents to practice new skills during sessions and in their own home, f) requiring parents to practice with their child"in vivo" during sessions, are the necessary common characteristics of a parenting program, in order to produce significant and meaningful changes.

In Greece, manualised parenting interventions for CD barely exist and if so there are not adopted by public or private child psychiatric services. Most parenting interventions are called «parenting work» or «parenting schools», they are not manualised, do not have a sound theoretical or empirical background nor a specific targeted clinical population.

Therefore, based on scientific, theoretical and empirical evidence of the existing literature it was decided to create, implement and evaluate a Greek CBT parenting program, aimed to help families with children aged 3-8, with Disruptive Behaviour Disorders, at the Department of Child Psychiatry, of the Athens University Medical School. Given the high co morbidity of CD and ADHD in real world setting, ADHD diagnosis was also included. This paper reports on the outcome of the pilot implementation of the above program, named "Positive Parents - Happy Kids".

METHOD

The intervention

The intervention consists of 12 weekly 2-hour parent group sessions and 2 parent-child sessions. The intervention aims to reduce child behavioural problems and to improve the parent-child relationship, based on the principles of positive parenting. Each group was attended by parents of 8-10 children and run by two facilitators.

The whole intervention is manually based²⁶ and consisted of four parts: a) increasing desirable behaviour, b) developing social communication and emotional skills, c) preventing unwanted behaviour and d) applying positive discipline. The topics that are discussed, throughout the program are the following: child centered game, effective praise and rewards, positive communication, recognition and expression of emotions, building of social skills, household rules, selective ignoring, consequences and time out. The strategies that are used in the program include: therapist brief introduction on the topic, guided group discussion, therapists' role-play, parents' role-play and in vivo exercises. The parents are given the program's book for parents to read²⁷, and weekly homework to do, which is reviewed during the following session.

The two parent-child sessions were delivered after the completion of the 6th and 12th weekly group session respectively. The first session consisted of child-centered game, presentation of a reward system and a free topic discussion. The second session consisted of child-centered game, parent commands, presentation of a discipline system and a free topic discussion. The therapists sit behind a oneway mirror and by using an ear bug device give live feedback, reinforcing parental skills and appraising the parents' behaviours.

Intervention fidelity

The groups were monitored for implementation fidelity. There was a detailed manual for the 14-session program and therapists completed weekly checklists of the content covered. Group sessions were video-recorded and weekly meetings here held with all therapists in order to monitor treatment integrity, treatment delivery and parents responsiveness. Parents satisfaction and engagement was measured by using the purpose constructed Weekly Satisfaction Questionnaire.

Therapists

Four therapists (one child psychiatrist, one clinical psychologist and two psychologists with a master degree in mental health) administered six parenting groups. The child psychiatrist, who developed the program, trained the psychologists for a period of six months.

Setting

The trial took place at the Department of Child Psychiatry Greece, of the Athens University Medical School, in «Aghia Sophia» Children's Hospital, Athens, Greece between 2012-2014. The relevant ethics committee approved the project. Children were referred either by a mental health service or by an educational setting.

Participants

Eligible parents were those of children aged 3-8 years old, who scored 5 and above on the conduct problems subscale and/or 6 on the hyperactivity subscale, of the Strengths and Difficulties Questionnaire (SDQ-Hel)^{28,29} during an initial telephone intake. They should have been able to speak adequate Greek and attend the group meetings. Exclusion criteria were clinical apparent major parental illness and children with major developmental delay (learning disability or pervasive developmental disorder).

Measures and procedure

A structured clinical interview was held by the child psychiatrist in order to assign DSM IV diagnosis and to confirm eligibility criteria for participation to the study.

The primary outcome instrument was the Strengths and Difficulties Questionnaire, parent rated (SDQ-Hel)^{28,29}. The SDQ is a brief measure questionnaire that asks parents to rate their child behaviours/symptoms and positive attributes. It comprises 25 items, with answers being rated on a 3-point severity scale. The SDQ provides a "global" total difficulties score (TDS), as well as five individual subscale scores: Conduct problems, Emotional symptoms, Hyperactivity, Peer problems and Prosocial behaviours. With the exception of the Prosocial subscale, the sum of the other four subscales generates the TDS. Because of this, the Prosocial scale was not included in the statistical analysis. There are cut-off scores for all subscales and the total difficulties score to indicate a likely clinical disorder^{29,30}. An impact scale in the SDQ indicates the extent of the burden that the child's problem behaviour has on his everyday life. The psychometric properties of the SDQ-Hel (Greek version of SDQ) are good, as have been reported in various studies with Greek samples^{31,32}.

The secondary outcome instrument was the Parenting Stress Index Short- Form³³. It consists of 36 items and is comprised of three subscales, which include the Parental Distress (PD), Parent-Child Dysfunctional Interaction (PCDI) and Difficult Child (DC) subscales. Child and Parent domains combine to form Total Stress Scale. Reliability and validity of the test supports that parenting stress is a measure that is useful across diverse populations and has proved useful in designing a treatment plan, for setting priorities for intervention or for follow-up evaluation³⁴.

The Parental satisfaction was measured by the Weekly Satisfaction Questionnaire, which was constructed for the purpose of the current study and assessed satisfaction of parents from weekly group sessions. It comprised the following 8 items for the group sessions 2-12, and only the first 6 items for the 1st group session: 1) the content covered during the session, 2) the overall role of the therapists, 3) the therapists' role plays, 4) the exercises during the session, 5) their opportunity to talk about their child, 6) how well the parental homework was explained, 7) the usefulness of the parental material and handouts and 8) the review of parental homework during the session. Understandably, the items 7 and 8 could not be assessed during the first session and therefore were not included. Each item could be scored 0 (not at all), 1 (a little), 2 (just enough), 3 (a lot) and 4 (very much), yielding a maximum score of 32 for the sessions 2-12 and a maximum of 24 for the session 1. The total score of the questionnaire gives the overall satisfaction from the specific session.

The outcome instruments were completed in two times: pre-intervention and two weeks after completion of intervention (returned by paid post).

Statistical Analysis

A series of paired sample t-tests were conducted in order to assess the differences pre- and post-treatment, in child difficulties (externalizing symptoms, emotional symptoms) and child positive social behaviour as well as in parenting stress (parental distress, parent-child dysfunctional interaction and difficult child). The McNemar test was used to assess the proportion of children who post-treatment moved from the borderline-clinical range to non-clinical range in SDQ scale.

RESULTS

Sample demographic characteristics

Seventy-eight parents of children 3-8 years old with behavioural problems attended the intervention. Thirteen parents were excluded from the current study. In particular three parents attended less than six sessions and ten did not complete the pre or post intervention measures. Sixty-five parents (45 mothers, 20 fathers; 18 couples) of 47 children with behavioural problems (mean age 6.1 years, S.D. 1.4, boys=40) participated in the current study. All parents were of Greek Nationality. 77.9% were married, 13.3 % were divorced, 2.2% divorced with a partner, 2.2% separated, 2.2% widowed and 2.2% single.

Child psychiatric diagnoses

According to clinical DSM IV diagnoses, 12 children were diagnosed with ODD (25,5%), 8 children with ADHD (17%), 12 children with ODD & ADHD (25,5%), 3 children with ODD and Depression (6,5%) and 12 children with Disruptive Behaviour NOS (25,5%).

Child behavioural problems pre- and post-treatment

Paired sample t-tests were conducted pre and post treatment. Intervention produced a significant reduction in mean total difficulty score (t (64)= 8.08, p<.001). In particular, externalizing symptoms were reduced: inattention and hyperactivity (t (64)= 4.41, p<.001), conduct problems (t (64)= 7.03, p<.001) and problems with peers (t (64)= 6.46, p=.001). Additionally, emotional symptoms were ameliorated (t (64)= 5.14, p<.001). Improvement was reported in child positive social behaviour (t (64)= -3.44, p=.001). A statistically significant reduction of the overall impact of the difficulties in the daily life of the child was also found (t (59)= 4.86, p<.001). Mean scores, standard deviation and effect size are presented in Table 1.

Table 1: Child symptoms pre and post treatment

SDQ (cut-off score)	Pre- treatment assessment Mean (SD)	Post- treatment assessment Mean (SD)
Total difficulties (≥15)	17.35 (6.38)	11.89 (5.37) **
Inattention/hyperactivity (≥6)	6.57 (2.71)	5.40 (2.53) **
Emotional symptoms (≥5)	2.95 (2.11)	1.66 (1.81) **
Conduct problems (≥5)	4.66 (2.03)	2.92 (1.48) **
Problems with peers (≥ 4)	3.17 (2.27)	1.91 (2) *
Positive social behaviour (≤ 6)	6.37 (2.17)	7.23 (1.78) *
Overall Impact	4 (3.18)	2.25 (2.86) **

* p=.001, ** p<.001

Using the cut off scores on Total Difficulties, on individual subscales and on Impact factor, as a boundary between the borderline-clinical and the non-clinical as suggested by Giannakopoulos et al²⁹, there were significant improvements in the proportion of children who post-treatment moved from the borderline-clinical range to non-clinical range. The difference was statistically significant for the Total Difficulties Score, (McNemar's test < .001), the hyperactivity subscale (McNemar's test= .001), the conduct subscale (McNemar's test= .001), the proportion of the prosocial behaviour (McNemar's test= .078). Table 2 shows the overall frequencies of improvement, deterioration and no change.

Table 2: Percentage of improvement, impairment and notalteration of child difficulties according to SDQ

	Total difficulties N (%)	Inattention/ hyperactivity N (%)	Conduct problems N (%)	Problems with peers
From the borderline/ abnormal to normal range	16 (24.6)***	17 (26.2)**	26 (40.0)***	13 (20.0)*
From normal range to borderline/ abnormal range	0 (0.0)	2 (3.1)	0 (0.0)	1 (1.5)
Maintenance of the clinical level	25 (38.5)	26 (40.0)	10 (15.4)	12 (18.5)
Maintenance of the normal level	24 (36.9)	20 (30.8)	29 (44.6)	39 (60.0)

* McNemar's test < .01, **McNemar's test = .001, *** McNemar's test < .001

Parental Stress

Paired sample t-tests were conducted in order to identify the differences pre and post treatment in PSI short form. Parents at the end of the intervention scored statistically significantly lower in Total Stress Scale (t (64) = 6.44, p< .001), in "Parental Distress" (t (64)= 4.09, p< .001), in "Parent-Child Dysfunctional Interaction" (t (64)= 4.39, p< .001) and in "Difficult Child" (t (64)= 5.70, p< .001) (see Table 3). From the scoring levels in the three sub scales, it appears that the most stressful parenting field is related to the Difficult Child.

Table 3: Mean and standard deviations of Parenting StressIndex pre- and post- treatment

Parenting Stress Index	Pre- treatment assessment Mean (SD)	Post- treatment assessment Mean (SD)
Total Stress	86.97 (16.89)	76.29 (17.60) *
Parental Distress	28.43 (6.32)	25.68 (7.00) *
Parent-Child Dysfunctional Interaction	24.22 (6.63)	21.48 (6.35) *
Difficult Child	34.32 (7.87)	29.14 (8.14) *

*p<.001

Parental attendance and satisfaction from the program

The mean number of attendance was 10.02 group sessions out of 12 (median 11.00; minimum 6.00, maximum 12). Additionally, all of the 65 parents attended the two individually scheduled, parent-child sessions. Parents reported high levels of satisfaction after each weekly group session. Table 4 shows the levels of satisfaction.

Table 4: Parental satisfaction

Level of	Mean	Median	Minimum	Maximum
satisfaction				
Session 1	18.15	18.00	11.00	24.00
Session 2	25.03	26.00	13.00	32.00
Session 3	25.27	25.00	18.00	32.00
Session 4	25.62	26.00	16.00	32.00
Session 5	25.78	26.00	17.00	32.00
Session 6	25.96	26.00	20.00	32.00
Session 7	25.80	26.00	16.00	32.00
Session 8	26.46	27.00	18.00	32.00
Session 9	25.98	25.00	18.00	32.00
Session 10	26.54	26.00	21.00	32.00
Session 11	26.23	26.00	15.00	32.00
Session 12	27.71	28.00	19.00	32.00

Discussion

The evaluation results are promising and in line with those reported over the years, by other widely evaluated parent training programs based on cognitive behavioural and social learning theory^{14,16,17,18,19,20,21,22}.

Following completion of the program, the child symptomatology improved on all four domains of SDQ, which were the primary targets of our intervention (conduct, hyperactivity, peer relationship and total difficulties). Very encouraging finding was that this improvement seems to have a qualitative and not just a quantitative effect, given that it was associated with a change in diagnostic category to back to normal in a significant number of children for all the above 4 domains. In addition, the significant reduction on the impact score of SDQ reflects the improvement in the everyday functioning of the child and his family, which is always a substantial and key goal in any kind of therapeutic intervention.

The above findings from the primary outcome measure (SDQ) are supported by the findings from the secondary measure (PSI). After the end of the intervention, parents perceived their child as less difficult, they reported improvement in their in-between relationship and felt less stressed in their parental role. This finding is also supported by previous findings that reduction in parental stress is associated with improvement of child behaviour in this age range³⁵ and especially among clinical populations^{36.}

It is noteworthy that the parental attendance rate was high reaching a mean of 10 and a median of 11 group sessions (out of 12). It should be mentioned that an attendance rate of 60-70% for the 80% of the sessions has been reported as a usual, average one in similar studies³⁸. Regarding the dropout rate for parenting programs, Webster-Stratton and Reid³⁷ suggest that this can be as high as 50% to 80% in this type of clinical population. In our study the dropout rate was 4% given that only three out of the initial 78 parents attended 5 sessions or less. The parental satisfaction for each session ranged between "a lot" to "very much" as shown by the completion of weekly questionnaires. It should be said that we did not have the means to offer facilities to parents such as child minding during sessions or transportation expenses. The above findings allow us to suggest that the program was well accepted and perceived as a helpful and worth doing intervention by the participants.

Why did the intervention work?

Our program, although it was not tested in a RCT, seems to produce positive results. In our view this was achieved by the way that the whole program was designed and delivered. More precisely, it was based on a solid program theory, proved to be effective, according to widely accepted scientific standards and recommendations, it had a clearly defined target population, was relevant and acceptable to the participants, promoted positive relationships, had the right dosage, was timely delivered, assured treatment fidelity and training of staff and was culturally sensitive^{39,40,41}.

Comparison with other studies

To the best of our knowledge, by the time funding and implementation of our program were assured, there were not other studies of parent training interventions in a Greek clinical population. Ever since, there has been a publication of a pilot study by Giannopoulou et al³², reporting on the effectiveness of a CBT parenting group intervention of young children with behavioural problems. Their findings are in accordance with ours and suggest that the implementation of a culturally sensitive program, sharing the effective characteristics of an intervention, based on social learning theory, can be positively accepted and implemented in Greek population, for the prevention and treatment of conduct problems.

Limitations

The study does not use an instrument to measure changes of parenting practices and to which extent these changes are associated with the changes observed in the young person behaviour. The study solely relies on the parental perspective for measuring their child's mental health symptoms. Measures from multiple perspectives, particularly from teachers would have been useful. Since this was a single group design outcome study, there was no control group for comparison with the group that received treatment. We therefore cannot say with high degree of confidence that the improvement in children and parents occurred because of the intervention. More studies are needed, preferably using randomized clinical trial methodology, which could also help to determine whether the intervention would benefit a wider population. Parents involved in the program were only followed up once, shortly after the end of the group parent-training program. This is insufficient to help us understand whether or not the program achieves longer lasting changes. A follow-up at 6 and 12 months would provide this information.

Implications for clinical practice

International bodies urge local governments to make such programs available to their population²⁴. However there is an ongoing debate whether it is preferable to design new programs, specific to each country or to import evidencebased programs, which have been developed and researched in high-income western countries. The financial and the cultural context challenges are the main ones.

According to United Nations Office on Drugs and Crime⁴² importing programs may be less expensive than developing and evaluating new programs for many different groups, but we cannot assume that evidencebased programs developed in one context will continue to be effective in other contexts⁴³. In addition, affordability is another consideration, when importing programs into low and middle-income countries. Many of these programs are expensive, there are costs associated with materials, training and support and many potential purchasers, such as governments and non-profit organisations, are unable to pay the high prices charged for these programs⁴⁴. In Greece, there is an ongoing economic crisis, with rapidly and drastically decreasing public health expenditure affecting seriously mental health services, as well as the scarcity of funding⁴⁵.

Even if the purchase of the material of an existing evidencebased PT program, and examination of its feasibility and effectiveness within a Greek population was considered, its dissemination, ongoing acceptability and purchase ability by mental health agencies, throughout the country was thought to be a non viable and unsustainable option, in the current socio-economic situation. At the moment of writing, the cost of the training and acquisition of the material of our program is in the area of 500 euros (600 USD) and still its affordability has been questioned and it has to be offered for free in the majority of our National Health System services, in order to be implemented.

The second challenge has to do with the specific sociocultural issues. The relevance of prevention programs to the participants appears to be of primary concern and includes a variety of dimensions, such as local community norms, cultural beliefs and practices⁴⁶. Culturally tailoring prevention programs goes beyond surface structure language translation to deep structure modifications sensitive to cultural factors that influence development and receptiveness to the intervention⁴⁷. Giannopoulou et al. ³² reported on special cultural issues that came up about the meaning of child play, reward system, household rules, acceptance of different forms of discipline or punishment, in their Greek sample, which was also our shared experience from our parenting groups.

Our findings, although they come from a single study group, do suggest that a culturally (and financially) adjusted program, which is based on characteristics that are common to effective prevention programs, is likely to be effective and accepted in a country like Greece.

Questions and future research

It will be important to establish whether the program works well in a RCT and in 6 and 12 months follow up. A cost effectiveness evaluation study of the program will also be equally important if it is to be used to influence the government or nonprofit organisations to fund parenting programs.

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Contributors:

Apostolos Vourdas, MRCPsych, Ph.D., Consultant in Child and Adolescent Psychiatry, had the idea of the study, was the developer of the program, provided therapy sessions, trained and supervised the rest of the therapists and contributed to the writing of the paper.

Kalliopi Triantafyllou, Ph.D., Clinical Psychologist, served on the screening of the groups, collected outcome measures, conducted statistical analysis and contributed to the writing of the paper.

Gerasimos Kolaitis, Associate Professor in Child and Adolescent Psychiatry, Head of the Department (at the period of the study), applied for the grant, oversaw the implementation of the study, provided supervision, contributed in the research design and reviewed the manuscript.

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