TECHNICAL COMMENTARY

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Family relationships

Introduction

Familial expressed emotion involving hostility, emotional over-involvement, and critical comments has been associated with increased psychotic relapse in people with schizophrenia, so these traits may contribute to the development of psychotic symptoms in vulnerable individuals. Negative parental affective style involving guilt induction, over-intrusiveness and personal criticism, as well as a lack of clarity in communication (communication deviance) may also increase risk for schizophrenia.

Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2000 that report results separately for people with a diagnosis of schizophrenia, schizoaffective disorder, schizophreniform disorder or first episode schizophrenia. Due to the high volume of systematic reviews we have now limited inclusion to systematic meta-analyses. Where no systematic meta-analysis exists for a topic, systematic reviews without meta-analysis are included for that topic. Reviews were identified by searching the databases MEDLINE, EMBASE, CINAHL, Current Contents, PsycINFO and the Cochrane library. Hand searching reference lists of identified reviews was also conducted. When multiple copies of reviews were found, only the most recent version was included.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis[1]. Reviews with less than 50% of items checked have been excluded from the library. The PRISMA flow diagram is a suggested way of providing information about studies included and excluded with reasons for exclusion. Where no flow diagram has been presented by individual reviews, but identified studies have been described in the text, reviews have been checked for this item. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

Results

We found four reviews that met inclusion criteria[3-6].

- Moderate quality evidence suggests a large effect of high communication deviance in parents of people with schizophrenia.
- Moderate to low quality evidence suggests medium to large effects of poor relationships with parents, family instability, and negative affective style in childhood of people with schizophrenia.

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- Moderate to low quality evidence suggests there are generally higher levels of expressed emotion in families of people at high risk of, or with, psychosis. High EE may be related to more severe symptoms and poorer functioning.

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de Sousa P, Varese F, Sellwood W, Bentall RP

Parental Communication and Psychosis: A Meta-analysis

Schizophrenia Bulletin 2014; 40: 756-768

View review abstract online

Comparison	**Communication deviance in parents of people with schizophrenia vs. controls.**
Summary of evidence	**Moderate quality evidence (inconsistent, precise, large sample, direct) suggests a large effect of high communication deviance in parents of people with schizophrenia.**
Parental communication deviance	
A large, significant effect of increased parental communication deviance; 20 studies, N = 1,753, g = 1.95, 95%CI 0.92 to 1.97, $p < 0.001$, I^2 = 92%, $p < 0.001$ After removal of one outlier: g = 0.97, 95%CI 0.76 to 1.18, $p < 0.001$, I^2 = 46.47, p = 0.014 There was no change in the effect size according to; study design, comparison group, diagnostic criteria, communication deviance rating method, inter-rater reliability not reported/reported, year of publication, verbosity, level of education, and offspring's age.	
Consistency in results	Inconsistent
Precision in results	Precise after removal of outlier.
Directness of results	Direct

Izon E, Berry K, Law H, French P

Expressed emotion (EE) in families of individuals at-risk of developing psychosis: A systematic review

Psychiatry Research 2018; 270: 661-72

View review abstract online

Comparison	**Expressed emotion in families of people at clinical high risk of psychosis or with first-episode psychosis. One study also included chronic patients.**

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Summary of evidence	**Moderate to low quality evidence (small to medium-sized samples, unable to assess consistency, imprecise, direct) suggests there is generally higher levels of expressed emotion in families of people at high risk of, or with psychosis. High EE may be related to more severe symptoms and poor functioning.**

Expressed emotion (EE)

1 study (N = 235) found perceived irritability of a close relative predicted conversion to psychosis within 18 months.

1 study (N = 210) found EE was significantly higher in families of high risk or first-episode patients compared to controls.

1 study (N = 168) found caregivers' criticism was not significantly associated with caregiver-youth agreement or symptom severity.

1 study (N = 143) found a third of the families had high EE, mostly due to over involvement. Duration of untreated psychosis was related to high EE in families of a person with first-episode psychosis. There was no relationship between EE and severity of symptoms or functioning.

1 study (N = 119) found EE was significantly higher in families of people with chronic schizophrenia or mood disorders than in families of people at risk of psychosis. There was a relationship between longer duration of untreated illness and higher levels of familial EE.

1 study (N = 99) found the levels of criticism and depression were similar between families of high risk or first-episode patients.

1 study (N = 90) found change in criticism predicted improvements in positive symptoms at 12 month follow-up.

1 study (N = 79) found adolescents at risk had increased negative self-concept, and their caregivers provided significantly fewer initial positive statements about them.

1 study (N = 78) found caregivers anxiety was strongly associated with criticism and over involvement.

1 study (N = 63) found individuals with high EE families had more severe positive symptoms compared to low EE families. There was a protective effect from warmth and optimal involvement on functioning at 6 months.

1 study (N = 49) found perceived maternal criticism was associated with fewer negative symptoms.

1 study (N = 44) found familial EE was associated with patients' symptoms and impaired functioning.

1 study (N = 32) found parents' positive remarks predicted a decrease in negative symptoms, whilst caregivers' warmth predicted an increase in social functioning.

1 study (N = 27) found both parent and child constructive communication was related to improved social functioning. Parents' critical communication was associated with more positive symptoms, but not negative symptoms.

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1 study (N = 26) found 35% of caregivers of people at risk of psychosis had high EE, mostly critical comments. Higher involvement, positive remarks and warmth by caregivers were associated with a reduction in negative symptoms and an increase in social functioning by 3 months.	
Consistency in results	Unable to assess; no measure of consistency is reported.
Precision in results	Unable to assess; no measure of precision is reported.
Directness of results	Direct

Laurens KR, Luo L, Matheson SL, Carr VJ, Raudino A, Harris F, Green MJ

Common or distinct pathways to psychosis? A systematic review of evidence from prospective studies for developmental risk factors and antecedents of the schizophrenia spectrum disorders and affective psychoses

BMC Psychiatry 2015; 15: 205.DOI 10.1186/s12888-015-0562-2

View review abstract online

Comparison	**Childhood family relationship factors in people with schizophrenia vs. controls.**
Summary of evidence	**Moderate to low quality evidence (small to medium-sized samples, unable to assess consistency, imprecise, direct) suggests medium to large effects of poor relationships with parents, family instability, high communication deviance, and negative affective style in childhood.**

Family relationship factors

2 prospective studies (N = 193 and N = 85) reported significant, medium to large effects of increased risk of schizophrenia with unsatisfactory or poor relationships with a parent during childhood, and a reduced risk of schizophrenia with good relationships with a parent;

Unsatisfactory relationship with mother: OR = 5.56, 95%CI 2.17 to 14.22, $p < 0.01$

Unsatisfactory relationship with father: OR = 5.88, 95%CI 2.29 to 15.07, $p < 0.01$

Poor parental relationship: OR = 4.31, 95%CI 1.51 to 12.32, $p < 0.05$

Good parental relationship: OR = 0.25, 95%CI 0.08 to 0.82, $p < 0.05$

1 prospective study (N = 678) reported a significant, medium sized effect of increased risk of schizophrenia with atypical mother-child interactions during childhood (adjusted for sex and SES);

Atypical mother-child interactions: OR = 2.65, 95%CI 1.20 to 5.60, $p < 0.05$ *1 prospective study (N = 103) reported a significant, medium size effect of increased risk of schizophrenia with more family instability or paternal conflict during childhood, but no significant association with maternal conflict;* Family instability: OR = 2.36, 95%CI 1.10 to 5.09, $p < 0.05$ Paternal conflict: OR = 2.41, 95%CI 1.12 to 5.20, $p < 0.05$ Maternal conflict: OR = 1.74, 95%CI 0.81 to 3.72, $p > 0.05$ *1 prospective study (N = 51) reported a significant, medium size effect of increased risk of schizophrenia with parental high communication deviance during childhood, and no significant differences with parental low communication deviance;* High communication deviance: OR = 4.18, 95%CI 1.20 to 14.59, $p < 0.05$ Low communication deviance: OR = 0.15, 95%CI 0.02 to 1.25, $p > 0.05$ *1 prospective study (N = 52) reported a significant, large effect of increased risk of schizophrenia with negative parental affective style during childhood, and reduced risk of schizophrenia with benign parental affective style;* Negative affective style: OR = 14.02, 95%CI 3.18 to 61.82, $p < 0.01$ Benign (non-negative) affective style: OR = 0.05, 95%CI 0.01 to 0.38, $p < 0.01$	
Consistency in results	Unable to assess; no measure of consistency is reported.
Precision in results	Imprecise
Directness of results	Direct

Roisko R, Wahlberg K, Miettunen J, Tienari P

Association of parental Communication Deviance with offspring's psychiatric and thought disorders. A systematic review and meta-analysis

European Psychiatry 2014; 29: 20-31

View review abstract online

Comparison	**Association of parental communication deviance with schizophrenia spectrum disorders in the offspring vs. controls.**
Summary of evidence	**Moderate to low quality evidence (inconsistent, imprecise, large sample size, direct) suggests increased parental communication**

	deviance in parents of people with schizophrenia spectrum disorders.
Communication deviance scores	
A large, significant effect of increased communication deviance scores in parents of people with schizophrenia spectrum disorders; 1 prospective study and 6 cross-sectional studies, N ~ 1,139, *d* = 0.71, 95%CI 0.21 to 1.37, *p* = 0.007, I^2 = 89.5%, *p* < 0.001	
Consistency in results	Inconsistent
Precision in results	Imprecise
Directness of results	Direct

Explanation of acronyms

CI = Confidence Interval, *d* = Cohen's *d* and *g* = Hedges' *g* = standardised mean differences (see below for interpretation of effect size), I^2 = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), N = number of participants, *p* = statistical probability of obtaining that result (*p* < 0.05 generally regarded as significant), SES = socio-economic status

Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[7].

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† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) which allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect[7].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[8]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios

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measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (*b*) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

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‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula[7];

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

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§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed[9].

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

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References

1. Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMAGroup (2009): Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *British Medical Journal* 151: 264-9.
2. GRADEWorkingGroup (2004): Grading quality of evidence and strength of recommendations. *British Medical Journal* 328: 1490.
3. Laurens K, Luo L, Matheson S, Carr V, Raudino A, Harris F, *et al.* (2015): Common or distinct pathways to psychosis? A systematic review of evidence from prospective studies for developmental risk factors and antecedents of the schizophrenia spectrum disorders and affective psychoses. *BMC Psychiatry* 15: 205.
4. Roisko R, Wahlberg KE, Miettunen J, Tienari P (2014): Association of parental communication deviance with offspring's psychiatric and thought disorders. A systematic review and meta-analysis. *European Psychiatry* 29: 20-31.
5. de Sousa P, Varese F, Sellwood W, Bentall RP (2014): Parental Communication and Psychosis: A Meta-analysis. *Schizophrenia Bulletin* 40: 756-68.
6. Izon E, Berry K, Law H, French P (2018): Expressed emotion (EE) in families of individuals at-risk of developing psychosis: A systematic review. *Psychiatry Research* 270: 661-72.
7. CochraneCollaboration (2008): Cochrane Handbook for Systematic Reviews of Interventions. Accessed 24/06/2011.
8. Rosenthal JA (1996): Qualitative Descriptors of Strength of Association and Effect Size. *Journal of Social Service Research* 21: 37-59.
9. GRADEpro (2008): [Computer program]. Jan Brozek, Andrew Oxman, Holger Schünemann. *Version 32 for Windows*.