The Role of the Family in Schizophrenia

James Canavan

Introduction

"One of the most elusive diseases known to man and unknown to medicine"

Schizophrenia is a devastating illness, often resulting in a loss of social functioning in affected individuals. The sufferer's family has a profound effect on their illness. Having a relation with schizophrenia also affects the roles and interactions within the family. James Joyce, who's daughter, Lucia, was diagnosed with schizophrenia, characterised the disease as "one of the most elusive diseases known to man and unknown to medicine".[1] Lucia's treatment was viewed by him as a "calamitous failure" and led to an acrimonious split between Joyce and Carl Jung.

Even though phenomenal changes have occurred in the conceptualisation and management of schizophrenia in the sixty years since Joyce wrote this, its diagnosis remains clinical. Characteristic features exist, such as hallucinations, delusions and formal thought disorder. These 'positive' symptoms may be joined by 'negative' symptoms such as affective flattening, social withdrawal, avolition and poverty of thought and speech content. Negative symptoms do not respond as well as positive ones to therapeutic intervention and confer a poorer prognosis. The functional decline associated with the negative symptoms leads to social and economic difficulties and puts a burden on the family.[1]

Schizophrenia has a lifetime prevalence of 1%,[2] affecting 35,000 people and their families in Ireland. It affects about 2 million people in the United States at a cost of $70 billion per annum. As with Lucia, young adults are affected at a time when increasing independence is their goal. Families are heavily burdened as the primary caregivers for relatives with a seemingly intractable illness.

Here, the role of the family in the aetiology of schizophrenia as purveyors of genetic material and providers of the environment is examined as well as the experience of grief arising from a diagnosis of schizophrenia and the controversies involving expressed emotion. Furthermore, the role of the family in schizophrenia therapy and its role in advocacy and service promotion are studied. Looking at the varied roles of the family in schizophrenia we can see if Joyce's pronouncement still rings true.

Nature and Nurture: A Double Inheritance

Nature

Genetic material is the fundamental gift of parents to their offspring. Genetic theories about the aetiology of schizophrenia have existed since the turn of the century when Kraepelin noted that unusual behaviour was common among the untreated relatives of schizophrenics he had met.

The recent Roscommon Family Study found that in interviewed relatives of schizophrenic probands, siblings had a 9.2% risk and parents a 1.3% risk of schizophrenia. The comparable general population morbid risk was 0.5%. The overall risk of schizophrenia in all first-degree relatives of probands was found to be thirteen times higher than in the relatives of unscreened controls.

Analysis of data from more than forty family and twin studies conducted between 1920 and 1987 also shows that the risk to relatives of affected individuals is significantly greater than the population risk for schizophrenia. The risk also varies with the degree of genetic relatedness. These risks are presented below in Table 1. The monozygotic (MZ) concordance rate (48%) for schizophrenia is approximately three times the corresponding dizygotic (DZ) concordance rate (17%). This 3:1 ratio strongly implicates the

Table 1: *Risks of Schizophrenia for Relatives of Schizophrenics*

Relation	Morbid Risk
General Population	1%
Spouses of Patients	2%
Third-Degree Relatives	
First Cousins	2%
Second-Degree Relatives	
Uncles/Aunts	2%
Nephews/Nieces	4%
Grandchildren	5%
Half-siblings	6%
First-Degree Relatives	
Parents	6%
Siblings	9%
Children	13%
Siblings with one Schizophrenic Parent	17%
Dizygotic Twins	17%
Monozygotic Twins	48%

(Gottesman II. Schizophrenia genesis: the origins of madness. New York, NY. WH Freeman & Co., 1991.)

importance of genetic factors but the monozygotic concordance rate of significantly less than 100% implicates non-genetic factors.

A single locus model could explain the familial aggregation of schizophrenia, and so linkage studies have been carried out to identify possible candidate genes. In 1988, Sherrington et al. reported linkage of deoxyribonucleic acid polymorphisms on Chromosome 5 to schizophrenia in Icelandic and British pedigrees that was consistent with a single locus model of inheritance. Further analysis, however, has excluded this locus and it is likely that this report was a false-positive result.[8] Searches for polymorphisms of the dopamine receptors have not been promising, nor have studies on γ-aminobutyric acid receptors and tyrosine hydroxylase polymorphisms. Wang et al. found statistically important evidence for linkage in schizophrenia implicating a section of the long arm of Chromosome 6. Furthermore a large U.S. multicentre linkage trial found suggestive but inconclusive evidence that linkage in Chromosomes 6 and 8 exists in schizophrenia. These chromosomes are currently the most promising candidates for the discovery of potential schizophrenia susceptibility loci.[8] Association studies searching for candidate genes have not been encouraging but as more researchers apply their skills to diverse samples, the probability of detecting candidate genes increases. Negative results will ensure the validity of previous studies.

However it is unlikely that hallucinations and other phenomenology are coded for directly by genes. The path from genes to behaviour is composed of a number of intermediate steps. "Alternative phenotypes" are biological traits that either correlate or co-segregate with schizophrenia. These include the clinical failure to inhibit the p50 auditory evoked response to repeated stimuli, which has been linked to the a-7 nicotinic acetylcholine receptor on Chromosome 15q14. It is feasible that these characteristics confer a vulnerability to developing schizophrenic phenomenology. They may also be pathognomic for specific neurodevelopmental defects, such as the cerebellar cortical defects associated with eye tracking abnormalities in schizophrenic patients.

While Mendelian inheritance does not apply to schizophrenia, it has been noted that both current experimental data and clinical heterogeneity are consistent with the phenomenon of genetic anticipation. Two studies examining 26 and 24 pedigrees found that genetic anticipation did occur, even when biases for earlier detection of illness in offspring were taken into account. These results are not conclusive, however, as another large study[2] failed to show anticipation in its cohort.

Nurture

The second gift of the family to its offspring is the environmental milieu in which it develops. Environmental factors such as viral exposure, nutritional deficiencies and obstetric complications may be aetiologically significant in schizophrenia and have been studied in the past.[2] Early development of schizophrenia in particular is associated with an even greater likelihood of obstetric complications[21,22] consistent with neurodevelopmental theories of schizophrenia.[23] However, exposure to these factors has a poor predictive power for the future development of the disease.[8]

Epidemiological data from genetic studies provides evidence for the importance of environmental mechanisms on normal and pathological development.[24] Low monozygotic twin concordance rates provide powerful evidence for the active and distinct role of the environment in schizophrenia pathogenesis. Is it possible that genes control sensitivity to environmental stimuli, varying liability to developing schizophrenia? A Finnish project studying adopted-away offspring of schizophrenic mothers[25] found that no offspring adopted into "healthy" or "mildly disturbed" families developed schizophrenia. It is noteworthy that all offspring who developed psychosis had been adopted into "disturbed" families. Sugarman and Crauford studied the prevalence of schizophrenia among the Afro-Caribbean community in Britain.[26] Siblings of Afro-Caribbean probands were 7 times more likely and U.K.-born siblings 15 times more likely to develop schizophrenia than their white counterparts. Afro-Caribbean and white populations have similar levels of familial predisposition to schizophrenia. So the increased prevalence of psychosis in immigrant offsprings' siblings may be due to environmental stresses in susceptible individuals.

Because monozygotic pairs share the same genetic material, the discordance in the development of schizophrenia must be due to what is termed "non-shared environmental effects".[24] Siblings, who share the same social class and upbringing, represent the uppermost estimate of the importance of the shared environment. Shared experiences should lead to similar outcomes. However, concordance rates of less than 10% have consistently been found for siblings in psychiatric disease[27, 28] implicating "non-shared environmental effects".

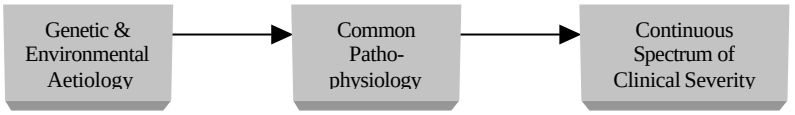
Overall, the roles of nature and nurture can be conceptualised in a multilocus model of schizophrenia[29] where genes confer a differential vulnerability to detrimental environmental influences, illustrated in Figure 1 below. This is the patient's double inheritance from the family.

Grief and Stigma: The Family's Response to an Ominous Diagnosis

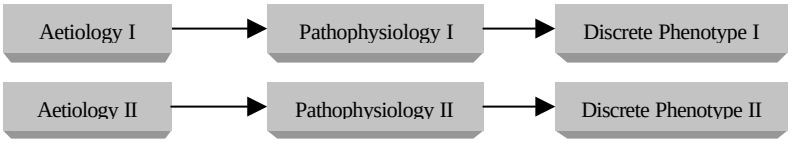
The feelings of "utter despair" expressed by Joyce[30] in his letters are commonly described following the diagnosis of a family member with schizophrenia. Martin S. Willick, an American psychiatrist whose twenty-eight year old Harvard-going son was diagnosed with schizophrenia

Figure 1: Models of the Role of Genetic and Environmental Factors in the Complex Inheritance of Schizophrenia

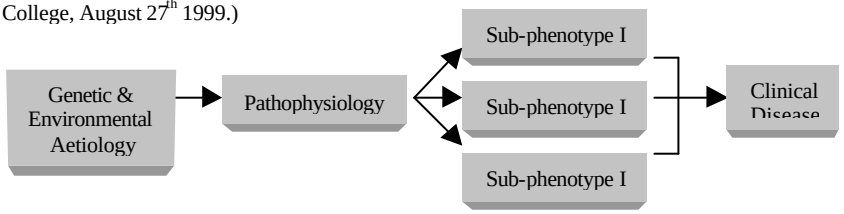
"Unitary" Model: Multiple sets of aetiological factors can all initiate the same pathogenic process. Phenotypic heterogeneity reflects quantitative differences in a single continuum of severity. Alternatively, phenotypic heterogeneity may be due to genetic pleiotropy, not aetiological heterogeneity. The common factor underlying the disease is proposed to be a "latent trait" that is transmissible but not directly observable, for example, the trait that may cause eye-tracking abnormalities and schizophrenia. (Kremen WS, Tsuang MT, Faraone SV, Lyons MJ. Using vulnerability indicators to compare conceptual models of genetic heterogeneity in schizophrenia. *J Nerv Ment Dis* 1992; 180: 141-152.)



"Discrete" Model: Schizophrenia can be subdivided into a series of discrete disorders at the level of aetiology and/or pathophysiology. (Kremen, et al.)



A Third Combined Model: Environmental and genetic factors act to produce a series of inter-related sub-phenotypes that combine to produce the clinical disease. (Conneally M. Molecular genetic advances in neurology and psychiatry; impact of the human genome project. Address to "Life and Death of the Brain" Symposium, University of Dublin, Trinity College, August 27th 1999.)



> "We experience this terrible feeling of loss and grieve for the son we knew. There is also that terrible loss of our expectations. We feel cheated out of watching him mature and flower the way adolescents do when they grow into young adults… it is a mourning without end because, of course, Gary is not dead at all. He is very much still with us, seeming eternally twelve years old needing constant care and attention."[31]

This "mourning without end" is tempered only by the "lingering hope that one day Gary will be returned to his former self".

Mourning encompasses the culture-bound social and cognitive processes through which families must pass to accept a diagnosis of mental illness.[32] A familial grief reaction in schizophrenia is complicated by the ambivalence of recognising chronic illness in a loved one while having recurring demands for action to cope with an evolving situation.[33] Loss of emotional contact with a physically living relative makes grieving especially painful, ambiguous and difficult to resolve.[34] The chronic or insidious progression of schizophrenia may lead to relatives minimising the implications of their loss, leading to poor grief resolution.[35]

Resolution of grief is also complicated by the stigmatisation of mental illness. In one recent study, it was found that half the parents and spouses of recently hospitalised psychiatric patients concealed the hospitalisation to some degree.[36] The hospitalisation of a female relative was more than twice as likely to be concealed than that of a male relative (OR=2.27). Because a diagnosis of mental illness is

Table 2: *Stages of Grieving. A Model of Family Response to Mental Illness*

1. REALISE that schizophrenia is not rare. It may seem to be but that's because it's not "talked about". Even within Australia's small population there are about half-a-million people who, like you and me, will face this illness in their immediate family.	8. PAY GREAT ATTENTION to the needs of the other members of the family.
2. LEARN as much as possible, as soon as possible, about schizophrenia: its cause, its course, its outcome.	9. TAKE HEED that unlimited unconditional self-sacrifice on behalf of someone with schizophrenia is fatal to effective caring and coping.
3. NEVER BECOME a moth around the flame of self-blame: it can destroy your chance of coping, FOREVER. It can destroy YOU. Free yourself with the modern knowledge that schizophrenia is NOT caused by the relatives.	10. BE AWARE that spending massive amounts of time with the person who has schizophrenia can make matters worse.
4. SEEK professional helpers who are EFFECTIVE. Identify them by their compassionate natures, informative style, eagerness to have you as their ALLY, and ability to ensure you receive comprehensive education in understanding and coping with schizophrenia.	11. MAINTAIN AND ESTABLISH friendships, activities and hobbies, particularly those that take you outside of the home.
5. CONTACT a self-help group for families with schizophrenia.	12. SET YOUR SIGHTS on maximum appropriate independence for your relative AND FOR YOURSELF.
6. ACCEPT that with an illness as complex as schizophrenia, the promptings of our natural instincts are often an unreliable guide to coping and caring. We, the relatives, DO need training.	13. DON'T BE SURPRISED to discover that in the end, it is the ability to change, to look at things differently, that distinguishes relatives who will cope, from those who will not.
7. GET TO KNOW the origins of the pressures, the ever-increasing pressures, to which we, the relatives are subject to.	14. TAKE very great CARE of yourself.

(Alexander K. Understanding & coping with schizophrenia: 14 principles for the relatives. Melbourne: Wilkinson Books, 1991.)

often concealed from those outside the family unit, it may not attract the same attention and support that an overt source of grief, for example a death, would. This has been termed "disenfranchised grief".[37]

Following structured interviews with thirty families with schizophrenic members, Tessler et al.[33] proposed a model of grieving in families with chronic mental illness (c.f. Table 2). This attempts to include the social context of the family and their interactions with health-care professionals within a biopsychosocial framework. While each stage is not exclusive, nor would all families go through each stage in the order shown, this model offers a means of understanding a family's reaction to the diagnosis of schizophrenia. Conceptualising the worries and stresses of each stage allows a greater understanding of the family's experience and offers opportunities for therapeutic interventions.

Expressed Emotion and the Family

Expressed emotion (EE) comprises critical or emotionally over-involved attitudes and behaviours displayed by one or more parents to their schizophrenic offspring.[38] Research into expressed emotion reveals that family dynamics are an important but controversial predictor of relapse of positive symptoms. Important studies by Brown el al.[39] and Vaughn et al.[40] established the detrimental effects of poor neuroleptic medication and high face-to-face contact (over 35 hours per week) on relapse rates in patients living in high-EE families. A recent meta-analysis showed a 48% median relapse rate in a high-EE environment, versus 21% in a low-EE environment.[41]

The effects of expressed emotion have also been shown to be remarkably constant across cultures. Leff et al.[42] showed that high-EE in Indian families are also associated with relapse. It was concluded that the significantly better outcome for Indian patients compared to a London cohort was due to the substantially lower proportion of high-EE relatives in the Indian study group.

Controversy remains over whether high-EE exists as a true cause of relapse in schizophrenia or as an epiphenomenon reflecting the difficulties of living with a patient with chronic mental illness. Recent evidence suggests that family members experience significant stress in coping with a family member with schizophrenia.[43] High-EE relatives report higher subjective levels of burden and personal stress and have more difficulty coping than low-EE relatives.[44] Indeed, Levene et al.[43] report that the "Perceived Family Burden Scale", an instrument measuring patient behaviour and family burden, demonstrates greater predictive power for early symptomatic relapse in schizophrenia than expressed emotion.

Does high-EE reflect a sub-clinical family psychopathology in affected households?[45] Expressed emotion is associated with the degree of sub-clinical psychopathology in schizophrenic patients.[46] Relatives who score highly on EE

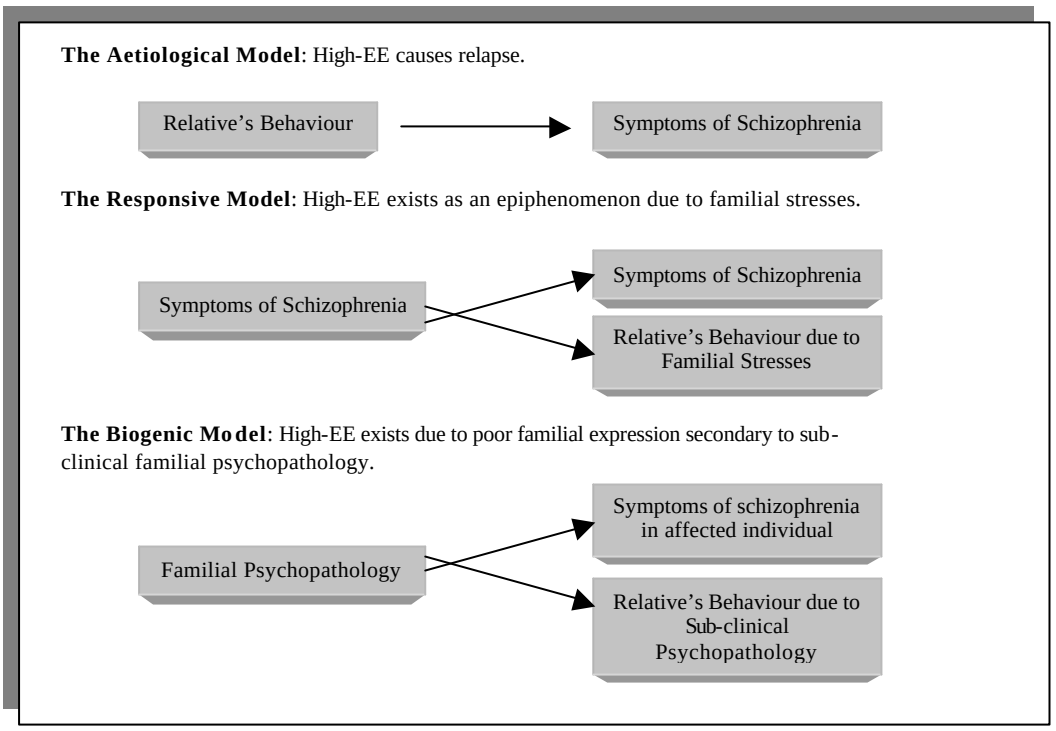


Figure 2: *Unidirectional Models for the role of high expressed emotion and relapse in schizophreni* a

(Kavanagh DJ. Recent developments in expressed emotion and schizophrenia. *Br J Psychiatry* 1992; 160: 601-620.)

assessments tend to listen less effectively and talk more in family interviews.[45] Romney contended in a recent meta-analysis that sub-clinical formal thought disorder is commoner in relatives of schizophrenics.[47] Furthermore first-degree relatives of schizophrenic probands are 15-times more likely to develop psychopathology than controls with schizotypal personality disorder and other non-affective psychoses aggregating in these families.[48]

While the mechanisms of action and exact significance of high-EE in the course of schizophrenia are unclear, it is clear that families have a role in the course of the illness. Unidirectional models of EE and schizophrenia are probably oversimplifications (c.f. Figure 2 above). Eva and Puri[45] (c.f. Figure 3 below) and Kavanagh[41] have proposed dynamic, interactional models explaining the role of EE in the course of schizophrenia. These are consistent with the vulnerability-stress model,[38] and attempt to integrate the complex forces contributing to schizophrenia's heterogeneous long-term course and outcome.

Involving the Family in Treatment

Close relatives, especially mothers, act as the major carers for patients with schizophrenia.[49, 50] With the movement away from institutionalised care for psychiatric patients, the respite afforded by this care is being replaced by greater contact with families.[33] If a patient is in regular contact with family members, it is reasonable to engage these relatives in the patient's care.[51] Families both need and want education, coping and communication skills, emotional support and to be treated as collaborators in the management of a relative's illness.[52]

Models of the aetiology of schizophrenia since the 1940's have included the schizophrenogenic mother,[53] the double bind theory[54] and marital skew and schism.[55] These blame the family for the emergence and prolongation of schizophrenia in a relative. Despite the lack of empirical evidence for such theories, covert blame on the family has often led to a therapeutic misalliance with the physician.[56] This leads to rejection of the therapist and creates an atmosphere of adversity and mistrust with poorer outcomes for the patient.

In response to evidence of the negative impact of high expressed emotion on the course of schizophrenia, family-oriented psychosocial interventions were developed. These view the family as a resource in need of education, training and support rather than as a pathogenic unit.[4] Goals of family therapy include support, family education, the reinforcement of medication compliance and family empowerment.[57] All recently developed family intervention programs begin with basic educational sessions. Subsequent sessions encourage the setting of realistic expectations and encompass cognitive behavioural techniques such as training in stress management and problem-solving skills.[58] These provide family members with both information about schizophrenia and strategies for managing common problems.

Ample evidence exists for the efficacy of family interventions for schizophrenia. Living in a family environment improves clinical and functional

recovery following psychosis.[59] In a seminal study by Leff et al.,[60] patient care including a family intervention consisting of psycho-education, relatives' support groups and at-home family sessions reduced nine-month relapse rates to 8%, compared with 50% in the group receiving pharmacotherapy and case management alone. Most studies replicate the protective effects of family therapy on relapse versus routine care alone.[58] Family interventions have also been shown to significantly reduce expressed emotion and hospitalisation and increase medication compliance.[61]

Involving family members as collaborators in the treatment of a schizophrenic relative is also beneficial for the clinician's management of a case. Issues can be discussed with patients and key relatives in the context of a "family consultation"[34] This is an opportunity to share both the family's observations, which offer a unique insight into the patient's environment and the clinician's specialised knowledge. This consultation should exist without an initial assumption that family relationships are problematic. Family members retain the right to decide on appropriate courses of action and in what way this should be a family responsibility. In this way, appropriate strategies can be devised to encourage patients to participate in programmes of social or vocational rehabilitation, or develop systems of behavioural contracting at home. Cognitive strategies such as fostering appropriate detachment and reducing criticism can also be undertaken in this environment.[57]

The education and empowerment of families has also led to the rise of family-led advocacy movements, such as the National Association for Mental Illness in the United States and Schizophrenia Ireland.[34] Resources in mental health services are scarce and the provision of family treatments fall substantially short of levels suggested by the best evidence on treatment efficacy.[62] Advocacy groups lobby for appropriate provision of services in addition to promoting schizophrenia research. Carers' and family support groups are also run by Schizophrenia Ireland, designed to educate, support and empower families, based on the principles illustrated in Table 3. Such groups importantly develop networks to reduce social alienation and stigma.[34] Schizophrenia Ireland also provides self-help (Phrenz) groups for clients, as well as social groups and theatre and vocational programmes. Thus not only is family involvement beneficial in therapy, families have a significant role in influencing the development of services and support structures through advocacy groups.

Future Directions

Even though huge advances in our understanding of schizophrenia have occurred since the days of Kraepelin and Bleuler, huge controversies remain.

While the relative importance of genetic and environmental effects in schizophrenia remain controversial, it is clear that both are important.[24] Subtyping schizophrenia into familial (genetic) and sporadic (environmental) types may be useful clinically but this genetic/environmental division has not been widely useful experimentally.[63]

Both aetiological and phenotypic (or phenomenological) heterogeneity complicate schizophrenia research. A more accurate classification may require a better understanding of the biology of schizophrenia. Similarly, clarifying the biology of schizophrenia may require a more homogenous nosology than is encompassed by current classifications.[63] New techniques, such as studies of monozygotic twins discordant for schizophrenia to study environmental factors and

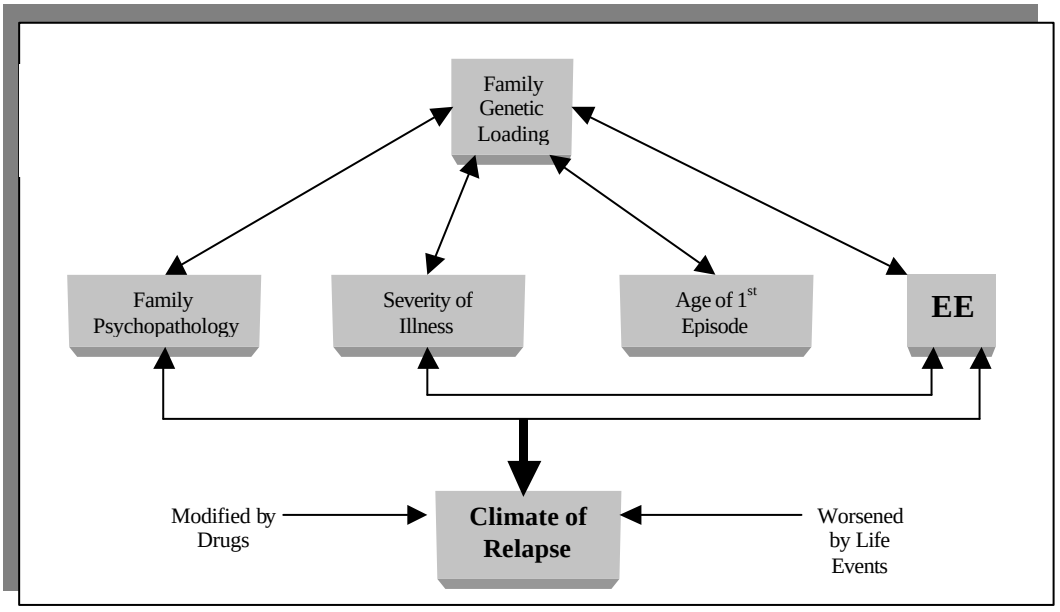


Figure 3: *A dynamic model for schizophrenia relapse*

(Eva FJ, Puri BK. Expressed emotion and a hypothetical model of relapse in schizophrenia. *Med Hypotheses* 1994; 45: 99-105.)

Table 2: *Stages of Grieving. A Model of Family Response to Mental Illness*

Stage 1: Initial Awareness	*"We just thought we had a difficult child – we didn't recognise the mental illness."*
Stage 2: Denial	*"When he first got ill, I thought he was on drugs."*
Stage 3: Labelling (At the time of a dramatic crisis which requires more drastic action than calling the family doctor or consulting the school counsellor.)	*"It was when she attacked her father in the car."*
Stage 4: Faith in Mental Health Professionals	*"Yes, we trusted the psychiatrists. If you have a broken leg, you go to the doctor."*
Stage 5: Recurrent Crises	*"When he first got ill, I thought he was on drugs."*
Stage 6: Recognition of Chronicity	*"It's an incurable situation is what we're finding. I still find it hard to accept."*
Stage 7: Loss of Faith in Mental Health Professionals	*"Years ago, we being 'dummy parents' thought the experts knew what they were doing."*
Stage 8: Belief in the Family's Expertise	*"When somebody is in the home with you all the time, you get to know when medication is working and when it isn't."*
Stage 9: Worrying About the Future	*"The future is the biggest question on my mind. My husband is 60 and I'm 59. And we hope to live forever, as long as our son does. Who's going to care about him as much as we do?"*

(Tessler RC, Killian LM, Gubman GD. Stages in family response to mental illness: an ideal type. *Psychosoc Rehab J* 1987; 10: 4-16.)

advances in genetic techniques such as genome-wide scanning, offer hope for eliciting the complex aetiology of schizophrenia.[64]

As models of the aetiology of schizophrenia are unfolding, so too are models of its course. Competing models for the role of expressed emotion exist,[41, 45] yet these remain largely theoretical. Further research is needed to clarify the true aetiological, responsive or biogenic role of expressed emotion in the context of the biopsychosocial vulnerability-stress model of schizophrenia.[38]

While it is clear that family intervention is more effective than "routine care" in preventing relapse,[46] no clear advantage has been found for any one format of family intervention. New studies are required to determine the "critical ingredients" of family interventions. The scope of patient groups and evaluated outcomes should be expanded.[65] Together with further research, advances in therapy should also include funding for provision of increased family services for education, support and day-care.

In this article, the role of the family in the aetiology, acceptance, course and treatment of schizophrenia has been discussed. One can conclude that while schizophrenia is indeed an "elusive disease", it is becoming progressively more "known to medicine". Perhaps in time, its true origins and most appropriate management will be revealed.

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