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Notice

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Meet the editor

Floriana Irtelli, a psychoanalyst psychotherapist, is a member of the Italian Society of Psychoanalysis and has been lecturing for several years at the Catholic University of the Sacred Heart, Milan, Italy. She has worked at the Fatebenefratelli Hospital, Milan, performing research and clinical activities. She is among the authors of the books "A Fresh Look at Anxiety disorders" and "Psychopathy New Updates on an Old Phenomenon", published in the Journal of Affective Disorders, the Journal Research in Psychotherapy and the Journal of Psychiatric and Mental Health Nursing. She has participated in numerous conferences, seminars and congresses, such as the 2015 World Congress of Psycho-Oncology. She is the author of the books: "Illuminarsi di Ben-essere", "Familiar-mente", "Contemporary Perspectives on Relational Wellness, Psychoanalysis and the Modern Family".

Contents

Preface

The awareness that psychotic suffering can no longer be considered a disorder that can't be treated is very important for this book. This is why it's very important to deepen the research on its genesis and treatment in the most complete and updated way possible. As Oya Mortan Sevi recalls, compared to the past, now we are also aware of the existence of a continuity among normal beliefs, anomalous experiences and psychotic symptoms: it is a more widespread phenomenon than what was thought decades ago. In fact, recent research points out that even people considered healthy may manifest mild psychotic symptoms. This creates a growing social interest in this issue, being aware of the fact that psychosis involves a greater part of the population than was previously believed. As Lui Unterrassner emphasizes in his contribution, the interest for the study of subclinical psychosis has now increased, as it could provide critical information on the mechanisms that are involved in the exacerbation of subclinical symptoms and in maintaining mental health.

In this book, Starlin Mythri rightly points out that psychotic manifestation can be a devastating personal experience because of its ability to rob a person of his/her self-determination and control over his/her behavior. In the interpersonal context, it can damage confidence in the relationship and can decrease the familiarity between the healthy person and the person affected, giving rise to negative interpersonal criticism, and this can even lead to a complete loss of the relationship.

In the wake of these awarenesses, the relational aspects of psychosis have been investigated in various research, and this is important, because, there is a deep intertwining between the cognitive and relational aspects, and the research on it must therefore be deepened. There is therefore a greater awareness of the fact that psychosis does not only concern individuals, but also their families, as well as the society in which they live: it was therefore essential to take into consideration the psycho-social implications of this disease. Eduardo García-Laredo emphasizes that research on psychosis highlights the importance of psychosocial factors and family factors. Just as we must not neglect the biological aspects, as Abdulwakeel Ayokun-nun Ajao points out: there are indeed interesting perspectives on the new approaches to cure the disease.

From what has been mentioned, it is evident how this book adopts a perspective that respects the complexity of the human person and his/her relationships; it has been highlighted that the central themes in psychotic manifestations and in patient care are the existential anxieties (such as the preoccupation of maintaining one's own identity), find meaning in one's life experience, maintain hope, and for this reason, the assistance to the psychotic person and the care pathways that support the family must be articulated while taking into consideration, in a global manner, all the dimensions of human existence, to be effective and to truly meet the needs of those who suffer. This perspective today finds its roots when George Engel introduced the term "Biopsychosocial Approach" as a privileged way to understand the processes of health and disease along the entire existential path and to articulate forms of care. The biopsychosocial model is inspired by the paradigm of complexity, in clear contrast to biomedical reductionism, as well as to the hierarchization of the sciences. It adopts the perspective of the general systems theory developed by Von Bertalanffy [5], which considers a set of interrelated events as a system, which manifests specific functions and properties depending on the level to which it belongs

compared to a more broad level that includes it. The theory of systems maintains that all levels of the organization are connected to one another, so that the change of one affects the change of the other, overcoming the dichotomy between holism and reductionism. Overall, the model refers to three basic principles: dialogue-connection, relationship, and humility. In other words, it aspires to look at the person in his "whole" as genetic heir (bio), subject of reflection and decision (psycho), as well as historical-cultural and family (social) subject. The axioms of the model are focused on understanding diversity, and not setting aside what is considered not to be within its competence. The answers that look for this kind of perspective are global regardless of the point of entry into the system (biological, psychological, social). The usefulness of this model has been confirmed and validated by a now limitless literature, which marks the transition from a traditional medical model centered on the biological aspects of the disease to a person-centered medicine, and it is now widespread knowledge that a biopsychosocial screening, more than a compartmentalised approach to medical and psychosocial models, can help plan a more effective treatment. As a matter of fact, the human being tends to be constituted through the development of complex group systems that affect the three main areas explored by the biopsychosocial model, and any alteration of the patient's health will be characterized by a variation both in an area and throughout the system overall. Consistently, this book devotes a space both to the deepening of the more strictly biological aspects, the psychological aspects, and the social aspects. Each section of the book (biological, psychological, social) reveals a deep connection with the themes of the other sections, showing the strength of this interweaving. The relationship and the intertwining between different fields are certainly a foundation of our existence and constitute a law that we cannot escape from, so it is necessary that the biopsychosocial model is always considered in the interventions for the psychotic patient. Focusing only on one aspect or another can be misleading: to interpret the mental illness exclusively from a neurobiological perspective leads to losing sight of the life experiences of the specific subject, but also, for example, a single sociological reading of the disease can be confusing and partial. Fortunately we can argue that during the last two decades, the psychological interventions that respect this complex optics have become central in psychosocial interventions for patients and their families as they have proved useful in improving various dimensions of Quality of Life. In the light of what emerged we cannot therefore recognize the appropriateness of the proposal of a book that is based on the complex biopsychosocial and relational dimensions, adopting a perspective that integrates the issues related to biology, with the psychological aspects and intersubjective-social topics.

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Section 1

Psychological Point of View

Chapter 1

Subtypes of Psychotic-Like Experiences and Their Significance for Mental Health

Lui Unterrassner

Additional information is available at the end of the chapter

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Abstract

More recently, the interest in studying subclinical psychosis has increased, as it might provide critical information regarding mechanisms that are implicated in the exacerbation of subclinical symptoms and the maintenance of mental health. However, psychosis research has tended to focus on clinical outcomes and not to differentiate between subtypes of psychotic-like experiences (PLE) that might differ regarding their psychopathological significance. Importantly, this might have obscured a more accurate picture of the complex structure of psychosis and the significance of particular risk and protective factors. Notably, while studies point toward a continuity of psychotic experiences and accompanying factors across the general population, there is evidence indicating that some PLE in healthy individuals might also be associated with a weaker expression of other subclinical symptoms, increased well-being and even resilience to some degree. Importantly, such findings might have implications on strategies in psychosis prevention and therapy, early detection, as well as the construction of continuum models of psychosis. The present chapter aims at drawing together findings that necessitate a more differentiated view and assessment of PLE. It intends to provoke new questions that might offer starting points for future investigations, such as longitudinal studies investigating the interplay of subclinical symptoms.

Keywords: psychotic-like experiences, psychosis continuum, psychosis phenotype, subclinical psychosis, positive symptoms, disorganized symptoms, negative symptoms, affective symptoms, well-being, mental health, resilience, risk, specificity

1. Introduction

Psychotic disorders such as schizophrenia may feature frightening hallucinations as well as bizarre beliefs and behaviors that not only arouse anxiety in the general public and the media

but also amongst doctors [1]. But, even after more than 100 years of research, they remain some of the most mysterious and costliest mental disorders [2] that can only be detected and treated once the symptoms are manifest. More recently, psychosis research has increasingly shifted its focus to the non-clinical part of the general population.

Delusions and hallucinations are the core features of psychosis. They are also referred to as "positive symptoms," as it appears that they have been added to the experience of affected individuals. While they are the hallmark feature of different psychotic disorders, it is their combination with other psychological difficulties as well as their relative expression that defines a specific diagnostic categorization of an affected individual [3, 4]. Research on the symptoms of schizophrenic patients has suggested the presence of two additional basic symptom clusters associated with psychosis, namely disorganized and negative symptoms [5]. Disorganized speech and disorganized behavior refer to loose associations in speech and physical actions that do not appear to be goal-directed (e.g., catatonia, which is maintaining peculiar and often uncomfortable postures) [6]. As opposed to positive and disorganized symptoms, the term "negative" symptoms refers to the impression that something has been taken away from the patient's behavior and experience. Negative symptoms manifest in flat or blunted affect (a reduced range of expression of emotions, reduced amount or fluency of speech) and avolition (the loss of will to do things). According to a more recently suggested model, psychosis exists as a transdiagnostic phenotype including affective symptoms as additional factors, i.e. depression and mania [7, 8]. The notion of transdiagnostic associations between psychotic and affective symptoms has recently been adopted in the fifth and latest edition of the standard diagnostic manual in the United States (DSM5, see [4]) in that bipolar disorders were separated from depressive disorders and relocated between depressive disorders and schizophrenia spectrum disorders [9]. Hence, if affective difficulties are not the predominant symptoms, but positive, disorganized, and negative symptoms are prominent, an affected individual might be diagnosed with schizophrenia (or "non-affective psychosis") [7]. In contrast, individuals with fewer negative symptoms but with a high prevalence of affective symptoms (manic and depressive symptoms) might be diagnosed with psychotic depression or bipolar disorder. Lastly, if affective and psychotic symptoms are similarly present, an individual might be diagnosed with schizoaffective disorder.

In contrast to the categorical, "Kraepelinian" approach, the Swiss psychiatrist Eugen Bleuler thought already 100 years ago that psychosis was just an extreme expression of thoughts and behaviors that could be found in varying degrees throughout the general population [10]. This was seminal for different models considering psychosis as a series of symptoms that are aligned along a continuum between clinical and non-clinical populations, such as schizotypy, psychosis proneness, subclinical psychosis, or at-risk mental states [11–14]. More recently, it has been suggested that psychosis exists as an extended *and* transdiagnostic phenotype that can be conceptualized at subclinical levels as a measurable behavioral expression of risk for psychosis [15, 16]. Psychotic experiences in the absence of a diagnosis are generally referred to as psychotic-like experiences (PLE), irrespective of their apparent severity. Research has mostly focused on them since they are the best indicators of early stages, although negative-like symptoms might present themselves earlier on the temporal trajectory leading to mental illness [17, 18]. There has been growing interest in the study of PLE, as it promises to provide new insights into factors and mechanisms involved in both the emergence of mental disorders and the maintenance of mental health [19].

Importantly, it has been shown that PLE and psychotic disorders share etiological risk factors, cognitive correlates, demographic characteristics, and diminished well-being, which supports a continuum of psychotic symptoms and associated factors across the general population [20–22]. However, while it is generally agreed upon that a psychosis continuum exists, there is no consensus even on the most basic dimensions of the psychosis phenotype and involved constructs lack clear definitions [23–25]. While PLE are generally seen as indicators of psychosis proneness, studies suggest that they are frequently reported in the general population and are not necessarily associated with distress, help-seeking, or the onset of psychotic disorders [20, 26, 27]. More specifically, there is some evidence indicating they might be differentially implicated in mental health and the formation of mental disorders [28–32]. However, as psychosis research has tended not to differentiate between different PLE and to categorize them homogeneously, only little is known about their individual psychopathological significance and their role in the formation of different psychosis spectrum disorders [32, 33]. Similarly, only little attention has been given to comparing the phenotypical similarity of psychotic experiences between healthy and clinical individuals [19, 34]. Therefore, new instruments have been called for in order to allow accurate mapping out of the psychosis continuum [35]. Further complicating the study of PLE, a variety of terms and self-report instruments with different conceptualizations of psychosis and PLE are being used, which may entail inconsistent results and blur the sources of these inconsistencies [24, 34, 36]. However, these limitations are rarely addressed or regarded in the study of PLE although they might ultimately impede progress in all areas of psychosis research.

Importantly, attaining a clearer picture of PLE and associated factors might contribute to elucidating psychosis formation, improving risk screening, as well as facilitating new therapeutic approaches. Understanding the specific meaning of different subtypes of PLE for mental health might have become even more important since recent approaches aim at studying the subclinical interplay of symptoms leading to mental illness or the retention of mental health [37, 38]. In this context, an empirically established and generally agreed upon categorization of PLE regarding their psychopathological significance may be of fundamental importance. Although similar categorizations have been proposed [30, 39], it has not yet been clarified to which categories certain PLE should be assigned.

This chapter presents empirical findings that necessitate a more differentiated investigation of PLE and points out limitations in their current assessment. Further, it advocates a more differentiated view on PLE and clearer use of the associated terminology, concepts, and instruments. Aiming to stimulate further research in this area, a tentative categorization of PLE is provided, and possible future research directions are indicated.

2. Psychotic-like experiences: they are probably not all the same

Research into subclinical psychosis is marked by a rather general view on psychotic-like experiences (PLE) and the interchangeable use of various instruments and terms with different underlying conceptualizations of psychosis [24, 25, 32, 34]. This section presents evidence necessitating a more differentiated view on PLE and points to pitfalls in their assessment that need to be considered when researching subclinical psychosis.

2.1. Some psychotic-like experiences could be less worrisome than others, but might some also be beneficial?

Some of the earliest evidence raising the question if different PLE might be variably associated with disadvantage and mental health comes from research using the Wisconsin Schizotypy Scales [40–42]. It was found across several studies that PLE relating to magical thinking (MT) (and perceptual aberrations) were negatively correlated with physical anhedonia, but not other scales measuring negative-like symptoms [28, 41, 43, 44]. Notably, the negative associations were detected in samples of college students and healthy adults while the correlation was close to zero in outpatient clinic clients and schizophrenics [40, 43]. However, analyses indicated a true incompatibility of magical ideation and physical anhedonia rather than sampling effects as a cause for this pattern [43]. It was suggested that people scoring high on both magical ideation and physical anhedonia are more likely to become hospitalized, which might cancel out the otherwise negative correlation in these populations. Whereas these findings still remain to be explained, it has been speculated that magical ideation might reduce physical anhedonia by conveying meaning to (sensory) experiences or that both are linked through a third factor, e.g., extraversion and emotional stability [28, 45]. However, room for interpretation is limited, as most of the aforementioned scales for PLE may contain several different constructs rather than one. For example, the Magical Ideation Scale (MIS), (see [41]) includes paranormal beliefs, superstitious beliefs, ideas of reference, and suspicious-paranoid thoughts [46]. Hence, it is not clear which of the contained constructs are ultimately responsible for the observed associations. Nonetheless, the results indicated that it might be important to differentiate between subtypes of PLE, as they might be variably associated with other psychological (risk) factors.

Less ambiguous evidence for differences in the psychopathological significance of PLE comes from more recent research using the Community Assessment of Psychic Experiences Questionnaire (CAPE), (see [47]). The CAPE was constructed to investigate the extended psychosis phenotype [15] and has become one of the most frequently used self-report instruments for PLE [34]. A few studies have investigated which categories underlie PLE in the CAPE and how they are related to factors indicating risk for transition to psychotic disorder, i.e. distress, depression, and impairment [48]. Using exploratory factor analyses, one study identified bizarre experiences (BE), persecutory ideas (PI), and magical thinking (MT) to underlie the CAPE positive dimension in a sample of non-psychotic help-seekers [31]. Interestingly, only BE and PI were found to be associated with distress, depression, and poor functioning while MT was not. Notably, reminiscent of the aforementioned studies implementing the MIS, the researchers also found that MT was not correlated with anhedonic depression, unless accompanied by distress. Further, MT even turned out to be a negative predictor of anhedonic depression when adjusted for BE and PI. The apparent lack of associations of MT with any maladaptive feature such as depression and poor functioning lead the researchers to suggest that MT might be benign. Similarly, in a community sample of high school students, four types of PLE were found, namely BE, perceptual abnormalities (PA), PI, and MT [30]. Again, only BE, PI, and PA but not MT were strongly associated with distress, depression, and poor functioning. It was thought that the lacking association of MT with indicators of disadvantage could be explained with the finding that two items referring to paranormal beliefs were more closely associated with age and cultural background than psychopathology

[30, 31]. Therefore, two corresponding items were dropped from the analyses in a subsequent study [29]. This time, PLE clustered into four classes, i.e. BE, PI, PA, and grandiosity while all subtypes were associated with one or more indicators of disadvantage. The authors speculated that PI and BE might lead to more evident symptoms than PA and GR, as they are more invasive experiences and more disruptive of the self-structure. Importantly, the studies showed that all forms of PLE were associated with disadvantage, once items specifically related to paranormal beliefs (but not grandiosity) were removed. At the same time, however, they indicated that PLE might be maladaptive in different ways and it was speculated that they may confer varying levels of risk for psychosis and other mental disorders [29].

The latter studies inspired a more extensive investigation of the specific relationships between different subtypes of PLE and "co-morbid" subclinical symptoms in healthy adults [28]. The study aimed at gaining first information about possible symptom-level mechanisms implicated in the emergence of mental disorders featuring psychotic symptoms and a meaningful categorization of PLE. Importantly, the researchers not only included experiences that are relevant regarding the specific extended psychosis phenotype (i.e., including positive-, negative-, and disorganized-like symptoms) but also those that are associated with the more recent notion of a transdiagnostic extended psychosis phenotype (i.e., also including affective symptoms). PLE were operationalized using the positive scales of the Schizotypal Personality Questionnaire (SPQ), (see [49]). Further extending the description of PLE, a novel questionnaire was included whose items were not derived from clinical symptom presentations (the revised Questionnaire for Assessing the Phenomenology of Exceptional Experiences (PAGE-R), see [50]) and that had just recently been introduced into psychosis research [44]. Whereas most subclinical symptoms were correlated, the researchers found unique associations between certain PLE and subclinical symptoms that were consistent across the numerous applied scales when co-occurring PLE were controlled for: paranoia-like experiences (suspiciousness) were uniquely associated with various scales measuring negative-like experiences. In contrast, different hallucination-like experiences (including dissociation) exclusively predicted different anxiety-related experiences while ideas of reference appeared to be specifically implicated with affective symptoms (anxiety and depression). Importantly, numerous negative associations between PLE and other subclinical difficulties were detected, namely between ideas of reference and physical anhedonia, magical thinking and constricted affect, PAGE-R odd beliefs (e.g., seeing meaning in coincidences) and depression, emotional instability, as well as unspecific symptoms (e.g., difficulties falling asleep). Notably, unlike suspiciousness and ideas of reference, magical thinking and PAGE-R odd beliefs did not positively predict any subclinical symptoms. While these results pointed to possible symptom-level interactions implicated in the development of psychosis spectrum disorders [37, 38], they also contributed to an empirically founded and much-needed categorization of PLE [30, 39]. Furthermore, the findings suggested that negative associations between PLE and other subclinical symptoms might be more extensive than previously thought and indicated that some delusion-like PLE *per se* might be associated with less psychological difficulties while being indicative of increased psychological burden at the same time (as indicated by their positive correlations with diverse psychological difficulties). Interestingly, there are complementary findings suggesting that some PLE might not only go along with less co-occurring subclinical symptoms but also with well-being. In a sample of university students, it was found that ideas of reference positively predicted subjective well-being, (e.g., standard of living, community-connectedness), when

adjusted for co-occurring PLE, negative- and disorganized-like symptoms [51]. Notably, this finding was in line with suggestions that ideas of reference (in contrast with paranoia) must not necessarily be burdensome [52, 53].

Odd beliefs as measured by the PAGE-R were prominently represented in the detected negative associations. Importantly, odd beliefs refer not to beliefs in a strict sense, but to experiences characterized by "seeing" patterns in noise (e.g., meaningful linking of separate events, correctly anticipating future events). Importantly, this sets odd beliefs apart from scales assessing e.g., magical thinking that often contain paranormal beliefs rather than experiences, which might be less relevant for the study of subclinical psychosis [54]. Further, in contrast to most studied forms of delusion-like experiences (e.g., suspiciousness), odd beliefs in healthy individuals were particularly enriching and positively-valenced experiences. Nonetheless, odd beliefs are conceptually similar to other delusion-like experiences and may be associated with indicators of psychosis proneness, such as biases in probabilistic reasoning and a tendency to jump to conclusions [55, 56], alterations in attributional styles [57, 58], differences in theory of mind [59], and magical ideation [60]. Importantly, experiences similar to odd beliefs have been suggested to reduce distress in perceptually ambiguous or stressful situations [61, 62] and to facilitate (perceived) control as well as to confer confidence and agency under lack of control [63]. Before this background, it was speculated that odd beliefs in healthy individuals might represent a psychologically stabilizing cognitive response to burdensome experiences [28]. Hence, despite their delusion-like quality, odd beliefs might paradoxically exert a positive effect on psychological well-being. Intriguingly, a new study investigating specificities between PLE and forms of childhood trauma found for the first time that odd beliefs in healthy adults were associated with stronger self-concept of own competences (SC), when adverse childhood experiences were held constant [64]. In contrast, paranoid-like experiences remained negatively associated with SC once adjusted for childhood adversities. SC is the fourth dimension of locus of control according to Rotter's social learning theory [65, 66] and refers to the self-perceived capability to act in new, difficult or ambiguous situations [67]. Notably, addressing SC might also strengthen self-esteem, which has been identified by individuals with schizophrenia to be the most important treatment target [68]. Moreover, strengthening SC in therapy might help to alleviate psychotic symptoms SC [66]. Due to their positive association with SC the question was raised if odd beliefs might contribute to resilience toward mental illness, despite conferring an inaccurate perception of the world [64]. Further, as an individual's inability to give meaning to an adverse experience is important in determining its long-term effect [69], the tendency to have positive delusion-like experiences might perhaps be exploited for therapeutic purposes.

The presented findings suggest that despite their tendency to co-occur, PLE may be variously implicated in mental illness and mental health. These results are in line with earlier suggestions that a co-occurrence of characteristics seen in pathological and non-pathological conditions must not necessarily mean that they are indicators of psychopathology [70]. More specifically, some characteristics could simply be by-products of the psychosis dimension but not be clinically relevant *per se*. However, it is cautioned to jump to premature conclusions and these symptom-level insights require further investigation, as there are several limitations to be considered. For example, all studies applied cross-sectional study designs,

preventing any causal conclusions to be drawn. Further, the samples were not representative of the non-clinical part of the general population (e.g., consisting of high school students), which puts the representativeness of the results into question. Further, it is not clear if e.g., odd beliefs are similarly associated with indicators of well-being and disadvantage across the psychosis continuum and across other instruments assessing PLE. It might well be that the tendency to have odd beliefs might worsen outcomes in some cases by acting as an accelerant among other PLE. Nonetheless, the reported results might serve as starting points for the creation of theoretical models and longitudinal investigations into the interplay of subclinical symptoms leading to the exacerbation of subclinical symptoms or the maintenance of mental health, respectively [28].

2.2. The heterogeneous conceptualization and assessment of psychotic-like experiences

Self-report instruments for psychotic-like experiences (PLE) are a central source of information in epidemiological research on subclinical psychosis. However, it is mostly not regarded that these instruments are tied to certain conceptualizations of (subclinical) psychosis and originally served a specific purpose [24, 25, 34]. Notably, many instruments used to assess PLE stem from schizotypy research and are fundamentally influenced by the underlying schizotypy model and the assumed link between schizotypal personality features and schizophrenia. For example, one of the earliest and most frequently used schizotypy scales is the Magical Ideation Scale (MIS, see [41]) [34]. It bases on Meehl's [11] quasi-dimensional schizotypy model and as a screening tool for psychosis proneness (and vulnerability to schizophrenia in particular) its scope is restricted to illness and schizophrenia risk [25]. Accordingly, the MIS conceptualizes "psychotic-like symptoms" as attenuated or milder forms of Schneiderian first-rank symptoms of schizophrenia that manifest in the acceptance of unconventional forms of causality. Hence, the items in the MIS might have a distinct bias toward schizophrenia-related PLE. Furthermore, the selection of items might not be reflective of different forms of PLE in the general population, as items with extremely high and low difficulties were chosen to attain normality of the scale score. In comparison, the popular Schizotypal Personality Questionnaire (SPQ, see [49]) was constructed to screen for schizotypal personality *disorder* according to DSM-III-R criteria and not to assess schizotypal personality organization [25]. Hence, its categorization of PLE into paranormal beliefs/magical thinking, ideas of reference, suspiciousness, and unusual perceptual experiences is entirely derived from a theoretical diagnostic profile. Notably, item-level factor analyses have repeatedly produced incongruent categorizations of the experiences [71]. One of the most widely used self-report instrument to assess PLE not founded on schizotypy research is the Community Assessment of Psychic Experiences Questionnaire (CAPE, see [47]). The CAPE was created against the theoretical background of the extended subclinical psychosis phenotype [15] and is an attractive tool for clinical and research use, as it is comprehensive and measures not only the frequency of PLE but also distress associated with them [48]. In contrast to questionnaires assessing attenuated versions of clinical symptoms, the CAPE inquires symptoms seen in patients with psychotic disorders (albeit toned down by adding "as if" to the questions). Hence, existing instruments assessing PLE may differ regarding the constructs they cover, the qualitative expression of

PLE ("symptoms" vs. attenuated versions thereof), as well as their rating format. Importantly, choosing one instrument over the other may profoundly affect the ensuing results [25]. For example, although similar sex differences have been found in non-clinical samples as in schizophrenic patients [72, 73], the non-detection of sex differences in a community sample has led researchers to conclude that they only present themselves in full-blown psychosis but not in sub-threshold states [74]. Interestingly, using a sample of healthy individuals, a study could replicate the detection and non-detection of sex differences in the latter studies, depending on the scales for PLE that were being analyzed [44]. It was suggested that scales including fewer and more severe or difficult items (e.g., someone has power over your thoughts [75]) might not be able to detect sex differences in healthy individuals, whereas scales inquiring more and attenuated experiences might do so (e.g., I have sometimes felt that strangers were reading my mind [41]). Importantly, different populations across the psychosis continuum ranging from non-disordered schizotypes, to prodromal patients, to patients with a schizotypal personality disorder, and to psychotic patients might all experience positive(-like) symptoms such as odd beliefs. However, these groups might differ regarding the relative prevalence of increasingly severe forms of experiences ranging from magical thinking to full-blown delusions [24]. Hence, depending on the sample, the research question, as well as the theoretical model of psychosis, some surveys might be more adequate to be used than others.

In addition to the mostly non-transparent choice of instruments [34] and their heterogeneous designs, unclear content validity of scales may additionally entail mixed results across studies and contribute to a blurred picture of psychosis [25]. Studies investigating symptom-level associations have applied multiple regression modeling to account for overlapping variance between different PLE scales in order to gain insight into their specific psychopathological significance [29, 30]. Whereas these results are meaningfully interpretable, the reliability of the interpretations ultimately depends on the choice of instruments and the (content) validity of the applied scales. Notably, scales measuring certain PLE may often conflate different constructs impeding a reliable interpretation of results, as exemplified by the MIS [24, 46]. Additionally, the emergence of ever-new concepts and terms as well as the interchangeable use of different terms for PLE with overlapping but not necessarily identical meanings has resulted in a "near Babylonian speech confusion" that hinders clarity in the nomenclature, blurs sources of inconsistencies between findings and constricts their interpretation [24, 32, 36]. Hence, to successfully elucidate the complex structure of psychosis, researchers should have detailed knowledge of existing constructs and be familiar with the limitations of their operationalizations.

3. Future research directions

3.1. Toward differentiated and empirically founded categorizations of PLE

A generally agreed upon and empirically substantiated categorization of PLE would be a helpful tool for clinicians as well as researchers. For example, it might help to provide more accurate screening procedures, predict risk for certain disorders featuring psychotic

symptoms, facilitate more adequate treatment, and counteract stigmatization [29]. Further, it might also help to integrate findings across studies implementing different psychometric instruments and conceptualizations of PLE.

More recently, similar categorizations of three basic types of PLE have been proposed, suggesting that: (1) some indicate a specific vulnerability toward psychosis while (2) others might be non-specific and also be implicated in the development of affective disorders, and (3) some might not be associated with any clinical disorder at all [30, 39]. It has been speculated that some PLE such as paranormal beliefs are benign and might explain why they are mostly not associated with mental illness [32]. In contrast, it has been suggested that PLE specifically associated with distress and poor functioning might be more likely to indicate vulnerability to psychotic disorders [30]. However, it yet remains to be clarified to which category certain PLE should be assigned [32].

Recently, to shed light onto possible categorizations of PLE, a study investigated unique associations of certain PLE with subclinical symptoms relevant for psychosis spectrum disorders [76], i.e. negative-like symptoms, affective symptoms (anxiety, depression), and other psychological difficulties in a sample of healthy adults [28]. Referring to the model introduced above, following categorizations are suggested: Paranoid-like experiences in healthy individuals might specifically indicate vulnerability to psychosis (category 1), as they were the only significant predictor of schizophrenia-like negative symptoms (physical anhedonia, no close friends, and constricted affect) but were not associated with any type of affective symptoms. In contrast, hallucination-like experiences were uniquely associated with experiences from the anxiety spectrum (e.g., phobic anxiety, obsessive-compulsive symptoms) but not with negative-like symptoms. Further, ideas of reference were a positive predictor of anxiety symptoms and depressive symptoms. Therefore, the latter PLE might belong to the category of non-specific PLE, hence, predisposing toward affective and psychosis spectrum disorders (category 2). Lastly, paranormal beliefs and PAGE-R odd beliefs did not positively predict any of the subclinical difficulties, which might reflect that they are not associated with any clinical disorder at all (category 3). The latter categorization was underlined by the observation that paranormal beliefs and odd beliefs were negatively associated with various psychological difficulties. Notably, these findings raise the question if more categories for PLE might be needed that account for associations of PLE with well-being and stronger resilience [51, 64] and lower load of negative-like symptoms. However, it remains to be determined if these findings can be accommodated within a framework encompassing three classes of PLE.

The tentative categorization of PLE presented above requires more data and replications in samples representative of the healthy general population. Ultimately, longitudinal studies are needed to determine if specific PLE predict certain psychosis spectrum disorders more likely than other diagnoses and how they are implicated in the maintenance of mental health. Notably, other symptom factors that are relevant for determining the psychopathological significance of PLE were not regarded. Amongst other factors, these include intrusiveness, distress, and frequency of experiences as well as the associated development of functional impairment [47]. Furthermore, similar analyses are needed including other subclinical difficulties that might be part of the psychosis phenotype [16], such as disorganized symptoms and mania [51].

3.2. Toward a comprehensive assessment of psychotic-like experiences

A comprehensive and phenomenological differentiated description of psychotic-like experiences (PLE) might be the prerequisite for attaining reliable classifications of PLE and new insights regarding their individual roles in the exacerbation of subclinical symptoms and the maintenance of mental health [34, 35].

The clinical perception that psychosis presents itself as "cases" in need of treatment has profoundly shaped the way the psychosis phenotype is conceptualized in the current classification systems [15]. Consequently, this has also influenced the way PLE are operationalized across various psychometric instruments (e.g., be it as psychotic "symptoms" or their attenuated equivalents) [25]. However, there is evidence indicating that the phenomenological quality of psychotic experiences may differ between healthy and clinical individuals [28, 77]. Further, it might be argued that there are experiences belonging to the PLE spectrum that may not have been sufficiently regarded in research. In this context, the novel PAGE-R questionnaire assessing "exceptional experiences" is worth mentioning, as its items are not derived from clinical symptoms but are based on reports from individuals from the general population seeking advice due to their experiences [50]. Indeed, a recent study suggested that EE in healthy individuals can be meaningfully integrated into positive-like symptomatology while potentially expanding the existing description of PLE [44]. Importantly, the PAGE-R might capture more subtle PLE that are often not considered in psychosis research, such as sleep-related perceptions [4, 20] or enriching delusion-like experiences [45, 78]. At the same time, it focuses on experiences and does not include beliefs in the paranormal that might be less relevant for the study of subclinical psychosis [31, 54]. Interestingly, factor analyses suggested the presence of three types of experiences that paralleled the basic structure of the CAPE positive dimension [48], encompassing odd beliefs (*cf*., delusional ideations), dissociative anomalous perceptions (*cf*., bizarre experiences) and hallucinatory anomalous perceptions (*cf*., perceptual anomalies). Importantly, this finding indicated that PLE basing on clinical observations and PLE basing on reports of unusual experiences by the general population might represent overlapping and complementary facets of positive psychotic symptomatology. Indeed, current research suggests that the PAGE-R might provide a more differentiated picture of PLE and new information on their associations with indicators of disadvantage and well-being as well as etiological risk factors [28, 64].

However, the PAGE-R was originally not created to study PLE, but a construct referred to as "exceptional experiences" (EE, see [50]). More specifically, its representativeness for PLE in healthy states might be questioned, as individuals reporting EE are characterized by diverse psychological problems [79] and the selection and design of items are substantially influenced by the underlying concept of EE. However, the PAGE-R is currently under further development (Fach, pers. comm.). Nonetheless, its use in psychosis research might be a first step in the right direction regarding a more comprehensive assessment of PLE, as the PAGE-R is not restricted to experiences derived from clinical symptoms and inquires comfort that the experiences may confer and the context in which they occurred (e.g., during meditation). Both might be important but mostly neglected factors for evaluating the clinical relevance of certain PLE. However, pursuing this "non-clinical" approach, psychosis research might tap into supposed indicators of subclinical psychopathology that might as well measure healthy and socially desired abilities.

For example, the PAGE-R item referring to perceiving thoughts and feelings of others might not only capture an attenuated version of a Schneiderian first-rank symptom of schizophrenia (thought transmission) but just as well an individual's ability to empathize with others.

4. Conclusions

Psychosis research has tended not to differentiate between subtypes of psychotic-like experiences (PLE) and to hold a predominantly deficit-oriented perspective on them. However, studies indicate that PLE might fundamentally differ regarding their individual psychopathological significance and risk for psychosis spectrum disorders. These results require further (longitudinal) investigations aiming at the creation of an empirically founded and accurate categorization of PLE. Importantly, new instruments featuring PLE not derived from clinical symptoms including positive valence ratings might contribute to a more accurate and comprehensive description of subclinical psychosis. Ultimately, these steps might help to advance psychosis research in explaining why some individuals with PLE become ill while others do not and could contribute to more precise risk screenings and more effective therapeutic strategies in the long run.

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Chapter 2

From Vulnerability to Resilience: A Coping Related Approach to Psychosis

Oya Mortan Sevi

Additional information is available at the end of the chapter

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Abstract

Many of us may have to face stressful events during life. How we are affected by these events depends on our vulnerability limit and our coping mechanisms. Both vulnerability-stress models and cognitive-behavioral theories of psychosis consider biological, psychological, and social factors together as determinants of our vulnerability limit. This point of view enables us to handle the psychotic disorders as a continuity of normality. In addition, coping mechanisms have an important role in the maintenance and/or recovery of psychotic symptoms. Therefore, the objective of this chapter is to summarize coping-related explanations that facilitate understanding the symptomatology of psychosis and defining the adaptive ways to challenge it.

Keywords: psychosis, stress, vulnerability, coping, cognitive-behavioral therapy

1. Introduction

In the beginning, the common idea was that the psychosis is completely different from the other disorders. But this idea has only increased the stigmatization and labeling. As a result, severe mental illnesses like psychosis and schizophrenia were categorized as "disorders which are untreatable with psychological methods." Today, models suggesting the existence of a continuity between normal beliefs, anomalous experiences, and psychotic symptoms are accepted [1]. It is well known that healthy people may also experience mild psychotic symptoms like delusions of being watched or talked about, or auditory and visual hallucinations as a result of stress, drugs, trauma, and sleep deprivation [2, 3]. These kinds of thoughts and perceptions are called as psychotic-like experiences, to the extent that they do not necessitate

getting any support or treatment [3–5]. In community, every one person of four reports at least one psychotic-like experience [3]. The rate of psychotic experiences that cause seeking treatment ranges from 3 to 8% [2, 3, 6].

The persons who are confronted with anomalous experiences and do not need to seek help are the ones who generally do not overevaluate these kinds of experiences. On the other hand, the persons who develop psychosis in the end are more anxious about and more preoccupied with their beliefs and experiences. The person searches for a meaning of this anomalous experiences and the coping process with severe anxiety lead delusions and voices [7, 8]. In addition, maladaptive-coping strategies such as avoidance or safety behaviors play a particularly important role in the maintenance of the psychotic symptoms.

In this chapter, we initially review the vulnerability-stress models and the other cognitive-behavioral explanations to psychosis. These explanations will be stated as "coping-related explanations" in the text, because they often emphasize the coping process with the anomalous experience or the interactions between internal (e.g., deprivation in self-monitoring process) and external (e.g., environment, trauma) factors. With the help of these explanations, we try to understand the development of psychotic symptoms as a continuity of normality. Then, we handle the role of maladaptive-coping strategies in the maintenance of psychotic experiences. Patients' relatives' coping strategies will also be taken into consideration due to their role in the maintenance of psychosis. We finally address the importance of developing and enhancing adaptive-coping strategies and changing irrational thinking for challenging psychosis. We also emphasize the role of social support in every stage of psychosis.

2. From vulnerability to resilience

We can conceptualize both vulnerability and resilience terms with the help of similar explanations or factors. In other words, factors that enhance or reduce resilience are similar. Resilience means the ability to protect the mental health. The sources of resilience may be psychological (personal traits, interpretation of events, etc.), biological (brain structure, genetic factors), or environmental (family interactions, community factors, etc.). Thanks to these adequate sources, the individual can cope with stressful events. On the other hand, lack of these adequate sources makes the person more vulnerable in the struggle of life. In addition, the sources of resilience can be weakened because of several factors (stressful life events, deprivation in brain structure, misinterpretations of events, etc.); thus, even a resilient person may also be more vulnerable and develop a mental illness. The terms of vulnerability and resilience should be thought in a continuum, and thus it is both possible to proceed from vulnerability to resilience and regress from resilience to vulnerability.

2.1. Coping-related explanations for psychosis

Coping-related explanations for psychosis include vulnerability-stress model of psychosis and several cognitive-behavioral explanations. These explanations often emphasize the

similarities between the normal, anomalous, and the psychotic experiences. With the aim of evaluating the psychotic symptoms in a continuum, we separately look through these explanations.

2.1.1. Vulnerability-stress model of psychosis

Vulnerability-stress model integrates the overall explanations—biological, psychological, and social factors—to explain the structure of psychosis [1, 9–14]. The vulnerability to severe illnesses can arise due to genetic predisposition, birth trauma, brain injury, viruses, and early childhood traumas like physical and interpersonal deprivations [1]. It can be said that a person who has been influenced by one or more of these factors is more vulnerable to develop a mental illness than the others who do not have such a past.

But vulnerability only defines the possibility of developing a psychiatric illness while facing stress. We all have different psychological structure and social environment, and accordingly, the stress level that we each can endure is different. Some of us have significant heritability for the psychotic disorders and the others have not [15]. For instance, the family history of psychosis can indicate the high vulnerability. The more vulnerable person is, the less stress is required for the occurrence of psychosis. According to Zubin and Spring's concept of vulnerability-stress diathesis, so long as the stress stays below the threshold of vulnerability, the individual can cope with events, but whether the stress surpasses the limit, he/she can develop a psychotic episode [16].

2.1.2. Beck's theory for delusions

The use of cognitive-behavioral theory (CBT) for psychosis is originated from Beck's theory of emotional disorders [15, 17]. Nearly 60 years ago, Beck has started to investigate the delusional system of a paranoid patient who believed that he was being watched by the members of a military unit who were working on behalf of the FBI. At the end of a 30-session treatment process, the patient recognized that his delusions were related to his own beliefs (e.g., "I am responsible of my daddy's unfavorable behaviors" and "I'm supposed to be punished due to my weaknesses") and impressed guilty in a schematic level [14, 17]. Thus, cognitive therapy was first shown as helpful for the treatment of psychotic patients [17–19].

Then, this success was supported by another case study [17]. Hole et al. [20] defined four dimensions for measuring delusions as a result of their hour-long interviews with delusional inpatients: *conviction, accommodation* (the degree to which a delusion could be modified by external events), *pervasiveness* (the percentage of the day spent ruminating about delusions), and *encapsulation* (the extent to which a decrease in pervasiveness could occur without any decrease of conviction). They decided that delusions may function as the other beliefs and may differ from them only quantitatively regarding how they can be influenced by external events [16, 20].

In his subsequent studies, Beck stated that the psychotic patients (particularly paranoids) concentrate especially on monitoring external—including social—sources on the purpose of

recognizing the potential danger. Because of being alert all the time for the potential danger, they misinterpret threat when there is none, and they suspect hostiles when there are none. This situation can be described as *externalizing bias*, the attribution of difficulties or internal events to external stimulus. They also have *internal bias*; this is the conviction that the attitudes and the feelings of others toward them cause the events. He also mentioned the *cognitive distortions* of schizophrenia. He emphasized that self-referential or persecutory content of their thoughts often cause anxiety, and sometimes sadness or depression. These distortions include *catastrophizing*, *thinking out of context* (the component of selective abstraction, overgeneralization, dichotomous thinking, jumping into conclusions), *inadequate cognitive processing*, and *categorical thinking* [17].

Beck's cognitive model suggests that genetic and experiential factors interact with *distorted internal representations* (patients' negative appraisal such as "me vs. them") which comprise *the physical and cognitive vulnerability* to psychosis. These representations are important factors which make patient vulnerable to a mental illness. Under acute and prolonged stress, these negative representations start to affect the information-process system and inhibit the patients' ability of reality testing [21].

2.1.3. The neurocognitive explanations of psychosis

According to Frith Model that explains the cognitive component of schizophrenia, there is *a deprivation in main self-monitoring process* of schizophrenic patients. Thus, they cannot differentiate the situation which results from their own actions and the external ones, so they attribute the internals to the external ones [1, 16, 21–25]. There is also *a lack of awareness of intended actions* in schizophrenic patients; this impairment might affect the sense of will and they can become isolated from their thoughts and actions [22].

Auditory hallucinations of schizophrenia are accepted to be caused by their own inner speech [22]. When the brains of people who reported hearing voices were scanned, many of the same areas of the brain were found to be active during both auditory hallucinations and inner speech [24, 26]. The psychotic patients also reported someone speaking while they were speaking. So, they tend to attribute their own voice to another person [22].

These processes would result in the attribution of internal voices or thoughts to external voices and one's own movement and speech to external causes. These misinterpretations are concluded with auditory hallucinations or thought blocking, and passivity or delusion of control, respectively [1, 16, 21–25].

2.1.4. A heuristic model

In a heuristic model of the determinants of positive psychotic symptoms, a psychotic experience is suggested as a response to a combination of internal (*inherent biological*: genetic heritability, *acquired biological*: birth trauma, *inherent psychological*: cognitive deficits, *acquired psychological*: cognitive biases, schemata) and external factors (stressors). It is stated that these factors operate via a mediating pathway (e.g., a dysfunction in the arousal system and its regulation) [27]. Consequently, the psychotic experience or persistent positive psychotic

symptoms (hallucinations/delusions) can occur. The experience of hallucinations and delusions has short-term and long-term results. Short-term results may be on emotional (anxiety, fear, anger), behavioral (belief-parallel behavior, testing the interpretations), cognitive (misinterpretation, attention to perceived threat, selective attribution), or coping basis, whereas long-term results include social withdrawal and isolation, loneliness, decreasing opportunities for reward, and social skill deficits. These results also cause maintenance of the illness [28].

2.1.5. Morrison's explanations for psychosis

The psychosis model of Morrison resembles Clark's cognitive model for panic. According to this model, the auditory hallucinations are intrusive thoughts which are externally attributed. These intrusive thoughts can be accepted as normal, but the person especially focuses his attention on these intrusions and the distress occurs when the person misunderstands and misinterprets these thoughts like "dangerous." So, this is not the intrusion, but *the interpretation* which causes distress and disability [29, 30].

The interpretation is the searching for a meaning of this experience. Its meaning depends on the interpretations of the person who heard voices whether he says, "devil is talking to me" or "this is a strange sensation, I think I am too tired" [16, 31]. The first interpretation may increase the person's distress, anxiety level, and lead the other negative emotional consequences. The person tries to find a way to cope with symptoms through maladaptive responses such as avoidance. These emotional consequences and maladaptive responses cause maintaining the symptoms [29, 30].

In fact, these are all internal experiences. Furthermore, the cycle between intrusions, interpretations of intrusions as voices, mood, body sensations, and behaviors are parallel with the idea that internal experiences are attributed to the external sources [29, 32, 33].

2.1.6. The model of Garety and colleagues for psychosis

This model involves the combination of important factors in developing and maintaining the psychosis. The principal factors are vulnerability, stress, social environment, emotional changes, cognitive dysfunction, and appraisal of the experience as external.

The authors emphasize the continuity of psychotic and nonpsychotic experiences. They suggest that *bio-psycho-social vulnerability* (it also includes cognitive and emotional vulnerability) can be triggered by the effects of the *social environment*, including stress and trauma.

They state that the interaction of vulnerability and social environment may cause some emotional changes. *Emotional changes* may include depression, anxiety, or low self-esteem.

They consider *cognitive dysfunction* very important because it can lead to anomalous experiences. Emotional changes and cognitive dysfunctions including reasoning biases lead the person to evaluate the experience as external.

The appraisal of this experience as external is influenced by reasoning and attributional biases, dysfunctional schemas of self and world, isolation, and adverse environments.

Because of this cycle, positive symptoms may occur.

The symptoms are maintained by *cognitive processes* including reasoning and attributions, dysfunctional schemas, *emotional processes,* and *appraisal of psychosis* [34, 35].

2.1.7. The classification of Kingdon and Turkington for psychosis

Kingdon and Turkington classify psychosis as a **gradual** or an **acute onset**. They categorize the gradual onset as *sensitivity psychosis* (the patient has predominant negative symptoms and the onset is adolescence) and *trauma-related psychosis* (the patient has a trauma history and the symptoms are very distressing and the content of hallucinations is about abuse). If it is acute onset, then it could be two possibilities: *anxiety psychosis* (as a response of a distressing life event, the patient becomes socially isolated, and he/she attributes their distress to an irrelevant situation actually related to their delusional system with or without hallucinations) or *drug-related psychosis* (the first attack begins with drug use and the following attacks have persisting psychotic symptoms which are the same nature and content of the initial episode). It is important to understand the type of psychosis to establish the engagement with the patient and to use the normalization rationale to explain the symptoms [15].

2.1.8. The social rank theory of auditory hallucinations

The social rank theory was generally used for depression and anxiety disorders but considering the parallel mechanisms within the scope of "attack the weaker and submit to the stronger," it was finally modified for hallucinations. Different from other cognitive theories, this theory considers *the patient's relationship with voices as well as with his significant others.* This approach uses the ABC framework. ABC model for auditory hallucinations of psychosis can be summarized as follows:

A: hallucinations (activating event),

B: beliefs including automatic thoughts, assumptions, and images about the activating event (this might not be the direct interpretation of the content of hallucination),

C: emotional and behavioral consequences (to resist, to cooperate, to attach, and to remain unresponsive).

Activating events can be categorized into three types including symptoms and internal events (e.g., hallucinations), descriptions of interactions with significant others like parents or siblings, and significant life events (diagnosis, hospitalization, and social stigma). According to this theory, the hallucinations demonstrate *a core self-perception of low social rank*, so the person perceives that he/she is in control of his/her parents or peers and community. The emotional consequences of these evaluations can be shame, humiliation, and depression. In this context, the distress and behavior are related to patients' perceived relationship with voices, their appraisal of voices power and omnipotence, as a result they evaluate the voice as benevolent or malevolent [33, 36–38].

The explanations mentioned earlier would help to understand the occurrence of psychotic episodes. The following passages will also address the maintenance of these psychotic symptoms.

2.2. The function of coping strategies for psychosis

Coping is a personal resource that an individual already possess and uses while trying to deal with an unpleasant stimulus. It comprises some mechanisms related to behavioral actions, as well as cognitive processes. As mentioned earlier, our vulnerability limit determines the stress level that we can handle. So, we can say that coping has a very close relation with vulnerability and resilience terms. Resilience protects the individual from the effects of stress, thus it is functional and adaptive. But coping responses to stress may be adaptive or maladaptive. In fact, psychotic patients often use maladaptive-coping strategies. Cognitive theories also emphasize the role of these maladaptive strategies in the maintenance of psychosis [39]. Due to their important effects, this part includes the coping strategies that the psychotic patients have already used.

In addition, a high expressed emotion term is accepted as an important factor that causes maintenance of the psychosis. The coping strategies of patients' relatives determine the expressed emotion level and style. Thus, this topic is also addressed in this part.

2.2.1. The psychotic patients' own coping strategies

Three types of psychological reaction to psychosis are suggested: *denial and lack of awareness, passive acceptance of the role of patient, acceptance of psychotic illness, and compliance to the treatment*. Neither the first one nor the second are functional because they both inhibit the treatment. The person who does not have awareness refuses the help because he/she does not believe that he/she has an illness and may gradually become more disorganized and dangerous to himself/herself and others. The second one, who passively accepts the sick role, probably abandons to try and ever loses his/her self-esteem. He/she can also develop other clinical problems, depression, and suicidal ideas. Inversely, the last one believes that he/she can learn to cope with his/her symptoms, takes medication, and is motivated to psychotherapy and can adopt the sick role when necessary [1].

According to patients' description of coping strategies with auditory hallucinations, three phases were described: startling phase in which the patients felt fear, anxiety, and desire to escape in the beginning, then investigated the meaning of voices, and do not try to escape anymore; organization phase in which many patients try to communicate with the voices; and the stabilization phase in which they start to accept the voices as part of themselves [40].

Researches about coping and psychosis show that patients generally use maladaptive-coping strategies, for example, excessive avoidance and safety behavior [41, 42]. Patients with delusions, especially persecutory delusions, often use safety behaviors to decrease the risk of danger. For this reason, they can use a number of rituals such as making hand movement or

praying to avoid the effect of evil spirits or lock themselves in the house and hide under the bed to escape from the Mafia. These safety behaviors play an important role in the maintenance of the delusions [18].

Some studies indicate that the patients' own method to cope with psychotic symptoms include both adaptive and maladaptive strategies. These strategies usually have cognitive, behavioral, physical, social, or medical components.

The results of the investigation of Falloon and Talbot [43] revealed three group strategies used to cope with auditory hallucinations: **behavior change** (e.g., speaking with people), **efforts to lower psychological arousal** (e.g., relaxation, listening to music to reduce symptoms), and **cognitive-coping methods** (e.g., listening attentively to the voices, accepting their guidance to reduce the distress, or ignoring them). They did not find any differences between females' and males' coping behaviors [15, 43].

Carr [44] assessed 200 patients and grouped 310 responses like Falloon and Talbot's study [43]. Five coping subgroups were determined. Eighty-three percent of patients used **behavior control**, 38% of them used as these coping behaviors for delusions, and 43% for hallucinations. Behavior control included *distraction involving passive diversion* such as listening to music, watching TV, or *active diversion* like writing, reading, playing a musical instrument. Using an auditory input through headphones was also found to be effective to cope with hallucinations [45]. Other types of behavior control were *physical change* involving body movement (passively; e.g., relaxation or actively; e.g., walking, swimming), *indulgence* (e.g., eating, drinking, and smoking), and *nonspecific strategies* ("I will try to do something different"). The second important subgroup was **socialization** via talking to family or friends, but social withdrawal and avoidance were also reported. Tarrier has also found and reported that these avoidant behaviors were used as a conscious-coping method [46]. **Cognitive control** was the third one, and it has its own three subgroups including *suppression of unwanted thoughts and perceptions* (I ignore the delusions, I try not to think about the voices), *shifted attention* (redirecting the attention to the neutral ideas), and *problem solving*. **Medical care** (using/changing medication, going to hospital, visiting a mental health specialist) and **symptomatic behaviors** (telling the voices to stop talking, shouting them to leave him/her alone, behaving aggressively) as the remaining subgroups were the rarely used coping strategies. The patients with delusion did not prefer passive coping strategies; they preferred to use active ones, such as problem solving [16, 44].

Cohen and Berk [47] evaluated the coping styles of 86 patients to determine which strategies were used for which symptoms. They found that patients used "*fighting back*" and "*medical strategies"* to cope with psychotic symptoms and "*prayer*" for schizophrenic thoughts [47].

Miller and colleagues [48] stated that 52% of patients that they interviewed reported positive effect (*relaxing, companionship, financial*—for example, income—*protective, self-concept*—for example, feeling attractive—*reactions of others*—for example, people are nicer—*performance*—the need to hear voices to maintain self-care, *relationships*—the need to hear voices to be close to people, *sexual*—increase in desire), whereas 94% of them commented adverse effect (*financial*—incapacity to work, *emotional distress, performance*—impairment in functioning, *reactions of others*—for example, the stigmatization, *feeling endangered or*

threatened, relationships, self-concept—feeling ugly, *loneliness, sexual*—decrease in desire) of auditory hallucinations. They also suggested that many of the patients that they investigated believed the voices that they heard had both adaptive and maladaptive functions; however, they would prefer not to hear voices [16, 48].

A more recent study which aimed to determine the effect of the patients' own coping strategies on psychotic symptoms suggested that *distractive coping technique* including relaxation, watching TV, conversation with others, listening to music, listening to the radio, body movement, hobbies, and thinking of other things were evaluated as passive-coping technique and the *counteraction strategies* including echoing voices, retorting or dissuading the voices, falling asleep, posture change, and making noises were active-coping strategies. They found that the patients did not prefer using distraction-coping strategies against hallucinations with delusional features [49].

Nelson and colleagues [50] examined the effect of earplugs use, subvocal counting (like 1,2,3… 1,2,3), and listening to music through a portable cassette on persistent auditory hallucination. They found that the most effective technique was subvocal counting; following this method, the patients mostly used earplugs and listening to music, respectively. The effect of these methods especially was shifting attention and reducing anxiety [50].

Ozcan and colleagues [51] investigated the coping behaviors of patients with schizophrenia and they found that most of the patients were using at least one method. The methods can be categorized as religious activities (85%), cognitive controlling (20%), changing the dose of neuroleptic drug or changing the drug itself (20%), enhancing social activities (18%), symptomatic behaviors (10%) and listening to radio, watching TV, walking around, and drug abuse (tea, smoking, alcohol).

2.2.2. The coping strategies of patient's relatives

The relatives' coping strategies with psychosis are directly related to "expressed emotion." Expressed emotion is a resistant multidimensional measure of family emotional atmospheric, through which relatives exhibit critical, hostile, and emotionally overinvolved attitudes toward a family member with mental illness [52]. Expressed emotion of relatives is especially important in the maintenance of psychosis.

There are few studies in this field, but these studies usually emphasize the relation between perceived stress, coping, and expressed emotion. A recent study showed that the relatives of inpatients with first episode psychosis experienced high levels of perceived stress, poor social support, and expressed emotion in moderate to severe levels. The relatives' perceived stress significantly predicted their expressed emotion [53].

In a study that aimed to analyze the mechanisms underlying the low expressed emotion of psychotic patients' relatives, four core themes were revealed: witnessing the distress (they spent time worrying about whether their family member would commit suicide or do something to harm themselves), empathy through acceptance and understanding (they viewed the psychosis as something that could not be prevented, they tried to understand the cause, normalized the illness, and had some idea of what was important in recovery, commented

on how the family member may have been feeling, suggesting that they were able to recognize and describe the person's emotional state), a broad range of coping strategies to reduce distress (e.g., asking for help from someone, using humor, taking time out away from stressful situations, distraction by carrying on with work and their normal routine), and realistic optimism for the future (they believe that illness would always be part of their family member's life, but they can modify their expectations from life) [54]. Another study suggested that coping through seeking emotional support, the use of religion/spirituality, active coping, acceptance, and positive reframing were associated with less distress, while coping through self-blame was associated with higher distress scores [55].

The information level of relatives about psychosis determined their cognitive view to the illness. These two factors were found to be related to stress level, expressed emotion, and patients' symptom severity. Beliefs about symptoms that "the major attributes of illness representation are oriented around" are one of the important factors of Leventhal's illness perception model by which to understand the process and outcome of distress in the relatives of patients with schizophrenia [56]. The other factors are chronicity or recurrence of the condition (time line and cyclical time line), consequences, personal control, treatment control, illness coherence, causes of the condition, and patients' emotional response to their condition [57, 58].

2.3. Challenging psychosis: developing and enhancing adaptive strategies

In order to establish a balance between vulnerability and resilience, we are able to help the patient to manage his symptoms by means of enhanced medical and psychological treatments. Enhanced coping strategies enable the patient to adaptively cope with distress and to reduce anxiety and stress level. This process can help reducing the severity of hallucinations and delusions. Patients can learn to modify their own coping strategies, or to use adaptive ones. Therefore, the first part includes adaptive-coping strategies used in the treatment of psychosis.

The patients may understand and try to improve their symptomatology with the help of cognitive conceptualization. Irrational thinking and maladaptive schemas should be handled with a collaborative approach. Stress-vulnerability logic may also be helpful to educate the patient about this conceptualization. In the second part described subsequently, these strategies are summarized.

Social support is also an important factor for psychosis in terms of its relation with coping. In the third part, the role of social support in the development and maintenance of psychosis is considered.

2.3.1. Learning to use adaptive-coping strategies for challenging psychosis

Following the success of Beck, clinicians have developed and used individual or group-based CBT programs for psychosis [1, 16, 17, 25, 26, 34, 59–63]. These programs generally included coping strategies because patients already have their own methods to reduce the distress caused by psychotic symptoms, so they can easily learn to enhance adaptive-coping mechanisms or to develop new ones.

According to CBT, hallucinations are accepted to be very similar to the symptoms of OCD. On the contrary of OCD, in hallucinations, the thoughts, images, and ideas are not attributed to the people's own mind and are attributed to the external sources. The themes are similar: violence, control, religion, and sexuality. Therefore, the strategies used for anxiety disorders are also suggested for targeting hallucinations: distraction, focusing, and anxiety reduction [39].

Distraction aims at helping patients to shift their attention to another stimulus or activity while hearing voices, in order to diminish the effect of hallucinations on the patients. It includes some strategies such as using headphone music and attentional focusing.

Focusing aims to reduce the frequency of voices and distress by means of close monitoring of experiences, listening carefully, and leading the patient toward a change in their awareness of hallucinatory experience. Unlike the attention distraction technique, the focusing technique necessitates patients to focus more on the source, nature, and content of voices for the patients to realize that the voices are not coming from the environment and can be controlled. Patients are encouraged to perform other strategies, such as arguing with or limiting the voices and changing the voice tones to funny tones.

Anxiety reduction is used in strategies like systematic desensitization. For example, in the imaginal exposure, a hierarchical list of symptoms and distress is constituted, and the patient is suggested to think only about the symptoms' content for a while. Then, he recognizes that the anxiety level decreases if he focuses on the symptoms [1, 26, 64].

2.3.2. Learning to change irrational thinking for challenging psychosis

There is some evidence that the contents of delusions reflect concerns about individual's himself and how others evaluate him. The delusions can be understood in terms of cognitive biases processing the normal beliefs. There may be extreme cognitive biases underlying extreme beliefs. Psychotic patients are seemed to miscalculate the probability of an event that may occur. In fact, they are most likely to use less information to make decisions; in other words, they jump into the conclusions. Delusions could be accepted as a response to the individual's search for meaning within his personal world [65]. To assign and understand the delusions, it is important to formulate how strongly the belief is held, the context of delusions in a person's life, how understandable the belief is, and how much the person relates the experience to himself/herself [39].

Psychotic patients catastrophically perceive the psychotic symptoms. Diagnosis or stigmatization of the others may create a traumatic effect. Thus, it is important to use a normalizing rationale and change this desperate point of view. This rationale enables the patient to apprehend that everyone has a potential to develop psychosis. Stress-vulnerability model is helpful to offer a personalized view to the patient including biological, psychological, and social explanations of how he developed vulnerable features and which stressful events triggered his vulnerable potential to develop psychosis [65].

Cognitive therapy suggests that the events do not directly determine our feelings and behaviors; our perceptions and interpretations influence how we feel and behave. All of us have some cognitive biases which also include some typical thinking errors. Dichotomous thinking

(black or white), arbitrary inference (jumping to conclusions), and selective abstraction (only focusing a little part of the overall picture) are some of the most observed thinking errors in psychosis. With the help of cognitive model, patient can understand that how he interprets the situations can affect how he feels and how he reacts that way. He also comprehends the relation between his irrational thinking and his symptomatology. Then, the patient and the therapist can collaboratively work on changing the interpretations of the problem and exploring more rational perceptions and more adaptive alternative responses [65].

There is also a link between early psycho-social stressors, dysfunctional assumptions underlying core maladaptive schemas, and the psychotic symptoms. Fowler and colleagues [1] summarized the main schematic themes for psychosis, and they categorized five schemas including *the belief that the self is extremely vulnerable to harm*—for example, "I am unsafe," *the belief that one is highly vulnerable to losing self-control*—for example, "I am dangerous to others," *the belief that the self is doomed to social isolation* "I am totally alone in the world," *the belief in inner defectiveness*—for example, "I am damaged/deficient," *the belief in strict standards*—for example, "I must perform the optimum standard in all areas at all times (schema compensation). Other core maladaptive schemas such as "I am different," "I am special," and "I am abandoned" are also effective in the development and the maintenance of the psychotic symptoms, especially of the delusions [65].

2.3.3. The role of social support for challenging psychosis

It is known that individuals with psychosis have smaller social networks and less satisfying relationships [66]. Social support is accepted as an important factor in every stage: in the development, maintenance, and recovery of psychosis.

2.3.3.1. The role of social support in the development of psychosis

Outcomes of the studies which examined the relation of positive social support/lack of social support and psychosis indicated many important results.

One of these studies in which the quantity and quality of social relationships in young adults at ultra-high-risk for psychosis were evaluated, fewer close friends, less diverse social networks, less perceived social support, poorer relationship quality with family and friends, and more loneliness were determined, and these features have been found to be related to low functioning, and also a high symptom severity [66]. Correlatively, Schuldberg and colleagues have found that high-risk individuals reported receiving significantly less positive social support from both friends and family [67]. The relationship between psychosis proneness and negative social support (e.g., hostility and criticism from others) has not been examined yet [68].

In a study that aimed to understand the gender differences between childhood physical and sexual abuse, social support and psychosis, it was suggested that especially for women with a child maltreatment history, powerful social network systems and perceptions of social support were found as important factors for resilience and against developing psychosis [69].

A study that examined the role of social support in delays between the onset of psychotic illness and initiation of an adequate treatment found that good social support was associated with a significant increase in this duration [70].

2.3.3.2. The role of social support in the maintenance and recovery of psychosis

Poor social networks may also cause more vulnerability during acute episode; therefore, psychotic symptoms can get worse and patients can continue withdrawals [69, 71]. Lack of positive social support was associated to higher levels of stress and psychopathology [68]. On the other hand, positive social support was clearly seen as a factor which motivated the individual to the use of adaptive-coping strategies [72].

Most patients often receive support from close family, as compared to friends and other relatives. In addition, schizophrenic patients find it particularly difficult to find emotional support [73], but reported the need for more emotional support, advice, and trust-based relationships [74]. Some researchers tried to quantitatively and functionally complement the patients' support network [73].

The results of the studies of social support indicate that both family and peer-based social support interventions can be used clinically to improve social support, to decrease the expressed emotion, and accordingly to positively affect the treatment process [72].

2.3.3.3. Integrating family members to cognitive-behavioral interventions for challenging psychosis

There is substantial evidence that integrating family members to psychotic patient's treatment is very helpful to reduce relapses. Techniques used in family interventions often tend to be on CBT based. They usually focus on reducing high expressed emotion and improving interpersonal environment. The key elements of these interventions are assessment and problem formulation; psychoeducation about the nature of the illness, its prognosis and treatment; and problem-solving techniques aiming to reduce conflicts and concerns, setting goals and improving interpersonal functioning [75].

3. Conclusion

The aim of this chapter was to understand the continuum between the normality and psychosis, to review the coping-related explanations and coping strategies for psychosis. It is important to understand patients' own coping mechanisms, as well as their relatives' coping strategies because of the relation between psychotic symptoms, "expressed emotion," and "social support." Studies show that most of these coping strategies used are maladaptive, thus it is important to educate patients about cognitive model and adaptive-coping strategies via cognitive-behavioral therapy.

It is remarkable that almost all cognitive explanations have a similarity with vulnerability-stress model, and they resemble each other except a few differences. The author tries to summarize all these explanations herein subsequently and show in a schematic assumption named as "a Coping Related Model for Psychosis" in **Figure 1**.

When a person with cognitive and physical vulnerability is exposed to stressful life events (e.g., low social support, environmental difficulties, or psychological traumas) which surpass his vulnerability limit, he may experience an anomalous experience. For example, he can hear a whisper

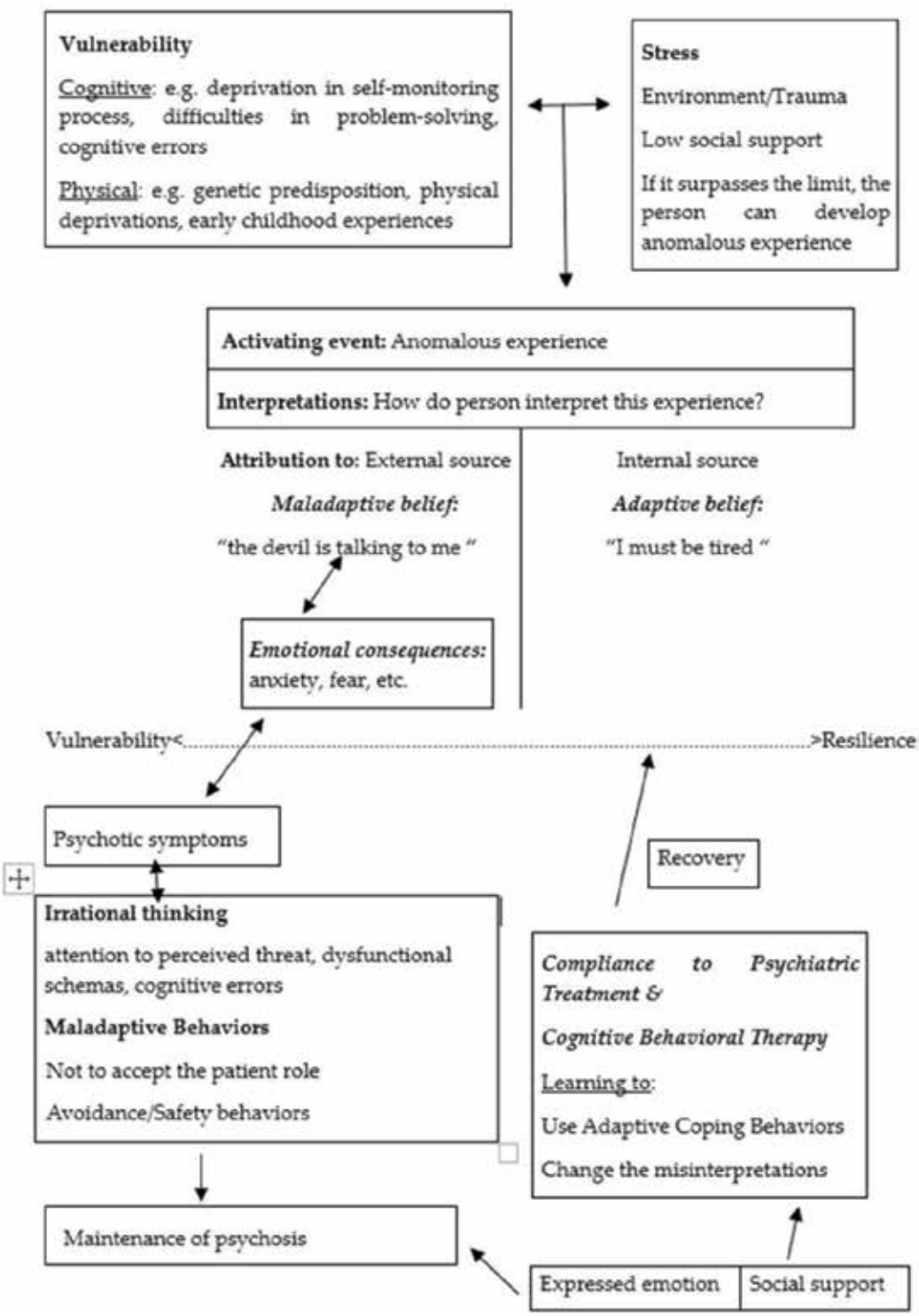

Figure 1. A coping-related model for psychosis.

or is supposed to see someone. If the person attributes this experience to an external source and interprets it such as "a talk of a Devil" instead of explaining it with an internal cause like "I must be tired," the anxiety level may increase. Because of the cognitive and emotional changes, the psychotic symptoms can occur. Once it develops, the maladaptive thinking patterns including attention to the perceived threat, dysfunctional schemas, cognitive errors, and selective attribution, or maladaptive behaviors like safety behaviors, or avoidance increase the risk of maintaining the psychotic symptoms. The individual's acceptance of the patient role, his compliance to the medical and psychological treatment, being educated about using adaptive-coping behaviors, or changing misinterpretations may help to enhance his vulnerability limit and ability to cope with stress, consequently to increase the possibility of recovery. Social support is also an important factor to decrease the potential risk of psychosis and to cope with the illness. On the contrary, a high level of expressed emotion is accepted to negatively affect the prognosis and may contribute to develop relapses. Therefore, integrating family members to cognitive-behavioral therapy program is very important in reducing expressed emotion and improving interpersonal environment.

Conflict of interest

The author confirms that there is no conflict of interest.

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Section 2

Biological Point of View

Chapter 3

Cognitive Impairment in Schizophrenia: Description and Cognitive Familiar Endophenotypes. A Review of the Literature

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Additional information is available at the end of the chapter

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Abstract

The presence of cognitive deficits in schizophrenia is a fact widely confirmed by a more than abundant literature. The existence of these deficits cannot be ignored, given their presence even with stabilized symptoms and their proven correlation with the functioning of the subject. The following chapter focuses on describing the main affected cognitive domains most frequently described in this pathology, mutually before and after the appearance of the clinical signs, as well as reviewing the presence of these affected domains in first-degree relatives of these patients. The existence of these deficits in relatives reveals that these alterations can not only be considered as markers of heritability and risk for the development of the pathology, but that their ignorance, in the family context, is also related to an important stain in the perception of the quotidian aspects, in the healthy interaction between relatives and an impact on the overall functionality of the subject.

Keywords: cognitive impairment, schizophrenia, cognitive endophenotype, family, psychosis

1. Introduction: cognitive impairment in schizophrenic disorder

There is considerable evidence of the presence of cognitive deficits in schizophrenic disorder that are unfavorably correlated to the daily functioning of these patients [1]. These dysfunctions are present before the beginning of the psychotic symptomatology [2]. Cognitive déficits in schizophrenia affect most of cognitive functions and are especially relevant in: memory and learning; abstraction and executive functions; processing speed and attention [3–7].

It is important to point out that there are similar cognitive impairments, in much lower intensity, in close relatives, and these deficits can be considered as potential cognitive endophenotype markers of the disorder [8–13]. From this data, it can be accepted that, in many cases, the effect of these alterations, potentially, may be affecting the functioning of any family nucleus and not only the patient or relative at risk of developing disease.

These data show the existence of a biological basis, despite the undeniable influence of environmental factors on the development and course of both pathologies. In this sense, the DSMIV-TR [14] notes that: *"Although numerous data suggest the importance of genetic factors in the etiology of schizophrenia, the existence of a substantial discrepancy in the frequency of monozygotic twins also indicates the importance of environmental factors".*

As expected, this cognitive dysfunction has influence in the main aspects of daily life [15]. Respecting the family point of view, there is also a great ignorance of the existence and influence of these cognitive symptoms present in the affected relatives. In general, it is suggested that the psychoeducational programs made for this subject directed to family members provide them with an important first step. These programs provides means in order to understand these factors, which make an important stain in their overall functioning, and therefore, in the daily life of these patients [16–19]. On the other hand, it is important to point out that the same patients do not usually present insight of their deficits, and when they do, although they are usually associated with higher levels of adherence to treatment, they also tend to do so with a loss of self-confidence [20]. This fact indicates that family interventions in the education of cognitive aspects should not only stay there and should also involve a research for solutions of family support in other ways. At this point, it cannot be ignored the effect on the family dynamics of the probable presence (even being slight) of these deficits in any of the relatives of the affected subjects. Their awareness and identification are important in order to carry out a family intervention.

2. Cognitive deficit in schizophrenia

One of the main recently advances of the concept of schizophrenia has been the confirmation that this disorder is primarily associated to cognitive deficits, do not being a consequence to symptoms or drugs [21]. Nevertheless, the idea that cognitive domains played a fundamental role in this disorder was not so recent. Since the first descriptions of schizophrenia, which was known under the Dementia praecox label, the aspects related to what it is now understood as cognitive deficit were considered as central symptoms of the picture. Besides the essential idea of Bleuler was that the core of schizophrenia, its fundamental symptoms, was the fragmentation of the thought process and delusions and hallucinations were accessory symptoms, a consequence of the main process [22, 23]. It has also been shown that this cognitive deficit has not only been described in long-standing schizophrenic patients [24], but is also present in patients with a first psychotic episode [25–27], in remission [28], in patients without antipsychotic medication [21, 29] and even in studies in high-risk subjects [30] and in close relatives and healthy patients with schizophrenia [12].

It is estimated that among 61–78% of patients with schizophrenia manifest a significant level of cognitive deficit [1] reaching between 1 and 2 standard deviations below the control

groups of the same age [6, 31]. These cognitive deficits seem independent of positive symptoms [32] and are maintained throughout the course of the disease.

Although some early investigations [33] showed that about 27% of schizophrenic patients, after neuropsychological evaluation, could not be considered deficit, in fact, it has been proven that they would continue to present neuropsychological deficit compared to healthy subjects, even matching IQ measurements [34]. This group of patients, without supposed deterioration, would show high levels of premorbid functioning, but once the disease was diagnosed, this would be considerably lower [35]. In addition, discordant monozygotic twin comparisons for schizophrenia suggest that almost all affected twins perform worse on cognitive tests than their unaffected twin [36]. In this sense, it can be safely talked about cognitive deficits in schizophrenic patients although, in any case, it is very likely that their cognitive performance is below than what was expected in the absence of disease. It is also interesting to mention that several authors have found a worse performance in tasks of work memory (especially in visual) and in learning verbal tests and free memories in unaffected monozygotic twin brothers and, even a lesser degree, in not affected dizygotic twin brothers against controls [37–40].

It is interesting to point out that many patients have a lack of awareness of cognitive dysfunction. Those who are better aware of their deficits are not associated with a lower use of treatment, nor with a lesser deterioration of executive function. But they do have better results in the rehabilitation of some cognitive domains, in adherence to treatment and in their functional capacity [41, 42].

The neurocognitive dysfunction affects the ability to perform activities of daily living, impairs the ability to solve social problems [15, 16] and has proved to be the better predictor of reincorporation to activities in social and community settings [43, 44] and, especially, in terms of work rehabilitation and maintenance works [45–48]. These data review the importance of cognitive domains as a reliable scale of clinical improvement [15, 49–52] and, as is to be expected, the degree of cognitive impairment implies a worse adjustment in the quality of life of these patients [52–54]. Some authors also consider cognitive functions as an integral part of the concept of resistance to treatment [55]. On the other hand, several studies emphasize the importance and efficacy of cognitive rehabilitation treatments in early stages of psychosis [56, 57].

As expected with these data, the cognitive alteration in schizophrenia is the current focus of attention for the research of therapeutic strategies, both pharmacological and psychological. Regarding the interventions on cognitive domains, the pharmacological treatment, although it has offered certain results, has not been very encouraging [58], however studies using cognitive stimulation (training in executive skills, memory and other cognitive processes) have achieved more hopeful data [59–62].

2.1. Cognitive domains affected

Patients with schizophrenia have, comparing with healthy subjects, problems in performing almost all conventional neuropsychological tests. The most widely affected functions are executive tasks. Memory and attention, in their different modalities, are not the only ones affected, but it is these domains that stand out especially about a generalized cognitive

dysfunction. The functions relatively preserved in schizophrenia are usually verbal knowledge and linguistic comprehension and naming. Cognitive functioning in schizophrenia is considered a primary or essential characteristic of the disorder [15, 63], so that schizophrenia is now considered to be a complex disorder whose base is fundamentally neurocognitive [64, 65]. For a review of the characteristics of these disturbances see **Table 1**.

2.2. Description of the disturbance in the affected domains

In general, it can concluded that the meta-analysis by Schaefer *et al* [69] would indicate that patients with schizophrenia would present important alterations in: Attention, especially in sustained attention and interference control; significant deficits in the operational memory (maintenance of information and manipulation) and important alterations in long-term memory. However, the implicit memory, specifically the so-called procedural memory, related to the ability to learn psychomotor skills, would be relatively preserved [73] and the recognition of verbal material was not as altered as the delayed memory. They presented important alterations in the different components of the executive functions such as cognitive flexibility and planning and serious alterations in the speed of processing.

Going in dept. the studies of executive functions in schizophrenic patients, these tend to describe a greater presence of persistent responses. The Wisconsin card sorting test [74] indicates that these patients tend to have a low number of categories achieved and many persistent responses, which can be seen as a deficit of cognitive flexibility [75]. This inability to select the relevant information and reject the irrelevant has also been documented using tasks such as the Stroop test [76–78] or the Tower of Hanoi [79].

This inability to inhibit response (which would affect to planning and organizing actions, persist in an activity and find novel solutions) is present, to a greater or lesser degree, in these patients, even in the case of not showing up serious dysfunctions in attention capacity and operative memory (necessary for an adequate executive functioning) [52, 70].

Regarding to memory in schizophrenia, it is common to see studies showing general alterations in all memory processes. It shows that there is poor performance in declarative (explicit) memory, short-term and long-term memory, intentional learning, operational memory, semantic memory and priming. However, non-declarative memory (implicit) seems be less affected and procedural memory seems to be preserved [80, 81].

Some authors have considered that the alteration of autobiographical memory [82] as well as in prospective memory (the ability to remember the performance of planned actions in the future) [83] and the memory of the source (of the contextual aspects of the information: Where, when, etc.) [84] are the product of a general deficit, especially related to a reduced executive function [70].

The studies of working memory in schizophrenia reflect the existence of deficits in the capacity of storage/apprehension [85], although it is considered if such storage difficulties could be linked to alterations in the process of coding the information (more related to the executive function),

Balanzá-Martínez and Tabarés-Seisdedos [66] highlight the following aspects:

- They affect significantly the majority of patients.
- On a generalized cognitive impairment, the most intense deficits are linked to memory, attention and executive functions.
- They are not secondary to psychotropic drugs, institutionalization or symptoms, although they may be related to negative symptoms.
- They are very stable during the evolution of the disorder.
- They are present since the first episode, even in the premorbid stages.
- They are also present in healthy patients relatives (cognitive endophenotypes) [67, 68].
- They are indicators of functional prognosis.
- Nowadays, they constitute a therapeutic objective.

The meta-analysis conducted by Shaefer *et al.* [69] concluded:

- There is evidence of a broad cognitive deterioration in schizophrenia, which can be considered moderate to severe compared to control subjects in all the neurocognitive measures studied.
- The cognitive deficits are somewhat greater in the domains of processing speed and episodic memory.
- Studies of diverse world regions in which a study of cognition is carried out present very few differences to each other.
- The studies showed higher percentages of involvement in male patients.
- The cognitive deterioration does not keep too much relation with the majority of the measures of symptomatology, something in contrast with the studies that highlight moderate but statistically reliable associations between cognition and negative or disorganized symptoms [32].
- Interestingly, they found no significant relationship between the duration of the disorder and cognitive decline.

Crespo, Rodriguez-Sanchez, Barbas-Calvo, Duarte-Armolea and González-Blanch [70] clarify that the existence of these deficits (to a much lesser degree) is not exclusive to patients and is often found within first-degree family members. Considering the affected domains and controlling medication variables, it can be considered:

- Attention: Difficulty to inhibit irrelevant information. Presence of these deficits in both patients and their children (higher than controls and young subjects at high risk for affective disorders).
- Executive functions: Difficulties in the use of problem solving strategies, self-control and supervision of own behavior. In first-degree patient's relatives, there have been problems in verbal fluency, inhibition of an arrogant response pattern or tasks with a change in cognitive function.
- Working memory: Deficit in the storage capacity of information (verbal and spatial) and also emphasize the role of working memory as an essential element for the processing of information, which malfunction compromises the execution of other cognitive systems. It is interesting to complete it with the study of Guimon, Padani, Lutz, Eack, Thermenos and Keshavan [71] about how emotional distracters impacted more on their performance in working memory tasks than in control subjects. Also note that Botero *et al.* [72] tested performance on tasks involving verbal work memory and the results were lower in subjects with schizophrenia and their relatives that in the controls of the community.
- Memory: Deficits to remember are present, to a lesser degree, in healthy relatives of patients. These memory deficits are aggravated by attention problems, working memory and coding difficulties.
- Speed of processing: Indicate a slowdown that affects other cognitive domains.
- Psychomotor functioning: Significant psychomotor slowdown even in first episode patients and, to a lesser degree, in parents of patients.

Table 1. Presence of cognitive disturbance in schizophrenia and first grade relatives.

rather than in processes related to the actual maintenance of the information. Authors such as Sharma and Antonova [86] and Brebion *et al*. [87] consider that schizophrenic patients did not use the properties/facilities of the material to be memorized in learning (for example, grouping it by categories or sequences) because they presented problems when are making complex coding strategies (based on the characteristics of the information). Although, these alterations in coding could be secondary related to the generalized slowdown in processing speed [88]. It is also point out that deficits in working memory could be due to errors in the search, maintenance and manipulation of information.

2.3. MATRICS study (measurement and treatment research to improve cognition in schizophrenia) of the National Institute of Mental Health (NIMH). The cognitive search in schizophrenia

One of the most important study projects of cognition in schizophrenia comes from the National Institute of Mental Health (NIMH) in the United States. The MATRICS initiative, Measurement and Treatment Research to Improve Cognition in Schizophrenia, is a program whose initial objective was to provide data that facilitated the development of drugs that improve the deficits presented in cognition in schizophrenia [89, 90] and that adopted as an initial objective the identification of the domains of cognitive effects in schizophrenia as well as the development of a battery for their evaluation.

The MATRICS project [91, 92] pointed out seven cognitive scopes in which patients with schizophrenia presented critical deficits: Speed of processing, attention/vigilance, working memory, learning and verbal memory, learning and visual memory, reasoning and problem a solving, and, a domain that was often ignored in many studies, social cognition.

2.4. Social cognition and schizophrenia

It is interesting to emphasize the relevance that social cognition has achieved in schizophrenia. This comes, among other sources, from the evidence that relates social cognition to social functioning [15, 93, 94] as well as for its mediating role between neurocognition and social functioning [95, 96].

Although there is no generalized consensus on the domains that make up social cognition, most authors identify five domains: Emotional processing, theory of mind, social perception, social knowledge and attribution style [97]. Even if the domains of emotional processing (perception and handling of emotions), and of theory of mind are usually cited as the most affected in schizophrenia, it can be accepted, based on the investigations carried out, that there is a mishandling of all of them on some of these patients [98].

Considering the meta-analyses of Chan *et al.* [99] and Savla *et al*. [100] it is indicated that people with schizophrenia present serious and generalized deficits in social cognition, especially in perception of emotions. More specifically, they show important difficulties in the perception of facial emotions as well as in the identification and discrimination of different emotions compared to undiagnosed controls. Difficulties in the processing of emotions were also observed in emotional prosody, that is, in the emotional tone of the voice. This alteration

is found in early stages of the disorder [101]. They also found that people with schizophrenia have major alterations in the theory of mind. In general, they also found alterations, although to a lesser extent to the previous ones, in social perception (ability to identify roles, social norms and social context as well as social knowledge that refers to the conscience of roles, norms and objectives that characterize social situations and direct interactions) [102]. However, Savla *et al*. [100] did not find significant differences in attribution biases between people with schizophrenia and non-diagnosed controls.

Regarding the presence of alterations in social cognition in relatives of patients, it is usually noted that patients score significantly worse in all domains of social cognition evaluated compared to controls and in the attribution style domain compared to family members [103].

In the Mondragón-Maya *et al*. review [104] point out that consistent discoveries on deficits in the theory of mind have been reported in family members of patients with schizophrenia compared to control subjects. In this sense, two meta-analyzes have reported effects (from modest to moderate) on alterations of the theory of the mind in unaffected relatives [105, 106].

Moreover, Mondragón-Maya *et al*. [104] consider that studies of the other fields of social cognition in family members offer more scarce and inconsistent results, requiring further investigation. Cella *et al.* [107] and the meta-analysis of Lavoie *et al*. [106] reported moderate déficits in social perception in relatives of schizophrenia versus controls. However, later, Lavoie *et al*. [108] did not find that parents of patients with schizophrenia showed worse performance than controls in social perception tasks. Regarding attribution style, Rodríguez *et al*. [103] reported that there were no deficits in the unaffected relatives of patients with schizophrenia. Studies on emotional processing in unaffected family members of patients with schizophrenia are also scarce. Despite this, some studies have reported worse performance of their relatives to identify emotions compared to controls [109]. The meta-analysis of Lavoie *et al*. [106] found a moderate deficit in emotional processing of unaffected family members, especially in tasks of emotional identification. However, this result is not completely generalize and needs further investigation, since it focuses on emotional identification skills, more than other components of emotional processing, such as emotional regulation [104].

2.5. Clinical status and cognition

It is important to emphasize that these deficits are not a direct consequence of pharmacological treatment, nor of the institutionalization situation or other factors such as lack of motivation or distractibility due to psychotic symptoms [3]. Cognitive deficits in schizophrenia affect the majority of cognitive functions [6], but they are especially marked in executive functions and memory [3, 4]. This cognitive deficit is presented with autonomy of positive and negative symptoms, even when there is a greater association with this latter ones [63, 110].

The systematic review of Dominguez *et al*. [32] (58 studies, 5009 individuals) shows a relation between the psychopathological dimensions of psychosis (negative, positive, disorganized and depressive) and measures of neurocognitive impairment in subjects with non-bipolar psychosis. The results showed that negative and disorganized symptoms are significantly but modestly associated with cognitive deficits. The positive and depressive dimensions

were not associated with neurocognitive measures. The patterns of association between these dimensions were stable in all neurocognitive domains and were independent of age, sex and chronicity of the disease. In addition, significantly high correlations were found for the negative dimension in relation to verbal fluency and in the disorganized dimension for reasoning/problem solving and attention.

2.6. Origin of cognitive deficit and family endophenotypes

Traditionally, two hypotheses about this disease have been considered [111]: The neurodevelopmental hypothesis, which considers that schizophrenia would come from an early disorder of brain development, which would be present in a relatively silent way during childhood, and that it would begin to exacerbate during adolescence and the beginning of adulthood with cerebral maturation [112, 113]. The neurodegenerative hypothesis indicates the existence of an active pathological process associated with periods of exacerbation, due to the neurotoxicity of acute psychosis, which would explain the progressive deterioration observed in these patients in the first years of the disorder. The evidence points out that although there is an alteration in neurodevelopment in schizophrenia [2, 111, 114, 115], but neither can be ignored that there are progressive brain changes in the appearance of psychotic crises not always associated with treatment [111].

There is evidence which shows that these cognitive disorders are prior to the onset of psychotic symptoms and the diagnosis of the disorder [114] and even seem to indicate that, the subjects who will suffer from schizophrenia, already in the 7–13 years of age, obtain lower scores in neurocognitive tests compared to subjects who did not develop it. These scores will remain relatively stable until descending significantly between 13 and 38 years [2]. These data would be in favor of the authors who suggest that these dysfunctions are significant and central to the disorder [116] and close to the neurodevelopmental hypothesis [112].

Similar cognitive alterations are also found, but to a lesser extent, in first-degree relatives of schizophrenia [8–10] and in people at risk for the disorder [8, 117]. This fact suggests that cognitive alterations may represent the expression of genetic vulnerability to schizophrenia and may be endophenotype for psychosis [118]. Other studies have indicated functional dysfunctions in brain regions (medial prefrontal cortex, posterior cingulate cortex, and superior temporal gyrus) in both non-psychotic patients and first-degree relatives and healthy controls [119, 120].

The alteration of executive functions in schizophrenia has come to be proposed as a phenotypic marker of the disease. Not surprisingly, studies with first-degree relatives of these patients have shown that they share some of these executive deficits [70].

Also note that the heritability of schizophrenia is high and family studies indicate that first-degree relatives of patients with schizophrenia have a seven times greater risk of developing the disease compared to individuals who do not have an affected family member [121].

2.7. Some considerations from interventions from the family

Antipsychotic drugs, although essential in the treatment of the disease, have a limited capacity to improve the general cognitive functioning of patients with schizophrenia. Numerous

studies agree that including psychosocial treatments of psychoeducation, family intervention, skills training and cognitive interventions for long periods (a year or more), produce a greater functional improvement especially in patients of first psychotic episodes which can be only obtained with drugs [122–127].

As previously pointed out, in general the data suggest that many subjects affected by schizophrenia are poor assessors of their own cognition [19, 128, 129] and its daily functioning. In this line, it is important to indicate that, in the study by Poletti *et al*. [19] noted that close relatives of patients also have great difficulties in recognizing the presence of cognitive deficits in their affected relatives and they usually interpret them as a product of their personality, attitude, lack of interest or motivation, instead of understanding that they are due to the disorder. In addition, it should be remembered that the relatives of patients with schizophrenia also present more neuropsychological alterations than the control subjects [130], such deficits could represent an important difficulty to identify some symptoms of schizophrenia that can be present in the family.

It is also important to remember that knowing the biological and genetic origins of mental disorders does not help reduce social distances or avoid stereotypes. (In fact, Angermeyer *et al.* [131] found the opposite. They describe they were related to an even stronger rejection). In family interventions of patients with schizophrenia, although the lack of knowledge the parents is linked to a poor vision of the patient on their deficits and on their awareness of disease, [132] these must go further. The study by Macgregor *et al* [133] concludes that it should not be focused only on giving information and observing compliance with treatment, but also on other parental factors such as better cognitive performance (since there is an association between cognitive performance of parents -especially in executive functioning and verbal comprehension - and the perception of the illness of their children [18]), daily contact, a lower attitude of rejection are associated with better patients awareness of their disorder. Therefore, they conclude, that these factors should be included in specific programs aimed at caregivers, including cognitive intervention aimed at improving the cognitive flexibility of parents. In general Macgregor *et al.* [17] support the introduction of cognitive remediation techniques in family interventions. The objective would be to reduce the cognitive biases of healthy first-degree relatives. The perception of the patient and parents is an essential step on the road towards a good prognosis of the disorder.

It should be noted that, within family influences, not all are reduced to the simple knowledge of the symptoms. At this point, one of the most accepted hypotheses is that high levels of expressed emotion (EE) in front of a sick family member can lead patients to feel more ashamed and less open to self-understanding about their disorder [133]. This hypothesis underlies the idea of the influence that the development of the parent–child relationship implies [134]. Commonly, family therapy is recommended to reduce stressful family interactions and increase support, this, joined to cognitive training exercises are interventions that not only improve the well-being and functioning of patients, but also, even during the prodromal phase [135], can promote resiliency to stress, which has the potential to prevent the appearance of psychotic episodes [136].

Other family aspects to consider are the ones pointing out by Raffard *et al*. [18] in their study: In the prodromal phase of psychosis, patients often show nonspecific symptoms, such as anxiety and depression, social deterioration, drug abuse or alcohol, which are not interpreted

as possible symptoms of a major condition [137] and are associated with behavior typical of adolescence [138]. If a young individual is labeled as "sick" or "psychotic" is always a source of anguish [139, 140] and a potential risk of stigma [141], which can lead to maladaptive coping such as denial, avoidance and difficulties [142, 143]. The presence of cognitive deficits in patient and parents, can lead both to the difficulty to receive corrective feedback from professionals and to affect the ability to adequately judge the psychotic experiences of their children, which can lead parents to use coping strategies "avoidant" (as denial/disengagement) instead of more "approximation" strategies (such as seeking social support, reinterpretation, acceptance).

As already mentioned, there are programs of psychoeducation of cognitive symptoms for family members of schizophrenia and numerous intervention programs of cognitive symptoms in schizophrenia [59–62]. But nowadays, there are hardly any specific programs focused on cognitive intervention since the same family. Among the very few family intervention programs we can mention the Family-Directed Cognitive Adaptation (FCA). This program is designed to teach patients and family members the neurocognitive problems associated with schizophrenia; how to develop compensation strategies to minimize their impact on family and daily functioning; and teach families how to implement adaptive strategies to solve problems [144, 145].

In a first application of the program to a patient who lived with his mother [144], these authors, in addition to cognitive problems, also found a situation of abandonment of activities (friends, leisure), sedentary life, absence of social life beyond of family members, dull mood, poor diet, side effects of drugs and a family activity limited to doing small household chores (often incompletely, although the evaluations revealed a capacity to do tasks preserved, he used to leave them in the hands of his mother, including medication and calls to the doctor). In spite of everything, patient and family could take an active role in solving problems and generate practical objectives. They were taught what cognitive skills were and then strategies for adapting them in daily life (some of them already used list of "things to do" to avoid frequent forgetting of the patient). Then the best and worst preserved domains were observed (the latter: verbal memory, processing speed and executive function) and a series of strategies were introduced to overcome these difficulties (such as: using notes and reminders, dividing goals into smaller steps and maintaining short and simple communication …). An identification and problem solving format was applied (similar to that used in behavioral family therapy programs [146]) to prioritize goals (take care of food, make calls, medication …) and specific strategies aimed at addressing these barriers (lists of foods, use of agendas, summarize what is heard and ask for clarification of what was not understood, exercise …) and cognitive-behavioral technique to see the evidence for and against beliefs and concerns (this technique also it was used by the mother to test the irrational beliefs of the patient-possible residual symptoms-instead of acting against them fearfully or hostilely. Assertiveness and communication skills programs were also applied, identifying barriers and examining evidences (pros and cons). As the tasks increased, mutual trust improved, the patient was able to do more skills on his own and the burden of the mother decreased, improving the relationship and communication between them.

In a second pilot application of the program to a larger sample [145], the aspects considered most useful by relatives were: "Learning about cognitive deficits related to schizophrenia" and "learning about the specific cognitive strengths and difficulties of my relative" and patients considered: "Learning about my strengths and cognitive difficulties"and "learning strategies to overcome cognitive difficulties". This pilot study suggests that it may have helped family members to better understand the nature of cognitive challenges, which may have reduced feelings of irritation or guilt and with them the family burden. Despite the limitations of this study, it can be affirmed that it was shown that families could be involved in a program designed to teach strategies to reduce the effects of cognitive disabilities on daily living skills. They also suggested some benefits in terms of improved functioning and reduced family burden. Finally, they pointed to the natural and supportive role that relatives play in helping a member(s) with schizophrenia to have more control over their life and to progress towards important personal goals.

However, these achievements were not maintained. Although the program was effective during its implementation, it is possible, according to its authors, that 16 sessions are insufficient for families to master the basic fundamentals to implement cognitive adaptations on their own (not in vain, it is usually recommended that cognitive training last more than 1 year); or that the families that would have benefited from the program were gradually reducing participation in reinforcement sessions and did not facilitate the maintenance of the results.

Within other compensatory deficit strategies programs that involve the family exits the 9-months Cognitive Adaptation Training (CAT) [147]. It is especially applied, with the purpose of recovering vocations (work, studies) in first episode patients. Although the results seem promising, they are still pending confirmation in studies of larger samples.

It can be concluded that, in addition to inquiring into the ways of application of specific programs to treat cognitive deficits from the family framework (there are few programs yet, and despite having apparent good results, are still pending on a further study), the simple fact of giving knowledge about the symptomatology of schizophrenia is not always enough for parents to adopt attitudes of understanding towards the symptoms of their children. As pointed out by Friedman-Yakoobian *et al.* [145], rehabilitation and intervention should be oriented to improve the daily needs of each patient and it cannot be ignored the fact that many of these patients live with their families. Even when they live far away, relatives usually get involved in trying to give support (financial, emotional, etc. …) and a common consequence of this is that family members often suffer significant levels of stress, anxiety and caregiver burden. Therefore, we must also address attitudes such as the acceptance and overcoming of defeatist and critical attitudes, which help to avoid the denial of symptoms and improve their perception of the disorder and its daily adjustment. Highlighting that the association between the patient and the vision of the parents depends not only on the biological relationship, but on the frequency of daily contact and, therefore, in the immediate environment, supporting the role of environmental factors play in the perception of the disorder by the patient [133]. In this sense, as Kirkpatrick *et al*. point that [148] it is often forgotten the enormous complexity of schizophrenia and its impact, treatment and social and family functioning by focusing exclusively on psychotic symptoms.

3. Conclusions

Deficits influence in cognitive domains in schizophrenia disorder is something that severely affect the clinic symptomatology as well as in social, labor and familiar adjustment of this patients, been something not to be ignored. Even so, so few familiar intervention programs are focus in explain and give intervention strategies to this deficits from home daily life. To these problems it might be added a big possibility of finding a lower cognitive deficit in some family members without pathology, with what it might be necessary to intervene face to them having a more realistic and adjusted perception of their children illness. With that we wish to avoid that cognitive disrepair might be seem as a personal product, an attitude lack or even a defiance sign [19].

Considering all the presented data about cognitive endophenotypes, it might be understand that a genetic component exits in the pathology, but we cannot erase environmental factors influence. It is not impossible to add changes in the psychosocial patient environment with whom it might improve, not only symptomatology, but it social and labor adjustment. In the other hand, it is already been commented that family might affect negatively in both patient types, frequently because a high expressed emotion [133] affecting patient self – perception and with it, its global functionality.

In this way, it was expected to find that, in general, familiar interactions to resolve problems might seem to be less constructive and more problematic when the family member suffers schizophrenia disorder versus others disorders. Salinger *et al*. [149] recently studied those interactions between parents and their teenage affected children (or at high risk) of psychosis and bipolar disorder. After control variables in the parents as: sex, age, functionality, education. They observed that mothers of psychotic teenagers got a significantly more conflictive and less constructive communication than mothers of bipolar teenagers. The obvious conclusion is that, given that the family environment among adolescents seeking help may be more challenging for families with adolescents with psychosis than in other serious pathologies. These families need a more intensive and focused communication training than would be required for families with adolescents with high-risk for bipolarity or other mood disorders.

In general, research highlights the importance of psychosocial and family factors. These interventions become more important if we take into account works such as Engh *et al.* [20] where he pointed out that an adequate awareness of deficits is related to a good adherence to treatment, but also to a bad perception of self-confidence and self-efficacy. And on the other hand, we cannot ignore that all these aspects will be terribly influenced by the more than frequent stigmatization suffered by these patients and the disastrous consequences of it in their personal perception [139–143]. As can be observed, the intervention of cognitive aspects, although important, must go beyond and in order to ensure their effectiveness, it should be encompassed in other fields closely linked to family interactions according to achieve a greater perception of the effectiveness of the subject, which can lead to greater functional participation as it would be through the promotion of self-esteem, absence of continuous criticism, skill training, daily contact and attitudes of acceptance and coping.

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Conflict of interest

The author declares that have no conflicts of interest concerning this review.

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Chapter 4

The Ambit of Phytotherapy in Psychotic Care

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Additional information is available at the end of the chapter

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Abstract

The rate of psychosis has drastically increased in recent years and the number of prescriptions for psychiatric medications has made an even bigger jump. With the worrisome side effects of the medications, which can pose serious health risks and make medication compliance difficult, coupled with the prohibitive cost for many patients, there is an obvious need for alternative solutions. This review presents the ambit of phytotherapy in psychotic care. Interestingly, the review revealed that, plant-based medicines are rich in phytonutrients of antipsychotic importance and may be effective as stand-alone treatments or supplementary to conventional interventions. Despite the emerging interest in phytotherapy for mental disorders, the majority of the formulations are yet to be clinically certified. However, simply disregarding them for this reason might be consequential and as such, for better and improved mental health, research into phytotherapeutic care for psychosis must remain to be continuously explored as a promising niche.

Keywords: hallucination, mental health, phytonutrient, phytotherapy, psychosis

1. Introduction

Feelings and perceptions like paranoia/hearing voices may be highly discomforting, worrying, and necessitate people to seek definitive aid. Generally, help have been offered medically, and mental illnesses or psychosis have always been diagnosed for such feelings. Many individuals always assume that psychosis occur in the manner as other ailments exist and may be accurately revealed by medical tests in the same way. However, this is not always the

case and several theories are in place to significantly understand the causatives of mental disorders. The notion that psychosis is a typical symptom of illnesses, possibly caused by some chemical imbalance or infiltrations in the brain, is just one of these theories [1]. While the rate of psychosis has drastically increased in recent years, the number of prescriptions for psychiatric medications has made an even bigger jump [2, 3]. For instance, in the United States, the prescription and use of antidepressant drugs has increased by almost 400% between 1998 and 2008 [4]. With the worrisome side effects of the medications, which can pose serious health risks and make medication compliance difficult, coupled with the prohibitive cost for many patients, there is an obvious need for alternative solutions. Interestingly, in addition to medical and clinical care for psychosis, the significance of phytotherapy has also become well established over the past decade. For instance, phytotherapeutic formulations such as St John's Wort and Kava have potentiated remarkable clinical evidence [5]. Also, the beneficial effects of peppermint aroma from plants on memory and alertness have offered new opportunities for research regarding cognitive decline [6]. Such formulations are direct efforts of the plant-based remedies that have been used by indigenous cultures for thousands of years.

Although, attempts have been previously made on the review of the significance of traditional systems of medicines in the management of mental illnesses [5, 7–11], a comprehensive review on the ambit of herbal remedies and the mechanism of actions of the anti-psychotic bioactive principles is still lacking till date. It is on this background, that, this review was conducted to identify the major psychotic disorders, the broad scope of phytotherapy in psychotic care and the mechanisms of action of anti-psychotic phytonutrients.

2. Major psychotic disorders and classifications

Psychotic disorder forms a diverse group of illness that are serious and often treatable [12]. Psychotic disorders affect the way a person may act or feel (loss of motivation, delusion, social withdrawal from others, depression, intense elation, 'uncontrollable laughter or crying', altered emotions), thinking (confused or disjointed thoughts, superficially-irrelevant thinking, unconsolidated connections between ideas, and incoherence), auditory and visual hallucination [13]. These itemized features make it difficult for the affected individuals to distinguish between what is real and not real. On the other hand, psychosis encompasses conditions that influence the mind where contact with reality has been lost [14].

According to the American Psychiatric Association [15], psychotic disorders can be classified into four basic groups including; non-affective psychotic disorder (e.g. schizophrenia, schizoaffective, schizophreniform, delusional, brief psychotic, shared psychotic, and psychotic disorder NOS), affective psychotic disorder (e.g. bipolar I and II disorder with psychotic features and major depressive disorder with psychotic feature), substance-induced psychotic disorder (e.g. alcohol-induced psychotic disorder and other substance-induced), and psychotic disorder to general medical condition [16, 17].

Schizophrenia is one of the most common and severe psychotic disorders. It is a cluster of disorders characterized by fundamental disturbances of thinking, perception and emotions.

The onset of schizophrenia is often in young adulthood, and for those affected, the disorder often causes many years of intense suffering [12]. The course, sign and symptoms in affected individual are highly inconsistent, but for a smaller ratio, the disorder causes lifelong disabilities with deterioration in functional capacity [18]. However, an average of 1 in every 7 patients with schizophrenia have been able to recover from the ailment despite the improvement in available treatment options in the recent years [19]. Schizophreniform disorder is basically identical with schizophrenia except that the ailment period is at least 1 month, but full recovery in 6 months is required. Another difference is that decline in functioning is not required in diagnostic criteria of schizophreniform disorder, while decline in social and occupational function is one criteria of schizophrenia. The diagnosis is often provisional and diagnosis may be changed to schizophrenia, should symptoms remain longer than 24 weeks [20]. In schizoaffective disorder on the other hand, the full criteria of both the active phase of schizophrenia and a mood episode should be met. In the same illness period, a 14-day delusional or hallucinational feeling without obvious mood symptoms may be evident. Symptoms meeting criteria for a mood episode should be present for the duration of the disorder [21]. The delusional disorder is often characterized by non-bizarre delusions and mostly last for almost 4 weeks. However, with the exception of the presence of tactile and olfactory hallucinations, other active-phase signs of schizophrenia should not be present, particularly if they are delusional-related. Besides the delusional impacts, normal behavior is always observed and functioning is not markedly impaired [15]. Unlike others, the brief psychotic occurrence is accompanied by sudden onset of psychotic symptoms (disorganized speech, delusions, catatonic behavior, hallucinations,) which persist for at least 24 hours but usually not exceeding 4 weeks. After this, a full remission and return to an optimal level of functioning is normally achieved [22, 23]. Furthermore, a variant of the non-affective psychotic disorders, the shared psychotic ailment, occurs rarely and is normally characterized by delusional experience in one individual when in a close relationship with an established delusional person [24]. Also, with the psychotic disorder NOS, the symptoms of psychosis are evident, but a specific diagnosis of any psychotic disorder cannot be made. There may be inadequate information to make a specific diagnosis, the information is contradictory, or symptoms fail to fulfill full criteria for a specific psychotic disorder. According to Arciniegas [17], diagnosis may be assigned for example if; a postpartum psychosis fails to meet criteria for a specific psychotic ailment, symptoms of psychosis have existed not beyond 4 weeks but yet to be remitted, occurrence of persistent auditory hallucinations void of any other psychotic feature, existence of persistent non-bizarre delusions with episodes of overlapping mood, evidence of uncertainty as to whether symptoms of psychosis are primary or substance use related or of general medical issues [12].

Unlike the non-affective disorders, the bipolar I disorder is an affective type of psychosis, characterized with manic or mixed episodes, usually accompanied with major episodes of depression. Symptoms of psychosis, which have to be hallucinations/delusions, can occur during manic, mixed and severe depressive episodes [25, 26] Typical mood-congruent psychotic symptoms during manic episodes include grandiosity and persecutory delusions linked to some special features of the person. Mood-incongruent psychotic symptoms include persecutory delusions without grandiose themes or delusions of thought insertion, thought broadcasting or being controlled [27]. The bipolar II disorder diagnosis means that person

has had at least one hypomanic, but no manic or mixed episodes, and one major depressive episode. Bipolar II disorder may also include psychotic symptoms during the severe depressive episodes. Bipolar I disorder leads to hospitalizations, need for treatment, and decline in daily functioning more often compared with bipolar II disorder [28, 29]. Similarly, the major depressive disorder with psychotic features is diagnosed when the criteria for major depressive disorder episode are met and delusions or hallucinations occur within the episode. Mood-congruent delusions or hallucinations are consistent with the depressive themes (delusions of guilt, delusions of deserved punishment, nihilistic delusions etc.). Mood-incongruent delusions or hallucinations do not have any apparent relationship to depressive themes (persecutory delusions, delusions of thought insertion, delusions of control etc.) [30]. For the substance-induced psychotic disorders, the victim is characterized by prominent hallucinations or delusions that are judged to be due to the direct physiological effects of a substance (drug of abuse, a medication, or a toxin exposure). Substance-induced psychotic disorders are distinguished from the substance-induced delirium (clear consciousness), from substance intoxication or withdrawal with perceptual disturbances (more persistent, clinically relevant symptoms, and the individual is void of insight) and from primary psychotic disorders [31]. The onset of substance use typically precedes the onset of psychotic symptoms, and the symptoms should disappear within 1 month after the substance use has ceased. Psychotic symptoms may occur during withdrawal or intoxication of these substances: cannabis, inhalants, hypnotics, hallucinogens, amphetamine, opioids, cocaine, alcohol, anxiolytics, phencyclidine and sedatives [32]. Some medications (e.g. antiparkinsonian medications, corticosteroids, anticholinergic agents, antimalarial medications and chemotherapeutic agents) can also trigger symptoms of psychosis. The clinical picture of psychosis varies depending on the substance [12]. For the one resulting from a general medical condition, the victim feels hallucinated or delusioned. These symptoms can be judged to result from the direct physiological impacts of a general medical condition, and they are not explained by any other mental disorder [33]. Clear temporal association should be found between the general medical issue and the onset of psychotic disturbance. Additionally, there must be literature evidence on the particular medical condition causing psychotic symptoms [34]. Examples of general medical conditions that can cause psychotic symptoms include temporal lobe epilepsy, brain lesions and tumors, central nervous system infections and any severe medical condition requiring treatment in intensive care unit [34, 35]. Delirium is a condition characterized by disturbance of consciousness and cognition which may have psychotic symptoms as an associated feature [36, 37]. The etiology of delirium varies, including substance-induced delirium and delirium due to underlying general medical issues. Irrespective of the cause, associated challenges emanate within the shortest time possible and usually not consistent during the course of the day [37–39].

3. Conventional treatment and management options

Many of the drugs that have been introduced for the treatment of psychotic disorders are known to interfere with the normal physiological actions of several of the brain neurotransmitters and their receptors. The major brain neurotransmitters that have been implicated in

psychiatric disorders are: neuropeptides, epinephrine, norepinephrine, dopamine, acetylcholinesterase, 5-hydroxytryptamine, and Gamma-aminobutyric acid (GABA). In the hospital, many psychotic patients that are not confined to the bed and medication may be given and/or administered at a central point rather than having a 'drug round'. In psychiatric units, patient's compliance may be a problem and it is often necessary to ensure that drug is taken [40, 41]. Occasionally, a patients' paranoia may extend to the drugs they are given. They may think the staff members attending to them are trying to poison them [42].

Traditionally, antipsychotic drugs are classified as typical (classical) or atypical. The typical antipsychotic drugs are generally those that have been use for many years and common examples include; chlorpromazine, flupentixol, fluphenazine, haloperidol, and thioridazine [43]. The atypical antipsychotic drugs on the other hand, are more recent additions to the repertoire of drugs available. These drugs (e.g. amisulpride, clozapine, olanzapine, quetiapine, risperidone, zotepine) produce fewer adverse effects (e.g. tremor) on the motor system and may also help patients who do not respond to typical antipsychotic drugs [44].

4. Mechanism of action of antipsychotic drugs

Almost all antipsychotic drugs have many different pharmacological actions that it is very difficult to relate any one action to a therapeutic effect [45, 46]. Effective antipsychotic drugs share the ability to inhibit the physiological actions of dopamine D_2 receptors in the brain [47]. Collectively, the drugs are quite useful in controlling the states of agitation observed/found in acute schizophrenia, mania and some other forms of delirium and in paranoia. Their exact mode of action in these conditions remains unknown but most of them block the action of dopamine on D_2 receptors in the mesolimbic system of the brain and this seems crucial to their sedative and antipsychotic properties [48]. These drugs also inhibit the action of dopamine on chemoreceptor trigger zone of the brain and are thus antiemetic. Furthermore, drugs such as haloperidol prevent the action of the dopaminergic nerves that run from the substantia nigra to the corpus striatum. Disruption of physiological action of this system causes Parkinsonism and these drugs may cause various disorders of movement and posture [49].

5. Phytotherapy and the conventional therapies for psychosis

5.1. Conventional therapy

Contrary to phytotherapy that involves the use of medicinal plants, conventional therapy for psychosis is majorly by the use of medications. Others include cognitive therapy treatment, counseling, family or support group, the use of mood stabilizers etc. Cognitive therapy centers on identifying different patterns of thought (perception about situation) that brings about undesirable action or feelings. In some countries of the world particularly United Kingdom and United States, this kind of therapy is embraced (sometimes in combination with medications) as the most effective way of treating psychosis or psychosis-related disorder such as schizophrenia,

depression and or substance abuse. Additionally, family or support group form of psychosis therapy deals with the informal measure of treatment by a way of caring or providing support to people or family members suffering from the menace geared towards knowing how they fare on the various treatment or medications being exposed to and perhaps discussion on whether there is need for a change if medication is presenting havoc than alleviating the situation.

5.2. Medications as a form of therapy for psychosis

The discovery of chlorpromazine in the mid-1900s (1953) for the treatment of psychosis or related ailments led to the emergence of other conventional or typical antipsychotics such as perphenazine (marketed in 1957), trifluoperazine (1958), fluphenazine (1960), haloperidol (1966), thiothixene (1968), loxapine (1978), flupentixol (1983) usually referred as the first line or first generation antipsychotics [45]. These traditional agents aside exhibiting different level of potencies such as low (e.g. chlorpromazine), intermediate (perphenazine), high (haloperidol) are embraced and adopted for short or long-term use against acute or chronic psychotic disorders (schizophrenia, schizoaffective and or delusional disorders, psychotic-depressive ailments, dementia etc.). Antipsychotics or neuroleptics (derived from the combination of neuron and 'lepsis' to mean 'take hold of nervous system') ordinarily acts by blocking the Dopamine D_2 receptors (protein) domicile in the limbic system and striatum, thus, producing adverse effects such as the development of extrapyramidal side effects (EPSs), hyperprolactemia (elevated level of prolactin in the blood), neuroleptic malignant with Tardive dyskinesia, sexual dysfunction, restlessness, stiffness and shaking of the joints etc. among common names or features of these effects [50, 51].Moreover, the coming of the newer or modern or second generation antipsychotic drugs (**Table 1**) otherwise referred to as atypical antipsychotics have in a way in recent times in clinical medicine replaced the use of first generation (FG) counterpart owing to their ability to lower some of the side effects known with FG. They exert these actions by proffering less affinity for D_2 receptor,

Antipsychotics	Brand name	Year of first market
Clozapine	Clozaril	1991
Olanzapine	Zyprexa	1996
Quetiapine	Seroquel	1998
Risperidone	Risperdal	2004
Ziprasidone	Zeldox	2009
Aripiprazole	Abilify	2013
Asenapine	Saphris	2009
Iloperidone*	Zomaril	2009
Blonanserin	Lonasen	2009
Lurasidone*	Latuda	2010

*Not yet approved by Food, Drug and Administration (FDA, US).

Table 1. Modern antipsychotics.

higher affinities for other neuroreceptors such as serotonin (e.g. 5-HT_{1A}, 5-HT_{2A} etc.) and norepinephrine (α1, α2 subtypes) as well as regulate glutamate receptor-mediated functions and behaviors among others [51, 52]. However, it is interesting to note that with issues relating to pharmacological effect, efficacy, safety, tolerability, cost effectiveness and adverse effects, it is important to weigh the pros and cons between both sides in terms of the above enumerated factors. In fact, there are reports that these newer generation drugs are more expensive, although the benefits they rendered outweighs the financial implications and are of less consequence as highlighted by clinicians and policy makers [51]. Similarly, despite revelations of side effects such as weight gain attributed to some modern class of antipsychotics such as Clozapine and Olanzapine but evidence as to why this is so is still unclear. Above all, in a review by Gardner and others [45] at comparing the superiority between typical and atypical antipsychotics taking into consideration above factors, they affirm the supremacy of the atypical antipsychotics over the old ones as evidenced in a number of cited reports (though accompanied with limitations) but still, generated huge number of prescriptions and acceptance globally [53–55].

5.3. Phytotherapy in psychotic care

Herbal medicine or phytotherapy according to World Health Organization (WHO) means herbal (medicinal plant) product containing the active components of plant parts or materials or both combined. In recent times, the use of medicinal plants in complementary and alternative medicine has continued to receive wider publicity in many quarters of the world. In fact 80% of the entire global population makes use of one form of traditional medicine in the prevention, diagnosis and treatment of numerous diseases facing them while also being incorporated within their national healthcare system. Psychosis, a mental condition resulting in the ability of an individual to witness distorted or total loss of contact with reality is considered among the neuropsychiatric disorders according to WHO with 13–49% of individual worldwide being affected by them at a particular stage within their life time [13]. Many medicinal plants and orthodox medicines are embraced and used in the management of this derangement [13, 45, 56], despite the numerous adverse effects including but not limited to restlessness, sexual dysfunction, extrapyramidal (EPSs) such as tardive dyskinesia (persistent tongue, mouth and jaw movement), malignant syndrome etc. attributed to these chemical moieties [51]. Interestingly, it is worthy of mention that out of several medicinal plants with reported antipsychotic effect [13, 11], very few, such as Lemon balm (*Melissa officinalis*), Yokukansan (TJ-54), Ginkgo (*Ginkgo biloba*), Valerian (*Valeriana officinalis*), St John's wort (*Hypericum perforatum*), Kava-kava (*Piper methysticum*) have been developed as agents with reported use for phytotherapy while being functioning as antidote against prominent psychiatric ailments (depressive, somatic, psychotic, anxiety, sleep) [5, 57] with the latter four agents among the first 10 best-selling herbal formulations in the US [13] and Africa in the management of neurological diseases [58], although, there are reports of agent like St John's wort inducing psychosis [59, 60]. In fact, despite their wide usage and preference over conventional antipsychotic drugs with varying adverse effects [61], psychiatric patients have continued to adopt herbal therapy for the management of psychosis [11]. The respective list of selected medicinal plants commonly used in psychotic care and the most prominently implicated phytonutrients of antipsychotic significance are presented in **Tables 2** and **3**.

Family	Species	Parts	Folkloric usage	Scientific validation	Toxicity	Phytonutrients
Alliaceae	*Agapanthus campanulatus* F.M. Leighton	Root	Decoction of the root is taken orally [62]	Extract exhibited serotonin, noradrenalin, and dopamine transporter inhibitors [63, 64].	No record	Flavonoid [64]
Amaryllidaceae	*Boophane disticha* (L.f.) herb	Leaves and bulbs	Decoctions of bulb scales given to sedate violent, psychotic patents [65]	Affinity to the serotonin transporter protein [66]; It also inhibited serotonin, noradrenalin and dopamine transporters [64]	No record	Alkaloids (buphanidrine and buphanamine) [64]
Anacardiaceae	*Spondias mombin* L.	Leaves	Leaves extract is used traditionally [67]	The aqueous extract prolonged the sleeping time and decreased the stereotyped behavior [67]	Non-toxic [67]	Tannins, anthraquinones, flavonoids, glycosides. Phenols, saponins, phlobatannins and alkaloids [67]
Apocynaceae	*Rauvolfia vomitoria* Afzel.	Root	The root is ground into powder and taken with pap or decoctions orally taken [68]	Decreased locomotor behavior [69]	Non-toxic [70]	Beta-carboline alkaloid, alstonine [69]
Apocynaceae	*Rauvolfia tetraphylla* L.	Leaves	No record	Significant affinity for 5-HT2A and DA-D2 receptors [71]	Non-toxic [71]	11demethoxyreserpiline (3) and 10-demethoxyreserpiline (4), α-yohimbine (5) and reserpiline [71]
Asclepiadaceae	*Gomphocarpus physocarpus* E. Mey	Leaves	Powdered leaf is used to sedate psychotic patient [65]	The extract inhibited monoamine oxidase [72]	No record	Carbohydrates, cardiac glycosides, steroids/ terpenoids, alkaloids and phenols [73]
Asclepiadaceae	*Xysmalobium undulatum* (L.) Aiton.f.	Root	Roots administered [74]	Extracts exhibited SSRI activity [64]	No toxicity [75]	Flavonoid (xysmalorin and uzarin) [64]
Euphorbiaceae	*Securinega virosa* (Roxb ex. Willd) Baill.	Leaves and root	Decoction of the leaves and roots [76]	The extract exhibited significant effect on D1 receptor by inhibiting grooming and climbing behaviors in rats [76].	Non-toxic [77]	Alkaloids, saponin, flavonoid, and tannin [76]

Family	Species	Parts	Folkloric usage	Scientific validation	Toxicity	Phytonutrients
Fabaceae	*Afzelia Africana* Smith	Stem bark	Fresh stembark of *Lophira alata* and *A. africana* are powdered together. The powder is then infused in water for 2 h and given to the patient to drink and bath [78]	The extract reduced the locomotive activity, rearing and sniffing in rats [78]	Non -toxic [79]	Alkaloids, tannins, saponins, flavonoids, triterpenoid, phytosterols and glycosides [79]
Fabaceae	*Amblygonocarpus andongensis*	Stem bark	Aqueous extract of the stem bark is taken orally [80]	The extract reduced the psychotic behavior characterized by anorexia and agitation in rats [81]	Mildly toxic and has reducing effects on weight [80]	No record
Fabaceae	*Arachis hypogaea L*	Leaves and stem	Aqueous extract of the leaves taken orally [82]	It has sedative effect [83]	No records	Linalool [83]
Fabaceae	*Lonchocarpus cyanescens* (Schumach and Thonn.) Benth.	Leaves	It is used in combination with another recipe of plant origin [84]	The extract inhibited stereotype behavior and spontaneous motor activity [84]	No records	Alkaloids, anthraquinones, cardiac glycosides, cyanogenetic glycosides, flavonoids, saponins, steroids and tannins [84]
Lamiaceae	*Ocimum sanctum L.*	Leaves	Extract from the leaves is taken orally [85]	Attenuation of locomotory activity and dopamine levels [85]	Non-toxic [86]	Eugenol, cardinene, cubenol, borneol, linolenic acid, oleic acid, palmitric acid, steric acid, vallinin, vicenin, vitexin, vllinin acid, orientin, circineol, gallic acid, vitamin A, vitamin C, phosphorus and iron [87]
Lamiaceae	*Mentha aquatica* L.	Leaves	Mixed with leaves of *Tagetes minuta* L. burned and the smoke is inhaled [88]	Leaf extracts exhibited SSRI activity and MAO-B inhibitory activity [63, 89]	No record	Flavones and flavanone derivatives [90]
Liliaceae	*Allium cepa Linn*	Bulb	Paste [91].	Onion paste inhibited dopaminergic neurotransmission and possibly blocks dopamine D2 receptor [91]	Non-toxic [92]	Phenolic acid, flavonoids, anthocyanin, sterols, vitamins, pectin and peptides [91].

Family	Species	Parts	Folkloric usage	Scientific validation	Toxicity	Phytonutrients
Ochnaceae	*Lophira alata* Banks ex. Gaertn.f.	Stem bark	Fresh stembark is powdered with *Afzelia africana* stembark. It is then infused in water for 2 h and given to the patient to drink and bath [78].	The extract reduced locomotive activity and rearing in rats [78]	Non-toxic [79]	Alkaloids, tannins, saponins, flavonoids, triterpenoid, phytosterols and glycosides [79]
Piperaceae	*Piper guineense* Schum & Thonn	Fruit	No record	Significant reduction on rearing, locomotor activity and dips in mice [93]	Non-toxic [94]	β-Sesquiphellandrene, limonene, linalool [93]
Rutaceae	*Ruta graveolens* L.	Leaves	Decoction of the leaves and oil extract are used [95]	It exhibited MAO inhibitory activity [89]	No toxicity [96]	Furocoumarins, furoquinolines and acridone alkaloids [89].
Solanaceae	*Datura stramonium L.*	Leaves and seeds	Information not provided [65, 97]	The seeds and leaves of *D. stramonium* are used to sedate psychotic patients [98]	Toxic [97]	Alkaloids, tannins, saponins and cardiac glycosides [97]

Table 2. Medicinal plants list of plant with antipsychotic potential, their ethnopharmacology, toxicity and mechanism of actions.

Active compound	Mechanism of action	References
Ursolic acid (terpene)	Activation of dopamine D_1 and D_2 receptors	[99]
Reserpiline(alkaloid)	inhibition binding to DA-D2 and 5-HT2A receptors	[71]
α-Yohimbine (alkaloid)	inhibition binding to DA-D2 and 5-HT2A receptors	[71]
Methylaplysinopsin (alkaloid)	Inhibition of monoamine oxidase (MAO) and displacement serotonin from its receptors	[100]
Polygalasaponins (saponin)	Affinity for dopamine and serotonin receptors	[101]
Yuanzhi-1 (triterpenoid saponin)	Uptake of inhibitor that block dopamine, norepinephrine and serotonin transporters	[102]
Geranial, neral and 6-methyl-5-hepten-2-one, citronellal, geranyl-acetate, β-caryophyllene and β-caryophyllene-oxide, and 1,8 cineole (terpene)	Nicotinic and muscarinic cholinergic receptor binding properties in human brain tissue, acetylcholinesterase inhibitory properties and inhibition of enzyme GABA transaminase, leading to increased GABA activity	[103, 104]
Tropane (alkaloid)	Muscarinic acetylcholinesterase receptor antagonist	[105]
Purine (alkaloid)	Receptor interactions, specifically involving DA D1 receptor signaling	[106]

Active compound	Mechanism of action	References
Isoquinoline (alkaloid)	Opioid receptor binding	[107]
Pyridine (alkaloid)	Agonist nicotinic acetylcholinesterase receptor binding	[108]
Physostigmine (alkaloid)	Cholinesterase inhibitor and direct agonistic nicotinic acetylcholinesterase receptor binding	[109]
Pilocarpine (alkaloid)	Muscarinic acetylcholinesterase receptor agonist	[105]
Reserpine (alkaloid)	Irreversible blockage of norepinephrine and dopamine	[110]
β-Sesquiphellandrene (terpene)	Inhibition of dopamine neurotransmission at D1/D2 receptors	[93]
Buphanidrine and buphanamine (alkaloids)	Affinity to the serotonin transporter (SERT) protein	[66]
Xysmalorin and uzarin (flavanoids)	Affinity for SERT in the binding assay.	[64]
Atropine (alkaloid)	CNS depressants and competitively antagonize muscarinic cholinergic receptors.	[111]
Scopolamine (alkaloid)	CNS depressants and competitively antagonize muscarinic cholinergic receptors.	[111]
Agathisflavone and amentoflavone (flavanoid)	Affinity for GABAA-benzodiazepine receptor	[110]

Table 3. Psychoprotective bioactive metabolites.

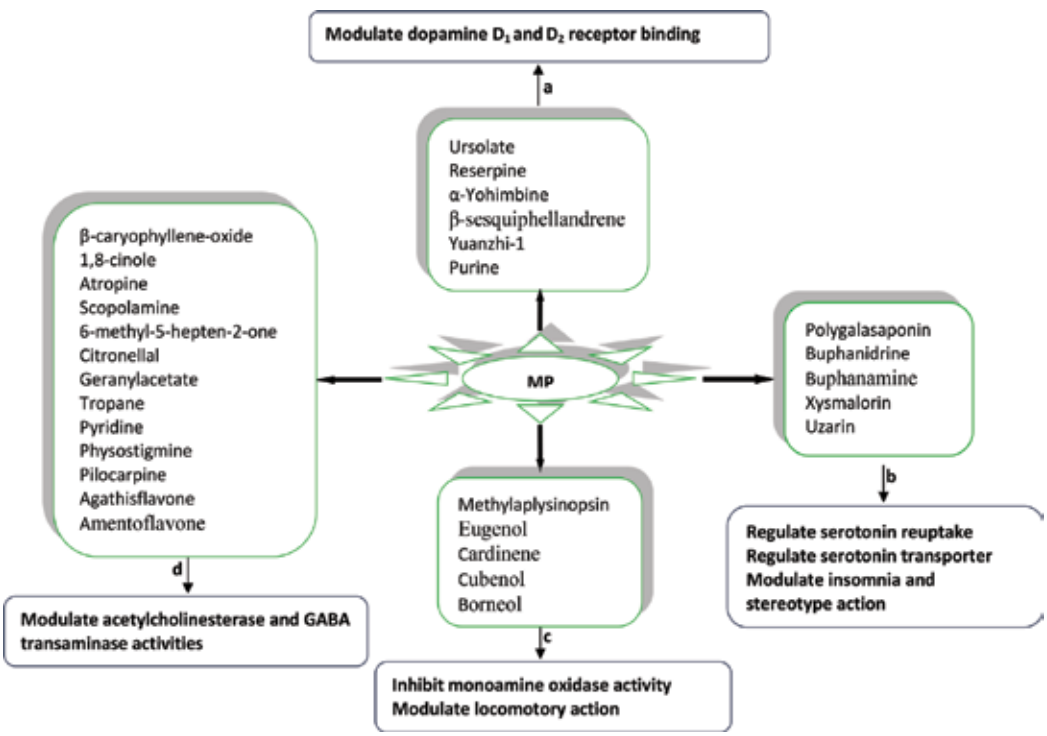

Figure 1. A unified mechanism of actions of antipsychotic phytonutrients. MP, medicinal plants.

Taken together, a unified mechanism of actions of the antipsychotic phytonutrients could be proposed as presented in **Figure 1**. This may be conceptualized to potentiate either (a) modulatory role on dopamine D_1 and D_2 receptors, (b) regulation of serotonin reuptake/transporters, (c) inhibitory effect on the specific activity of monoamine oxidase, or (d) regulation of the specific activities of acetylcholinesterase and Gama-aminobutyric acid transaminase. Plants endowed with these metabolites (**Figure 1**) may unilaterally or synergistically be employed with other conventional antipsychotic therapies to achieve optimal results in alleviating the ill episodes of the different forms (depression, hallucination, schizophrenia, etc.) of psychosis related disorders.

6. Conclusion

Conclusively, considering the potential benefits of medicinal plants in antipsychotic care, it may be evidently suggested that, there is a need for an inclusive integrative approach to manage and treat psychosis. One of such strategies may be to embrace traditional systems of medicine with the use of medicinal plants. This is mainly due to the plants being endowed with antipsychotic phytonutrients and demonstrating significant results in the management of mental health disorders. However, embracing herbal formulations in combination with conventional pharmaceuticals may provide better outcome with a view to targeting different aspects of mental being alertness. Although this concept may be controversial, research into phytotherapeutic care for psychosis is a promising niche for further studies.

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Section 3

Social Point of View

Chapter 5

Insight in Psychosis: An Integrated Perspective

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Additional information is available at the end of the chapter

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Abstract

Insight in psychosis is a multidimensional concept with each component being influenced by various biological, individual and cultural factors. The study and understanding of such a concept needs to be done at various levels and with needed emphasis on the personal and interpersonal aspects of the people suffering with psychotic disorders, as this is routinely neglected in the clinical discourse in favor of reductionist biological models. An adequate understanding of the nature of human person should undergird a complex effort like the inquiry into the higher concepts of human experience such as delusion and insight into illness, which in turn should guide the therapeutic, administrative and legal management of people with psychotic illness.

Keywords: insight, psychosis, jaspers, psychopathology, neuroscience

1. Introduction

Psychosis can be a devastating personal experience due to its ability to rob a person of his self determination and control on his behavior. In the interpersonal context it can damage trust in the relationship and diminish the familiarity between the healthy and the affected person, giving rise to interpersonal negative criticism and can even lead to a complete loss in a relationship. In this background how a person suffering with psychotic disorders reflects on his illness and how he interacts with treating team or the legal system with that self-understanding becomes important. The ability of a person to reflect upon his illness is called Insight into illness (psychotic illness in this case).

In this chapter we will chart a historical and conceptual development of the concept of insight in psychosis and how brilliant people throughout history interacted with this concept and its implications. Later we will look at the current neurobiological and socio-cultural perspectives

and outline the need for an integrated view of the concept especially in the background of the nature of human person. We will end the chapter with an attempt to see how far we understand this concept, as well as what the unanswered questions are which would benefit from further study.

2. History of the concept

The concept of Insight in psychosis or the lack of it, did not receive much attention till mid nineteenth century due to its close association with the concept of delusion, so much so that loss of insight was part of the definition of insanity. Two empirical factors [1] that brought about the need for an investigation of this concept were:

1. episodic nature of certain forms of insanity, and
2. incomplete insanity or monomania, in which there was the impairment of specific faculties of the mind and not a global impairment.

Both these factors lead to the assumption that there might be some forms of insanity which can be called Partial Insanity. The idea of Incomplete Insanity in the eighteenth and early nineteenth centuries had to fight the prevalent idea put forward by John Locke of an indivisible or simple mind. This idea was challenged with the help of Gall's Phrenology which divided the brain according to anatomical parts with specific functions and Thomas Reid's Common sense theory of mind which suggested that mind has separable components like will, emotion, etc. After this there was a significant change in the discourse of Insanity with talk of "emotional" insanities and "volitional" insanities.

Partial insanity and the related ideas about specific faculties of the mind therefore led to the birth of an idea of insight as something to be studied and understood in its own right, separate from the concept of mental illness. There was understandable resistance for such a concept because of its far reaching implications on legal responsibility of the people with mental illness. In 1869, an important conference was convened by the Société Médico-Psychologique to inquire into the legal questions raised by the partial insanity and the nature of a person's awareness about his mental illness. Some of the important observations in that conference and subsequent scientific debates were: (1) fair reasoning capacity in an ill person does not always mean that he is aware of his illness; (2) some people who were aware of their illness suggested that they were powerless to prevent few behaviors related to their illness; (3) awareness of mental illness or its symptoms does not mean that the ill person has freedom of choice with regard to the resultant behavior. These issues will be important when insight is discussed in the context of coercion and legal responsibility.

From then on the discussion went in two different streams of thought. On the one hand alienists and prominent biological psychiatrists of the late nineteenth and early twentieth century like Kraepelin, Maudsley, Despine and Lewis spearheaded the view that the insane cannot have insight or judgment about their illness. On the other hand, Dilthey's concept of Human Sciences and Husserl's phenomenology, which later influenced Karl Jaspers, fostered another view that insight or patient's judgment about their illness is dynamic and is related to deeper concepts like that of a person's self.

Another important aspect in the development of the idea of insight into psychosis was the use of different terms in different European countries. For example, Germanic languages like German and English used terms like Einsicht, Insight or Introspection which encouraged a narrow view that the concept of insight is a circumscribed notion and is separable from the larger concepts of mind, consciousness or the self. The French, by contrast, lack a specific term and so used the word "Conscience," which had a wider meaning encompassing consciousness, self-knowledge and introspection. This led to differences in the way the concept of insight was discussed in the French scientific literature compared to that in the Anglophone or German scientific literature.

3. Current perspectives on insight in psychosis

Over the past two decades, there is a resurgence of interest in the concept of Insight in psychosis. This might be due to its relevance with regards to treatment adherence, long term prognosis, psychological management of psychotic symptoms, as well as use of coercion in treatment and legal responsibility of people with psychotic disorders. The understanding of the concept has greatly evolved from the initial categorical yes or no assessment in studies like International Pilot Study of Schizophrenia [2] and assessment schedules like Present State Examination [3] to a multidimensional construct covering various aspects of Insight.

The initial multidimensional construct by David [4] was characterized by three aspects of awareness of being mentally ill, awareness of pathological nature of symptoms and acceptance of treatment. Though this approach was lauded by various researchers who further expanded it, many others from the anthropological perspective have deemed it as a biomedical approach which favors a reductionist biological understanding of the concept of Insight and mental illness.

4. Problems with the concept of insight in psychosis

Insight in psychosis is a difficult concept to define within a biomedical model due to various factors which are listed by Fulford [5] as:

1. Insight, like the concept of Time, is a higher level concept which is easier to use than to define.
2. Insight is related with particular features of mental illness like delusions, hallucinations and thought alienation phenomena and not to other features.
3. Delusion is a psycho-pathologically and ethically central feature in mental illness.
4. Delusion has a conceptual range of forms comparable to normal human reason.

When we consider the usage of the concept of insight we find that the distinction between psychotic and nonpsychotic has wide clinical use and is legally important. Within the symptoms of psychosis, it is delusions which are perhaps most closely associated with insight and therefore the understanding of insight has similar conceptual limitations as the understanding and definition of delusion.

5. Neurobiology and metacognition research

Metacognition is the ability of the human mind to reflect, look upon and influence itself. In the fourth century AD, Saint Augustine in his popular Confessions [6] ponders about the metamemory, a concept akin to metacognition that, "When, therefore, I remember memory, then memory is present to itself by itself, but when I remember forgetfulness then both memory and forgetfulness are present together – the memory by which I remember the forgetfulness which I remember." And in his Allgemeine Psychopathologie [7] Karl Jaspers also similarly writes, "I am not only conscious in the sense of having certain inner experiences, but I am turned back on myself – reflected back – in the consciousness of self. In the course of this reflection, I not only come to know myself, but I also influence myself." Though, as shown, this faculty of human mind was known from ancient times, it was not neuro-biologically investigated.

Over the last decade, interesting research into the neuroscience of self and self-reflection has opened new avenues for the understanding of the human mind and perception of changes within the self. In the study of the concept of insight in psychosis these are relevant findings as they pertain to normal and abnormal self-reflection. We will point out few prominent and replicated functional MRI findings using the Beck Cognitive Insight Scale [8], though these were done on small sample sizes and did not account for the effects of duration of illness and use of antipsychotic medication.

1. Cortical midline structures (CMS) comprising of medial prefrontal cortex, anterior and posterior cingulate cortex are seemingly associated with self-reflection. Researchers [9–12] have found that in people with schizophrenia, the anterior portion of CMS was often functional when self-appraisal was contrasted with other-appraisal and also that within the anterior portion of CMS, the ventro-medial prefrontal cortex is more correlated with information relevant to self than the dorso-medial prefrontal cortex. This suggests that CMS deficits might lead to people with schizophrenia having problems with distinguishing self from others.

2. Other researchers [13, 14] have shown an anterior to posterior shift in CMS activity in a similar group of people with schizophrenia during self and social reflection tasks. An associated observation was that there was also a functional connectivity change between anterior and posterior cingulate cortex.

3. Symptom unawareness component of insight was observed to have widespread brain activation including CMS areas compared to symptom misattribution component which was localized to specific brain regions [13]. This finding is interesting due to its implications on the relationship between the various components in the concept of insight in psychosis.

4. There was a positive association between posterior CMS activation and cognitive insight in people with schizophrenia but not in those with bipolar disorder with psychotic symptoms [15]. This particular finding has to be replicated.

Unlike the earlier research which made multiple unsuccessful attempts at finding a specific executive deficit associated with the whole concept of insight as was suggested by Aubrey Lewis at the beginning of the twentieth century [16], the above mentioned research correlates more with specific components of insight rather than a unitary whole. However, caution

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needs to be employed in view of limitations of above mentioned research and also due to the fact that this studies only the brain correlates which may be down-stream events and their interpretation as to whether they are causes or effects depends on the worldview espoused, biomedical or any other.

6. Cultural critique of insight

Markova and Berrios [17, 18] have suggested three broad ways that the field of mental health conceptualizes problems with insight:

(1) Insight as impaired awareness, i.e., a neurobiological deficit in awareness due to the psychotic disease process. This is biological psychiatry's position on the concept of insight.

(2) Insight as self-deception, i.e., a psychodynamic defense mechanism that needs to be overcome in therapy. This view is a broad understanding not limited to psychosis, and is more relevant in the neurotic conditions and those requiring psychotherapy.

(3) Insight as misattribution, i.e., cognitively attributing symptoms to different causes.

Socio-cultural critics of the concept of insight take the third position, and argue that a person who is suffering with psychotic illness may attribute problems to different causes. However as long as the person is able to construct a meaningful explanation of his symptom experience and integrate the psychotic experience into his life, he should be considered to have insight into illness [18]. Insight should not be restricted to just a biomedical explanation, as that explanation itself is argued to be a socially- constructed model among those who subscribe to a western, individualist, post-enlightenment and biologically reductionist position.

A few workers have suggested socio-cultural modifications to the multidimensional model of insight [19], for example accepting any kind of help including nonmedical help should qualify as presence of certain form of insight. As the causal explanations of mental illness are contested across cultures, anthropological critics argue for a wider and an inclusive understanding of the concept of mental illness and a suffering person's judgment about it.

One other aspect of the cultural critique of insight in psychosis is the consistent observation that the prognosis of schizophrenia is demonstrably better in developing countries [2]. These cultures are also often less likely to espouse the biomedical models of causation and treatment by default. The role of strong family systems has long been postulated to be a contributor to the better prognosis in developing countries, and it is worth considering the role of family beliefs in impacting the patient's insight into his illness.

7. Nature of the human person

The nature of Human being has been discussed since antiquity. Mind–body relationship and nature of the human mind has given rise to numerous debates. All the research discussed till now from a biomedical viewpoint has presented empirical facts as opposed to the evaluative

dimension of human person. Therefore it is important to understand the personalist emphasis provided by Dilthey and Husserl. Personalism [20] as a distinctive philosophy which emphasizes the centrality of personhood of human being and his dignity, has been explored prominently by Immanuel Kant and later by people who were influenced by him.

Wilhelm Dilthey [21] notably distinguished natural sciences from human sciences emphasizing that the approach needed for studying distinctly human aspects of men and women has to be different from the methods of natural science. He suggested due to the dual (i.e., biological and psychological) aspects of human nature it has to be studied from both an "erklaren" (causal explanation) perspective and "verstehen" (empathic understanding) perspective. While Erklaren-perspective deals with descriptive aspect of symptoms and tries to give causal explanation, Verstehen-perspective describes the meaningful nature of human experience and therefore is more akin to the personal aspects. Dilthey's ideas, as mentioned earlier, exercised tremendous influence on Jasper's psychopathology. Buber [22], another personalist contemporary of Dilthey, distinguished between two types of relationships possible for us, i.e., the "I-You" relationship and the "I-it" relationship. The "I-You" relationship emphasizes the uniqueness of human personal encounters with other personal beings which is not comparable to a human encounter with an impersonal object (an "it").

Lastly, Wojtyla [23] defined a person as a being towards which the only adequate attitude is one of love and respect. It is in this personalist background, Fulford claims that delusion (and by implication the related concept of insight) is a failure of practical-reason of the person rather than a cognitive deficit [24]. Practical reasoning is the opposite of theoretical reasoning which is concerned with facts, cause–effect relations and impersonal objective explanations, and is the reasoning needed in the practical life to subjectively evaluate choices for actions and therefore is related to values. So, according to Fulford there is a failure of practical reasoning which presents as wrong choices and actions in people with psychotic disorders. We here introduce the alternative viewpoint which emphasizes the regard for the personhood of a human being in the discussion of the Insight in psychosis.

8. Discursive psychology and intersubjectivity

In second half of the last century, there were numerous voices from humanities and even from within the natural sciences decrying the reductionist anthropology in scientific psychiatry. The coercive practices of psychiatry in this context were discussed as violations of human rights and dignity. For example, research suggests that involuntary treatment is overused in some parts of the world based on narrow biomedical models of insight [25] and historically totalitarian governments like the Soviet Union have used (as part of their "official" classifications) unscientific labels like "sluggish schizophrenia" with the alleged symptom of "inflexibility of ideas" to incarcerate political dissenters.

This movement aimed at broadening the narrow emphasis of biological psychiatry was enhanced by the developments in the study of language and discourse. Discourse analysis and the related field of discursive psychology [26] regard human verbal interaction as a performative act within a context, i.e., language is used not only to *describe* internal and external

reality but also is used to *perform* or achieve certain ends based upon the context within which such an interaction happens. Discursive psychology helps us understand the clinical context in which an assessment of insight happens, for example a delusion or a thought insertion is attributed differently by the clinician and the suffering person. Language therefore is used to describe what the patient is experiencing as well as to interpret and inform his beliefs about the cause of the symptoms in the clinical context. It gives us tools to unravel the intended goals of the person with psychotic illness when he communicates his judgment about the illness.

We are also enriched by the concept of narrative insight [27] which tries to understand the insight of the person suffering from psychosis as a tool by which she tries to make sense of her illness. These concepts of human discourse and narrative add complexity to the concept of insight while emphasizing the personal and interpersonal aspects during the assessment and management of people with psychotic illness.

9. Integrated view of insight in psychosis

Considering the various arguments from neuroscience and anthropology, David [28] accepts that the "acceptance or awareness of the mental illness" component of his model can be influenced widely by the pre-existent interpretative frameworks in the suffering person's culture while the "acceptance of the kind or duration of treatment" component may also be depended more on the pre-morbid personality of the suffering person and may not be related to his or her neurobiological deficits due to the illness. Only the component of "acceptance or the relabeling of experience as pathological" may be closely related to the cognitive deficits due to the neurobiological disease process which may be consistent across cultures. This last point is corroborated by the empirical evidence from the developing world [29], that people with schizophrenia when assessed with multidimensional rating scales of insight more often accept the pathological nature of their symptoms but are hesitant to accept the biomedical model of the mental illness as a whole.

When we hold both sides of the argument (the biological and the personal) together it helps us to better understand the complexity of the concept of insight in psychosis. Such a composite view is presented in Jasperian phenomenological psychopathology (with its emphasis on "erklaren" and "verstehen" perspectives in investigating psychopathology), which is more holistic and person-centered than the narrow reductionist focus on symptoms in Kraepelinian descriptive psychopathology. The Jasperian model allows the impersonal disease to be combined with the personal illness, and the biological deficit to be combined with the failure of reasoning which evaluates personal choices and action [30]. Such an integrated view is more reflective of the kind of being that we are discussing about, i.e., the mystery of how the neurobiological and psycho-spiritual components come together in the complex entity we call the Human Person.

The current chapter through a historical, neurobiological and personalist review of the concept of insight, however, raises many questions, while bringing some clarity to the discussion. Some of the questions are:

1. In the psychological capacity assessment by Appelbaum et al. called McCAT [31], the psychotic loss of capacity is considered an "appreciation disorder." This is distinct from the reasons for the loss of capacity in other illnesses like dementia, which are due to memory and reasoning defects. So the question remains as to what is the relation between delusional loss of rationality and the loss of rationality due to cognitive defects?

2. The concept of delusion is intimately related to the loss of insight, but the difficulty in precisely defining and delineating it is an added problem. Delusion is thought to be pathological either due to problems in perception or in logical reasoning, which purportedly displays a "loss of contact with reality." But there are research studies which report that it is difficult to demonstrate a problem with either aspect in patients with delusions: the posited perceptual basis for a delusion is internal and therefore cannot be accurately measured externally, while problems with logical reasoning are not observed [32]. So, what is the demonstrable criterion by which delusion can be incontrovertibly established? A definite answer to this question has thus far been elusive, even though delusions are certainly reliably assessed, diagnosed and treated in clinical practice regularly. A related—and even more clinically challenging—question is by what criteria can we differentiate a delusion from a strongly held religious, scientific or any other over-valued belief?

3. What are the relational dynamics and pitfalls of the inter-personal assessment of loss of insight between the clinician and the person with psychotic illness? And what are the borderlands between providing care and unethical coercion?

Others who want to delve deeper may want to explore the relation between delusion, belief, discourse, power relations and the nature of reality. Though interesting, they are beyond the purview of the discussion of the concept of insight in psychosis.

10. Conclusion

Historically, the concept of insight in psychosis has evolved over time from being part of the very definition of psychosis to being an independent, modifiable aspect of the experience of a patient with psychosis. There has also been an evolution in the understanding of insight from a unitary to a multidimensional construct, with each component being influenced by various biological, individual and cultural factors. The study and understanding of such a complex, multidimensional concept needs to be carried out at various levels and with needed emphasis on the personal and interpersonal aspects of the people suffering with psychotic disorders, aspects that are routinely neglected in the clinical discourse in favor of reductionist biological models.

While exciting neurobiological research seems to indicate that certain aspects of insight in psychosis may be biologically driven, it can no longer be justifiably considered a unitary construct. Individual and sociocultural factors play a key role in insight. "Acceptance of mental illness as the cause of symptoms" and "acceptance of treatment" are both factors that may be significantly colored by one's pre-morbid personality, worldview and cultural background. A patient who is able to recognize symptoms as being abnormal experiences and attempts to organize his experience in a meaningful way leading to help-seeking should be considered as having good insight into his illness even if the explanation and treatments he espouses differ from biomedical ones.

An imposition of biomedical models into the definition of insight may not only alienate patients from other cultural backgrounds from approaching treatment, it may also impede accurate clinical judgment by making the assessment of this crucial aspect of illness incomplete.

Fundamental to any effort to understand higher aspects of human experience (such as delusions and insight into illness) is an adequate understanding of the nature of human personhood. Taking after Kraepelinian descriptive psychopathology, biological psychiatry has tended towards reductionist understandings of personhood that emphasize neurobiology and symptoms of illness. We suggest that the more holistic Jasperian phenomenological approach to psychopathology which emphasizes both the "erklaren" (descriptive and causal explanations) and "verstehen" (empathic understanding) aspects of psychopathological assessment is a better reflection of the complexities that make up the human condition. Such a holistic, integrated understanding of the concept of insight in psychosis would in turn guide the therapeutic, administrative and legal management of people with these debilitating illnesses.

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This book collects chapters from a number of scientists all over the world, giving their contribution to the comprehension and clinical management of psychosis. The book adopts a perspective that respects the complexity of the human person and his/her relationships. It devotes a space both to the deepening of the more strictly biological aspects, the psychological aspects and the social aspects. Each section of the book (biological, psychological, social) reveals a deep connection with the themes of the other sections, showing the strength of this biopsychosocial interweaving. The relationship and the interweaving between these different areas is certainly a foundation of our existence and constitutes a law to which we cannot escape, so it is necessary that the biopsyosocial model is always considered in the interventions for the psychotic patient. This book also focuses on some specific and very innovative topics such as the importance of psychosocial factors and family factors, complementary approaches to psychosis managment, subclinical psychosis and relational aspects of psychosis.

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